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What's Next?: How Do We Make Vertical Urban Design?

下一步是什么？我们如何开展垂直城市设计?

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Abstract | 摘要

It seems sometimes as if the further away from the ground we rise, the more architectonic and less urban our buildings become. Skyscrapers have always been about power, but they should also be about society. As our global society increasingly becomes an urban one, then development of skyscrapers should be taking a critical new direction. The question is not, how many skyscrapers can we build, and how high? The questions are: How do we make vertical urban design? How do we take those facets we value the most about our urban villages – informality, flexibility, human scale, evolutionary growth – and incorporate these into vertical cities? How do we validate programs to deal with them in the context of local culture, instead of merely "attacking" localities with monotonous tower blocks? What's next for the planetary skyline, which is inextricable with the question, what's next for life on this planet?

Keywords: Architecture, Sustainability, Urban Design, Urban Planning

对我们的建筑而言，似乎在离地面越远的时候会变得越关注建筑学，也越脱离城市。摩天大楼一直都与能力相关，但同时它们也应该关注社会。随着我们的全球化社会逐渐转变为以城市为主体，摩天大楼的发展应该转向关键的新方向。因此问题的关键不在于我们建造多少和多高的摩天大楼？问题在于，我们应该如何开展垂直城市的设计？我们如何把我们认为城中村最有价值的方面：自主性、灵活性、人性化的尺度和演进式的增长整合到垂直城市的设计中去？我们怎样达成从当地文脉的角度来处理垂直设计，而不仅仅是以单调的高楼大厦来"攻占"地方？这个星球的天际线未来会是什么样的，接下来不可避免的问题就是，这个地球上的生命会面临怎样的未来？

关键词：建筑、可持续性、城市设计、城市规划

Introduction

At the beginning of the third millennium, the world is denser than ever before. It is inhabited by more and more people, who want to consume more, who want to live with more space and comfort, and who can move around more. Such a world seeks space, almost desperately, for manufacturing, living, water, energy production, oxygen, ecological compensation, safety, and buffers, owing to the increased likelihood of natural disaster due to climate change.

Against this hypothesis, there are two possible scenarios. The status quo reaction to the need for space in an increasingly crowded world has been to create introverted, isolated, monolithic towers – 3D extrusions of 2D thinking – which create no more of a community connection than flying above the city does. We can continue with the introverted 2D city – or we can react to, investigate, explore, and analyze it. This leads us to something much more appealing and sustainable – the concepts of the Vertical Village and the Porous City, which make a 3D city. This is a community of porous towers, in

引言

二十一世纪初，世界人口密度空前暴涨。人口增加的同时，人们的消费欲也随之增长，对舒适和宽裕的居住空间、活动空间的需求也有了很大提高。同时，气候的反常变化，各种自然灾害的发生几率大大增加，也使得这个世界急需拓展更大的空间，以供人们正常的生活起居、饮食耕作、安保消费、自由转圜。

如何在日益拥挤的世界中另觅空间？为实现此需求，有两种可行的解决方案。其宗旨是建立向内发展的，独立的巨塔式构架一即在日常的二维城市发展体系上，深挖掘开拓三维空间体系一一这就像是在城市上空凌空构架各群体间的交通体系一样。也许以此，我们便可以现有的二维模式的城市架构为基础，进一步对其研究、探索、解析。该类方案最终为我们呈现的，是一个别具吸引力和可持续性的概念一一垂直村落和多孔道城市，该两者构成了一个三维化城市。它属于多孔道巨塔构架的一部分，具有固有的联通性一一这样的塔式构架能够向世界开放，并促使与千年来存在的低地势，高密度的村落相同的社群意识的产生。

which connectivity is inherent to the design – such towers "want" to do nothing but open up to the world, and foster the same sense of community that low-lying, high-density villages have done for millennia.

The Vertical Village

In order to create fully functioning communities in the sky, we need to think about not just the physical connections between people and the places they inhabit, but how spaces are programmed, and how they are interlinked. If the old thinking about communities was formerly confined to a 2D city plan, the new thinking should be about validating new programs that can deal with the context of local culture.

For example, in space-starved Taipei, it is common practice to build informal additions on top of existing buildings as families expand and needs change (Figure 1). The authorities' first reaction is to regard these as "illegal" and dangerous additions, and to have them demolished. But what if we decided to accommodate this organic trend, this clear expression of a need, instead of trying to legislate it away (Figure 2)?

We need to find ways to build for programs that the 2D city plan never anticipated, because it was always assumed that there would be more space on which to build. It is all too common today to see projects in which one function is stacked above another, and this is called a "mixed-use" building or a "city in a city." But in reality, there is very little mixing going on. A more holistic approach is needed.

Let's take a look at some projects that suggest ways to intensify use of the city, but also make it more livable.

Pig City

This project (Figure 3) explores a possible transformation of the skyscraper, which, rather than being a frozen typology, instead becomes a way of looking at the future and responding to the new needs of society.

This concept arose at a moment when crises such as Swine Fever and Foot and Mouth Disease were raising serious questions about pork production and consumption, and fighting these problems cost governments huge sums of money. Here again, two opposing reactions could be imagined. Either we change our consumption pattern and become instant vegetarians, or we change the production methods and demand organic farming. But is there space?

Figure 1. Additions on top of existing buildings in Taipei (Source: MVRDV)
图1. 台北现有建筑物顶部添加物（来源：MVRDV建筑事务所）

Figure 2. Additions on top of existing buildings in Taipei showing MVRDV intervention (Source: MVRDV)
图2. MVRDV设计后的台北现有建筑物顶部添加物（来源：MVRDV建筑事务所）

垂直村落

为了在天空建造功能健全的社群，我们不仅需要考虑人与其居住地之间的实体连接，而且要考虑空间的规划、各空间互联的问题。如果说之前对于社群的考虑只需局限于对二维城市的规划，那么该新方案的设计必须确保能够协调各种不同的地域文化。

例如，在空间匮乏的台北，居民通常会在其居住建筑顶部搭建非正式建筑，以适应其家庭人员增加或变更的需要（图1）。权威专家表示，这属于非法建筑，极具危险性，必须予以拆除。但是，与其将之视为非法建筑而彻底革除，我们是否能够转换态度和思维方式，想方设法适应该环境中人们的这种自然需求呢（图2）？

我们需要寻找的，是在普通的二维城市规划中构建前所未有的建筑计划，因为我们普遍认为，只要修建新建筑就会有新的空间。而在当今社会，我们也经常见到堆叠式的建筑，即被称为“多功用型”建筑或“城中城”。但实际上，该类建筑根本难以发挥其预期功用。所以，我们的新规划应当整体布局，从大处着眼。

下面，让我们看几个能够同时加强城市功用并且保证宜居性的规划方案。

猪城

这项计划（图3）使得摩天大楼的转型成为可能，它不是一种老朽的象征主义，而是一种真正能够预见未来，并适应社会新需求的方法。

猪城的概念来源于猪瘟、手足口病等疾病的爆发所带来的问题。该类疾病的爆发为猪肉产销模式带来巨大争议，同时政府也为应对疾病爆发投入了大量金钱。问题需要解决，对此，可以想见又会有两种不同的应对方式，一是我们转变自己的消费方式，立即成为完全的素食主义者，二是改变现有的生产模式，进行有机耕作。但是，有足够的空间吗？

这项计划提出了一种垂直的，再生性肉食（及能源）生产体系，反映了建筑所应具有的社会功用。建筑不是单纯地建造楼房。建筑应该能够严格应对当前的挑战，并适应变化。建筑应不仅仅与特定的环境相关联，还应与广泛程度上的动态变化相关联：气候，迁徙，农业等等。这才是建筑所应该担负的职责。

中国山

随着中国城市人口的增加，住房供给和相关置业需要占用的空间超出了可供应量。这提供了怎样的可能性呢？中国山的城市化融合了城市的个性化与集中责任制，将建筑与城市化相联系，并使城市化构架向景观性建筑转化（图4）。中国山是一种理想的、对未来社会革新至关重要的城市规划模型。

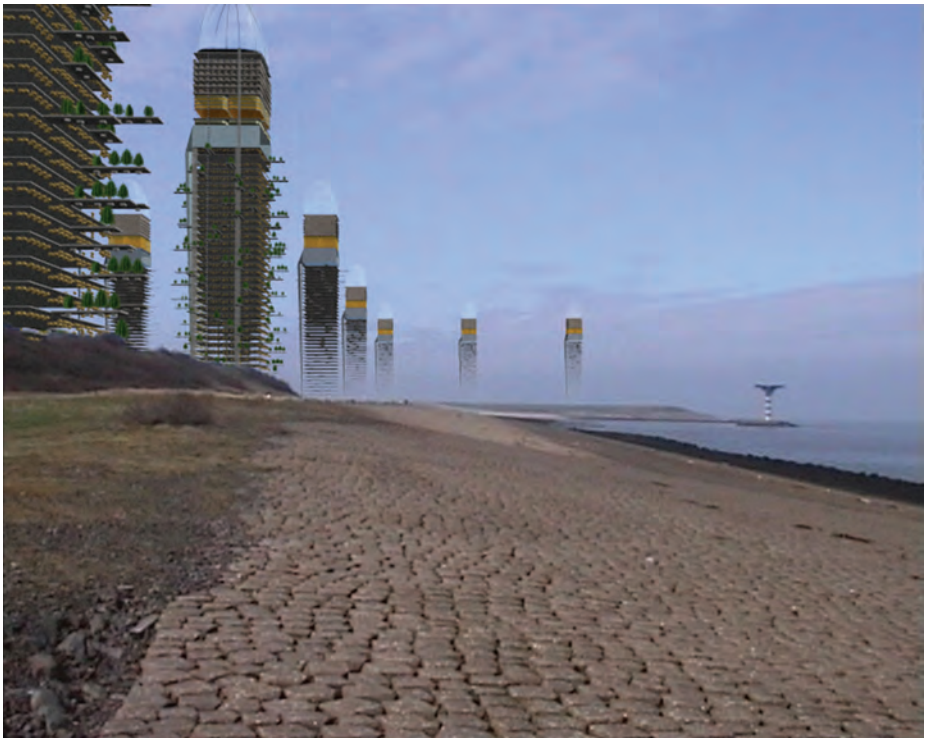

Figure 3. Pig City (Source: MVRDV)
图3. 猪城（来源：MVRDV建筑事务所）

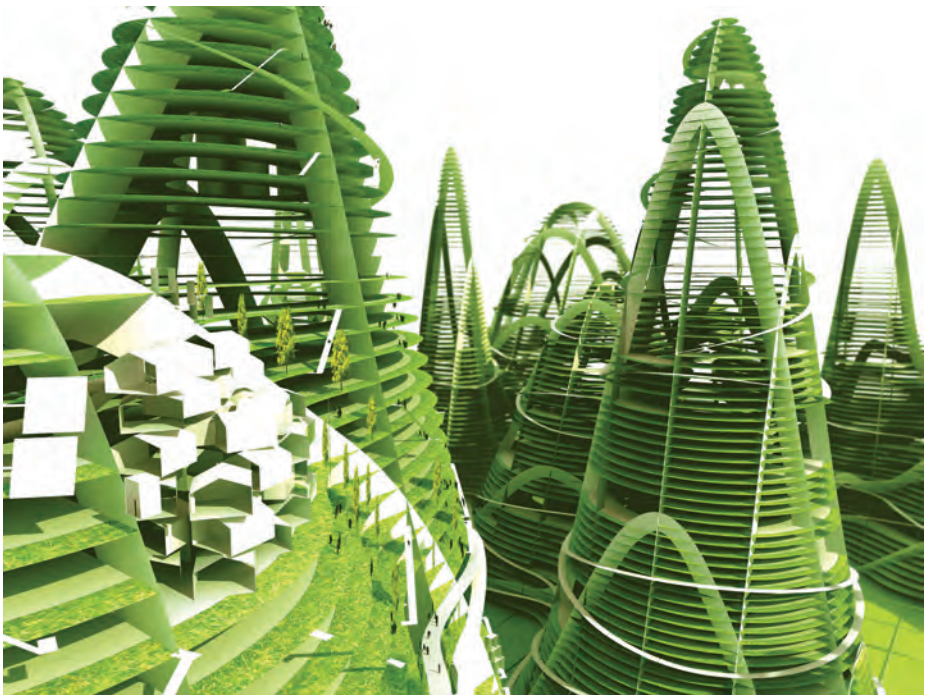

Figure 4. China Hills (Source: MVRDV)
图4. 中国山（来源：MVRDV建筑事务所）

This project, which proposes a vertical, regenerative system for meat (and energy) production, reflects the social responsibility of architects. Architecture is not simply about buildings. Architecture should react critically to contemporary challenges and look further to understand, react to, and adapt to the changes, not only related specifically to the built environment, but also to dynamics happening on a much broader scope: climate, immigration, agriculture, etc. That is a role that architects could (and should) take.

China Hills

As the urban population of China grows, housing and other programs will require more space than is available. What possibilities does this offer? Blending individuality with collective responsibilities, the urbanization shown in China Hills connects architecture with urbanism, and turns urbanism into landscape architecture (Figure 4). China Hills is a visionary project, a model through which future urban planning programs can exhort social reformation.

德国2000年汉诺威世博会荷兰馆

人口密度的增加能否不影响生活质量的提高？需要怎样的条件？自然环境在其中将发挥怎样的作用？无论怎么理解，这不都是“新自然”的主题吗？2000年世博会的荷兰展馆（图5）体现了一种科技与自然的融合，突出了自然的易变性和可塑性。其在已有公共空间的基础上，拓展出了多层公共空间。这种堆叠式构造节省了空间、能源、时间、水和基础设施，使得以往互无联系的项目达成了纵向合并，为城市带来了崭新的体验和活力。

上升式集约

在东京的销售中心Gyre（图6）和鹿特丹的临时展馆Stairs to Kriterion（图7），即是城市垂直规划的集中体现。而通常意义上的，局限于窄处“循环”或“垂直运输”规则的上升，则成为了一种社会化体验、一种艺术，毕竟，谁喜欢挤在电梯中与别人前胸贴后背呢？该种建筑使人们在三维化空间了解城市，强化了城市体验。

垂直化村落是楼群化的替代

几个世纪以来，东亚城市的肌理是由城中村所构成的，它们往往是与人群聚落相适应，非正规的 “轻质”建筑：如北京的胡同、东京的小木屋、新加坡的村庄、雅加达的甘榜以及台北的独屋和房顶建筑。这些城中村形成了各人群聚落之间的紧密联系，并且各聚落间的个性与差异也得以保存。因为这些地方大多居住着穷人，且土地便宜——因此，这些地方也容易发生改变（图8）。

自第二个千年以来，这些城市在人口和经济因素的驱使下快速转变。在残酷的“楼群侵袭”下，高楼大厦、木板砖块构建的住房单元、平面及立体楼层不断入侵，使得几百年来的城中村构造被破坏。这些外来入侵的建筑物提供了一种西方标准，破坏了本土的人群聚落模式。这些建筑阻碍了城市革新和个性化，严重影响着城市的独特性和灵活性（图9）。

那么，有没有一种更好的方式发展这些区域呢？我们能否在不牺牲城中村的基础上，使这些区域更加密集呢？我们能否应用这些本地习俗性的规则构建新的邻里关系呢？我们能否革除堆叠式的群落建筑模式，垂直化地发展城中村呢？我们能否畅想一种新的亚洲城市发展模式，可以统筹兼顾城市发展的个性化和变异性需要，以及密集发展的集中制需求？我们是否能够创造一种垂直村落———一种能够使得城市生活充分保证人身自由、人类活动多样化、灵活性和邻里关系——作为群落式建筑的替代？这种垂直村落又将是什么样呢？

Netherlands Pavilion, Expo 2000, Hannover, Germany

Can increasing population density coexist with an increase in the quality of life? What should be the conditions and what role will nature play? Is not the issue here one of a "new nature," literally and metaphorically? The Expo pavilion (Figure 5) shows a mix of technology and nature, emphasizing nature's mutability and artificiality. It provides multi-level public space as an extension to existing public spaces. This act of stacking saves space, energy, time, water and infrastructure, and allows the vertical combination of programs that traditionally were disconnected, bringing new experiences and activating the city.

Ascending Intensification

At the retail center Gyre, Tokyo (Figure 6), and the temporary pavilion Stairs to Kriterion, Rotterdam (Figure 7), the verticality of cities is emphasized. The act of ascending, normally confined to narrow "circulation" or "vertical transportation" regimes – who enjoys being stuffed into an elevator and looking at others' backs? – instead becomes a social experience, an art. It intensifies the experience of cities by allowing people to understand the city in 3D.

Vertical Village as Defense Against the "Block Attack"

For centuries, the fabric of East Asian cities has been formed by urban villages that are built up of human scale, informal, often "light" architecture: the hutongs in Beijing, the small – mostly wooden – houses in Tokyo, the villages in Singapore, the kampungs in

Figure 5. Netherlands Pavilion, Expo 2000, Hannover, Germany (Source: Rob't Hart)
图5. 德国2000年汉诺威世博会荷兰馆（来源：Rob't Hart）

Figure 6. Gyre, Tokyo (Source: Rob't Hart)
图6. Gyre，东京（来源：Rob't Hart）

在行动前，我们首先需要明确这种"村落"的优点是什么？在我看来，无非以下几点：密集、个性化、群聚性、灵活性、集中性、革新性发展、多样化、人性尺度的、公共性、随俗的、同一性。

那么，在城中村中，这些特征是怎么充分发挥作用的？

城中村

"垂直村落"和"垂直聚落"是最近比较流行的词条。这两个概念在建筑规划领域的许多工程的描述中屡见不鲜。然而，在实际应用中，其含义是什么呢？从其他成功的垂直村落、垂直聚落的案例中，我们能够学到些什么呢？

通过较为可行的规划方案，我们可知，建筑物的"村落化"需要公共空间的支持。一个开放的公共通路可有效地提供公共交通空间。而随着内部通路更像街道，这些堆叠的房屋开始变得具有"村落"的特性。这包括公共项目的恰当融合和需要足够大以适应经济可变性、支持社会互动。

到目前为止，没有任何建筑能使租户有充分的自由，随心所欲地改造建筑的外观和房型以打造其个性化的房屋。只有一些乌托邦式的方案提供这种灵活性，而正因为是乌托邦式，其最终是不可实现的。那么，这种建筑所需哪些构造要素呢？大量堆叠的楼盘面可以提供这种终极的自由，但是其建造确是消耗甚巨。采用三维网格构架是行得通的，但是同时，这会限制了建筑的开放性。而考虑到革新性的垂直增长和个体自由度，真实而灵活的建筑概念是垂直村落发展的另一种关键元素。

该建筑宗旨体现在阿姆斯特丹的Silodam（图10），一种由集合空间互相连接，并由迷你邻里社区相互融合构成的网络结构。它具有一种堆叠式结构，其中为了鼓励融合，其堆叠构架在部分相互抵消。这种迷你邻里关系由片状模块构成，可廉价而大量地生产，而且能够很容易地定制以实现个体化。

该模式的进一步探索见于Montepelier的一项住宅工程。Folie Richters的建筑构造（图11）是住房和生活质量革新进程的其中一种体现。垂直村落计划显示出了每个建筑单元的个性化，并且使得住房建设与选择更具自由性。

垂直村落构架同时能提供高质量住房和有吸引力的环境，适用于各种用户，无论年轻人还是老人，无论个人还是家庭，均是独一无二的。我们可以想见有一系列的居民区：露天家居，街上的房屋，以及房屋和公共区域和花园洋房的集合。它们具有不同的外观，不同的外立面以及不同的庭

Jakarta, as well the individual houses and rooftop-extensions in Taipei. These urban villages form intense, socially connected communities where strong individual identities and differences are maintained. Because they are, and have been, inhabited mostly by the poor, land is cheap – and therefore, change comes easily (Figure 8).

Driven by demographic and economic forces since the start of the second millennium, these cities are rapidly changing. In a relentless "Block Attack," massive towers, slabs and blocks with repetitive housing units, floor plans and façades are invading – scraping away the urban villages that have evolved over hundreds of years. These alien buildings provide a Western standard of living, destroying indigenous communities in the process. They obstruct urban innovation and discourage differentiation, flexibility and individual ideas (Figure 9).

Is there a better way to develop these areas? Could we densify them without sacrificing the informality of the urban village? Could we even apply the principles of informality to generate new neighborhoods? What if we could grow urban villages vertically, as an alternative to the monotonous sea of blocks? Can we dream a new model for the development of Asian cities that combines individuality, differentiation and collectivity with the need for densification? Can we create a Vertical Village – a three-dimensional community that brings personal freedom, diversity, flexibility and neighborhood life back into cities – as an alternative to the Block Attack? What would this Vertical Village look like?

To do this, we first need to identify the positive characteristics of what we think of as a "village." Words that come to mind include: Density, Individuality, Critical Mass, Flexibility, Collectivity, Evolutionary growth, Diversity, Human Scale, Publicness, Informality and Identity. How do these characteristics reach their potential in a vertical condition?

Village in a City

The terms "vertical village" and "vertical community" are fashionable expressions these days. These terms can be found in the descriptions of many projects in the fields of architecture and planning. But what do people actually mean when they use them, and what can we learn from other vertical villages? Can we analyze the ways other planners have achieved vertical communities?

Figure 7. Stairs to Kriterion, Rotterdam (Source: Ossip van Duivenbode)
图7. 鹿特丹天梯（来源：Ossip van Duivenbode）

Figure 8. Different villages across Taipei (Source: Left to right, up to down: Picture 3,7,8 Chun-Yan Chen, Chiung-Hsien Ho; Picture 9 Neil in Seffield UK; rest unknown.)
图8. 台北各地不同的村庄（来源：从左至右，从上至下：图3、7、8 Chun-Yan Chen、Chiung-Hsien Ho；图9 英国谢菲尔德 Neil；其余未知。）

The more promising projects show that public spaces are needed to support the "villageness" of a building. An open and public access route is effective for providing collective spaces. When internal access start to resemble streets, a stacked housing project takes on the qualities of "villageness." This scenario includes the right mix of public program, which needs to be large enough to be economically feasible and support social interaction.

So far, no built examples of projects using these descriptions give tenants the freedom to create an individual house, with a façade and shape that suits his or her desire. Only some of the utopian projects provide this

院。它将成为一种真正的能够适应市场需要并吸引不同消费人群的居民区集合。该集合同样具有总纲规划性，其最终的规划是一系列活动的集合；学生宿舍，中高价房屋，完全迎合各年龄带人群和各类社会群体。

该建筑成为了Montepelier的多面体现，其同样由多种单元组成。这些邻近单元互相堆叠产生了户外空间、庭院、广场和梯田。最终整体形成了垂直村落。建筑体量之间的空档中采入自然光和自然风景，有时可形成梯田构架。不同的邻近区域标记以不同的颜色，保证每个单元项目的视觉性，使其很容易被辨别。

kind of flexibility, and being utopian, they are unbuilt. What structural elements would these structures require? Large stacked floor plates could offer the ultimate freedom, but the large spans they need would be very expensive. A three-dimensional grid of sorts is feasible, but at the same time, it would limit the openness of a structure. A realistic and flexible structural concept is another key element in the development of a vertical village, allowing for evolutionary vertical growth and individual freedom.

This topic was addressed at Silodam, Amsterdam (Figure 10), a collection or network of mini-neighborhoods integrated and connected through collective spaces. It has a stacked program that is offset in section, in order to encourage mixing. Its mini-neighborhoods are made of modular pieces, which are mass produced and inexpensive to reproduce, but can still be easily customized and individuated.

Further exploration on the topic can found in a residential project in Montepelier. The architectural composition of Folie Richters (Figure 11) is part of a process of innovation in housing and quality of life. The Vertical Village project reveals the individuality of each unit and induces a greater freedom in the approach to housing.

It offers quality and attractive environments, both unique and suitable for all types of users, both young and old, singles and families. A

Figure 9. Modern day tower blocks (Source: Open source images)
图9. 现代高楼街区（来源：开源图片）

Figure 10. Silodam, Amsterdam (Source: Rob't Hart)
图10. 阿姆斯特丹Silodam公寓（来源：Rob't Hart）

多孔城市

多孔城市是集体主义和个人主义交汇的地方。在这里，最小的构成部分最先被设计，充分提高了城市能容纳人类规模的可能性，即使人口有了巨大增长。多孔城市利用了迭代的思想，在Why Factory实验室——由 MVRDV建筑设计事务所和代尔夫特理工大学合办的研究机构——开展试验。 各学生团队使用乐高积木创造出尽可能多的建筑原型（图12）。

工作室主要的研究议题就是，如何把更多的“空气”引入到建筑环境之中?

“空气”与建筑质量和环境质量密切相关，比如景观、日照、地面与植被的贴近度/循环流通性。使用标准建筑模块——被成为“像素”的基本建筑单元来实现快速迭代。

像素是一个中性工具，用以保持设计的可比较性，也使得测量单位更加简单。设计概念是根据封闭像素（团块）和开放像素（空白）的比率来进行评估和比较的。此外，还可以评估建筑正面和平台像素。最终，“多孔性”可以用建筑质量与外表面积的比率来描述。

当这种概念进一步发展到现实建筑领域的时候，会导致如下情形的出现：一直以来决定城市密度的二维分区规划开始逐渐变为三维分区规划，城市化也开始朝着垂直化方向发展。在以下案例中，我们证实了现实中多孔城市的外观以及运行方式。

马德里米洛德住宅

许多高层住宅都有阳台，通过它，个人或者家庭住户可以以一种私密，独占的方式来体验户外生活。同样，多单元住宅项目都有一个中央公用庭院。但是在一个垂直的多孔城市里，这两种因素得到了结合，因此庭院也就变成了一个半空中的Mirador（图13）。

Peruri 88，雅加达天空之城

低矮的雅加达甘榜（Kampung）是一片都市大杂烩，与商业区闪亮、封闭的摩天大楼形成了鲜明对比。而且，如上所述，单纯的功能堆砌算是摩天大楼最普遍的原型，但对于蓬勃发展中的社区来说它并不算一个好的蓝图。这个项目把叠加式的规划当作是摩天大楼的特点，然后把功能分散在几个不同的方向上，强调不同的形状、不同的项目、不同的人之间的交汇。这样，城市大杂烩中有价值的那一部分就被转移到了空中，重新获得了活力（图14）。

挪威银行大楼，奥斯陆

作为大型的城市规划项目的一部分，这家滨水银行有17个独特的楼层，表面积达36500平方米。这个像素化的体积基于小尺寸的工作单元，可以适应于都市情景的各种影响。这种都市情景把灵活有效的组

series of neighborhoods is imagined: patio homes, houses on the street, collective houses with communal areas and garden houses. One can imagine one, two or three levels of different sizes from one to 20 houses. And they may have different appearances, different façades and different gardens. It becomes a true collection of neighborhoods that can adjust to market demand and to attract different people. This collection is also programmatic – the developed program is a mix of activities; student halls, medium-to-high-price housing, all catering to a mixture of generations and social groups.

The building becomes a multifaceted image of the city of Montpellier, which is also composed of various cells. Stacking these neighborhoods with each other creates outdoor spaces, gardens, squares and terraces. The overall result is a vertical village. Breaks between volumes bring in natural light and views, which sometimes lead to collective terraces. The different neighborhoods are articulated in different colors, ensuring that each program is visually enhanced and easily identified.

The Porous City

The Porous City is a place where collectivism and individuality meet. Here, the smallest component is designed first, which substantially improves the likelihood that the greater city will be at a human scale, even as it grows very large. The Porous City was conceived as having many iterations, through an experimental studio at the Why Factory, the research institute run by MVRDV and Delft University of Technology. Using LEGO building blocks, teams of students sought to create as many archetypes as possible (Figure 12).

The main research question of the studios was, how to introduce more "air" into the built environment?

This "air" directly relates to architectural and environmental qualities such as views, daylight exposure, accessibility/circulation on the ground, and vegetation. To iterate solutions quickly using the standard building block, the basic unit of construction was deemed to be "the pixel."

The pixel is a neutral tool to keep designs comparable and measurement units simple. Design concepts were evaluated and compared based on their ratio of closed pixels (mass) to open pixels (void). Furthermore, it is possible to evaluate façade and terrace pixels. Ultimately, "porosity" can be described as the ratio between the building mass and its envelope.

Pursuing this concept further into built reality could lead to a condition where the 2D zoning that has dominated how city densities are determined turns gradually into a 3D

织机构同各种特定的公共空间，如主要入口大厅、透明交易大厅、有遮蔽的公共通道结合起来，同时保留了城市景观线和集体平台，后者可以眺望到南边峡湾（图15）。建筑外表的玻璃和砖头传达出挪威银行作为一家现代金融机构所保证的透明度和稳定性。建筑的设计基于6X6米的像

Figure 11. Folie Richter, Montpellier, France (Source: MVRDV - Antonio Coco)
图11. 法国蒙彼利埃弗里赫史特垂直住宅（来源：MVRDV建筑事务所 – Antonio Coco）

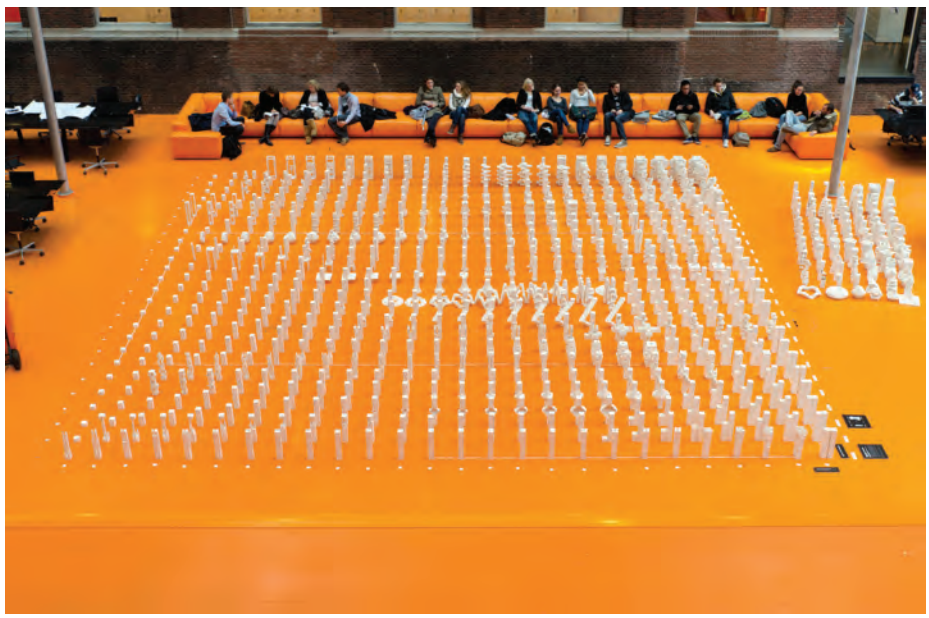

Figure 12. Why Factory models (Source: Frans Parthesius)
图12. Why Factory 模型（来源：Frans Parthesius）

Figure 13. Mirador, Madrid (Source: Rob't Hart)
图13. 马德里米洛德住宅（来源：Rob't Hart）

Figure 14. Peruri 88, Jakarta (Source: MVRDV)
图14. 雅加达天空之城（来源：MVRDV建筑事务所）

zoning, and urbanism becomes vertical. In the following projects, there is evidence of how a porous city might look and function in reality.

Mirador, Madrid

Many residential tall buildings feature balconies as a way for individual occupants and their families to experience the outdoors in a privatized, single-unit way. Likewise, many multi-unit housing developments have a central and communal courtyard. But in a vertical porous city, these two elements can be combined, so that the courtyard becomes a midair mirador (Figure 13).

Peruri 88, Jakarta

The urban jumble of the low-slung Jakarta kampung is in stark contrast to the shiny, sealed-off skyscrapers in its commercial areas. And, as argued above, the mere act of placing one function on top of another may be the prevailing archetype of a skyscraper, but it is not a blueprint for a thriving community. This project takes the stacked programming typical of a skyscraper and turns it in several directions, emphasizing the intersections between the shapes, and between the programs – between people. Thus, some of what is valuable about that urban jumble is transferred into the sky, and given new invigoration (Figure 14).

DnB Nor Building, Oslo

Part of the larger Barcode urban planning project, this waterfront bank headquarters has 17 unique floors and a surface of 36,500 square meters. The pixelated volume, based on small-scale working units, adapts to the various influences of the urban context, combining an efficient and flexible internal organization with a variety of specific communal spaces such as the main entrance lobby, a transparent trading floor, a sheltered public passage, respect for urban view lines and collective terraces overlooking the fjord

素，对于银行来说是理想的工作环境。其多功能性使它适应于灵活的组织机构。集体空间由集体平台之间的交错排列、不间断的内部通道连接而成，所有的集体平台都被当做玻璃像素，鼓励雇员在此开展非正式的会议与沟通。这条通道从接待处一直蜿蜒向上，穿过建筑，把全部17个办公楼层和公共区域联结起来。

珊瑚塔，悉尼

这座高度标准化、笔直的办公楼修建于19世纪70年代，在当时受到了干预调整，它可以通过增加模块来延展其现有的网格设计，也可以从功能方格上减掉模块来实现采光、景观、通风等功能（图16）。一些由此导致的内部地貌里包括了一个“冷却峡谷”，办公室的过量空气可由此排出，大面积凹陷空间和广场的温度就会降低；除此之外还有“绿色峡谷”，所有的平台和露出地表的地方都种满了植物。这座建筑特意地对城市的需求做出了回应——高度、朝向、效率——并且总是保持以人为本，这与周边办公楼普通的抽象概念形成了鲜明的对比。

Turm Mit Taille，维也纳沙漏塔

与上下文中提到的高层建筑设计类似的方法也同样也使用在了Turm Mit Taille 项目上面。这座实用性强的高楼同时容纳了办公区和住宅区。由于当地的分区规划和日照权利禁止奇特的大体积建筑，因此解决方案就是按照参数比例把较低的10个楼层做成扭曲的形状，这样它每天投射在临近建筑物正面的阴影时间就可以缩短为两个小时（图17）。为了换取在建筑体积和楼面布置上的让步，市政当局对建筑高度的限制从75米放宽到110米。通过这样的操作，一个优雅的建筑形象就出现了，它与周围的美景相呼应，视野可通向维也纳著名建筑Gasometers和城市其他地方。

阿姆斯特丹拉威尔广场

Ravel广场（图18）让我们看到了底座+高楼模式之外的选择。这种底座加高楼的模式过去一直主导着混合用途高层建筑的发展。作为推拉形式的“山景”，这个耸立在平坦的荷兰平原上的建筑项目代表了一种小规模的个人主义，并且是在一种更接近于山区小镇而不是典型摩天大楼的氛围中。Ravel 广场和许多商务大楼一起坐落在中央商务区，它打破了千篇一律的形式，引入了小细节、小尺度、以及个人主义的观念。它使得底座更加透明，通达性强，为居住区域带来了更多的景观、日照和更多的隔音效果。尽管其外观看起来比较随意，显得四分五裂，但是它的设计也是分析过程的一部分；通过分析噪音、日照、阴影等参数，对建筑的外形进行优化和改进。通过设定建筑正面的角度，使得阳台背离吵闹的大街，同时也可以接受到光照、避免上面阳台的阴影。

to the south (Figure 15). The glass and brick exterior expresses both the transparency and stability of DNB as a modern financial institution. The design is based on an ideal work group of the bank, a pixel of 6 x 6 meters, whose versatility permits adaptation to the flexible nature of the organization. The collective spaces are connected by a staggered continuous internal route of collective terraces, all being executed as glass pixels, encouraging informal meetings and communication between employees. This route meanders from the reception upwards through the building, connecting all 17 office levels with the communal areas.

Coral Tower, Sydney

This highly standardized, rectilinear 1970s office building was subjected to an intervention that would extend its established grid with modular additions, while also carving out modules from the grid in order to admit light, views and ventilation (Figure 16). Some of the resulting interior topographies include a "cooling canyon" into which the excess air flow from the offices is dumped, providing a temperature drop in the larger pockets and the plaza, and the "green canyon," featuring planting on all terraces and outcroppings. The architecture responds specifically to the requirements of the city – height, orientation, efficiency – and retains a human scale at all times, in stark contrast to the generic abstraction of the surrounding office buildings.

Turm Mit Taille, Vienna

A similar approach to contextual high-rise design is taken at Turm Mit Taille, a flexible tower that can accommodate both offices and housing. A singular massive block was not allowable under local zoning and rights-to-light restrictions. The solution was to parametrically shape the lower 10 floors of the building into a twist, to minimize the structure's shadow cast onto the neighboring façades to only two hours a day (Figure 17). In exchange for this concession in building volume and floorplans, the city allowed the building to reach a height of 110 meters, instead of 75 meters as was set originally. Through this operation, an elegant figure emerged that responds to its surroundings, by opening up views towards Vienna's famous Gasometers and to the rest of the city.

Ravel Plaza, Amsterdam

Ravel Plaza (Figure 18) presents an alternative to the plinth + tower model that predominates in high-rise mixed-use development. As a "mountainscape" of pushed and pulled forms that rises above the flat Dutch plain, the project represents the individual and the small scale, but embraces these in an atmosphere more akin to a hill town than a typical skyscraper. Located in a CBD area with many corporate buildings, Ravel Plaza breaks up the monotony and introduces the small grain, the small scale, the individual. It makes the plinth more transparent and accessible, and brings good views, sunlight and protection from noise to the residential part. Although its appearance may seem random and fragmented, the design is part of an analytical process; its form is optimized and improved by parametric scripting, using parameters such as noise, daylight, and shadow. The angle of the façade is set so that the balconies turn away from

如何建造一个垂直村落?

垂直村落的演进式发展不同于自上而下的发展或是总体规划。这种发展需要规则的引导。如果一间屋子的旁边或者顶上修建了另一间屋子，我们如何能保证这间屋子有充足的光线？我们如何才能保证一个10层村庄的安全？当村子增加到50层时，如何确保每个人在紧急情况时能够安全逃离？

为了增加垂直村落发展的知识，理解其不同成分的关系，同时对必要的规则进行验证，我们构造了一个模拟练习（图19）。

Figure 15. DnB Nor Building, Oslo (Source: Jiri Havran)
图15. 奥斯陆挪威银行大厦（来源：Jiri Havran）

Figure 16. Coral Tower, Sydney, after intervention (Source: MVRDV)
图16. 悉尼珊瑚塔（翻新后）（来源：MVRDV建筑事务所）

Figure 17. Turm Mit Taille, Vienna (Source: MVRDV)
图17：维也纳沙漏塔（来源：MVRDV建筑事务所）

Figure 18. Ravel Plaza, Amsterdam (Source: A2 Studio)
图18：阿姆斯特丹拉威尔广场（来源：A2 工作室）

立方体代表单个的房子，每一种颜色代表一个参数。超过X年的被模拟为6天，有6个相同的标绘，对应6个参数，这就构成了一个冲突环境。村庄的经济发展如何与社区发展相竞争？通达性和能源之间如何实现完美的协调？这些演进式发展的系统性测试能够产生出一套规则，可成为未来垂直村落发展的基础。这个抽象试验模拟了演进式发展，得出了以下几个结论，即：

- 当每一个发展阶段都只关注自身的利益时，会导致衰退的结果。无论影响的次序如何，所有的村庄最终都会看起来大同小异。
- 日照在所有的发展阶段都很重要，这在很大程度上决定了建筑最终的外观。要想在垂直村落里长期生活，建筑物高度必须足够。
- 在经过特定的一段时间并达到一定的密度之后，自然增长似乎到达了最大值。这时候就需要大规模干涉，比如在自上而下的顶层设计中提供迂回路线，然后恢复增长。
- 如果我们想拥有辨识度，其中某个参数必须足够明显。要有意识地选择这个参数并把它应用在垂直村落里。我们也必须反思是否需要一些微型的总体规划。
- 不同参数要有明显的相关性并相互结合：气候和生态，结构和通路，社区和经济，经济和气候，以及社区和通路。在垂直村落里，这些参数的配对能实现美妙的效果。

the noisy streets, receive daylight, and avoid shadows from the balconies above.

How to Make a Vertical Village?

The evolutionary growth of the Vertical Village is different from that of a top-down development or master plan. Rules are needed to guide this growth. How can we guarantee that a house will have enough light, even if another house is built next to, or on top of it? How do we make a village of 10 floors safe, and ensure that once the village has grown to 50 floors, everyone will be able to escape in the event of an emergency?

To enhance knowledge of the Vertical Village's growth, to understand the relationships among its different elements, and to test the necessary rules, an exercise was constructed (Figure 19). Cubes represented individual houses, with each color representing one parameter. Growth over X years was simulated for six days, for six identical plots, following six parameters, resulting in a battle of conflicting desires. How does the village's economy compete with community? And what is the ideal synergy between accessibility and energy? These systematic tests of evolutionary growth generated a set of rules that form a basis for further development of the Vertical Village. This abstract experiment, simulating evolutionary growth, revealed several issues, namely:

- When each development phase focuses only on its own interests, atrophy results. Regardless of the sequence of influences, all villages will eventually begin to look more or less the same.
- Daylight prevailed in all developments, determining to a large extent what the final shape would be. Building high into the sky is needed for a Vertical Village's long-term survival.
- After a certain period of time, and after reaching a certain density, there seemed to be a "natural" growth maximum. Large-scale interventions, such as top-down superstructures, were needed to provide escape routes and allow continuous growth.
- If we want to achieve a recognizable identity, one parameter must prevail. One has to consciously choose this parameter and apply it to the Vertical Village. We also have to ask ourselves if mini-master plans are necessary.

Figure 19. Vertical Village Exercise (Source: Phosfor)
图19. 垂直村落练习（来源：Phosfor）

- Different parameters were obviously related and combined: climate with ecology, structure with access, community with economy, economy with climate, and community with access. The pairing of these parameters created beautiful dialogues in the Vertical Villages.

Conclusion

The vertical urbanism of the near future will be an intersection of the imperatives of the Vertical Village, which prioritizes the intensification and densification of individual needs and desires, and those of the Porous City, which generalizes those desires and subjects them to broader requirements, such as daylight, views and open space. In a sense, one starts from the individual, and the other from the collective, and they meet at a certain point in-between

This is an instructive proxy for how we might handle the rapid growth of megacities and the incredible demands they will make on our imaginations as well as our infrastructure. We need cities that are efficient, but not soulless. People want to customize their living and working spaces, but also need to tap into larger, collective support structures – both physical and social. We want to both foster higher density and to allow individual neighborhoods, cultures, nature and people to maintain their identities. Can all of these desires co-exist? We think the answer is "yes," but it will take a continuous investment in investigation and innovation to get there.

结论

不远的将来，垂直都市化将会是垂直村落和多孔城市的交汇融合。垂直村落把个人需求的集约化和紧密话放在了优先位置，而多孔城市则涵盖了这些需要，把它们置于更宽泛的需求之中，例如日光、景观和开放空间。从某种意义上说，个人主义和集体主义会在垂直村落的某一点相遇。

这是一个富有指导意义的替代品。我们可以用其来应对特大城市的快速发展及其对我们想象力和基础设施的惊人需求。我们需要的城市应当是高效的，但不是没有灵魂的。人们都想定制自己的生活与工作空间，但也需要利用更大的、集体性的支撑结构——不管是是物理意义还是社会意义上的。我们想提高密度，但同时也允许独特的社区、文化、自然环境和人群保留自己的个性。这些欲望可以共存吗？我们认为答案是"可以"，但是要做到这一点，在调研和创新方面我们还有很长的路要走。