

stefano boeri 斯坦法诺·博埃里 编著

a vertical forest 一座垂直的森林

instructions booklet for the prototype of a forest city
森林城市原型的说明书

edited by
Guido Musante/Azzurra Muzzonigro

编辑
圭多·穆桑特、阿族拉·穆重尼格罗

with the contribution of
Michele Brunello/Laura Gatti/Julia Gocalek

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Translated by
Yibo Xu

翻译
胥一波



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forest /

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Foreword 序

I have read many works of architectural history. Some are written by Chinese authors, some by foreigners. Some are talking about classical architecture, some about modernism. I developed a conception of how cities and buildings are fostered in different societies, eras, economies and culture in the journey through books, which is usually later materialized in journeys through the world. What a fabulous experience it is! Buildings are an indispensable element of culture. Where there are humans, there are houses to shelter them from winds and rains, and markets for them to exchange goods. Naturally, these markets, if large enough, will eventually develop into cities. As an old saying goes, it takes only one year to make a village, two a city and three a metropolis, the later of which is how Chengdu, the capital of Sichuan province, got its name (in Chinese, 'cheng' means emerge and make, and 'du' means metropolis). In all forms of societies, business is the most effective impetus of prosperity. While the number of markets climbs and their scales expand, there will be more kinds of commodities available and the region will get more affluent. The resulting growth of population and city will translate into more houses, which will gradually get their own lives and evolve with the time passing. Then, we demand more materials from the earth to explore the various possibilities of buildings: as we initially began digging down, hides, grass and wood, stone and soil were our primitive 'blocks' of building. Later, we dug deeper and turned to bricks, steel, cement, glass and all kinds of metal, which were synthesised, manufactured and applied to buildings. So, besides the cause of personal security, buildings have gradually gained the function of prompting prosperity, carrying belief, and engraving down civilisation, furthering our exploitation and perception of the world. As wars and businesses help to blend civilisations of different regions, the human society has always been advancing. While wandering in different cities and countries, one can feel clearly that all men are vulnerable to the inevitable end, but those marvelous buildings will forever stay, recording the past and awaiting the future.

我阅读过很多个版本的建筑史著作，中国人写的、外国人写的、古典的、近现代的，想象不同的社会背景、时代环境、经济状况和文化风格造就了各种不一样的城市和建筑群落，在后来的旅行中又能一一见证，实在是一种很棒的体验。

建筑是个绕不过去的文化元素，有人的地方就一定有遮风避雨的房子，人一旦汇集，很快就会出现交换商品的集市，规模大了自然成了城市，有句话叫：一年成聚，二年成邑，三年成都。家乡首府蓉城的名字也来源于此。在所有的社会形态里，商业都是最快的繁荣催化剂，交易的市集增多变大，商品种类愈加丰富，一个地区会逐渐富裕，人口上升，城市的规模逐渐扩大，房子就多了起来，随着历史推进还慢慢开始有了生命，一点一点开始进化。我们向土地索取更多的材料来尝试更多的建筑可能性，从地表开始一直向地下挖掘，兽皮、草木、石土等原始素材成为建筑物的血肉，再继续掘土烧砖瓦、采矿铸钢铁，水泥、玻璃、金属等更多的材料被发现、合成、制造并使用到建筑上。建筑的功能从保护我们的安全开始，慢慢地孕育了繁荣，承载了信仰，镌刻了文明，帮我们不断地去开发和认知世界。战争和商业使不同地区的文明融合，人类社会不断推进和演化，在不同国家的城市里漫步，会深深地感受到这些，人将逝去，而那些伟大的建筑会留下，记录过去，也在期待未来。

Records about economy, art, industry and other disciplines can well reflect the change of buildings through ages. In modern times, while both architecture and social reform leap forward, our buildings rise high into the sky and roads spread toward the sea; meanwhile, old buildings collapsed, but more new ones were springing up. It seems that buildings all have their own lives, growing from short, small and simple ones with rigid facades into tall, large and complex ones with curved profiles. Nonetheless, as more mega steel "towers" shoot up into the sky and more concrete roads spread under our feet, biological species are disappearing, the sky and the sea are losing their bright colour, and the environment is deteriorating and becoming more and more alien to all of us. Suddenly, it comes to us that human civilisation has diverted from its original course of development. Every single step forward by human means one step back by the nature. Now, it is a critical point for the development of cities, where the comfort has sharply declined. Of course, "man-built environment" can never match the work of nature. It is impossible for us to demolish cities and disperse humans so as to restore nature, but no communities should develop based on destruction and sacrifice. Fortunately, it seems that we have found some possibilities in buildings: some real brave hearts and great minds are thinking about our future, and their beautiful depictions of the future should be turned into reality. I believe, their inspirations will develop over time, helping to clean our sky, bringing back butterflies and birds, contributing to city's biodiversity and enriching our life. The road for answers and solutions is bound to be bumpy, and the result unknown, but we would go hand in hand for a simple reason: here is our home.

Akpher

March 2016, in Milan

再读经济、艺术、工业等各领域历史典籍，都可一一印证各个时代的建筑，步入近现代以后，建筑的发展与社会变革一样突飞猛进，我们往天空伸展，我们往海上筑路，老去的建筑崩塌，而更多的新建筑在崛起。建筑已经有了自己的生命，从矮到高，从小到大，从简单到复杂，从直线到曲线。但是当太多的钢铁巨塔插向云端，水泥路面铺满脚下的时候，一个个物种开始消失，天空和海洋开始褪色，环境越来越糟糕和陌生。我们突然发现文明的进程似乎已经偏离了航向，人类在迈步向前，而大自然退向地平线的远方。在当今，城市的发展模式抵达临界点，舒适度生存度急剧下降，人造的环境又怎么比得上上帝的作品。我们不可能拆毁城市驱散人群来返还大自然的原貌，但任何族群的进步发展，都不应该以破坏和牺牲为前提。

不过幸而我们似乎找到一些可能性，在我们中间总有一些真正的勇士和智者在思考未来，而这些对未来的美丽描绘就应该被一一呈现。我相信这些闪亮的灵感经过时间的孕育和发酵，一定可以让蓝天回归，让蝴蝶和鸟儿回归，让城市的生命重新丰富起来，让生活的颜色丰富起来。

寻找答案的前行之路崎岖坎坷，且未知成败，但我们愿意一起携手尝试，只因为，这里，是我们的家园。

天开书系策划



2016年3月写于米兰

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seven

Introduction

inspirations /

by / stefano boeri

七个灵感

斯坦法诺·博埃里

one

In 1972 I was 16 years old and I had no idea that travelling around the streets of my city, Milan, there was a bizarre character – the Austrian artist Friedensreich Hundertwasser – who while holding a tree was preaching the idea of a new style of architecture, built around the presence of trees in houses, courtyards and rooms.

HUNDETWASSER, FRIEDENREICH * P. 78

In the middle of the streets with a small oak tree in his hand and just a few metres from the La Scala Opera House, Hundertwasser was making the case for organic architecture, based on a standard that governed the relationship between the number of humans and the number of trees in any space where people lived.

HUMANS * P. 78

At that time I was a high school student involved in the movements of the extra-parliamentary left and I was walking the same streets protesting in Milan – not about issues such as ecology and environmental sustainability but rather the great problems of social inequality, the right to education, of “imperialism”.

I considered that ecology and environment issues were superfluous and irrelevant, typical concerns of the “capitalist bourgeoisie”.

Yet in Italy, in Florence during those same years, there were some young architects and artists in their twenties and thirties who were committed to the culture of protest. They formed the Gruppo 9999 and began to think about the relationship between trees and humans in cities and build extreme and radical visions of the urban future, images of urban settings filled with forests and woods permeated by architecture.

URBAN RADICALITY * P. 54

But even their vision, so strong and radical and disturbing, fell foul of the indifference of the dominant culture within the Italian and European intellectual left.

I never thought that 40 years later I myself would be the author, right here in Milan, of an architecture that aims to revolutionize the relationship between trees and humans in an urban centre and which aims to promote a new idea of the city.

(ANTI-) IDENTITY * P. 51

CULTURAL CELL * P. 65

1972年，我16岁。那时候的我，并没有意识到，在米兰城，我的城市街道上，出现了一位怪异人物的踪迹。他就是奥地利艺术家：百水先生。百水先生 * p.78他手握着一颗树苗，宣扬着一个前所未有的建筑理念：围绕着树木，建造房屋、庭院和房间。

在马路中央，离斯卡拉歌剧院仅几步之遥，百水先生手握着一株橡树苗。那时他正在进行一个关于有机建筑的实验。这个项目试图在所有的人居空间中建立一个平衡人口数量和树木数量关系的标准。人类 * p.78

那时的我，还是一个高中生，也在米兰的同一条街道上，在国会门口，参与左派社会运动的示威活动——但那时，我并不是为了生态和环境的可持续性，确切地说，是为了社会不平等、教育权力和“帝国主义”那一类更重要的问题在抗争。

那时的我以为，生态和环境问题是多余的、没有时代意义的。它们属于典型的“资产阶级”才关心的问题。

然而，在那几年里，意大利的佛罗伦萨，有一些二三十岁的年轻建筑师和艺术家，把生态与环境作为人类文化，并投身其中。他们组建了9999团，开始思考城市中树与人之间的关系。同时，他们还对城市的未来作出了激进的展望，想象着森林和树木，激进的原型 * p.54渗透在城市建筑之间。

然而，即使他们的愿景如此强烈和震撼人心，却与当时的意大利和欧洲主流文化格格不入。

我亦未曾料到，40年后，就在米兰城中心，我自己会创作出一个变革了城市中树木与人类关系的建筑作品，并致力投身于推广这场变革。反-反城市 * p.91
文化图腾 * p.65

two

NO TREE * p. 55

The idea of building a tower completely surrounded by trees came to me in early 2007 in Dubai – one of the cradles of the new oil and financial capitalism – when as editor-in-chief of “Domus” I was following the frantic construction of a city in the desert consisting of dozens of new towers and skyscrapers.

All clad in glass or ceramic or metal.

All reflecting the sunlight and therefore heat generators: in the air and especially on the ground, the area inhabited by pedestrians.

At that time I was teaching at the Graduate School of Design at Harvard and the School magazine (“Harvard Design Magazine” ¹) had published a piece of research by Alehandro Zaera Polo which explained that 94% of the tall buildings in the world built after 2000 were covered in glass.

MINERAL CITY * p. 87

Glass and mineral skins in an increasingly artificial and mineral city.

At that time I was starting the design of two towers in the centre of Milan and

suddenly – the most radical and bizarre ideas come without warning – it occurred

MATERIALS * p. 85

to me to create two eco-friendly towers; two towers covered not in glass but in leaves – leaves of plants, shrubs, but especially the leaves of trees.

Two towers covered in life.

To convince my clients – the Italian branch of a multinational American real estate company – I asked a journalist friend to publish a picture in an Italian newspaper showing the two towers covered with trees and a compelling title: “the first ecological and sustainable tower is going to be created in Milan”.

DEMINEALIZATION * p. 85

¹ *High-Rise Phylum*, on: “Harvard Design Magazine” n. 26, Spring/Summer 2007.

2007年初，在新兴石油与金融资本的摇篮——迪拜，我突然有了一个想法：建造一栋四周被树木环绕的塔楼。当时，作为 *Domus* 杂志的主编，我正在跟踪报道这座正疯狂建设摩天大楼的沙漠城市。所有的建筑表皮都由玻璃、陶瓷材料或金属构成。所有的建筑都反射着阳光，成为一个个巨大的加热器，炙烤着空气，炙烤着地面上的行人。

当时，我在哈佛大学设计研究院任教。扎埃拉·波罗在哈佛的校刊（哈佛设计杂志第一期^❶）上发表了一份研究报告，其中提到，2000年后新建的高楼中有94%的建筑外立面被玻璃覆盖。

玻璃表皮、金属外观及人造矿物立面的建筑，在城市中越来越普遍。

那时，我正在设计米兰市中心的两栋塔楼。毫无征兆地，一个冲动怪异的想法产生了——创造两栋生态友善的塔楼；他们不被玻璃，而是被树叶覆盖，不仅是灌木的树叶，更重要的是乔木的树叶。

生机勃勃的两栋大楼！

为了让客户，一家美国跨国地产的意大利分公司支持这个创意，我邀请了一位记者朋友，在意大利的报纸上发表了一篇文章，题为《首栋生态建筑将在米兰建成》，并附上了一张覆盖着绿色植物的两栋大楼的图片。

❶ 高层之门。哈佛设计杂志。2007年春/夏。26期。

In fact, the promise and the intention of these two buildings (120 and 90 metres high respectively) was to noticeably reduce energy consumption thanks to the filter that a facade of leaves exerts on the sunlight plus the microclimate that is created on the balconies, which reduces the difference in temperature between the inside and the outside of the apartments by about 3 degrees.

I added in that article - which was so successful as to push my clients to take this little 'quirk' seriously - that in addition to carbon dioxide, the leaves of the trees would also absorb the pollutant micro-particles created as a result of urban traffic and so would help clean the air in Milan, as well as producing oxygen in turn.

In the following months, together with the architects in my studio **2** we wrote a 'Manifesto for the Vertical Forest' which promoted the idea of a living and sustainable architecture that would reduce fuel consumption and therefore the human impact on the environment.

The truly revolutionary aspect of the project was not of course the presence of trees and shrubs on the balconies; but the idea of hosting nearly 800 trees from 3 to 9 meters tall along the kilometer and 7000 metres of pots that lined the perimeter of the balconies of the two towers.

The idea was to have two trees for every inhabitant of the two towers, leading to a total of 21,000 plants (4,000 shrubs and 15,000 perennials and climbers). Effectively, it was the idea of building a tower for trees - which incidentally housed human beings.

2 Boeri Studio, founded in 1999 and active until 2008 was formed by the three partners Stefano Boeri, Gianandrea Barreca and Giovanni La Varra.

实际上，建设这两栋大楼（分别为 120m 和 90m 高）的初衷，是希望通过树叶在光照条件下的过滤作用，优化阳台的小气候，从而显著降低能量消耗。这样可以将室内外温差减少大约 3℃。

那篇报道卓有成效，以至于我的客户幡然悔悟，开始认真而快速地思考了这个创意的潜在价值——除了降低二氧化碳排放量以外，树叶还可以吸收由城市交通产生的污染物微粒子，进而净化米兰城的空气并产生氧气。

在接下来的几个月里，工作室 2 的建筑师们共同编写了《垂直森林宣言》，倡议宜居的生态建筑，降低燃料消耗量，减少人类活动对环境造成的影响。

这个项目真正变革性的特点，当然不仅仅是把乔木和灌木呈现在阳台上，而是在这两栋大楼上种植了大约 800 株 3~9m 高的植物。为种植这些植物，阳台上的种植盆总周长达到了 7km。

这个想法的初衷是为每位住户提供 2 株植物，最终达到引入 21 000 株植物（其中包括 4 000 株灌木和 15 000 株多年生植物和攀援植物）的目标。实际上，可以认为，这是两栋为树木而建的大楼，只不过凑巧人类也在上面居住。

2 博埃里工作室，1999 年成立，三个合伙人为博埃里、巴莱卡和拉瓦拉。

three

The trees are not “green”, they are not “forest”, they are not “nature”.

PLANTS * P. 90

Every tree is a character in the life-giving story of the planet, with its own biography and a mysterious ability to preserve our public and private memories. I owe my

THE BARON IN THE TREES * P. 98

obsession with trees to Cosimo Piovasco di Rondò, the little Baron who one evening in 1767 in Ombrosa, a small town in western Liguria, decided – at the age of 12 – to

leave the ground and live in trees for the rest of his life. The character from the novel by Italo Calvino, published in 1957, is a staple in the imagination of my adolescence;

to him I owe my fascination with the forests of olive trees and oaks that line

the shores of the Mediterranean and their undergrowth of juniper, myrtle and

helichrysum. Also to the Baron of Ombrosa, born just a few kilometers from Badalucco, the village which is home to the roots of my father’s family, I also perhaps owe a taste

for obstinacy in radical and irreversible choices. But there were other memories from my life that inspired my obsession with trees, such as visits to the building site of a small

THE HOUSE IN THE WOODS * P. 99

house designed in 1968 by my mother Cini Boeri in the woods of Osmate, near Lake

Maggiore. I was 12, like Cosimo, and I remember the decision (then very much against

the mainstream) of building a house that took up land between the birch trees without

cutting down any of them. A zigzag house, with inset sections built around the trees and

big windows that looked out on the branches. A few years later, in 1972 – the very year

HUNDERTWASSER, FRIEDENSREICH * P. 78

in which Friedensreich Hundertwasser was walking in the streets of Milan with a tree

CELENTANO, ADRIANO * P. 60

– a great Italian singer and artist, Adriano Celentano, wrote one of his most beautiful

songs about the risks of pollution and land speculation – “A 30 stories-high tree” – which ends with the vision of a tree that grows up for thirty stories in the middle of the city **3**.

With intuitive and powerful simplicity, Celentano had opened the imagination to

a new architecture.

3 “... you shouldn’t grouse if the concrete blocks your nose, neurosis is in fashion: if you haven’t got it you’re out.

Ouch. I cannot breathe any more, I feel that I’m choking a bit, I feel my breath going down, it goes down and doesn’t come back up, I only see that something is emerging... Maybe it’s a tree yes it’s a tree 30 floors high”.



树木并不是“绿色”，也不是“森林”，亦不是“自然”。

植物配置 * p.90

每一棵树，都在星球的生命故事中扮演着一个角色，它们有着自己的传奇，还具备保存公众和个体记忆的神秘能力。我对树木的痴迷源于柯西谟，他是一位来自西利古里亚地区欧布鲁萨小镇的男爵。^{《树上的男爵》* p.98}1767年，在他12岁的一个夜晚，男爵毅然离开地面，决定在树上度过余生。柯西谟是意大利作家卡尔维诺1957年发表的小说中的角色，他也是我青春期想象的主角。我着迷于地中海海滨沿岸的橄榄树和橡树森林，着迷于它们树下的杜松树，着迷于桃金娘和蜡菊，而这些，都源于他。男爵出生的欧布鲁萨，距离我父亲家族的根基巴达卢科村庄只有几公里。这也许是我既固执己见，又特立独行的原因之一。当然，生命中还有其他的一些记忆，也是我痴迷于树木的缘故。比如，^{森林之屋 * p.99}参观我母亲奇尼·博埃里于1968年在马焦雷湖附近的奥斯马泰森林设计的小房子。我那时12岁，和柯西谟当年一般大。我记得，她决定在桦树之间建造房子，但绝不砍伐树木，当时这种做法十分违背主流。^{百水先生 * p.78}于是，一栋Z字形的建筑诞生了，它行走穿梭在林间，一旦打开大窗户，窗外枝叶扶疏。几年后，也就是1972年——^{阿德里亚诺·切伦塔诺 * p.60}百水先生拿着树苗走在米兰大街上的那年，伟大的意大利歌手和艺术家阿德里亚诺·切伦塔诺，写下了一首他最美的歌《30层高的树屋》，抗议污染与土地投机。在歌曲的结尾描述了一幅美景——城市中心有一棵长到30层楼高的树³。凭借本能和直白的强大力量，切伦塔诺开启了新式建筑的灵感之窗。

³ “如果混凝土阻挡了你的嗅觉，不要有怨言，神经官能症正在流行。如果你还没有受到感染，那你太落伍了。喔，我简直无法呼吸了，我感觉有点窒息，呼吸越来越困难，越来越困难，无法恢复，我只看到某种东西在显现……或许是一棵树，哦是的，那是一棵30层楼高的树。”