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# Open Source Architecture

Carlo Ratti  
with Matthew  
Claudel

Thames & Hudson

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download and build structures which are affordable and suited to their needs?”<sup>42</sup>

“The factor[ies] of the future may look more like weavers’ cottages than Ford’s assembly line,”<sup>43</sup>...an uncharacteristically bold statement from the pages of *The Economist*. The implication is that democratization of production will revisit the “timeless way of building,” the forms of production that yielded anonymous or vernacular architecture. Most notably, this will have a dramatic impact on urban economies and the production of the built environment. Parvin speculates that in the future we may look back on the monolithic, top-down, financially-capitalized, one-size-fits-all models of architectural production as an awkward, adolescent blip in mankind’s industrial development.<sup>44</sup> The idea of bottom-up, locally-adapted, copied typologies, produced by citizens using their social capital as well as their financial capital, is far from new. In many ways it is bringing technology to pre-industrial “barn-raising” approaches.

Open-source architecture is presented as an innovation, but it is really just the vernacular with an Internet connection. Local design fueled by a global community.

The challenge is looming, goals are clear and technologies for achieving them exist. The task, then, is to reflect on the potential implications that “future vernacular” will have on economic development, social justice, resource scarcity, labor economies, planning systems, and the role of professionals. The discipline cannot remain hermetically sealed forever – there is a critical mass of people, ready and willing to work in a bottom-up way. A tipping point is approaching that posits architecture as information and brings empowerment through fabrication. The boundaries of the discipline will be exploded outward by sharing marketplaces, building-scale “Thingiverses,” “remixes” of iconic buildings, fab labs for homes, open-source plans and 3D models, or the architectural Arduino. And when it does, will you hack your house?

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## Building Harmonies: Toward a Choral Architect

In reality, architecture has become too important to be left to architects.

Giancarlo de Carlo, *Architecture’s Public*, 1969 <sup>1</sup>

During the summer of 2006, Annie Choi – a recent graduate of Columbia’s School of Arts writing program – hunched over her laptop, typing quickly despite the noise of the New York City streets outside and the heat trapped in her apartment. Perhaps because she was relegated to a cramped 187-square-foot studio without air conditioning and “four pieces of furniture, total,”<sup>2</sup> she harbored festering resentment. On her screen was an open letter to architects, its first words: “Dear Architects, I am sick of your shit.”<sup>3</sup>

Through her network of architect friends, Choi had come to know the editors of *Pidgin* magazine – a recently founded annual publication based at the Princeton School of Architecture. The first issue of the magazine had been quite rigorous: a self-proclaimed “dispatch” from within the school to communicate architectural work and ideas to the outside world, taking shape as 256 (very well-designed) pages of theory, renderings, project descriptions (what amounted to “abstract blah-blah,” according to Choi). Very high-level, of course, so the editors reasoned that the second issue might need a breath of fresh air. It would be great to invite a non-architect to contribute, and better yet, why not their friend – an up-and-coming young writer based in New York?

Choi was about to publish her first book, *Happy Birthday or Whatever*,<sup>4</sup> finding her wry, irreverent voice through “humorous essays about family and, as I like to call it, ‘stupid shit I love to talk about.’”<sup>5</sup> Her work had nothing to do with architecture,

but sketched emotional, unpolished accounts of personal experience. The open letter on her screen emerged from what she called her “complicated relationship to architecture, which is to say that I don’t really give two poops to the wind about it, but all my friends are architects and the only thing architects talk about is architecture.”<sup>6</sup>

Whether or not the editors expected it, Choi delivered a scathing deadpan criticism. The open letter unapologetically made fun of the culture of architecture...“but you know, in a loving way.”<sup>7</sup>

After dense pages of *Pidgin*’s cutting-edge academic discourse on architecture, the letter from Choi was a jab in the ribs. She casually announced to the architecture community that they were irrelevant: architects “all design glass dildos that I will never work or live in and serve only to obstruct my view of New Jersey...I do not care about architecture. It is true. This is what I do care about: burritos; hedgehog; coffee. As you can see, architecture is not on the list. I believe that architecture falls somewhere between toenail fungus and invasive colonoscopy in the list of things that interest me.”<sup>8</sup> Behind the indelicate language, Choi was actually making an incisive criticism: architects, look around you. Don’t take yourselves so seriously, and spend a moment to think about the people you are designing for.

Responses to the letter were violent. Choi had hit a nerve. Hate mail poured in from architects around the world, demanding respect or challenging her to enroll in a graduate program on architectural theory before proffering an opinion. But by the same token, the letter gained considerable momentum and support. Architects who felt trapped in the system and culture of architecture identified with its refreshing perspective. The letter put into words – in the frank, readable language that architects cannot seem to get onto a page – the extent to which architecture had spiraled into itself, exposing the tremendous effort of

the Promethean architect as nothing but self-congratulatory irrelevance.

Aside from its institutional pertinence, Choi offered her own – very characteristic – explanation for her letter’s success: “I think maybe architects liked the letter because it’s so abusive and architects just like pain? Or they like any attention, even if it’s bad?”

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However crass or sarcastic, Annie Choi’s open letter made a pointed critique of the profession as a whole, unapologetically calling out the navel-gazing discourse and the irrelevance into which it has dissolved. In the letter she writes, “I have a friend who is a doctor. He gives me drugs. I enjoy them. I have a friend who is a lawyer. He helped me sue my landlord. My architect friends have given me nothing. No drugs, no medical advice.”<sup>9</sup> Choi rattles off a laundry list of grievances, from cramped apartments to sprawling malls, amounting to a portrait of the daily interactions with buildings experienced by the vast majority of humanity. Architects do nothing to address these very real, immediate concerns, despite those concerns being situated squarely in the purview of the architect. Academically and professionally, architects are disconnected.

There is a sharp asymmetry at play: people know what they need and want, yet architecture spins into navel-gazing and drifts farther and farther from the possibility of substantive contribution to the communities it is meant to serve. In his 1975 book *Soft Architecture Machines*, Nicholas Negroponte wrote that there is “a general feeling that architecture, particularly housing, has been inadequate and unresponsive to the needs and desires of its users...the design of housing is in the wrong hands, that is, in the hands of an outside ‘professional’ rather than that of the resident.”<sup>10</sup> No one is more familiar with the user’s

needs than the users themselves, yet they are excluded from the process. The same substantive criticism existed in pre-modern architecture – the object of a rant in the *Dictionary of Accepted Ideas* compiled/authored by Gustave Flaubert (1821–80) – published at the turn of the 20th century: “Architects all idiots; they always forget to put in the stairs.”<sup>11</sup>

The objective of user-focused design has long motivated architects. The goal of modernism and the *Gesamtkunstwerk* approach was to resolve all of the deficiencies, inefficiencies, and inadequacies of architecture in one swift stroke. Considering the totality of human inhabitation as the object of design, the Promethean architect sought to reform modern man, from spoon to city, from city to society. That gleaming white purity of intention has, over the past century, been at best revealed as a chimera, and at worst forcefully shattered by the realities of habitation and society. Yet the profession clings to its scraps of messianic idealism, at once aloof and impotent.

The blame, however, is hard to place. In what amounts to a universal tangle of finger-pointing, specific issues are shunted between participants in the design/construction/inhabitation process until human relevance is lost in the mix. Almost all governments, for example, promote the construction of more energy-efficient buildings, but effectively pass the baton to development organizations that (logically) see higher energy performance purely as a cost. The only person with a direct economic interest in designing for better energy performance is the person who will pay the energy bills<sup>12</sup>...and the only way that person can exercise control is to shut off the heater and shiver through winter. The general principle applies very tangibly to nearly every aspect of design.

An analogy is a child playing at the beach – completely absorbed in crafting the most magnificent sand-castle that the shoreline has ever known, he works with his back to the sea...



where, unbeknownst to him, a terrific wave looms, poised to crash. As the consummate American designer and theorist “Bucky” Fuller (1895–1983) ominously proclaimed in 1969, “Whether it is to be Utopia or Oblivion will be a touch-and-go relay race right up to the final moment.... Humanity is in a ‘final exam’ as to whether or not it qualifies for continuance in Universe.”<sup>13</sup> It is, perhaps, dramatic to swell architectural practice to the scale of the universe as a whole, but the same urgency certainly projects onto the rising tensions in human habitation. Architecture is, by necessity, at the brink of another revolution.

With the lack of user participation echoing throughout the history of modern architecture – and as users drift ever farther from the design process today – new open-source models for a collaborative approach may have dramatic implications. From software to fab labs, open-sourcing has emerged as a powerful new mode for engagement. The pressing question is how to reorient architectural practice toward people, and the answer will be to put architecture into the hands of those people themselves. Has the moment for a new, relational and less hierarchical form of production finally arrived?<sup>14</sup>

This amounts to a galvanic call for action. Ethel Baraona-Pohl maintains that “the time has come to transform dissatisfaction into serious proposals, to start taking back the city for the citizens, to remove the distinction between public and private in the urban environment, to go from DIY (do it yourself) to DIWO (do it with others).”<sup>15</sup> No doubt an extreme position, but there may yet be a future for architecture designed by humanity, for humanity.

In the course of this revolution, as control returns to the crowd, must the architect be guillotined? Does this toll the death of his Promethean figure? He can only survive through adaptation – and if he is successful, what will be his role?

This central question – a redefinition of the architect – has been explored from many angles by architects and thinkers since the 1960s. In a prescient answer, Nicholas Negroponte predicted the evolution of the designer into a “middle man:” a creator of open frameworks rather than deterministic forms. The process of architecture “would not be a case of reckless autocracy; rather, it would be a pervasive and evasive set of restrictions,”<sup>16</sup> suggesting a fundamental transformation of architectural deliverables. Rather than providing a finite and buildable design, the architect would determine a set of parameters that direct a flourishing body of ideas, a nearly infinite spectrum of potential architecture. Architects would design the question, not the response. Citing French architect and designer of the “*Ville spatiale*” (The Spatial City, [DATE?]) Yona Friedman, Negroponte wrote, “The paternalistic character of the traditional design processes will disappear. The enormous variety of emotional (intuitive) solutions which can be invented by a large number of future users might give an incredible richness to this new ‘re-designed’ design process.”<sup>17</sup>

Concerned with – in the words of Hans Ulrich Obrist – “flexibility, responsiveness, transience, relativity, joy,”<sup>18</sup> Cedric Price worked toward a similar reconfiguration of the architect’s role, forging an idea of the architect as programmer. In projects such as *Potteries Thinkbelt* (1965), *The Generator* (1976), and the *Magnet Project* (1997), the architect provided a set of algorithms, provocations and interactions. “In Price’s view, the architect should not be content with being a mere designer of hardware, but should demand an even broader responsibility for creating activity programs and determine how they could be integrated.”<sup>19</sup> Obrist focuses on Price’s key architectural contribution as the activation of space, rather than its creation. “The idea is not to occupy space, but to trigger relations and social spaces, stimulate new patterns and situations of urban

movement in the city.”<sup>20</sup> The architect offered event rather than form.

Beginning in the early 20th century, the emergent discipline of cybernetics sought to explore network systems, focusing on the communication and connections between interdependent nodes – and it offered the language in which Price would define the architect-as-programmer, in a fertile collaboration with pioneering cybernetician Gordon Pask. In *The Architectural Relevance of Cybernetics* (1969), Pask was one of the first to apply the conceptual framework of cybernetics to architecture, largely through discourse and collaboration with Price. “We are concerned with brain-like artifacts,” wrote Pask, “with evolution, growth and development; with the process of thinking and getting to know about the world. Wearing the hat of applied science, we aim to create...the instruments of a new industrial revolution – control mechanisms that lay their own plans.”<sup>21</sup> When exercised in architecture, cybernetics was less about designed, artistic, object-buildings than architectural scripts for adaptive ecologies that evolve through a form of dialogue with inhabitants.

Price was discarding architectural precedent, in favor of architecture as event. Conversely, N. John Habraken suggested that the redesigned design process would be discovered by the architect only through close scrutiny of the characteristics and tendencies embedded in the existing fabric of architecture – that is, considering the built environment as an autonomous entity (see earlier discussions in Chapter 2).<sup>22</sup> Throughout the history of architecture, as Habraken points out, building design has evolved on the timescale of generations. In the traditional evolution of vernacular architecture, a person may design her house to be similar to the neighbors’, but with slight modifications and improvements. After a project is built, it is evaluated by the community, even unconsciously, and subsequent projects will modify

and innovate. So architecture propagates and evolves, based on typologies, shared information and subtle experimentation – from Native American dwellings to Gothic cathedrals.

As Habraken articulated in *The Structure of the Ordinary* (1998),<sup>23</sup> willful architectural intervention should be predicated on diagnosis, just as a medical doctor studies the human body before he administers treatment. Based on a process of examining and analyzing the existing built environment, an architect can ultimately create frameworks that cultivate user-generated design, leading to “three-dimensional urban design.” A project is not a grand act of creation in and of itself, but a single link in a much longer evolutionary chain. The role of the architect, in Habraken’s estimation, is closer to that of a gardener. He learns horticulture, surveys the land, creates planter beds, and nurtures the plants that inhabit them. He is in partnership with inhabitants, rather than simply delivering a product. He leaves the most intimate material element of the built environment (house, work unit) to be the sole purview of users themselves. In this way, the living cells of architecture correspond directly to the individual in what Habraken calls a “natural relation.” The architect has an opportunity to participate in the evolution of the autonomous built environment through creating frameworks within which users design.

This is not traditional on-paper participation at the level of urban planning, and users are not embroiled in the politics of the overarching project as a whole. The key point, as Alastair Parvin notes, is to make a “distinction between group, consensus-based collaboration (which is almost impossible) versus a more plural, permissive, shared-protocol-based approach, in which individuals are more or less autonomous, but operate within basic common rules, and copy from each other (which is almost inevitable).”<sup>24</sup> It is a delicate process of independent but interconnected production, with the architect serving as

gardener, catalyzing the collective–individual scale. People can inhabit naturally, based on their preferences, yet exist harmoniously in the shared space of a single building. The architecture that people encounter, says Habraken, is “a living cell where the nominal social unit interacts without mediation with the smallest material unit recognizable as a changeable whole.”<sup>25</sup> That is, people have agency in their own environment, which, collectively, constitutes the driver of the evolutionary process: “Ultimately, once the living cell is capable of individual action to adapt or renovate, both invention and sustainability can penetrate rapidly in the entire body of an environmental fabric. At that point the network among inventors and designers – including lay people – can fully develop its true potential.”<sup>26</sup>

Habraken’s model, first posited in the 1970s, was prescient of production models that are only just coming into their own. Many of the collaborative experiments that have emerged on the Internet, such as Linux or Wikipedia, utilize a very similar distributed generative mechanism, but with a key difference: the autonomy of the individual contributors is guided, moderated and nurtured by editors who can make decisions from the top down. This editorial role, more than that of a gardener, a middle-man or a programmer, has a broader orchestrating function. He will have qualities of each, but simultaneously take on an entirely new character, in the context of a digital and networked world. It is a plural figure that could be called “the Choral Architect.”

As it outlines a new kind of designer, the idea of a Choral Architect brings with it a host of related questions. What tools and methods can direct dispersed energy in a way that transforms a crowd into a cohesive, motivated, and productive entity? How can a broad network of people, working together, arrive at a buildable and relevant architectural design? And if that is the goal, how is the Choral Architect different from the principal

of a corporate architecture firm? In light of this plural creative model, what is the specific role of the Choral Architect?

The first and most fundamental responsibility of the Choral Architect is to frame the process. Just as Torvalds did with Linux, the Choral Architect must begin by generating a “kernel” that is subsequently distributed, iterated and added to. Without an impetus, the crowd will default to Brownian motion. By the same token, Giuliano da Empoli suggests that one of the most important tasks is actually to end the collaborative production. “A new and better idea might emerge from the network a day, or a week after the project is closed. But he has to do it, otherwise nothing will ever get built...this prerogative is an essential one. It should be included in his job description.”<sup>27</sup>

Da Empoli implies that the Choral Architect is also responsible for steering the project by making often-difficult decisions and defining the rhythm of its development. He has a role as arbiter in the situations when consensus cannot be reached – again, much like the team of editors that guides Linux through a tumult of input. In some cases, the editorial hand needs to be incisive (more similar, perhaps, to that great critical tool that Ernest Hemingway described as his “built-in, shock-proof, bullshit detector”).<sup>28</sup> He is also responsible for setting the pace of the entire process, deliberately orchestrating the moments of openness and collaboration versus closed honing and decision-making. Within these capacities, the Choral Architect might also integrate his own esthetic or functional ideas, contributing expertise and personality to the specific project.

The output of an architect, then, would not necessarily be buildings or construction documents, but initiating, coordinating, and closing the process whereby architectural source code is shared, adapted and executed. The Choral Architect will orchestrate actions and interactions naturally emerging from a group of peers – and therein is the difference with the principal

of a corporate architecture firm – rather than creating objects. In framing the work of a co-design lab at Sitra, Alejandro Aravena wrote, “A good strategic framework will not precisely predict a single solution, but will help the best solution seem self-evident when identified.”<sup>29</sup> Yet this does not at all mean an abdication of responsibility or even “signature” from a given project, any more than it does for an art curator. Arguably, the curator’s voice is just as prominent as the artists’, but in a more diplomatic role: steering the meaning of an exhibition through proximities, juxtapositions and pairings, rather than speaking through a brush and paint.

If architecture can operationalize a similar design–curation ecosystem, each instance of this networked editorial creative process would be unique. A project would derive from the peculiarities of the particular group and the context it is working in, draw on the tremendous power of the network, and be moderated by the Choral Architect. Because the content of a project is not singularly generated (as in the author model), and because evolution happens within its lifetime, the choral approach yields surprising results. Valuable – and previously voiceless – insights will be aggregated and instrumentalized in the process of design. As the power of the crowd comes to bear on specific problems, the global could in effect mediate with the local, addressing some of the problems inherent in so-called “Critical Regionalism” – specifically, the irrelevance of a starchitect copying and pasting his characteristic style indiscriminately across regions or the blandness of standardized, anesthetized architectural products. The collaborative online design process brings together voices to create a kind of “Network Specificism.”<sup>30</sup>

Contemporary network technologies give rise to robust and productive curation ecologies, just as in open-source software. But ultimately that global collaborative energy must be funneled into bricks-and-mortar architecture. The role of the

Choral Architect is also to maintain and orchestrate that materialization process. As it has always been, the built environment becomes once again an autonomous entity, nudged in one direction or another by the processes of human inhabitation.

We can assert that design becomes plural – yet Habraken’s most incisive question, posed in response to the initial manuscript of *Open Source Architecture*, has still not been answered. What is different now than at any time in the past? After all of the frustrated efforts of involving users in the design process throughout the 20th century, what will make this substantively different? “That the digital revolution can and will play a role I do not doubt, but...how can a creative network of design and production driven by the digital revolution connect to the reality of built environment’s life and development?”<sup>31</sup>

There are several factors that are poised to ignite new possibilities in architecture. First, information – the “code” or DNA of a building – can be shared instantaneously and a-spatially. The intellectual project of such groups as CIAM (Congrès internationale d’architecture moderne, founded by Le Corbusier in 1928) was to share thoughts, ideas, theory (or code) and collaboratively to write a charter – but in order to do so they had to rent a ship and sail across the Mediterranean, to meet face-to-face. Today, collaborative writing happens effortlessly, implicating millions of people every second, around the world, through platforms like Wikipedia. Recipes or formulas for spatial phenomena can be considered as the software of architecture, notes Keller Easterling.<sup>32</sup> Just as in Wikipedia, Linux, and open-source software, code can be shared, augmented and refined before it is compiled and executed. Choral design ignites the autonomy of the building process within a single project. The kernel of architecture exists as data, is honed by a distributed sequence of adding and editing, and finally culminates in a physical structure – the execution of code in space.

This kind of sharing can happen effectively now that a building “exists” digitally before it is constructed – promoting a radical change toward openness and distribution in the design process. Traditional and vernacular collaborative processes worked through discrete leaps, as mutation and improvement happened from one execution of the code to the next – and today that is changing.

In the case of cuisine, for example, there exist basic structures. For example, take bouillon – each time a specific soup is cooked, the structure is expanded and made unique, it is shared and eaten; and subsequently modified for the next dinner. The result of each experiment is evaluated, and information about the most successful developments is encoded in recipes to be distributed and replicated. Mutation only happens from one dish to the next. Yet today (in architecture), the ability to assess a building before it is built allows collaboration at every stage. To continue with the cooking metaphor, it is as if an individual soup itself were created collaboratively – that is, by many cooks experimenting together in the kitchen, constantly tasting their work.

In this case, the design process would edge closer to the model of science writing, wherein a piece is created by a team of contributors, legitimized through peer review, and distributed for wider application within the field. Work is developed collaboratively (necessarily, given the acceleration of complexity), while the scrutiny of peer review ensures quality and provides a stamp of credibility. In the course of its development from idea to publishing, a single paper experiences a rhythm of opening up to peer review and revision by the authors. It is a self-regulating, participatory and incentivized system.

This is the mandate of the Choral Architect. To contradict the standard adage – architectural cuisine will benefit from many cooks in the kitchen, integrated by a talented chef. Situated

between Le Corbusier’s authoritative, era-defining voice and the Internet’s dispersed collective banter, a designer enmeshed in networked communities will make harmonies. The architect will not be anonymous, but plural and compositional. Authorship will not be erased, but contextualized as it is woven into a relational fabric. The new architect is situated between top-down and bottom-up, channeling the raw energy of the latter through the targeted framework of the former. The responsibility of the Choral Architect is less oriented toward object-building than orchestrating process. She is not a soloist, not a conductor, not an anonymous voice among many. The Choral Architect weaves together the creative and harmonic ensemble.

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This chapter has traced the outline of a new Choral Architect – but, hypocritically, with the singular confidence of an assured diva. If we, the author(s), are sincere about these ideas, we won’t be authors at all, but orchestrators of a vibrant dialogue. The text will grow in unexpected directions and at a faster pace if it takes the form of a wiki rather than remaining a monologue. Think of it not as a book, but as a debate, or a joke, or a brainstorming session.

With that, we turn it over to you....

## Notes

## Chapter 1

**The Promethean Architect: A Modern(ist) Hero**

- 001 Rand, Ayn. "The Soul of an Individualist." In *For the New Intellectual: The Philosophy of Ayn Rand*. Random House, New York, 1961, p. 82.
- 002 Le Corbusier. *Vers une architecture*. (Toward an Architecture.) G. Cres, Paris, 1923, p. 86 [author's translation]
- 003 *Architecture or Revolution!* was the provisional title of *Vers une architecture* as outlined in a letter to William Ritter, 7 April 1922.
- 004 Boesiger, Willi. *Le Corbusier et Pierre Jeanneret Oeuvre Complète, Vol. 1, 1910–1929*. Editions Girsberger, Zurich, 1930, p. 104 [author's translation]
- 005 Ibid.
- 006 Nieuwenhuys, Constant. *New Babylon – a Nomadic City*. Exh. cat. Haags Gemeetmuseum, The Hague, 1974.
- 007 Wolfe, Tom. *From Bauhaus to Our House*. Farrar, Straus & Giroux, New York 1981, p. 23.
- 008 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 009 Ledoux, Claude-Nicolas. *L'Architecture considérée sous le rapport de l'art, des mœurs et de la législation* (Architecture Considered in Relation to Art, Morals and Legislation). Paris, 1804.
- 010 Anonymous. "Etudes d'architecture en France." (Studies of Architecture in France.) *Magasin Pittoresque*. Paris, 1852.
- 011 Ledoux, *L'Architecture considérée*.

- 012 Fourier, Charles. *Théorie de l'unité universelle*. (Theory of Universal Unity.) Paris, 1822.
- 013 Fourier, Charles. *La Réforme Industrielle ou Le Phalanstère, Journal des intérêts généraux, de l'industrie et de la propriété*. (Industrial Reform or The Phalanstery, Journal of General Interests, Industry and Property.) Paris, June 1, 1832 to February 28, 1834.
- 014 Bentham visited Russia in 1787, later publishing his letters to a friend with postscripts. Bentham, Jeremy. *The Panopticon Writings*. London, 1791, p. 103.
- 015 Ibid, p. 1.
- 016 Ibid.
- 017 Wagner, Richard. "Das Kunstwerk der Zukunft." (The Artwork of the Future.) Leipzig, 1849.
- 018 Gropius, Walter. *Manifest und Programm des Staatlichen Bauhauses*. (Bauhaus Manifesto.) Weimar, 1919.
- 019 Wolfe, *From Bauhaus*, p. 43.
- 020 Rand, *The Fountainhead*.
- 021 Le Corbusier, *Vers une architecture*, p. 262.
- 022 Rand, *The Fountainhead*, p. 739.
- 023 Shapiro, Gideon Fink. "Review of *G: An Avant-Garde Journal of Art, Architecture, Design, and Film 1923–1926*. Detlef Mertins, Michael W. Jennings, eds." *Domus* web, March 25, 2011.
- 024 Easterling, Keller. Personal communication as Adjunct Editor. December 2013.
- 025 Sudjic, Deyan. *The Edifice Complex: The Architecture of Power*. Penguin, London, 2006.
- 026 Habraken, N. John. "Questions that Will Not Go Away: Some Remarks on Long-Term Trends in Architecture and their Impact on Architectural Education." Keynote speech at 6th EAAE/ENHSA meeting of Heads of European Schools of Architecture, June 2003, in Hania, Krete, Greece. In *open house international* 31: 2 (June 2006).
- 027 Colomina, Beatriz. "Towards a Global Architect." *Domus* 946 (April 2011).
- 028 Easterling, Keller. *The Action is the Form: Victor Hugo's TED Talk*. Strelka Press, Moscow, 2012, p. 21.
- 029 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 030 Haw, Alex. Personal communication as Adjunct Editor. January 2014.
- 031 Vanstiphout, Wouter. Interviewed by Rory Hyde, "Historian of the Present: Wouter Vanstiphout." *Australian Design Review* (August 2011).
- 032 Ibid.

## Chapter 2

**Bottom-Up Architectures: The Timeless Way of Building**

- 001 Le Corbusier. Quoted by Philippe Boudon, *Pessac de Le Corbusier*, Dunod, Paris, 1969, p. 2. English trans., *Lived-In Architecture: Pessac Revisited*. MIT Press, Cambridge, Mass., 1972.
- 002 Vasari, Giorgio. *Le Vite de' più eccellenti pittori, scultori, e architettori da Cimabue insino a' tempi nostri*. (The Lives of the Most Excellent Italian Painters, Sculptors and Architects, from Cimabue to Our Times.) Lorenzo Torrentino, Florence, 1550, p. 89.
- 003 Ibid, p. 71.
- 004 Ibid.
- 005 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 006 Rudofsky, Bernard. *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*. Museum of Modern Art (distr. Doubleday Press), New York, 1964.
- 007 Ibid
- 008 Ibid., p.58
- 009 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.
- 010 Rudofsky. *Architecture Without Architects*, p. 9.
- 011 Ibid, p. 7.
- 012 Ibid, p. 6.
- 013 Mau, Bruce, and the Institute Without Boundaries. *Massive Change*. Phaidon, New York, 2005.
- 014 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 015 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.
- 016 Haw, Alex. Personal communication as Adjunct Editor. January 2014.
- 017 Mumford, Lewis. *The City in History: Its Origins, Its Transformations, and Its Prospects*. Harcourt, Brace & World Inc., New York, 1961, p. 90.
- 018 Quarles, Philip. *The Decline of American Cities: Lewis Mumford's "The City in History."* Radio segment on WNYC, November 2012. <http://www.wnyc.org/story/206665-Lewis-mumford/>
- 019 Romano, Marco. "Saper vedere la città: forme e immagini" (How to Look and See a Town: Shapes and Images), in *L'Estetica della città europea* (Aesthetics of the European City). Einaudi Editore, Turin, 1993.
- 020 Belluschi, Pietro. Quoted by Rudofsky. *Architecture Without Architects*, pp. 8–9.
- 021 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.

- 022 Ibid.
- 023 Morris, William. *The Gothic Revival II*, in E.D. LeMire (ed.) *The Unpublished Lectures of William Morris*, Detroit 1969, p. 91.
- 024 James, John. *Chartres: The Masons who Built a Legend*. Routledge & Keegan Paul, London and Boston, Mass., 1982, p. 143.
- 025 James, John. *The Master Masons of Chartres*. West Grinstead Publications, Leura, NSW Australia, 1991.
- 026 Ruskin, John. *The Seven Lamps of Architecture*. Smith, Elder, and Co., London, 1849, p. 204. Project Gutenberg, 2011, p. 119.
- 027 Ibid.
- 028 Ibid.
- 029 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 030 Peter Smithson. *Patio and Pavilion Re-Built: A Gothic Afterthought*, in 'Places', VII, 1991, p. 3.
- 031 Price, Cedric, Reyner Banham, Paul Barker, and Peter Hall. "Non Plan: an Experiment in Freedom." *New Society* 338 (March 1969): 435–43.
- 032 Colomina, Beatriz. "Towards a Global Architect." *Domus* 946 (April 2011). <http://www.domusweb.it/en/architecture/2011/04/30/towards-a-global-architect.html>
- 033 Utida, Yositika. "Experimental Apartment Building in Osaka," *Domus* 819 (October 1999), pp. 18–26.
- 034 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.
- 035 Obrist, Hans Ulrich. Personal communication as Adjunct Editor. March 2014.
- 036 Price, Cedric. *Cedric Price: Works II*. Architectural Association, London, 1984. Republished as *Cedric Price: The Square Book*, Wiley-Academy, London, 2003, p. 92.
- 037 Cedric Price Memorandum (1964). Document cited by Stanley Matthews, *From Agit-Prop to Free Space: The Architecture of Cedric Price*. Black Dog Press, London, 2007, p. 73.
- 038 Obrist, Hans Ulrich. Personal communication as Adjunct Editor. March 2014.
- 039 Baraona-Pohl, Ethel. Personal communication as Adjunct Editor. December 2013.
- 040 Zenetos, Takis. Quoted in Dimitris Papalexopoulos and Eleni Kalafati, *Takis Zenetos: Visioni Digitali, Architetture Costruite*. Edilistampa, Rome, 2006
- 041 de Carlo, Giancarlo. In Alison Smithson, *Team 10 Primer*. Studio Vista, London, 1968.
- 042 Ibid.

- 043 De Carlo, Giancarlo. *Architecture's Public*. Originally Published in *Parametro Magazine* 5 (1970). Trans. Benedict Zucchi, *Giancarlo de Carlo*. Butterworth, Oxford, 1992.
- 044 Maki, Fumihiko. "Investigations in Collective Form." Washington University St Louis, School of Architecture, Mo. Special Publication No. 2, June 1964, p. v.
- 045 Maki. "Investigations."
- 046 Ibid.
- 047 Alexander, Christopher. *The Timeless Way of Building*. Oxford University Press, Oxford, 1979, p. 7.
- 048 Ibid.
- 049 Haw, Alex. Personal communication as Adjunct Editor. January 2014.
- 050 **Le Corbusier. Cited in Boudon, *Lived-in Architecture***
- 051 Boudon, *Lived-in Architecture*.
- 052 Huxtable, Ada Louise, "Le Corbusier's Housing Project — Flexible Enough to Endure." *The New York Times*. March 15, 1981.
- 053 Ibid.

## Chapter3

**Why It Did Not Work: A Horse Designed by Committee**

- 001 Alexander, Christopher. *The Oregon Experiment*. Oxford University Press, Oxford, 1975, p. 45.
- 002 Moore, Clement Clarke. Quoted in "Historic Documents on View; When Chelsea was Farmland," *The New York Times*. October 9, 1994.
- 003 Ibid.
- 004 Ibid.
- 005 Alexander. *The Oregon Experiment*.
- 006 Ibid.
- 007 Ibid.
- 008 A common adage, this is generally attributed to a *Vogue* article. Issigonis, Alec. *Vogue* (July 1958).
- 009 Bryant, Greg. "The Oregon Experiment after Twenty Years." *Rain Magazine* 14:1 (Winter/Spring 1991).
- 010 De Carlo, Giancarlo. *Architecture's Public*. Originally Published in *Parametro Magazine* 5 (1970). Trans. Benedict Zucchi, *Giancarlo de Carlo*. Butterworth, Oxford, 1992.
- 011 Bryant, "The Oregon Experiment."

- 012 Alexander, Christopher. *The Nature of Order: An Essay on the Art of Building and the Nature of the Universe. Book Three: A Vision of a Living World*. The Center for Environmental Structure, Berkeley, Calif., 1980. The first two volumes were more about the pattern language, and the third was a critical look at its implementation.
- 013 Alexander, *The Nature Book Three*, p. 261
- 014 Ibid.
- 015 Simon, Herbert A. *The Sciences of the Artificial*. MIT Press, Cambridge, Mass., 1969.
- 016 Archer, L. Bruce. *Systematic Method for Designers*. The Council of Industrial Design, London, 1965.
- 017 "The Design Method" in Birmingham (1965) and "Design Methods in Architecture" in Portsmouth (1967), both UK.
- 018 Rittel, Horst. Quoted by Churchman, C. West, "Guest Editorial." *Management Science* 14:4 (December 1967): 141–42.
- 019 Rittel, Horst and Melvin Webber. "Dilemmas in a General Theory of Planning." *Policy Sciences* 4 (1973) 155–69.
- 020 Ibid.
- 021 Blundell-Jones, Peter with Jeremy Till and Doina Petrescu. *Architecture and Participation*. Spon Press, Oxford and New York, 2005.
- 022 Sanoff, Henry. *Community Participation Methods in Design and Planning*. Wiley, New York, 1999.
- 023 Bryant, "The Oregon Experiment."
- 024 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.
- 025 Ibid.
- 026 Habraken, N. John. *Supports: an Alternative to Mass Housing*. The Architectural Press, London, and Praeger, New York, 1972. (Originally published in Dutch under the title: *De Dragere en de Mensen*. Scheltema en Holkema, Amsterdam, 1962.)
- 027 Maki, Fumihiko. "Investigations in Collective Form." Washington University St Louis, School of Architecture, Mo. Special Publication No. 2, June 1964.
- 028 Ibid, p. 11.
- 029 Castroni, Marco. "Refurbishing the '60s Masterpieces: La Rinascente and Corviale, Rome," *Arch Daily*. February 21, 2009.
- 030 Smithson, Alison and Peter. *Streets in the Sky*. Project on Robin Hood Gardens presented at CIAM IX Conference, Aix-en-Provence, France, July 1953.
- 031 Green, Steve. Comment on the article "Robin Hood Gardens Compulsory Purchase Plans Approved." *BD Online*. August 2012.



- 032 Alison, Charles and Obadiah Chambers. Quoted in "Row Over 'Street in Sky' Estate." *BBC News* website. March 7, 2008.
- 033 Smithson, Peter. Interviewed by Maxwell Hutchinson, "Rebuilding Britain for the Baby Boomers." BBC Radio 4. November 26, 2011.
- 034 Tange, Kenzo. NHK Programme. January 1961.

## Chapter 4

**Learning From the Network:  
New Paradigms for Participation in the Digital World**

- 001 McLuhan, Marshall and Quentin Fiore (illus.). *The Medium is the Massage*. Bantam, New York and London, 1967, p. 12.
- 002 Torvalds, Linus. Bulletin Board news:comp.os.minix, August 26, 1991.
- 003 Torvalds, Linus. "Torvalds on git." Lecture at Google Tech Talk. May 2007.
- 004 Haw, Alex. Personal communication as Adjunct Editor. January 2014.
- 005 Sennett, Richard. *The Craftsman*. Allen Lane/Penguin, London; Yale University Press, New Haven; Berlin Verlag, Berlin; Feltrinelli, Milan, 2008; Albin Michel, Paris and Anagrama, Barcelona, 2009.
- 006 Torvalds, Linus. "Linux-kernel" posting (<http://marc.info/?l=linux-kernel&m=137392506516022&w=2>). July 15, 2013.
- 007 Torvalds, Linus. "The Way We Live Now: Questions for Linus Torvalds." *The New York Times*. September 28, 2003.
- 008 These were: The Declaration of Independence (1776), The Treaty of Alliance (1778), The Treaty of Paris (1782), and The United States Constitution (1787).
- 009 Franklin, Benjamin. *The Private Life of the Late Benjamin Franklin...Originally Written by Himself, and Now Translated from the French*. J. Parsons, London, 1793. (First published as *Mémoires de la vie Privée de Benjamin Franklin, Écrits par Lui-Même, et Adressés à Son Fils*. Chez Buisson, Paris, 1791.) In J. Bigelow (ed.) *The Works of Benjamin Franklin*, Knickerbocker, New York, 1904, p. 237.
- 010 Ibid, p. 238.
- 011 McLuhan, Marshall. *The Gutenberg Galaxy: The Making of Typographic Man*. University of Toronto Press, Toronto and Buffalo, New York, 1962.
- 012 Stearn, Gerald Emmanuel (ed. and comp.). *McLuhan Hot & Cool: a Primer for the Understanding of & A Critical Symposium with a Rebuttal by McLuhan*. Dial Press, New York, 1967, pp. 314–15.
- 013 Berners-Lee, Tim (27 July 2012). "This is for everyone." Twitter. Retrieved October 18, 2014.
- 014 McLuhan, Marshall. Letter to Harold Adam Innis, March 14 1951. In Eric McLuhan and Frank Zingrone (eds.), *Essential McLuhan*. Anansi, Concord, Ontario, 1995, p. 73.

- 015 Kelty, Christopher. *Two Bits: The Cultural Significance of Free Software*. Duke University Press, Durham, N. Car., 2008, p. 6.
- 016 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 017 Barksdale, Jim. "Netscape Announces Plans to Make Next Generation Communicator Source Code Available Free on the Net," Netscape Communications Corporation Press Release. January 22, 1998.
- 018 Kelty, *Two Bits*, p. 12.
- 019 McCarthy, Tom. "Encyclopedia Britannica Halts Print Production After 244 Years," *The Guardian*. March 13, 2012.
- 020 Chesky, Brian. Interviewed by Thomas Friedman, "Welcome to the Sharing Economy." *The New York Times*. July 20, 2013.
- 021 Bacon, Derek. "The Rise of the Sharing Economy." *The Economist*. March 9, 2013.
- 022 <http://googlesystem.blogspot.sg/2013/06/google-mine.html>
- 023 Veblen, Thorstein. *The Theory of the Leisure Class*. Macmillan, 1899.
- 024 Barr, Stewart. "Strategies for Sustainability: Citizens and Responsible Environmental Behaviour." *Area* 35:3 (September 2003): 227–40.
- 025 Sandel, Michael. *What Money Can't Buy: the Moral Limits of Markets*. Farrar, Straus and Giroux, New York, 2012.
- 026 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 027 Huang, Carol. "Facebook and Twitter Key to Arab Spring Uprisings." *The National* (UAE). June 6, 2011.
- 028 Ibid.
- 029 "England Riots: Twitter and Facebook Users Plan Clean-up." *The Guardian*, August 9, 2011.
- 030 riotcleanup.co.uk.
- 031 Erdo du, Aysu. Quoted in Emrah Güler, "Sharing and Gift Economies Bloom in Turkey." *Hurriyet Daily News*. July 22, 2013.

## Chapter 5

**Open Source Gets Physical:  
How Digital Collaboration Technologies Became Tangible**

- 001 Gershenfeld, Neil. "Unleash Your Creativity in a Fab Lab." TED Lecture. February 2006.
- 002 Gershenfeld, Neil. Grassroots Invention Group. <http://gig.media.mit.edu/>
- 003 Gershenfeld, Neil. "Unleash Your Creativity."
- 004 Ibid.
- 005 Ibid.

- 006 Ibid.
- 007 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 008 Kelty, Christopher. *Two Bits: The Cultural Significance of Free Software*. Duke University Press, Durham, N. Car., 2008, p. 29.
- 009 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 010 Irvine, James. *Enzo Mari, Product + Furniture Designer. Celebrating 25 Years of Design*. Exh. print material, Design Museum London, 29 March – 22 June 2007.
- 011 Chin, Andrea. "Enzo Mari Autoprogettazione for Artek." *Design Boom*. April 8, 2010. <http://www.designboom.com/design/enzo-mariautoprogettazione-for-artek/>
- 012 Stallman, Richard. "GNU Manifesto." *Dr. Dobb's Journal* 10:3 (March 1985).
- 013 Casserly, Cathy. "The Future of Creative Commons." Press statement. June 2013.
- 014 Shirky, Clay. "Re: (decentralization) Generalizing Peer Production into the Physical World." Yahoo! Groups forum post. November 5, 2007. <https://groups.yahoo.com/neo/groups/decentralization/conversations/topics/6967>.
- 015 The OS Car Project website. <http://www.theoscarproject.org/>
- 016 Open Source Green Vehicle website. [http://p2pfoundation.net/Open\\_Source\\_Green\\_Vehicle](http://p2pfoundation.net/Open_Source_Green_Vehicle)
- 017 Free Beer website. <http://freebeer.org/blog/>
- 018 Arthur, Charles. "Technophile." *The Guardian*. February 27, 2008. See also Neuros website. <http://www.neurostechnology.com/>
- 019 RepRap website. <http://reprap.org>.
- 020 "Re: Looking for Your Thoughts." Rep Rap forum. June 2008. [Forumsreprap.org](http://forumsreprap.org).
- 021 Antonelli, Paola. "States of Design 03: Thinkering," *Domus* 948 (June 2011).
- 022 Ibid.
- 023 Ibid.
- 024 Price, Cedric. "Life Conditioning," *Architectural Design* 36 (October 1966) 483–94.
- 025 Sinclair, Cameron. "My Wish: A Call for Open-Source Architecture." TED Lecture. February 2006.
- 026 Open Architecture Network website. <http://openarchitecturenetwork.org/>
- 027 Sinclair, Cameron. "My Wish: A Call for Open-Source Architecture." TED Lecture. February 2006.
- 028 WikiHouse website. [www.wikihouse.cc](http://www.wikihouse.cc).

- 029 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 030 Lerodiaconou, Nick. Quoted by Suzanne Labarre in "WikiHouse, An Online Building Kit, Shows How to Make a House in 24 Hours." *FastCo Design* (August 2011).
- 031 Kickstarter website. <http://www.kickstarter.com/>
- 032 Sitra website. <http://www.sitra.fi/en>
- 033 Hill, Dan and Bryan Boyer, *Brickstarter*, Sitra, 2013. <http://brickstarter.org/Brickstarter.pdf>
- 034 Goteo website. [goteo.org/](http://goteo.org/)
- 035 Baraona-Pohl, Ethel. Personal communication as Adjunct Editor. December 2013.
- 036 Estate Guru website. <http://www.estateguru.eu/>
- 037 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 038 Boissière, Olivier. "Editorial: Being Jean Nouvel." *Abitare* 518 (December 2011).
- 039 Pavlus, John. "The Eames Studio's Inspiring History and Unknown Dark Side." *FastCo Design*. November 9, 2011.
- 040 Mirviss, Laura. "Starchitects Face Off in New Film." *Architectural Record*. April 2013.
- 041 Zara, Janelle. "Jean Nouvel, Frank Gehry and More Star in the Documentary Where Architects Stop Being Polite and Start Being Real." *Blouin Art Info*. April 2013.
- 042 WikiHouse website. [Wikihouse.cc](http://wikihouse.cc).
- 043 Markillie, Paul. "A Third Industrial Revolution." *The Economist*. April 21, 2012.
- 044 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.

## Chapter 6

**Building Harmonies: Toward a Choral Architect**

- 001 De Carlo, Giancarlo. *Architecture's Public*. Originally Published in *Parametro Magazine*, No. 5, 1970. Translated by Benedict Zucchi, *Giancarlo de Carlo*. Butterworth, Oxford, 1992.
- 002 Choi, Annie. Personal correspondence with Matthew Claudel. August 27, 2013
- 003 Choi, Annie. "Dear Architects." *Pidgin Magazine* 2 (2007).
- 004 Choi, Annie. *Happy Birthday or Whatever: Track Suits, Kim Chee, and Other Family Disasters*. Harper, New York, 2007.
- 005 Choi, correspondence with Claudel.

- 006 Ibid.
- 007 Ibid.
- 008 Choi, "Dear Architects."
- 009 Ibid.
- 010 Negroponte, Nicholas. *Soft Architecture Machines*. MIT Press, Cambridge, Mass., 1975.
- 011 Flaubert, Gustave. Trans. Jacques Barzun. *The Dictionary of Accepted Ideas*. New Directions, New York., 1968. (First published as *Dictionnaire des idées reçues*, in French. Paris, 1911.)
- 012 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 013 Buckminster Fuller, Richard. *Utopia or Oblivion*. Bantam Books, New York, 1969.
- 014 Baraona-Pohl, Ethel. Personal communication as Adjunct Editor. December 2013.
- 015 Ibid.
- 016 Negroponte, *Soft Architecture Machines*, p. 102.
- 017 Friedman, Yona. Cited in Negroponte, *Soft Architecture Machines*, p. 103.
- 018 Obrist, Hans Ulrich. Personal communication as Adjunct Editor. March 2014.
- 019 Ibid.
- 020 Ibid.
- 021 Pask, Gordon. "The Architectural Relevance of Cybernetics," *Architectural Design* (September 1969): 494–96.
- 022 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.
- 023 Habraken, N. John. *The Structure of the Ordinary: Form and Control in the Built Environment*. MIT Press, Cambridge, Mass., and London, 1998.
- 024 Parvin, Alastair. Personal communication as Adjunct Editor. January 2014.
- 025 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.
- 026 Ibid
- 027 Da Empoli, Giuliano. Personal communication as Adjunct Editor. January 2014.
- 028 Hemingway, Ernest. Interview by George Plimpton, "The Art of Fiction, No. 21." *The Paris Review* 18 (Spring 1958): 76–77.
- 029 Aravena, Alejandro. Cited in Justin Cook and Bryan Boyer, *Designing Social Housing but Building Wealth. Case Study: From Shelter to Equity*. Helsinki Design Lab –Sitra, Helsinki 2012.

- 030 Ratti, Carlo; Claudel, Matthew; Haw, Alex; Picon, Antoine. "The Power of Networks: Beyond Critical Regionalism." *Architectural Review*, July 2013. <http://www.architectural-review.com/view/the-power-of-networks-beyond-critical-regionalism/8651014.article>
- 031 Habraken, N. John. Personal communication as Adjunct Editor. December 2013.
- 032 Easterling, Keller. Personal communication as Adjunct Editor. December 2013.
- Chapter 7  
**Over To You: Go Ahead, Design!**
- 001 Various Authors. "Open Source Architecture (Open Source Architecture)." *Domus* 948 (June 2011).
- 002 Ratti, Carlo. Email to Paola Antonelli, N. John Habraken, Alex Haw, Nicholas Negroponte, Hans Ulrich Obrist, and Mark Shepard. May 3, 2011.
- 003 Wikipedia website: [http://en.wikipedia.org/wiki/OpenSource\\_Architecture](http://en.wikipedia.org/wiki/OpenSource_Architecture).
- 004 Le Corbusier. *La Charte d'Athènes* (Athens Charter). Éditions de l'architecture d'aujourd'hui, Collection de l'équipement de la civilisation machiniste, Boulogne-sur-Seine, 1943.
- 005 Smithson, Alison (ed.). *Team 10 Primer*. Studio Vista, London, 1968.
- 006 Various, "Open Source Architecture (Open Source Architecture)."