

# 生态之城 FERTILE CITIES

VINCENT CALLEBAUT ARCHITECTURES, PARIS

(比)文森特·卡勒博 / 编 孙哲 / 译

辽宁科学技术出版社

LIAONING SCIENCE AND TECHNOLOGY PUBLISHING HOUSE



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“上天逐月吧，即便错过，你也会闪耀在群星间！”

——奥斯卡·王尔德

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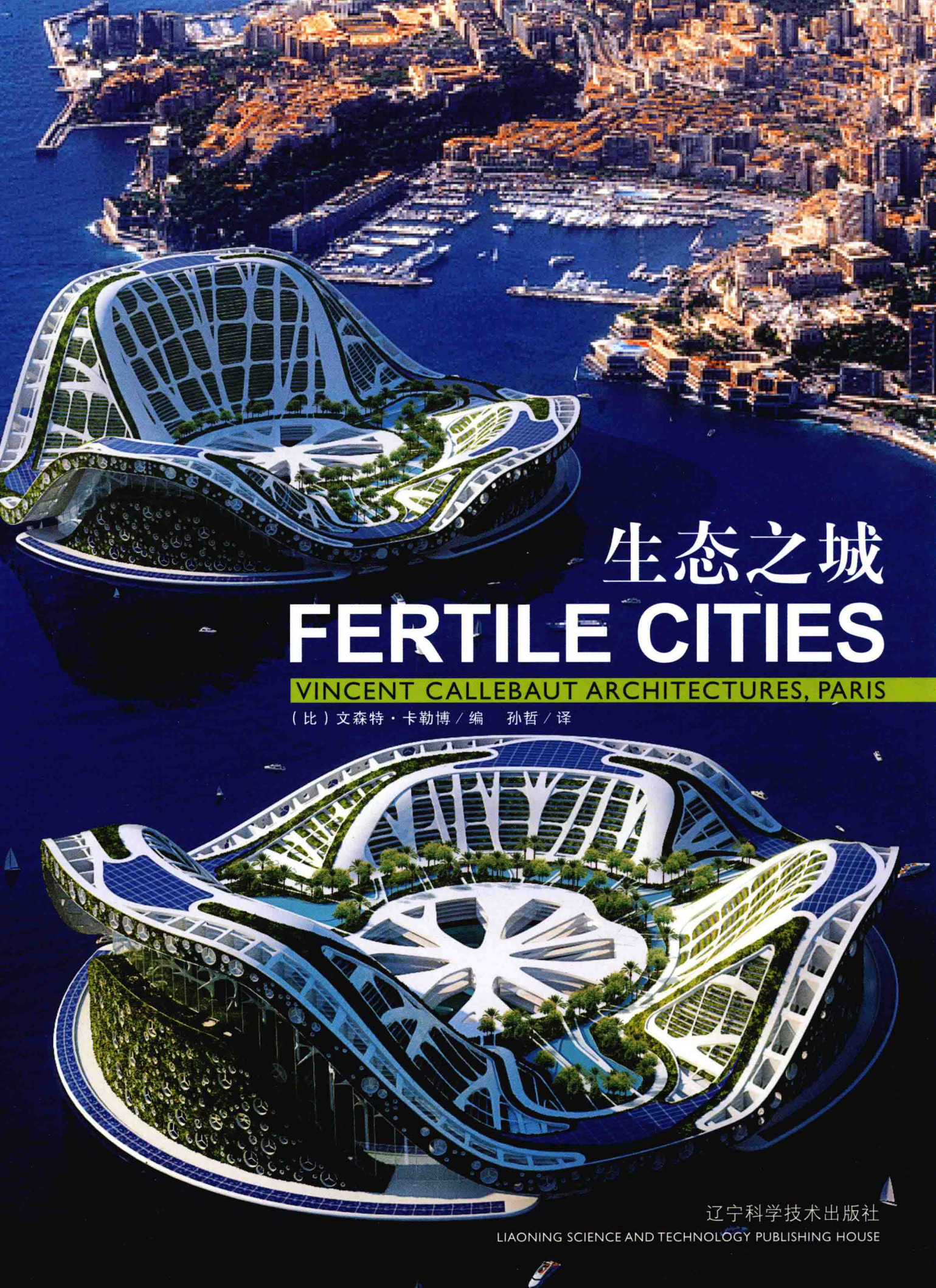
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## ■ 生态之城 FERTILE CITIES

Vincent Callebaut Architectures, Paris



Establishing his sterling reputation as practitioner of sustainable architecture, Vincent Callebaut militates continuously for the ecosystemic development of new fertile cities of tomorrow via an investigation process mixing the biomorphism, the bionic and the biomimicry to information and communication technologies in order to create new eco-responsible lifestyles.

Awarded in the top 50 of the Green Planet Architects, Vincent Callebaut is referenced as one of the best eco-prospective and visionary architects by the Time Magazine "Imagining fantastical projects that address the world's environmental and social ills".

作为可持续建筑的践行者，文森特·卡勒博声名远播。在研究中，他将生物形态主义、仿生以及仿生学与信息和通信技术相融合，创造有益生态的新型生活方式，以此对未来新兴城市的生态发展产生影响。

位列绿色星球50位顶级建筑师之一的文森特·卡勒博因其“能够解决全球环境和社会顽疾的梦幻建筑设计”而被《时代》杂志誉为最具生态视角和远见卓识的建筑师。

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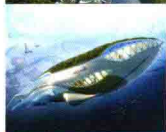
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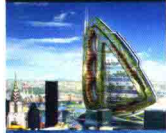
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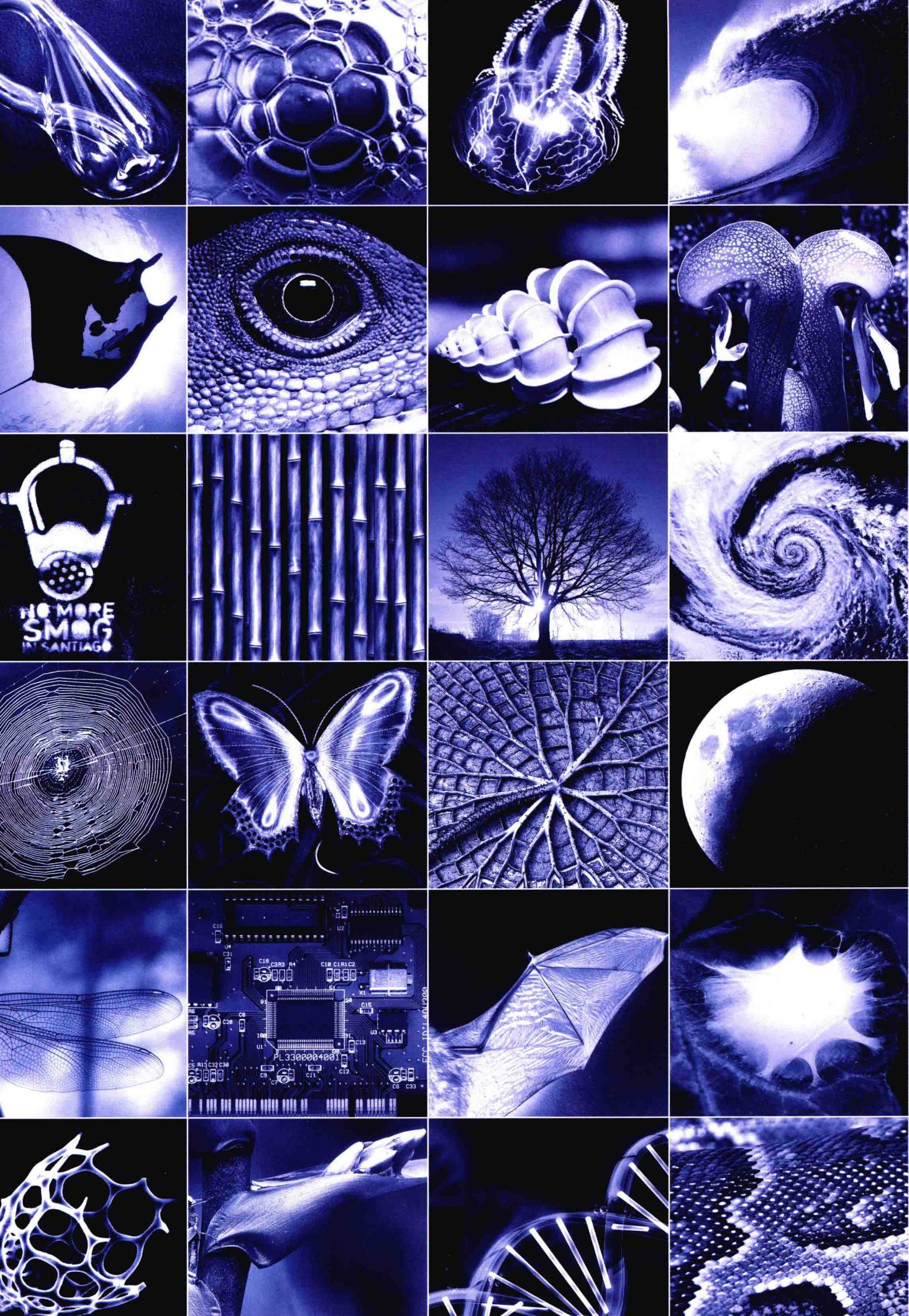
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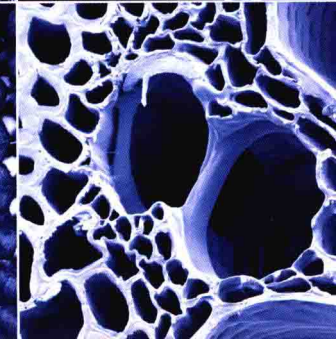
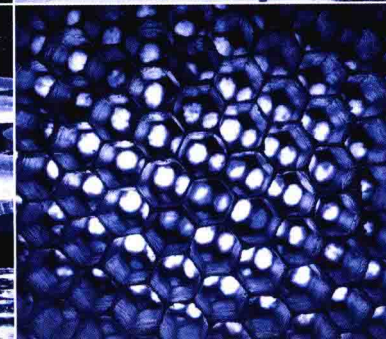
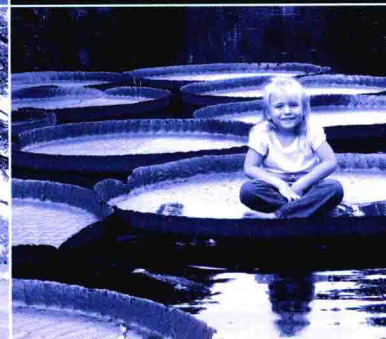
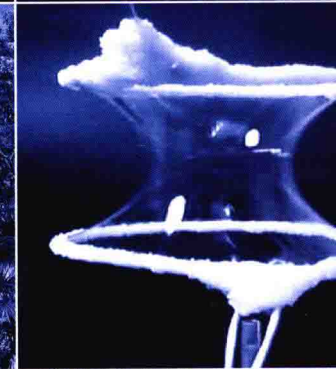
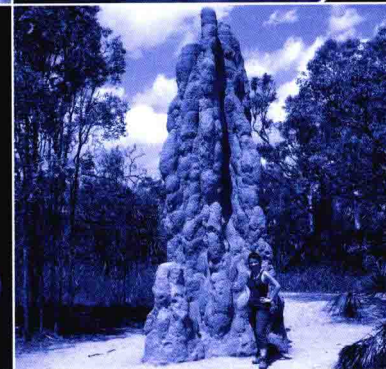
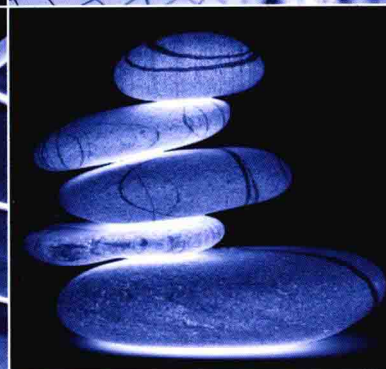
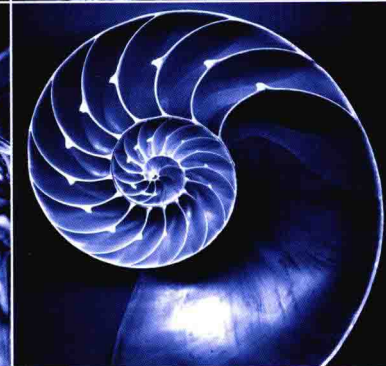
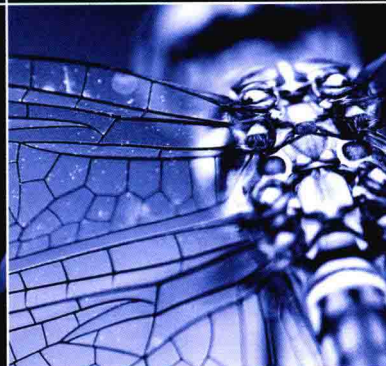
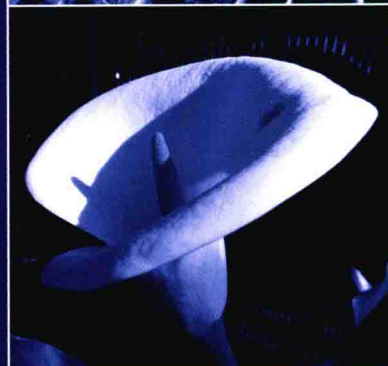
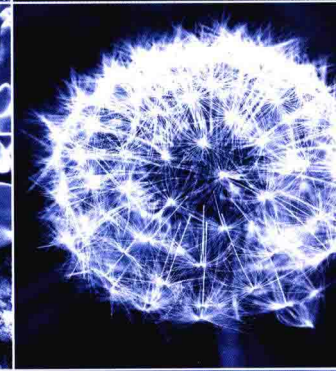
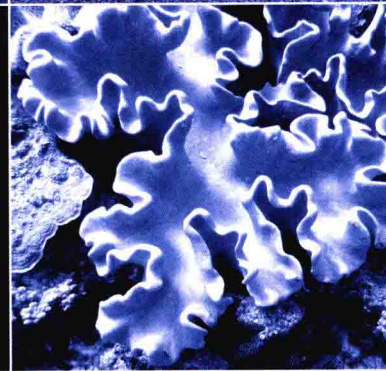
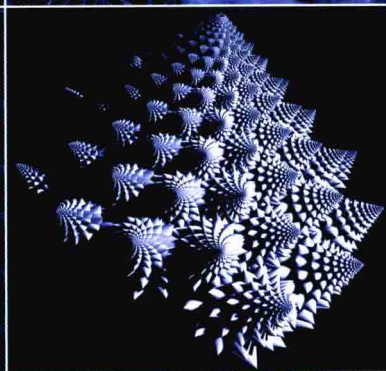
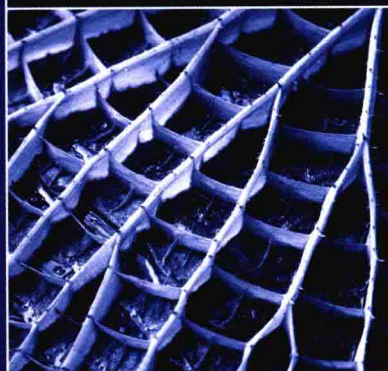
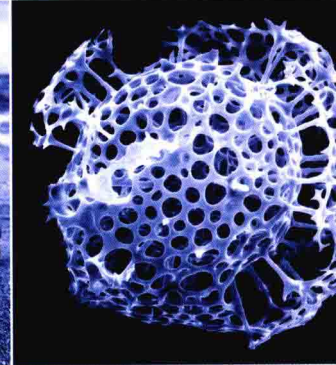
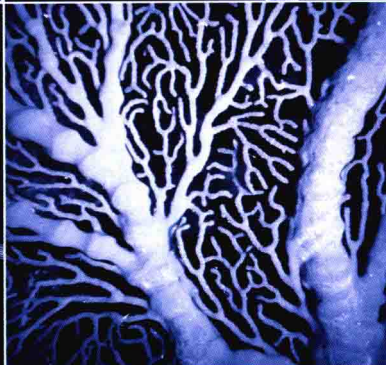
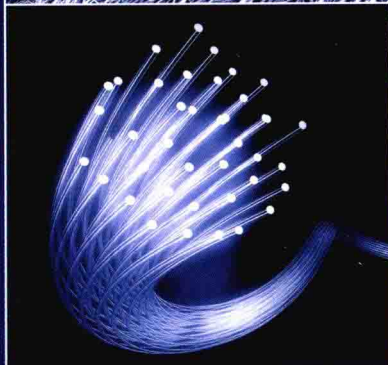
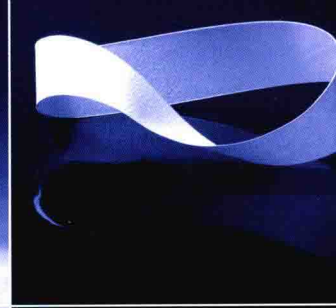
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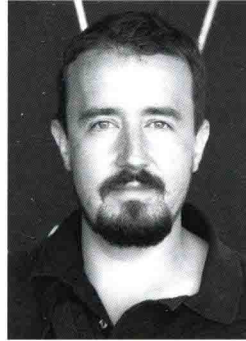


# FERTILE CITIES

## Eco-Lifestyles inspired by Biomimicry

by Vincent Callebaut, Paris 2013, France

Lead Architect, Vincent Callebaut Architectures



At the international crossroads of an economic and ecological crisis, the world's citizen seeks to reinvent himself through an eco-responsible way of life without putting a mortgage on future generation's destiny! With the goal of passing out stressful statement of facts and to propose alternative solutions, my agency "Vincent Callebaut Architectures" builds gates between fundamental laboratory research and industry applied research in order to conceive new architectural prototypes resilient to climate dysfunctions and growing pollution of our blue planet.

At the dawn of the third industrial revolution which emerges for a decade by the merging of Biotechnologies and Information and Communication Technologies, our green architecture introduces perspectives of new metabolic urban processes which are behaving on a biomimicry way, like mature ecosystems where nothing is lost and all is recycled or transformed. Like a tropical forest, our "post carbon" cities have to be eco-conceived to transform constraints in opportunities recommending on one side a self sufficient energetic part (either it is electric, calorific or alimentary) and on the other side recycling in sustainable energies of pollution waste. To adapt form to function, to bet on biodiversity, to program the multi-functionality, to encourage multi-culture and self management, these are the keys of an urban and social success to initiate the symbiosis within the couple Human-Nature.

The most ancient living form appeared 3.8 billion years ago. On a sustainable matter, human societies are late comparing to nature. If only 1% of species have survived, adapting relentlessly and this without a drop of petrol, their survival deserves respect. Inspired from these billion of years of research and development, new approaches of innovation targeting the modification of the carbon assessment are guiding us to the three references used by contemporary biotechnologies: Biomorphism, Bionic, and Biomimicry.

First of all, the Biomorphism allows us to study the intelligence of nature's shapes which uses often a minimum of material for a maximum of energetic effectiveness (e.g.: wings of the eagle, the hydrodynamic spiral shape of the nautilus, the natural ventilation of termite's nests). Then, Bionic makes us understand the strategy of the living and the structural ingenuity of materials (e.g.: plasticity of water lilies leaves, hyper resistivity of dragonflies wings or beehives honeycomb). At last, Biomimicry allows us to analyse and transpose to the scale of a city all retroactive effects which make long living mature ecosystems through diversification, cooperation and reduction of need from source (e.g.: self regeneration agriculture, photo synthesis copying, bio-hydrogen production from sea weed).

While the primary reason of architecture, from dawn of times, is to protect mankind from nature, the contemporary city wishes through these emergent methods to reconcile human with its natural ecosystem. Architecture makes itself metabolic, fertile and creative! Facades become like epidermises, intelligent, self regenerational and organic. They are moving material, covered of free plants and always adjust shape to functionality. Roofs become new grounds of a green city. The garden is not placed side by side with the building anymore, it is the building!

Architecture is now cultivable, edible. The vertical flows become digestive organs, metabolizing the waste of alimentary and everyday life. Architecture is not anchored into the ground anymore but planted in the soil, exchanging continuously with it organic materials transformed in natural richness.

Such green architectural projects are the sum of inter-disciplinary think tanks gathering around round tables international specialists whose intellectual and cultural complementarities lead us for a decade now to the elaboration of these new fertile cities prototypes, from conception to realisation.

© Vincent Callebaut, Lead architect



# 生态之城

## 仿生学启迪下的生态生活方式

文森特·卡勒博，法国巴黎，2013年

(文森特·卡勒博建筑事务所首席建筑师)

在经济与生态危机共同威胁着全球的时候，实际居民正通过一种对生态负责的态度去寻找新的生活方式，这种方式将彻底摒弃牺牲下一代未来的态度！基于传播以上强有力主张的目的，并设想了一些解决方案，“文森特·卡勒博建筑事务所”在基础实验研究和工业应用研究之间建立了几道互通的大门以构想新的建筑模型来应对气候的机能障碍和蓝色星球不断扩大的污染趋势。

在第三次工业革命的初期，生物技术和信息产业出现了，绿色建筑将新的观点介绍给大众。这些观点认为都市的进程是以生态模拟的方式进行新陈代谢的，这就像是一个成熟的生态系统。在这里，没有东西是会消失的，一切都在循环或是被转移。如同一个热带雨林，“后碳”城市的设计必须以生态的视角去构思，去改变，一方面自己能够供应充足的能源，一方面能在污染物和废弃物中回收可持续使用的能源。适应从形式到功能，到物种多样性，到多功能性，到多元文化和自我管理，这些都是一个城市和社会成功的关键。

大部分的现代生活方式在38亿年前形成。在可持续性的相关问题上，人类社会的产生较自然的形成要晚。如果只有1%的物种能够生存下来，它们适应了不减少一滴汽油的残酷环境，它们的幸存值得尊敬。通过数十亿年的发展和研究，在基于改变碳指数的前提下，创新方法正在指导着我们去依靠三种当代生物技术：生物形态主义，仿生学，生物模拟。

首先，生物形态主义允许人们去研究自然形态的智慧，它们往往能用最少的材料产生最大的能量效应（例如，鹰的翅膀，鹦鹉螺的流体力学螺旋形状，白蚁巢穴的自然通风性）。然后，仿生学让人们理解生存和材料结构的巧妙设计（例如，睡莲叶的适应性，蜻蜓翅膀和蜂巢的高电阻性）。最后，生物模拟让人们去分析和变换城市的规模。用研究的成果来使生态系统成熟且长效，通过生物的多样性，合作及减少资源的需求（例如，农业的自我革新，照片的合成复印，从海藻中提取生物氢产品）。

建造建筑的初级原因，从最开始是保护人类远离自然的危害，现代的都市希望能够通过应急的办法来调和人类和自然生态系统的关系。建筑本身变得可以进行新陈代谢，可以进行繁衍，且具有创造力。建筑的里面变得更接近动植物的表皮，充满智能，能自己更新且有机。表面的可移动材料，覆盖着具有调节功能的植物。屋顶成为绿色城市的新地面，公园不再与建筑并肩，它本身就是一座建筑！

现在，建筑是可以培育的，可食用的。建筑纵向上变成了消化器官，可以代谢日常生活产生的废水。建筑不再固定在地面上，而是种在土里，能与它自身在自然中提取的有机材料进行不断的交流。

这类绿色建筑项目是由国际上的专家们集体构思出的跨学科项目的汇总。这些项目是充满智慧的，文化互补的，指引着人们在未来10年里能够让这些新生的生态城市模型从构想变成现实。

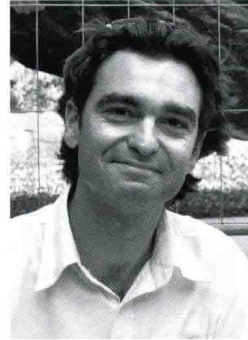


# PHYSIOTOPIAE

## A look into the work of Vincent Callebaut

by Ugo Bellagamba, Nice 2013, France

*Artistic Adviser of the Utopiales, international Science Fiction festival of Nantes (France); Science Fiction author, assistant professor in History of Law and Politics (University of Nice, France)*



© Ellen Herzfeld/Quarante-Deux

The first time you set eyes on the helicoidal structure, lushly clad in trees, of the Agora Garden double tower designed by Vincent Callebaut and his VCA team for Taiwan - currently under construction in the residential area of XinYin in Taipei City and set for completion in 2016 - you enjoy its deeply dynamic aesthetic shape.

Spiralling up around its core, as the swirling dress of a dancer, it seems to bind heaven and earth together. It reminds of the endless twist of a DNA double helix, evoking the advance of mankind as a species, through ten thousand generations of different individuals. Set against the preexisting cityscape, Agora Garden fits so harmoniously that it seems it has always been there, a part of the city's collective subjectivity, throwing a bridge between people's inner worlds and the threatened diversity of their environment. I believe it is the essential simplicity of its shape that instantly charms. Who wouldn't dream of living, even for a short while, in one of its forty modular flats, each a DNA strand stretched toward the sun? Agora Garden is almost already a piece of heritage; its inauguration will be a major political and cultural event.

But the work of an architect, especially Vincent Callebaut, is a quest for beauty that isn't limited to the research of a shape, however perfect it might be. An architect is no hermit whose knowledge is the fruit of asceticism and meditation. An architect is first and foremost a sharp observer of social interactions, of urban habitat and the links between individuals and social groups they engender. He seeks to understand the way people gather together and why they have been doing so for 12,000 years. Some human cities are viable, sustainable,

others are doomed to obsolescence, crisis and death; and their fates are not solely bound to the quality of their political institutions or the education of their citizens.

An architect has the power to alter reality or, at least, the way any society pictures reality. He pits the city against its reflection in people's eyes. Doing so, he stands at the crossroads between philosophy, history, law and even politics. An architect is a cultural actor, a civilization engineer, whose every project, be it a museum, a train station, a public building or a residence, consolidates the existing city. Conversely, he may also weaken it, throw it dangerously off balance and even make it unhealthy. This is the reason why an architect is generally faced with a choice in his career, between utopia and reality. He can opt for groundbreaking projects, utopian projections of uncompromising ideas which become, at best, models to emulate, at worst, exemplary failures. Or, he may turn his back on his dreams of youth, and carry out short term orders, conducting the erection of functional, lusterless buildings which, however devoid of marginality, are nevertheless utterly useful and necessary.

This impossible choice, supposedly inevitable, Vincent Callebaut has refused to make. Like Alexander the Great, he has decided to cut the Gordian knot and map out new potential territories, walking a thin crest line between reality's predictability and perfection beyond reach. This is the very foundation of his architectural challenge and the mark of his commitment as a citizen. His aim is to deliver working utopias to an insecure world. His Utopias are reassuring milestones to the future, allowing us to tame it, to envision it without worrying so much. They give shape to concrete places, built with readily available technologies and materials but bearing high hopes. Vincent Callebaut's ambition is neither Promethean (man has already stolen fire from the gods and nuclear power from Nature) nor is it strictly speaking utopian (his designs are more than lofty criticisms of existing cities and their social shortcomings). All considered, Vincent Callebaut's creations are close to Jules Verne's works. They strive to enchant the future and pave a didactic way to build it, to comprehend social possibilities yet to come without overlooking all the necessarily difficult steps that precede them. As any building, be it made of wood, ideas or granite, it must be erected first.

The "Lilypads", his remarkable floating ecopolises, are vivid illustrations of such a process. These nomadic, self-sufficient cities are made for climate refugees, for the bewildered survivors of coastal disasters or earthquakes. They are shelters for uprooted people, for stranded survivors in search of a haven, a sanctuary where to find themselves, to become human again. When the world must be rebuilt, the city, according to Vincent Callebaut, must reinvent itself in the shape of an ark. He



does not mean a biblical Ark, a mere metaphor that has no real purpose. He means a concrete hyper-technological ark whose amphibian structure was inspired by unsinkable giant Amazonian water lilies. A safeguarding habitat, by essence temporary, equipped with highly efficient automatic systems, able to ensure the survival of 50,000 individuals. "Lilypads" are not optimistic visions of science-fiction; they are tools for the near future.

We should also briefly mention the "Coral Reef" project, imagined by Vincent Callebaut's team for one island of Haiti whose heart was struck and whose side was torn apart by a violent earthquake in 2010. Composed of environmentally neutral dwellings (which produce no unrecyclable waste) and based on modular and standard units making them all equal, Coral Reef calls to mind the autarky of state-cities in Ancient Greece, finally made real. It also gives a believable shape to the future, inspired by corals, facilitating the circulation of air, water and life, the ever renewed exchange between light and shadow. Coral Reef is not a mere vision, informed in hindsight by the bitter lessons given by Nature. It is a proposition, a social step toward the adaptation of Mankind to a new type of environment, and, by extension, of urban organization.

Designing eco-responsible, energetically neutral cities that add no further burden on an already altered environment is just a starting point, nothing more. It is not enough to orchestrate a sustainable utopia. Vincent Callebaut's message has not a sole purpose to raise awareness; it also has a clear ambition to establish a programme. To step into the future, we must "repair" our previous mistakes and clear the accumulated waste. And this without, at any time nor for any price, sacrificing Humankind itself. To degrowth, Callebaut responds with regeneration. To the advocates of a vengeful environmentalism, Callebaut responds with a Humanism reconciled with Nature. That is the reason why V.C. also invents cleaning cities, able to heal the world itself. That is for example the case of "Hydrogenases", haughty-curved flying cities which self-produce, thanks to crops of green algae that proliferated as the climate changed, the hydrogen they need to become gracefully airborne and stay aloft. About 400 meters high, 180 meters in diameter, these aerostats would house strolling business districts, but also residential units, shops, hospitals and leisure spaces. Their hyper-technological nomadism, presented hereinafter, is a way to reconnect Mankind with natural cycles, ancestral migrations. Since the city is no longer sedentary, it no longer wears out its near environment. Hydrogenases literally clean the world and produce all the motive power they require. These true XXIst century phalansteries even have their aquatic anchorage, their daymark and their docking bay: floating farms that combine the manifold functions of water treatment, using algae to recycle the waste gathered by hydrogen-propelled boats, technical maintenance, fuel supply and runway. Even better, thanks to underwater "seamills" harnessing the energy of tides, the farms produce their own electricity.