互动 环境设计与研究

created by HC2O

Alan X HUANG / Chiaoming CHEN / Yuhua CHUNG / Sherman OU 黄晓江/陈巧明/钟裕华/欧修明 著

> 中 国 建 筑 工 业 出 版 社 China Architecture & Building Press

DESIGNAND RESEARCH ON RESPONSIVE ENVIRONMENT 互 动 环 境 设 计 与 研 究



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## 互动环境研究与设计

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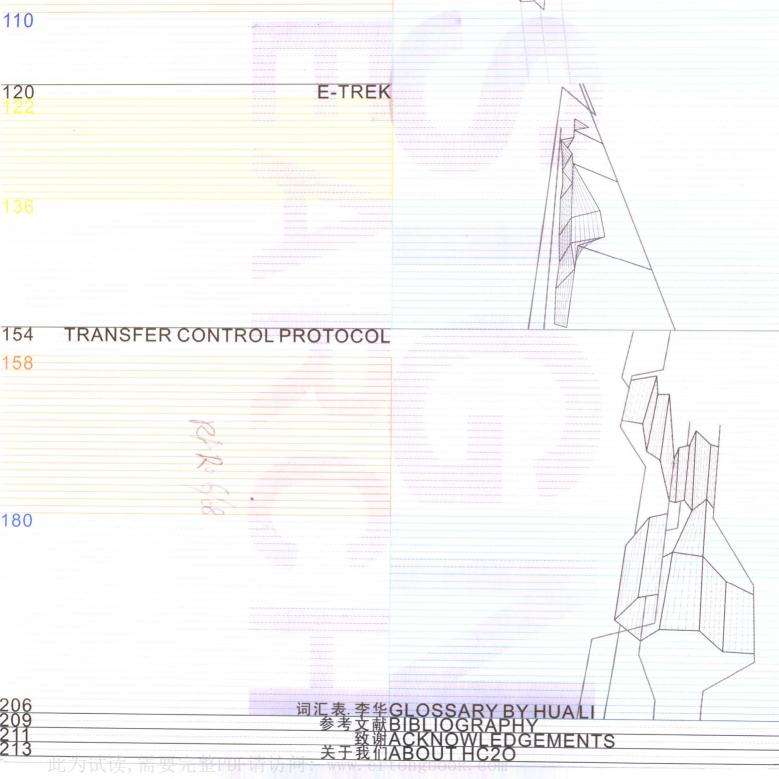
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层的重构RE-INCORPORATING THE STRATA 克里斯托弗·海特CHRISTOPHER HIGHT 016 作为研究的设计:DESIGN AS RE-SEARCH: 从线性到螺旋线FROM LINEAR TO HELICAL 026 038 互动环境RESPONSIVE ENVIRONMENT 巴比肯:过去的明天BARBICAN: THIS WAS TOMORROW 门厅空间LOBBY SPACE 052 **EMERGENT FURNITURE** 058 062 070 CORE-RELATION 092





AA school近年来在我国的建筑界已经广为人知,这可能与许多世界著名建筑师都出身于AA school有关。像理查德·罗杰斯、斯蒂文·霍尔、扎哈·哈迪德和莱姆·库哈斯、伯纳德·屈米等人,就或是毕业于AA school,或是曾经在AA school持教。也许,正是因为这些当红建筑师们的缘故,AA school在人们的心目中,才以其前卫性著称,并被大家认为是一所非常国际化的、会不断孕育出新思想和新观念的学校。

然而,国内对于AA school的介绍其实并不多见,除了个别简短的文章之外,目前只有毕业于AA school的刘延川、蔡一正等人,在2004年出版的《世界建筑导报·AA建筑教育专辑》中,比较全面地将 AA school的教学体制和教学内容作了系统的介绍。这是非常难能可贵的!但是由于篇幅所限,该专集对 AA school每个教学单元的具体内容,都只能作一些十分简要的说明,这对于想要深入了解 AA school的设计理念和教学方法的人们来说,确实有些遗憾。而本次由中国建筑工业出版社出版,黄晓江等人编著的《互动环境设计与研究》一书,却正好可以补充上述专集之不足。因为《互动环境设计与研究》是AA school教学单元中的一个典型范例,它记录了一个"设计研究"的全部过程和全部内容,可以让我们从中了解到很多东西,发现新的思维方式和新的工作方法,并且,通过该书我们还可以窥见 AA school教学体系之一斑。

《互动环境设计与研究》一书的作者们也都毕业于AA school,该书是他们整理学习成果的汇编。通过他们的书,我们便会发现,相对于"理论研究"而言,AA school的教学是非常注重对"设计"进行"研究"的。在AA school,建筑设计绝对不仅仅是一种技能或是技巧,而是一项实实在在的研究工作,是一种尽可能地运用更加广阔的视角,去探讨各种影响因素相互作用的方法,强调的是观念意识创新能力的培养。

《互动环境设计与研究》一书的前面部分,主要讲的是"设计研究"的目的和方法,并对设计理念及其基本概念进行了解释,书的后面部分是最主要的内容,即案例研究设计。案例研究设计分为4个阶段,Emergent Furniture、Core -Relation、E-Trek、TCP。Emergent Furniture是设计研究的起点,主要是提出问题或发现问题;Core -Relation是调研分析,对空间结构系统的构成和使用者的行为模式进行调查研究;E-Trek是从更大的范围入手提出构想,并对其进行检验;而TCP则是最后的综合总结。

这是一种借鉴科研模式的"科学的设计方法",即采取科学研究的方法和系统化的步骤去完成一个建筑设计,设计行为并不只局限于将构思通过纸和笔等媒介表达出来,而是要对设计课题进行反复的"研究"和"实验"。在这里,"设计"是"研究"的中心,"设计"的过程就是"研究"本身,是与理论研究一样的研究。在建筑设计领域,"理论研究"和"设计研究"已成为当今建筑学术研究的两个支柱,自20世纪60、70年代开始,人们便对建筑设计的方法与过程进行重新审视,而"设计研究"的兴起,即说明传统的设计模式已经受到挑战,不能满足信息时代的需求了,也许新的设计方法会在不久的将来,使建筑设计领域全面改观。

覃力 2004.8 Lobbies and their (Inter-) Activity: HC2O's Transfer Control Protocol

门厅及其内部(互动)活动: HC2O的传输控制协议

A Responsive Installation for the Barbican Centre

为巴比肯中心设计的互动装置

**Brett Steele** 

布莱特·斯蒂尔

In the environment, the participant is confronted with a completely new kind of experience. He is stripped of his informed expectations and forced to deal with the moment in its own terms. He is actively involved, discovering that his limbs have been given new meaning and that he can express himself in new ways. He does not simply admire the work of the artist; he shares in its creation.

在这种环境里,参与者将获得一种全新的体验。他原有的期望被彻底剥夺了,他被强制用这种环境特有的方式去体验每个时刻。他自己将会发现他的四肢被赋予了全新的意义,他能够用新的方式去表达自己。他不再只是简单地对 艺术家的作品进行赞美,而是共同分享着作品带来的创造。

Myron W. Krueger Responsive Environments 1977 迈伦·W·克鲁格《互动环境》1977

## I. Hanging Around

In the 1920s Siegfried Kracauer published in the *Frankfurter Zeitung* a short article (one of hundreds he published in the feuilleton section of the paper during the decade) on a uniquely modern, anonymous, kind of architectural space: the hotel lobby. For Kracauer, an architectrained critical theorist (who masked his work in the form of everyday journalism), a close analysis of everyday (and almost always, overlooked) settings like the lobby was a means by which to gain deep insight into the cultural experience of modernity. Lobbies, he wrote, suggest a very different kind of reality than the formerly sacred spaces of churches:

In the hotel lobby, equality is based not on a relation to God but on a relation to the nothing. Here, in the space of unrelatedness, the change of environments does not leave purposive activity behind, but brackets it for the sake of a freedom that can refer only to itself and therefore sinks into relaxations and indifference. In the house of God, human differences diminish in the face of their provisionality, exposed by seriousness that dissipates the certainty of all that is definitive. By contrast, an aimless lounging, to which no call is addressed, leads to the mere play that elevates the unserious everyday to the level of the seriousness.

Since the time Kracauer wrote these observations many critics, writers and filmmakers have shared a similar fascination with the unexpected forms (or at least story-telling possibilities) of human interaction found in this most defining of modern sensibilities, the lounging-around anonymity that we associate with a lobby (these days, converted into the industrialized forms of lingering we find as the business plans behind *Starbucks* or *AOL* chat rooms). Unsurprisingly, lobbies have been used for decades as backdrops for any number of Hollywood films, detective novels, or other forms of cultural production, continuously re-creating and then confirming a kind of abject modern spatial affect that remains almost as much of an enigma as most theories of modern subjectivity. Indueed, it's hardly a coincidence that Frederic Jameson returns to the topic of lobbies (in the form of John Portman's Bonaventure Hotel and its cavernous atrium lobby) in his seminal 1980s assessment of the blunt logics of post-modern capitalism.

The lobby space or rather a series of new inter-connected lobby and connection spaces is the chosen topic, site and brief of the following architectural monograph, which documents in considerable detail an architectural project called TCP, or Transfer Control Protocol. It's a year-and-a-half long design research proposal completed as an M.Arch Graduate Design Thesis Project, undertaken by Chiao-Ming Chen, Yu-Hua Chung, Xiao-Jiang Huang, and Sherman Ou at the D[R]L Design Research Lab during 2001-03, at the Architectural Association School of Architecture in London [fig.1cartoon figures of the team]. During their time with us these four architects worked as collaborative Members of a team titled HC2O (I could never work out if this team name was an acronym for something, or just a declaration of liquidity that the spatial effect or structural performance of their project systematically pursues).

During the course of their work the team completed a series of interwoven design experiments and investigations into new forms of highly adaptive built architectural form, which is the larger design agenda we set for the studio as the basis for specific project briefs. This overall

agenda is an area of work that we labeled 'responsive environments' during the year that this design research began. TCP's thesis creates a field of linked, mobile and re-configurable lobby spaces, used for arrival to and departure from the Barbican Centre in London. The Barbican is one of the City's last great modernist megastructures, designed and built during the 1960s and 70s in the style of the 'new brutalist' architecture of the time.

齐格菲·克瑞考尔于上个世纪20年代在《法兰克福日报》上发表了一篇简短的文章(这是他在那个年代为该报文艺专栏所写的无数文章中的一篇)。这篇文章是关于酒店大堂的—— 一种具有独特现代性、无定义的建筑空间形式。对于一位具有建筑师背景,以日常新闻评论的形式进行立著的批评理论家而言,对日常(经常被人们所忽略的)生活环境(如大堂)进行深入仔细的分析是一种获得现代文化体验的有效方式。他写道,大堂带来了与以往教堂神圣空间所不同的体验:

在酒店大堂里,平等性不是建立在与上帝的关系上的,而是与"虚无"相关。在这个"无关系"的空间里,环境的变化并没有把有目的性的活动丢弃,而是把它们加上括号。这是为了获得一种自我的、并由于这种自我而变得放松且满不在乎的自由。在上帝的房子里,这种短暂性让个体之间的差异不断缩小。一种能消散所有必然事实的严肃性暴露着人的短暂性。相比之下,一种漫无目的的闲荡导向了一种纯粹的游戏,而游戏本身则把不严肃的每日生活变得严肃了。

克瑞考尔写下了这些观察评论后,许多评论家、作家和电影制作人都开始对那些意想不到的人与人之间的(至少具有可叙述性的)互动形态产生强烈的迷恋。我们能从当我们置身于大堂(现在的大堂已经变成一种企业化的"逗留",例如美国在线的聊天室和星巴克咖啡背后的商业操作)时所受到的现代性及"闲荡"所带来的"无身份"性中找到这种特殊的互动形态。在过去几十年,大堂经常被众多好莱坞电影、侦探小说及其他各种形式的文化产物当作背景使用,然后再被重新创造并被定义为一种可怜的现代空间感受,如同关于现代主观性的理论一样变成一个不解之谜。实际上,弗雷德里克·詹姆森在他上世纪80年代对生硬的后现代资本主义逻辑的批判中,再次把主体回归到"大堂"(约翰·波特曼的Bonaventure酒店及其中庭式的大堂),这种回归并不是偶然的。

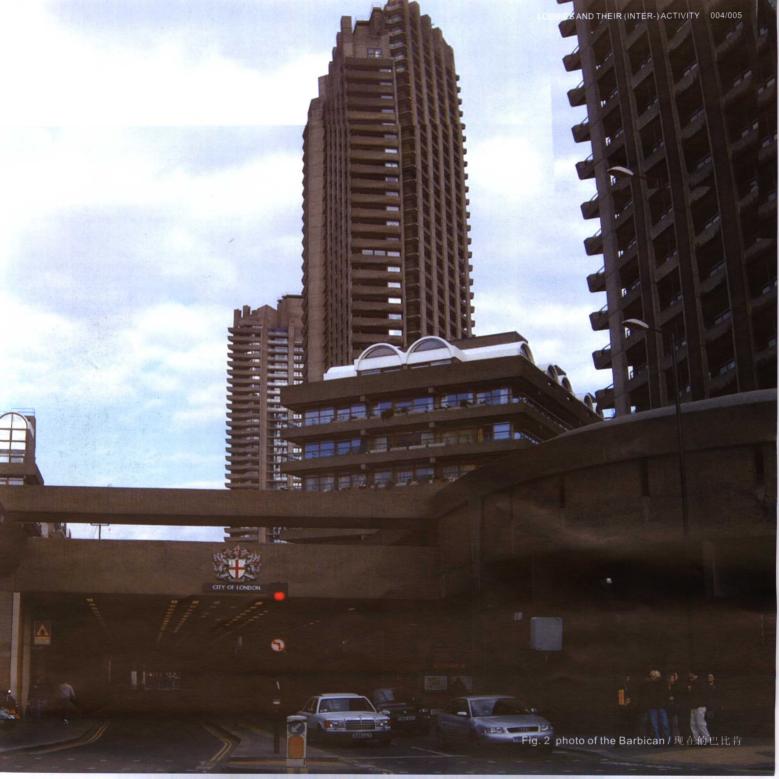
厅堂空间或一系列新的相互联结的大厅和联系空间是以下这本建筑专集的选题、基地和任务书。这本专集详细记录了一个名为TCP,或称"传输控制协议"的建筑设计研究方案。这是一个进行了十八个月,并作为建筑硕士毕业设计的设计研究方案,由陈巧明、钟裕华、黄晓江和欧修铭在2001至2003年期间于伦敦的建筑联盟学校设计研究实验室中共同完成的[fig.1]。在与我们共度的时间里,以上四位建筑师组建了一个叫做HC2O的设计合作团体(我从来没有弄明白他们的团队名字是包涵了某种特殊含义的缩写,还是代表了他们对在设计研究中追求的空间效果或结构功能所表现出来的流动性的宣言)。

在这个课程期间,HC2O完成了一系列关于具有高度适应性的新建筑形式(这是我们为实验室内每个不同的设计任务书所预设的总议程)的设计和研究。这个被我们命名为"互动环境"的总议程是在HC2O的设计研究开始之前设定的。TCP创造了一个联结的、机动的、可重组的门厅空间。这种新型门厅空间的用途是为使用者进入或离开伦敦巴比肯中心提供方便。巴比肯是伦敦最后一批现代主义巨构建筑中的一座。这种现代主义巨构建筑于上世纪六、七十年代兴起,其风格是当时流行的"新野性主义"。



→ Fig.1 cartoon figures of HC2O / HC2O的卡通造型





In its current rather worn-down and under-maintained state, the major public spaces and platforms of the Barbican possess, in remarkable ways, a high degree of the social estrangement, emptiness, and just plain ordinariness of the kind that Kracauer first alluded to in his lobby essay eight decades ago. [fig. 2, photo of the Barbican]. Interestingly, and to HC2O's considerable accomplishment, in this project the lobby is turned back upon itself, as a program deliberately treated as a corrective to the very problems the very same program's original installation and configuration created for the original architects of the Barbican Centrea neat trick of programmatic iteration further instantiated by then dividing the project's required floor area into discrete components then recursively installed across, atop and sometimes within an already-existing network of public lobbies, corridors and circulation spaces. It's a compelling attempt to overlay a new network of spaces atop an already distributed (if not fully-functioning) set of connections (more on this network sensibility below).

In TCP the idea of a new kind of intelligent, performative, 'lobby network', tries to adjust and correct the Barbican's current failings, whose deadly series of brutalist modern spaces are now so convoluted and uninviting that users today are obliged to follow a spider web of colored lines (as if in an airport) painted on its concrete surfaces in order to hope to find any of the major public spaces that are a part of the Centre (these include a bewildering arrangement of theatres, exhibition and other venues, which are hidden alongside meeting rooms, cafes, shops, and ticketing halls). In order to reach these amenities, buried deep within the megastructure, current visitors follow these painted lines while circulating through tunnels, ramps, corridors, terraces, stair towers and maze-like lobbies (usually, you're doing this against the clock, trying to get to one of the performance halls before a concert or film starts; like most other visitors, I've had plenty of close calls lost in the Piranesi-like interiors of the Barbican).

The Barbican in its current state is in many ways a thoroughly dysfunctional modern architecture (form following dys-function has been

under-analyzed generally in the discourses of modern architecture), making it a perfect context for a project like TCP (whose primary goal is anyway the creating of more intelligent, responsive, architectural spacestructures that through various electronics learn from and adapt themselves to the patterns of their inhabitants)this is why we initially selected the modern landmark as a site for that year's design research in the D[R]L. There is plenty at the Barbican to not only improve upon, but more importantly, to intelligently reconfigure rather than simply discard. This is what TCP ultimately accomplishes in their project, more as a distributed urban adjustment to an existing field of flows, connections and exchanges, than as any kind of 'remove and start over' development strategy familiar in the increasingly privatized, developer mentality of current London.

In this way TCP is, despite the imagery of an undeniably alien form and appearance, a deliberately contextual form of responsiveness;

namely to the statistical patterns of flow, connection and dis-orientation that the site presently finds itself in. Seen this way, the project is what I'd like to call an example of parametric contextualism; one that, unlike the traditional Anglo-American approach to context (which biases the look, massing and physical appearance of a structure), is sensitive instead to the more ephemeral patterns of movement, occupation, and pedestrian flows defining an urban field's actual performance. This performative pursuit of architectural design, which is based on a theory of form that is inherently dynamic and temporal, rather than static and permanent, is a signal feature of the architecture of our time. TCP is obviously intended to be 'responsive' in more obvious ways, (i.e. in its literally kinetic capacities) owing to the array of wiring, sensors, actuators, and other information-gathering technologies embedded in its structure (which provides the information needed by the system to reconfigure and adapt itself to the performance of its users, as well as the surrounding infrastructures connecting the site to the city). But in seeing these features of the project, we shouldn't overlook the significance of the overall design protocolswhich have been written as a kind

of operating system used by the designers to assert the larger urban, or better yet infrastructural, ambitions of the project.

The confusing constellation of existing public interiors into which TCP is inserted exists at a podium level below several towers containing domestic program, which at the Barbican includes several hundred units of housing. One of the early physical studies the team completes trying to identify where and how to insert the collection of components and furnishings making up the projects is machines as an array of possible configuration scenarios; the overall arrangement of these possible worlds, rather than definitive designs, is presented as if a scaled-up microchip of connective circuitry able to bring order to this jumbled interior [fig. 3, early white block models]. While a stunning monument to a last gasp of modern optimism that radically transformed London in the middle decades of the twentieth century (when in English architecture it still seemed, however briefly, that anything was possible), since its completion the Barbican has become an increasingly stagnant urban monolith; a glacier slowly eroding and drifting alongside the dense and active financial centre of London. TCP seeks both external, as well as internal, infrastructural connections between these two realms. Unlike the singular monumental public lobby of most hotels, train stations, or cultural centers, the strategy for TCP is one of deliberate dispersal and distributiona defining feature of modern infrastructure, much more than modern architecture (which for decades has privileged the pursuit of monumental singularitiescavernous central atriums or halls).

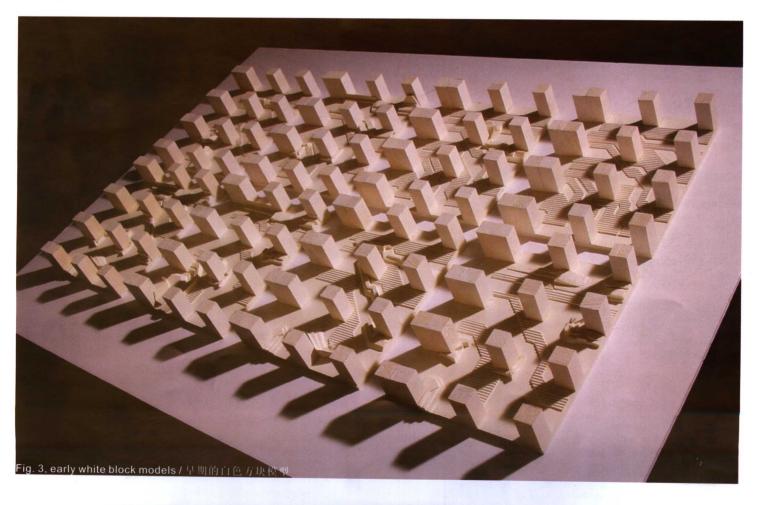
This dispersal strategy is used in TCP to distribute more than a dozen new interiors across the existing public realm of the Barbican, as nodes in a network undergoing, like any network, a constant state of growth, adjustment, and change [fig. 4, an example of the 'wiring' project diagram]. It's a spatial strategy derived from an examination of the most dynamic features of the surrounding city: its infrastructures, which are used here as a model for conceptualizing and then realizing an inherently dynamic field of architectural (rather than urban) connectivity. To a very great degree, an earlier form of this infrastructural impulse can be found in the mid-twentieth century architecture of the Barbican Centre and new brutalism, which awoke to the possibility of an increasingly network-based, infrastructural, approach to modern architectural spacea sensibility clearly visible for example in the remarkable catalogue of network diagrams that line the pages of such prominent design classics of the era as Alison Smithson's *Team X Primer*, or the branching diagrams illustrating Christopher Alexander's 'A City is Not a Tree'.

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Unlike the kind of traditional, stable typologies that Anthony Vidler once suggested in the 1970s as having forever guiding modern architectural production (a thesis that depends upon the existence of various fixed views of equally stable models of nature, modern production processes, or even the traditional city itself), here we are confronted with an example of a wholly different approach to the relationship between city and building; one whereby built architectural space is no longer trying to emulate the appearance or logic of the city. but rather the network intelligence of its most advanced artificial systems, its infrastructures. In this sense, TCP is a fully technological appeal one that sees architectural space itself not as the production of cultural forms of production so stable that we might imagine typological forms, but rather as inherently technological, and so the result of complex artificial design processes. In this way we might see TCP as part of a generational shift towards a conception of architectural space as inherently systematic, artificial and technological in its

Creation: call it an understanding of architecture not based upon a model of the image of the city (the implication of Vidler's 1970s thesis. regardless of whether that image is one of nature, production processes, or the traditional city), but rather, modeled on the logic of its already-existing infrastructural augmentations. TCP is an example not of architecture as urbanism, but rather, architecture as infrastructure.

在一种破旧和失修的状态下,巴比肯大部分的公共空间和平台层明显保持着一种与社会疏隔和空洞的状况,并且像克瑞考尔写于80年前关于大 堂的文章里所描述的那样极其普通与平淡[fig.2]。有趣的是,在HC2O这个出色的设计研究方案中,门厅反过来变成了一个建立在自身之上的 新program(这个新program面对的问题和当初设计巴比肯的建筑师所遇到的问题是一样的),即一种对原有门厅里的配置与组合的改良与矫 正。这种与现有功能的巧妙重叠具体表现在:把方案所要求的楼面面积打散成许多独立的个体元件,然后再把它们重新放置在一个由公共门 厅、走廊和过道空间共同组成的现有网络之上或之中。在一系列早已被分配的连接体(还不能称之为网络)之上再覆盖一个全新的空间网 络,这是一个非常引人注目的尝试。



TCP包含了创造智能型的功能化"门厅网络"这一新构想,这种新构想试图调整和改善巴比肯当前的失败。巴比肯内一系列的现代野性主义 空间是那么的迂回曲折而又缺乏趣味,以至于现在的使用者不得不依赖于由画在巴比肯混凝土地面上的色线(就如同在机场一样)所组成的 "蜘蛛网"。为了找到位于巴比肯中心内的各种大型公共空间(包括混杂在一起的剧场、展览馆及其他各种隐藏在会议中心、咖啡厅、商店 及售票大堂之后的活动场所),为了到达这些深藏在巨型结构之内的场所,来访者在跟着这些色线的同时,要经过各种各样的隧道、坡道、 走廊、平台、楼梯间以及迷宫式的门厅(你通常都是在非常赶时间的情况下,在演奏会或电影开始前,试图尽快找到其中一个你要到达的表 演厅;像大部分来访者一样,我也经常在这个皮诺内西式的巴比肯大厅内漏接了许多重要的电话)。

成不变,以至于我们可以想象到它的各种类型),而是认为建筑空间在本质上是技术化的,并且是经历了一系列复杂的人工设计过程后所产 生的结果<sub>[6]</sub>。由此,我们可以把TCP看作是一种本质上带有系统性、人工化和技术化的创造性建筑空间,也可以把TCP看成是这种划时代转变 的一部分,这种转变导向了一种创造具有系统性、人工化和技术化建筑空间的新概念。TCP是一种对建筑的新理解,这种理解不是建立在对 城市"意象"(维德勒在上世纪七十年代的文章中指出,这个"意象"可以是建筑的本性、制造过程或是传统的城市本身)的基础之上的, 而是根基于早已存在于城市中的基础结构的逻辑。TCP把建筑当作都市基础结构,而不是都市建筑。

综合各方面来看,如今的巴比肯是一座功能完全失调的现代主义建筑(许多关于现代主义建筑的著作早已对"形式跟随'不良'功能"这一 命题进行了广泛的研究)。我们把巴比肯作为像TCP这种设计研究方案(TCP的主要目标是通过多种不同类型的电子设备对使用者的行为模 式进行学习,并作出相应的调整和适应,从而创造一个更加智能化的互动建筑空间和结构系统)的研究背景 —— 这也是我们为什么选择巴比 肯这个现代主义经典作为D[R]L当年设计研究的基地的原因。巴比肯内还有许多可以被改造和利用的地方,但更重要的是,我们应该聪明地 对其进行重新配置,而不是简单地将之抛弃。这就是HC2O在他们的方案TCP中的最终追求,即追求对一个充斥着各种流线、连接和交换的 现有场所进行的一种分散式城市化调节,而不是那种越来越被今天的伦敦私人发展商认同的"拆后再重建"的发展策略。

尽管TCP具有迥异的形态和外观,但它却是一种具有文脉倾向的互动形态,即与现有的(在基地现状下经过统计后得到的)人流、连接和混 乱状态等之间的互动关系。这样看来,我愿意把TCP这个方案称为"参数化文脉主义";它并没有继承英美对文脉的传统观点和理解(即对 外观体量和结构表现的偏袒),而是注重对更短时间跨度内的运动、占据和行人流动等(形成一个真实城市场所功能的元素)的细腻体现。 这种对建筑功能性的追求,是建立在"'形式'不是固定不变或静态的,而是绝对动态和暂时的"这样一种"形式"理论基础上的。这种新 追求也是当今建筑学的重要特征。TCP积极尝试追求一种更直接的"互动"形态(例如实在的动态性能),而置入其结构(该结构为系统提 供信息以便根据使用者的需要而进行自我重组和调节,连接着基地与城市的基础结构也具有同样的功能)之内的各种电线、感应器、调节器 以及其他信息收集技术则实现了这种直接的互动。在看到上述特征的同时,我们也不应该忽略TCP整个设计策略制定的重要性由HC2O所编

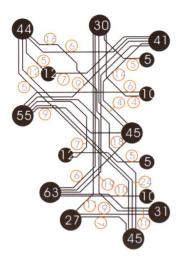
写的设计策略是一种运作系统,并体现了TCP追求更大的城市尺度或更完善的城市基础结构的野心。 一群混乱的(TCP将置入其内的)公共室内空间存在于巴比肯的第一层平台之内(平台层之上是多幢包含了几百个住宅单元的塔楼)。 HC2O其中一个早期实体研究模型就如同一架机器,显示了多种组合构成的可能性情节设定:在这个模型中,HC2O尝试确定在哪里和如何将 那些构成TCP的元件或家具置入巴比肯现有的室内空间。对于这个未来世界的总体设置并不是最终的设计结果,而是如同电脑晶片内被放大 的的电路图一样,为这个杂乱的室内空间带来新秩序[fig.3]。然而,当现代主义在崩溃前发出最后闪光之际,即在20世纪中期,正是现代主义 对伦敦进行大规模改造的时候(在那个年代,英国建筑似乎是无所不能的)。当巴比肯完工后,它就变成了淤积在城市中的呆滞的巨石,或 是漂流在伦敦这片高密度和活跃的金融中心里正在逐渐融化的冰川。TCP在这两者之间寻觅着一种外在和内在的基础结构联接。并不像绝大

多数的酒店、火车站或文化中心内巨大独立的门厅那样,TCP的策略是一种经过深思熟虑后的分解和再分布——与其称之为现代主义建筑

(一直不懈地追求一种纪念式的特征 —— 透空的中庭或大堂),不如称之为一种具有现代基础结构特性的构筑物。

TCP运用这种分解策略把十多个新室内空间分散置入整个巴比肯现有的公共区域内。这些新空间就象在网络中的许多节点一样,经历着一系 列持续生长、调节和改变的状态[fig. 4]。同时,这也是一种空间的策略。这是基于对现代城市的判断,即现代城市中最具动态特征的是城市 的基础结构。TCP把基础结构作为一种建立概念的模型并以之创造出一种动态的建筑化(非城市化)连接式场域。我们可以从20世纪中叶的 巴比肯中心和新野性主义建筑中看到这种越来越网络化和基础结构化的现代建筑空间的可能性——如艾莉森·史密森的《Team X Primer》所 记录的各种网络图解,或是克里斯托弗·亚历山大在《A City is Not a Tree》里所描绘的分支状图解,这些属于那个年代的著名设计经典之作 都清楚显示了这种可能性。 一种由安东尼•维德勒在上世纪70年代指出的具有固定不变形态的传统建筑类型,一直指导着现代主义建筑的操作和生产(这个论点是综合

了当时许多关于建立一个建筑本性、现代化生产过程,甚至是传统城市的标准模式的观点)。在这里,我们面对的是一种对城市与建筑间关 系的完全不同的理解:建筑空间的建造不再是一种对城市外观或逻辑的简单仿效,而是向城市中最先进的人工智能网络系统,即城市的基础 机构,学习其内在的智慧。这样看来,TCP是非常技术化的——TCP没有把建筑空间本身看作一种文化形式的产物(这种产物如此的一成不 变,以至于我们可以想像到它的各种类型),而是认为建筑空间在本质上是技术化的,并且是经历了一系列复杂的人工设计过程后所产生的 结果 。由此,我们可以把TCP看作是一种本质上带有系统性、人工化和技术化的创造性建筑空间,也可以把TCP看成是这种划时代转变的一 部分,这种转变导向了一种创造具有系统性、人工化和技术化建筑空间的新概念。TCP是一种对建筑的新理解,这种理解不是建立在对城市 "意象"(维德勒在上世纪70年代的文章中指出,这个"意象"可以是建筑的本性、制造过程或是传统的城市本身)的基础之上的,而是根 植于早已存在于城市中的基础结构的逻辑。TCP把建筑当作都市基础结构,而不是都市建筑。



- Fig. 4 an example of the 'wiring' project diagram / 线型方案图解
- → Fig. 5 Corb sketch for Algiers / 科布西耶的Algiers草图



Projet B. montrant les travaux de voirie nécessaires et suffisants pour alimenter une population de 200 000 habitants sur les terrains de Fort-l'Empereur

## II. Hanging On

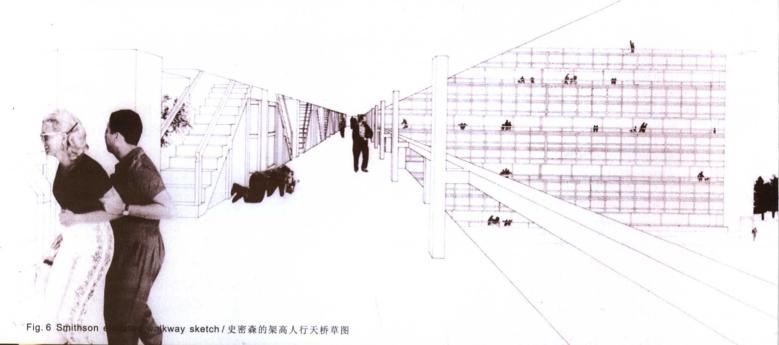
Infrastructures, which were mutually reinforcing and totalizing, are becoming more and more competitive and local; they no longer pretend to create functioning wholes but now spin off functional entities. Instead of network and organism, the new infrastructure creates enclave and impasse. . . Infrastructure is no longer a more or less delayed response to a more or less urgent need but a strategic weapon, a prediction. . .

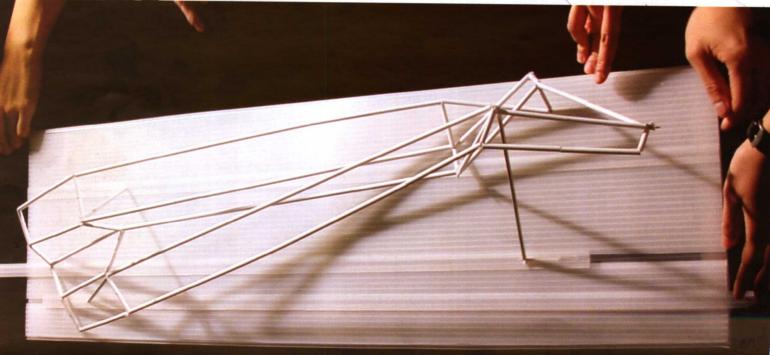
基础结构不断相互地增长和累积,变得越来越有竞争力和越来越本土化;基础结构不再假装去创造一个功能 化体系, 而是在消灭那些功能性实体。新基础结构并没有去创造网络和有机组织体, 而是创造着围城和僵 局……基础结构不再是一种对那些或多或少的紧急需求的或快或慢的迟滞反应,而是一种策略性武器,一种 预知 .....

> Rem Koolhaas, 'The Generic City' 雷姆•库哈斯《广普城市》

TCP pursues an 'infrastructural' sensibility regarding the organization of architectural space, by which I mean that diagrams of large-scale urban infrastructures (like roads, bus routes, or subways) are transposed into engines for the organization of space at the scale of a building, rather than a city. The possibility of such a project can be found, often suppressed, within many of the discourses of modern architecture itself (a favorite example of mine is the beautiful catalogue of freeway overpass sketches Le Corbusier made early in his career, which find themselves brought to life as the basis for projects like Algiers) [fig. 5, Corb sketch]. What Koolhaas notes in the above quote however is the way in which the status of an infrastructural diagram has shifted in recent time, now used not to organize cities, so much as create small independent domains within urban settings. Its an architectural strategy that has emerged, interestingly, at a time of an increasing breakdown and failure of real urban infrastructures (most famously, in the overcrowded roads or underground system in a city like London). This increasingly infrastructural approach to questions of architectural space, which decades ago could be equated with the elevated sky-ways, pedestrian routes, and other circulatory strategies of projects like those of the Smithsons or others[fig. 6, Smithson elevated walkway sketch sketch] has more recently flourished as an increasingly prominent diagram of our era: the deformed or warped surface today a familiar feature of contemporary design.

One of the refreshing aspects of TCP (especially for those of us in the D[R]L) is its studious avoidance of this most telltale image of contemporary architectural avant-gardes, often made overly literal in the form of a building's actual superstructure (the deformed floor plates of countless projects during the past decade). The image has recently become such a near-cliche of spatial connectivity (whether it's a genuine property of an architectural interior or not) that buildings like MVRDV's Villa VPRO have literally cast impossibly curved floor slabs (rolled back on themselves in ways so extreme that anti-gravity skateboarders couldn't negotiate their slopes) as an image hung from a building's elevation. It's a mildly distressing new form of modern symbolismone whereby the mannered pediments of an architect like Venturi





The models were built as if small mechanical puppets, whereby a loose structural frame was linked to a series of sliders on its base. 模型就像一个小型木偶一样,一个自由的结构框架链接在一系列固定在底座的滑杆之上。

have been replaced by a curled caricature of the Maison Domino (itself, a bit of a cartoon that has long lingered as, if not in, the conscience of modern architects). While this example is somehow a rather satisfying example of the revenge of modern imagery on the tactics of post-modernism (one might say it's a case of putting the 'mo' back in 'po-mo'something that just might be the legacy of certain Dutch architecture in the 90s), gestures like these can be seen as simply promoting images of an infrastructural connectivity rather than creating the conditions of a genuinely variable (i.e. urban) field of programmatic interaction. The subtlety and intelligence of TCP's project is to not make this a literal image, but rather, a performative possibility.

The warped floor plane of recent years in architectural projects has operated as a diagrammatic engine for many recent architectural projects and discourses, including of course the well-circulated discourse of the diagram (what has been called new 'diagrammatic' approaches to architectural production). The situation owes something to the considerable S,M,L,XL influence of Koolhaas' own warped surface projects, including especially OMA's *Urban Design Forum* competition project in 1992, subsequently elaborated in their *Bibliotheques Jussieu* a year later (which were worked on by young architects at OMA who later went on to literalize this imagery in projects like *VPRO*). A much-simplified version of these two seminal OMA schemes was later built by OMA as a large rolled floor section comprising their *Educatorium* finished a few years later. While the warped surface has not gone away entirely in TCP (where it can still be seen in the ruled surface of parallel components

used as the operable louver-like skin its spaces), it does a good job of avoiding the ready-made solution of creating a single, large-scale, twisted surface as the basis for a principal architectural ground. We've seen about a thousand of those kind of *Maya* or *3dStudio* diagrams during the past several years in the D[R]L and recent student versions these days owe a lot to the accomplishment of Yokohama v.1.0 (OMA) or Yokohama v.2.0 (FOA) two of the genuine architectural landmarks of our time (the former unrealized, the second built and now inhabited

In TCP by contrast a series of smaller pavilion-like interiors interweave key points identified within an already-existing three-dimensional field; the elevated platform of the Barbican that's already used (however badly) to try and connect the Centre's major public spaces. We might call the approach a kind of 'micro'-urbanisma 'bottom up' approach where the large infrastructural organization of the project's surrounding urbanism, including its global flow of users, activities and events, redistributed within a dispersed field of loose trajectories. Unlike previous decades' attempts to model distributed surfaces (like the geometrically-stiff order of Bernard Tschumi's *La Villette* in the 1980s, which depended upon an almost Euclidean stability of form and organization) this vectoral strategy for dispersion is fundamentally one of supple

and multiplicitous directionality, not superimposed structural grids (which for decades ordered the production of twentieth century urban space). In the countless diagrams and studies the team did as a build-up to their work, the focus was on how an existing field already operates, and might yet better perform, if modulated by a new network of routes and paths surgically inserted within an already-existing field of forces. The strategy depends entirely on an understanding of space as a dynamic form of interacting networks, rather than an entity carved

with great success).

out of the mass of stable, permanent, urban form.

TCP demonstrates how a growing awareness of, and the new sciences now studying, networks can transform the diagrams by which architects conceive, model and install built space today .

From the project's earliest network diagrams, TCP explores the possibility of a new collection of public lobbies stitched within the already-existing pattern of failed modern public and circulation spaces that make up the Barbican. These new regulator-spaces, whose protocol or procedure for modulating the movements of visitors is programmed as a network of transfer points (the 'transfer control protocol' of the project's name) are literally wired together along a circuitry of tracks and routes cut into the existing architecture of the site (one clear way of

reading the project is to see it as modeled on the intelligence of microprocessors and electronic circuitrycomplete with all the associated connotations of solenoids, switches and relays). The network thinking leading to the project began with several months of work by the team recording and analyzing the highly specific patterns of population movement across the existing site, which is exhaustively recorded (through population, demographic, and statistical charts), animated as a series of dynamic informational models, and then used to identify and focusin

on those locations within the field where existing infrastructures most often fail. These become the sites for a new series of responsive spaces able to operate as if a kind of Barbican version 2.0.

TCP privileges the performative, regulatory, aspects of built space, diagrammed and analyzed extensively by the team in terms of pedestrian and other forms of flow, rather that the static, compositional features that once ruled architectural conceptions of modern architectsincluding those precepts of new brutalism responsible for the inert physical oppressiveness of the Barbican's own design. The most significant spatial property of the Barbican's design, following a pattern Banham suggested in his work on new brutalism, is the building's sectional complexity, a signature feature of the brutalists (whose first sketches were often made in section, rather than plan). In the Barbican all of its major public spaces sit atop a podium raised a full story-and-a-half above its surrounding streets. This design strategy creates an elevated connective tissue of open exterior platforms that stretch hundreds of meters across the Barbican and which are the chief obstacle cutting it off from the surrounding network of buses, underground lines, streets and public spaces in its neighborhood. This is also the material system TCP targets as the focus of its own design, which is made out of a series of tension structures that hang down from this podium level to provide a series of new connections up on to and into the Barbican.

This tensile arrangement of structural components in the series of new spaces that the project creates are based on a rotational arm system of bent, structural members, which are then knitted together by a secondary system of other elements and enclosing surfaces (the many animations and digital studies the team did of this ballet of moving components is mesmerizing, for the ways in which it conveys a sense of

infrastructural choreography that makes architectural installations open, close, rotate and collapse as if a direct extension of the crowds gathering within them). This is the defining architectural aspect of the project, and its clever realization of a system hung and assembled in tension, rather than standing and self supporting is essential. By taking gravity out of the forces traveling through the rotational joints of this design HC2O creates a convincing solution for allowing for remarkably fast, fluid and life-like movements in the structures, which open up, close down and slide along to relocate themselves according to how they are being used by pedestrians and some of the surrounding infrastructures (popping up and opening, for example, in patterns that coincide with the arrival of buses, taxis, or other vehicles). The design of this complex machinic superstructure, as if a kind of linked structural elements, possesses many compelling sub-systems (I particularly like the louvered surfaces that can flex and rotate to modulate varying degrees of transparency to passers by). Many of these more detailed design decisions are the direct result of the team's considerable skill in creating operable, performative, models of the project in both digital and physical form; examples of which abound in the following book. All of these eventual physical studies stem however from an initial series of small plastic and aluminum models the team created early on in their initial development of the structure. They are my favorite moment in the work, and their discoveries proved essential to the overall coherence of the project.

These were a series of straightforward hand-built and hand-powered structural studies of incredible ingenuity, for the ways in which their machinic design were able to convert the application of simple forces along parallel, linear paths into incredibly complex, life-like, overall behaviors. The models were built as if small mechanical puppets, whereby a loose structural frame was linked to a series of sliders on its base. As these sliders were pushed, this simple x-axis displacement of the structural arms pinned to a floppy structural frame above the sliders was transformed into an incredibly complex movements of the loosely linked frame attached to this substructure. The discovery of this set-up was a moment of revelation in the project, and a thorough demonstration of what it means to create a genuinely complex system; that is, one whereby a non-linear linkage of otherwise relatively simple parts make possible emergent, sometimes unexpected, global results that exceed the simplicity of the systems underlying elements. In this case, the jerky, floppy, patterns of reconfiguration in the models' structural frames far exceeded the simple, even, application of force entering the system through the pushing of the models' sliders.

The clever trick that HC2O used for this conversion of simple one-dimensional displacement into a complex resultant of three-dimensional

rotation and animation (a transposition of orthogonal force into an indeterminate curvature of linked components) was an incredibly important

moment in the design of the projectone that the team then systematically examined in countless subsequent IK digital models and more refined physical studies. Underlying the genius of this experimental set-up (and confirming the importance of experiment itself in the design of complex, computational, forms of built space today) was a key structural insight, perhaps more bio-mimetic that it is traditionally architectural. It was the use of double-jointed rotational components that allowed for an overall flexing capacity within the movements of the system. Unlike a traditional building structure, which tends to treat a 'joint' as a simple and singular point of connection between two distinct, stable, structural members, HC2O deliberately chose to use (at select key moments in the frame's design) structural members that were themselves jointed, like a knee, and so which could perform, leg-like, with a considerable range of motion. The effect was remarkableby allowing these members to possess the range of motion associated with a leg, but by using the element as an array for an entire frame, the resulting motion in the system is life-like, while avoiding the familiarity of typically bipedal, symmetrical uses of this kind of limb/joint arrangement. The result was a kind of kinetic motion that is familiar, yet strangely alien; a grid of limbs, rather than a body with legs.

These small plastic prototypes were built, video-recorded, motion-captured, and studied endlessly during the following year of work on the

project presented in this book. Their discoveries, along with the intensive structural ingenuity of their organization of their components, are the result of a compelling, fundamentally networked, spatial sensibility. The four young architects, who came together for this work from Taipei, Shenzhen and Vancouver for an extended period of experimentation while studying together in London, make evident the promise of networks and connectivity not as any kind of image or technology, but rather as a fundamental organizational principle relevant to the redistribution of matter that is the basis for all architecture. The approach holds great promise for an increasingly responsive, that is adaptive and machinic, architectural future; one whereby the multiplicitous spaces we treat as lobbies are even more enigmatic that the modern examples from which they evolved.

通过把大尺度的城市基础结构图解(如道路图、公车路线图或地铁图)转化为一种描绘建筑而不是城市空间组织的工具,TCP追求着一种基础结构化的建筑空间组织形式。我们可以从过去许多现代主义建筑的文献中(我认为最好的例子是勒·科布西耶早期的描绘城市高架桥的草图,草图里的构想最后在某些实际工程中得以实现,如Algiers工程){fig.5},发现隐藏在其中的、像TCP所具有的这种可能性。而库哈斯的上述评论则表明了基础结构图解已经不再被用来组织一个城市,而是在现有的城市框架内创造小范围的独立区域。有趣的是,当越来越多的城市基础结构被证明是失败并逐渐崩溃的时候(最明显的是城市里拥挤不堪的道路或地铁系统,就象伦敦那样),这种建筑策略出现了。现在,这种建筑空间问题的基础结构式解决方法,已经成为我们这个时代越来越突出和重要的diagram — 一种当代设计中最常见的特征:变形或扭曲的表面;但在几十年前,这种方法则代表了架空天桥、人行通道以及其他各种流线解决策略,就像史密森夫妇等建筑师的设计那样[fig.6]。

TCP其中一个令人耳目一新的方面(也是D[R]L所具有的)就是,它刻意避免了与某种被当代建筑先锋们所滥用的外观特征的雷同。这些当代建筑先锋们经常过度地让建筑的真实结构去表现那些特征(过去10年间,无数的方案中都出现了被扭曲变形的楼板)。最近,这种外观特征几乎又变成了一种表达空间联结的陈辞滥调(不管这是否是这个建筑室内空间的真实特征),以致像MVRDV设计的Villa VPRO等建筑已经生搬硬套地把那些不现实的弯曲楼板(过分向内卷曲的楼板让那些善于"反地心引力"的滑板者都无法驾驭于其上)作为一种象征而悬挂在

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