

*Les architectes ne font pas des bâtiments, ils les imaginent et les dessinent.* Cet ouvrage explore des situations, actuelles ou historiques, qui troublent cette division entre conception et construction. Il met ainsi en perspective une certaine tendance à la valorisation du « faire » à l'œuvre en architecture, à travers diverses pratiques : l'enseignement par la production à l'échelle 1:1, les expérimentations matérielles en situation de conception, l'esthétisation des traces de la construction, le réemploi de matériaux, la fabrication digitale, la construction en terre crue ou encore l'autoconstruction. Au fil des chapitres, l'ouvrage interroge les promesses du « faire » quant à d'autres rapports possibles à la matière, aux techniques, aux acteurs et à l'environnement.

*Architects do not make buildings, they design them.* This book explores situations, whether contemporary or historical, which challenge this division between design and construction. It investigates the growing prominence of making in architecture through a series of case-studies: design-build pedagogies, material experimentations in the design process, the aesthetization of traces of the construction, the use of reclaimed materials, digital fabrication, the crafts attached to raw-earth construction, or practices of self-building. Throughout its eleven chapters, the book interrogates the promises of making in terms of other possible relationships to materials, techniques, actors and the environment.

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Pauline Lefebvre, Julie Neuwels et Jean-Philippe Possoz (dir./eds.) Penser-Faire/Thinking-Making

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## Penser-Faire

Quand des architectes  
se mêlent de construction

## Thinking-Making

When Architects  
Engage in Construction



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# Introduction

## Questioning the Growing Prominence of Making in Architecture [FR p.23]

Pauline Lefebvre, Julie Neuwels



**0.01** Shop and office by and for collectif dallas, a group of architects based in Brussels / Projet « atelier dallas » par le collectif dallas, Bruxelles, 2019. Photograph by collectif dallas.

The space we entered when we paid a visit to the architects of collectif dallas on a cold February morning is not just an architecture office.<sup>1</sup> The collective is the only occupant of a small building, formerly the stables of a police station, which the architects had adapted to their activities. The stalls were demolished, and a new partition wall was built to isolate the last two bays and set

<sup>1</sup> This visit took place in the context of the conference *Thinking-Making, Perspectives on the Growing Prominence of Making in Architecture* which took place in February 2020 at Université libre de Bruxelles.

up an office on a mezzanine level. The operation is simple, like the few words that describe the project on the architects' website: 'division of the space into two parts: workshop and offices'. The architects occupy both sides of the wall, sometimes sitting silently in front of the computer on the first floor and sometimes spreading dust with the circular saw at the bottom. The architects both designed and built this interior. This is how they intend to carry out the architectural practice that they launched in the summer of 2018:

At a time of over-specialization, dallas is aiming for a more generalist practice, between design and construction, art and craftsmanship. It is a field of experimentation, a back and forth between knowing and making, between the imaginary and the tangible. dallas thus gives a primordial role to the building site.<sup>2</sup>

Nearby, a huge velodrome made of wood, also designed and built by the architects, attests to this particular approach.

In his 1986 essay, *Translations from Drawing to Building*, Robin Evans reminds us that architects do not make buildings; they make drawings and models of them [Evans, 1986]. Unlike the artists who are in direct contact with their sculpture or their canvas (though this cannot be generalized either), the architects are only in charge of mediating devices (plans, models, specifications, etc.), while the artwork is *a priori* built by others (workers, craftsmen, etc.). Robin Evans' essay is a useful reminder of the architect's prerogatives. It stresses the mediating function of the drawing between the office and the building site [Simonnet, 2001], as well as the gap that necessarily exists between the projection and the building.<sup>3</sup> However, the modest case with which we began this introduction shows that some architects are not satisfied with such a division between design and construction, between drawing the project in the office and implementing it in the workshop or on the building site.

The stories collected in this book attest to such challenges regarding a clear partition between thinking and making in architecture, and more precisely between designing and building. They depict scenes, whether contemporary or older, in which making is gaining prominence in architecture, in the sense that architects (or future architects) are more or less directly engaged in construction or, at least, develop an approach that explicitly emphasizes construction. Together, the chapters explore the contours of a movement that is unfolding in architecture and gives a central place to making: under what guise does this movement manifest itself? According to what modalities, on what grounds, with what tools and means, in what contexts? Is it a new phenomenon? What

<sup>2</sup> See: <https://collectifdallas.eu/Info> (Accessed: 5 August 2020). Translation by the authors.

<sup>3</sup> A reminder that is particularly useful for when architects come to believe that they can control what happens to the building in just the same way that they can control what happens on paper: TILL, J. (2009) *Architecture Depends*. Cambridge MA: MIT Press.

does it owe to similar preceding undertakings? What are the motivations of the actors involved? What are the implications for architectural practices, for the discipline and the profession? Are the roles and responsibilities of the actors transformed? What difference does it make to the design and building processes, and to architectural production? What are the limitations, the pitfalls, but also the opportunities of such a movement?

## **Making in Architecture, a New Trend?**

Our point of departure for this book was the observation that making is under growing scrutiny in the field of architecture. Making directly refers to a wider trend in our societies to promote do-it-yourself, home-made, self-help, etc. The term ‘making’ evokes the development of the makers movement: the multiplication of manufacturing and repair workshops called ‘makers spaces’, where craftsmen, programmers, technicians, and do-it-yourselfers work under the name of ‘makers’ [Berrebi-Hoffmann *et alii*, 2018]. These spaces (fablabs, workshops, etc.) and activities (3D printing, laser cutting, digital milling, iron-work, carpentry, etc.) are not foreign to the field of architecture, even though they have a much wider scope.

We refer to making in architecture to discuss practices where architects intervene more directly in construction and relate more closely with certain materials and/or certain techniques. These architects choose, for example, to participate on the building site in the role of – or alongside – craftsmen and workers. They can also get involved in the production, transformation or assembly of building elements and materials. Their offices often have workshops equipped for manufacturing of furniture, objects or construction elements, in which case their teams are often multidisciplinary and include people trained in craft techniques and/or advanced technologies.

These practices are not limited to young collectives for whom bricolage constitutes a means as well as an end, as they are involved in temporary projects, with limited means and possibly a participatory vocation [Atelier Georges & Rollot, 2018]. Also, making is not necessarily low-tech or related to craftsmanship. It plays a central role in the discourse about digital manufacturing in architecture, and how these technologies may help bridge the gap between design and construction, by ensuring the use of the same tools throughout [Kolarevic & Klinger, 2008]. Besides this specific case, many architects who are at the forefront of the architectural scene and who target ‘classic’ markets (permanent constructions, public commissions, etc.) claim that they develop hands-on approaches; that they are craftsmen themselves or closely collaborate with some; or at least that they valorize in one way or another the act of building in their projects.

The increased emphasis on making in the architectural discipline is not limited to the professional practice of architecture. It is evident in teaching as

well. Design-build pedagogies are very successful in architecture schools. They rely on building at scale of 1:1, confronting students with materials, techniques and details. Furthermore, the interest in making also infuses research in architecture. On the one hand, the rising importance of research by design relies on the assumption that the tools of the designer are able to produce knowledge as much as the more exclusively intellectual and theoretical approaches [Fraser, 2013]. On the other hand, some research in the field of architecture follows a current trend in the humanities that emphasizes practices and materiality, in the guise of a ‘practical turn’ [Schatzki *et alii*, 2001] or a ‘new materialism’ [Coole & Frost, 2010; Bennett, 2010]. This trend may entail pragmatist approaches that focus on what architects are doing in the design process rather than what they think or say they are doing [Yaneva, 2009], and therefore involve concrete descriptions of how they relate to, for example, materials [Thomas, 2006].

Our hypothesis about an increased prominence of making in architecture was corroborated by the number of responses we received following the call for papers we launched on the subject in the context of a symposium held in Brussels in February 2020. We received more than eighty submissions, mostly scholarly pieces on architecture, but also a lot of reports from pedagogical experiences and a few proposals from architects willing to share their practice. This gives evidence that the question raises a great deal of interest. Furthermore, the great diversity of the answers received attests that the use of the term ‘making’ in the field of architecture opens up a wide range of possible interpretations. Besides cases of architects more directly involved in construction, the proposals addressed topics as diverse as: the material and manual aspects of the design process itself (the art of drawing, of modelling, etc.); the central role of spatial experiences and materiality in the design and reception of architecture; the relationship of practitioners to action in contrast to discourse; the establishment of closer links between theory and practice; or the cognitive dimension of making.

## Thinking–Making: Making and its Double

The trend of valorizing making can only be fully grasped when the term ‘making’ is confronted with its double: ‘thinking’. The division and the hierarchy between thinking and making are at the heart of such a phenomenon. Its underlying objective is first of all to counter a general tendency in modern Western societies to devalue action, manual labour, and material production, as opposed to intellectual activities, which are more readily celebrated [Crawford, 2009]. In *The Quest for Certainty: A Study of the Relation of Knowledge and Action*, the pragmatist philosopher John Dewey [1960] indicates that, in philosophy, the devaluation of acting and making is intrinsically linked to a corporatism by which philosophers have tended to defend their own prerogatives: thought, reflection, abstraction. A social division accompanies this hierarchy: manual

work is carried out by the most disqualified classes, while intellectual work is reserved for the elite, including philosophers.

In architecture, this double movement of dissociation and devaluation takes on the guise of a separation between design and construction. Architects and engineers take on the role of designers and are in charge of having ideas, while the manual trades see their room for manoeuvre reduced and become mere executors. Decisions are taken by the designers, who are equipped with the necessary instruments (drawings, standards, specifications, etc.) to specify as precisely as possible the work that others will carry out under their orders [Dupire *et alii*, 1981]. Historians generally date the establishment of the architect-designer back to the Italian Renaissance, in contrast to the master-mason of the medieval period. From then on, the architects dispose of the stylistic, mathematical and technical knowledge; they are only present on the construction site to supervise the work and do not need to have the practical and manual skills themselves [Kostof, 1977]. This division is also instituted in architecture schools with the creation of the academies, which contributed to the weakened authority of the builders' guilds [Epron, 1984]. Several historians, however, nuance this account. They insist, for example, on a continuity, beyond the medieval period, between architecture and craftsmanship [Payne, 2009], or highlight the role of hybrid figures of architects-builders [Nègre, 2016; Conor, 2018]. They invite us to revise the distinction often too quickly established between those who design and those who build. The development of hybrid architectural practices mixing design and fabrication or even building activities, such as the one with which we began this introduction, also confirms that the division between these two spheres of activity is far from being always verified.

Challenging the divide between thinking and making does not only occur at the level of the professional and legal definition of the architect's role, which relies on the distinction between the design and execution phases. Even if architects do not *a priori* build the buildings they design, their design practice itself involves the manipulation and fabrication of a whole series of very concrete artefacts. Architectural thought only unfolds from these multiple and repeated acts of making, mobilizing the body as well as the mind [Genard, 2017]. In their office, while they draw or create models, the architects trace, measure, erase, connect, cut, glue, tear apart, look, weigh, move, assemble, ... Not to mention that they do not only sit at their tables: on the site of the building to be designed, or later on the construction site, they also survey, walk, observe, touch, and test.

In addition, it is part of the architects' tasks to take construction into account, as they detail the expression, solidity and feasibility of the technical assemblages, or imagine the various stages of the building process, etc. The architects' graphic and textual production is descriptive, projective and prescriptive: it serves primarily as a mediation between design and construction, rather than as a separation between the two. The main task of the architects, namely the design of spaces, already necessarily intertwines thinking and

making. The French word for design is ‘*conception*’, which should not make us think that the action of ‘conceiving’ architecture is abstract and belongs only to the domain of the mind. However, the French term ‘*conception*’ (even more than its English counterpart ‘design’) inevitably refers to a distinction from the ‘*exécution*’ (the construction), as two distinct and often successive phases leading from the commission to the realization of an architectural piece of work – phases that *a priori* involve different actors, responsibilities, training, legal frameworks, gestures, materials, scales, devices and tools.

This book focuses on the relationship between design and construction. We identify making in moments when architects engage in material activities, especially when these activities go beyond the scope of their mission to design, prescribe and supervise, that is to say, when they aim at intervening in one way or another in construction. We are interested in architects who are involved in the processing of materials and techniques, especially when their relationship to these elements are mediated in ways other than through the transactional devices characteristic of their profession (drawings, specifications, etc.). What is at stake in such blurring of the distinction between design and execution is, among other things, a more nourished dialogue between the actors standing on each side of the process. From this perspective, architects develop a more sensitive (rather than merely prescriptive) relationship with materials and construction techniques, as well as with the persons involved in their implementation.

Our interpretation of making is particularly in line with the perspectives opened by a new materialism, especially when it addresses the relationship of the artist, the architect or the craftsman with the material, which is considered to play an active role in the process of creation and fabrication [Barrett & Bolt, 2013]. This approach presents itself as an alternative to hylomorphism, according to which the idea or intention comes first and is unilaterally imposed by the artist or craftsman on the material, which remains passive while taking shape [Simondon, 1964]. In contrast to this model of thought, new materialism suggests that the form emerges in the process of making, both thanks to the actions of the person and from the activity of the material used. Neither design, nor fabrication or building are therefore a matter of creation *ex nihilo* (or more precisely *ex spirito*). They are more or less intense negotiations with matter – negotiations from which all participants come out transformed [Lefebvre, 2018]. Tim Ingold therefore proposes to consider making as a process of growing, the material and the person who manipulates it undergo respective and reciprocal transformations [Ingold & Hallam, 2014]. Thinking itself cannot be considered as an internal activity of the mind. Cognitive operations also become an ecological affair in the sense that, in order to think, the mind relies on, recruits, and co-opts things from the environment.<sup>4</sup> This implies that whoever thinks and

4 CLARK A. & CHALMERS D. (1998) ‘The extended mind’, *Analysis*, N° 1, 7–19. Quoted by Tim Ingold in his keynote lecture entitled *Thinking, Making, Growing* at ULB on 18 February 2020.

makes is immersed in a world populated by active materials, which increases his or her responsibility to develop sensitive relationships with them [Ingold, 2013].

This includes but also goes beyond developing a haptic relationship to the material (manual work, direct participation on the building site, use of artisanal techniques, etc.). Investigating architectural practice in terms of making – i.e. the incursions of architects into the act of building – is an invitation to consider the activities of architects in terms other than those that refer to the elaboration of ideas to be realized by others, with as little deviation as possible. It is also a simple reminder that architects have in fact never ceased to be involved in construction, to be mixed up in a world of objects and material contingencies, to negotiate with the properties of materials in order to design spaces and details, and to improvise in the face of the unexpected on the building site.

## Teaching and Practising Architecture through Making

The eleven chapters that comprise this book do not offer an unequivocal and settled definition of making in architecture. Rather, they present a series of stories, or case studies, which seek to shed light on various manifestations of making, both historical and contemporary. Together, they outline what the term making can imply in terms of ways of practising, teaching, studying and researching architecture. Thus, the portrait of what making may well mean is progressively built up over the course of the chapters, in an additive manner. With each author appropriating the notion in their own way, the whole is exploratory rather than exhaustive.

Each chapter examines a particular scene where architectural practice meets construction: design-build pedagogies (Chapters 1, 2, 3); material experimentations during the design process (Chapter 4); the influence of the construction materials on the designers' choices (Chapters 5, 7); the tendency to aestheticize traces of the building process (Chapter 6); the implementation of reclaimed construction materials (Chapter 8); the promises of digital manufacturing (Chapter 9); the craftsmanship needed in earth construction (Chapter 10); and self-help building practices (Chapter 11). The book is structured in three parts, each exploring a particular topic: the role of making in teaching; the role of materials and techniques in the design process; and a series of practices and/or techniques where some preconceptions around making can be questioned.

The first part brings together contributions on design-build pedagogies. Addressing the role of making in teaching extends beyond the question of learning methods. In fact, schools are also the locus of broader questioning and experimentation; they witness and sometimes amplify the state of architectural practice and the societal issues that the discipline is facing. Richard W. Hayes discusses the First-Year Building Project developed at Yale University by Charles Moore in the late 1960s (Chapter 1). He enthusiastically emphasizes the educational and social virtues of this pedagogical approach, which aimed

to confront students with concrete demands from a community and invited them to continue their involvement until the building was constructed. Ole W. Fisher then contributes a critical reading of the goals and benefits of design-build education (Chapter 2). He presents the case of the production workshops integrated into the School of Applied Arts, first by Henry van de Velde, and then by his successor Walter Gropius, who founded the Bauhaus in Weimar in 1919. In addition to a careful study of the success of hands-on approaches in teaching at that time in Europe, the author addresses a series of questions that this type of teaching has continued to raise to the present day: its pedagogical advantages, but also the potential ethical problems it raises. In the last text of this section, Jean-Philippe Possoz investigates contemporary design-build pedagogies, based on the discussions held by a number of teachers on the occasion of a roundtable (Chapter 3). He provides a detailed account of what brings these practices together, and what, conversely, distinguishes them. The chapter questions their specific contributions to the education of future architects. It offers the hypothesis that these practices provide a complementary perspective to the more ‘classical’ pedagogies when it comes to questioning the social role of the architect and the purpose of architecture.

The second part of the book delves into the practice of architects and engineers at work, especially when they interact with materials. Egor Lykov describes the practice of the Swiss engineer Heinz Isler (1926–2009), who was engaged in an experimental process involving various materials in the search for optimal shapes for the construction of reinforced concrete shells (Chapter 4). This approach bears witness to the designer’s confidence in the ability of the materials to inform him. Eireen Schreurs recounts in detail the design produced by Otto Wagner (1841–1918) for the iron columns of the main hall in the Postal Savings Bank in Vienna (Chapter 5). The author speculates, through her archival and writing work, on the role played by the material in the design process. Bart Decroos analyses the architecture of the Belgian firm advvt in the light of the writings of John Ruskin. With the notion of an ‘aesthetics of imperfection’, he addresses how it matters when the architects make visible and legible, in the appearance of the building, some of the gestures that contributed to its construction (Chapter 6). To conclude this part, the text *X Artefacts* explores the modalities of making and its relations to thinking in the contemporary practice of ten Belgian architecture offices, based on ten objects produced by them and brought together in an exhibition on the topic (Chapter 7).

Each of the four chapters in the final part deals with a particular technique or practice where making is involved. They put into perspective some of the expectations or supposed advantages of making in architecture. Louis Destombes introduces this part by examining the use of reclaimed materials (Chapter 8). He recounts the evolution of the design and construction of a façade made of reclaimed wood, to address the relationships established between the different actors, within the context of an increasingly normative building sector. In another register, Leda Dimitriadi deals with digital manufacturing and

questions the promised bridging of the gap between design and construction that is commonly attributed to it (Chapter 9). Wayne Switzer then examines the conditions necessary for the adoption by building professionals of *a priori* low-tech and artisanal construction techniques, based on the case of raw earth in Oman (Chapter 10). Finally, in discussing the case of self-help construction, Sandra Fiori, Rovy Pessoa Ferreira and Tanaïs Rolland thwart the romantic visions that circulate around the issue by recalling that, in certain contexts, these practices are more a matter of necessity, or even constraint, rather than a deliberate choice or regained freedom of action (Chapter 11).

### **Some Stories about Making: Exploring Motivations, Actors and Some Assumptions**

The stories gathered in this book are both contemporary and historical, some of them set in the present and others in a past that has already been largely historicized. The book thus shows that the celebration of making in architecture is not a new phenomenon. The book does not, however, attempt to retrace the history of the valorisation of making – therefore the order of the chapters does not follow the chronological order of the case studies. The book also does not exclude the possibility that making is currently enjoying increased interest, or is at least being put under a new light (Chapter 7). The book aims at providing some clues about the long history of this question and its resurgence. Above all, it shows how history can nourish our current reflections on the subject. Some of the contributions rely on connections between scenes from different periods, which share an approach to making that is comparable, or at least useful for the argument. This is the case when John Ruskin's (1819–1900) theories on Gothic architecture are used to describe the aesthetics of the contemporary Belgian architecture firm advvt (Chapter 6); or when contemporary theoretical approaches such as a new materialism or vitalism [Ingold, 2013; Bennett, 2013] are mobilized to consider an iconic historical building, such as Otto Wagner's Postal Savings Bank (Chapter 5). These chapters describe a scene where architects invest in the constructive dimensions of architecture, while at the same time bearing witness to the success of theories (both old and new) that emphasize the role of making. The authors experiment, in their writing, with approaches that make the constructive, material dimensions of architecture more central. The book thus also shows how the way stories are told matters, and how this also participates in the growing prominence of making in architecture (Chapter 7).

The chapters also highlight the different contexts and motivations that may encourage architects to engage in making. For example, different experiences in design-build pedagogy can serve different purposes, such as the economic stakes of the Weimar Republic, which sought to valorise its production by bringing together crafts and industrialized production (Chapter 2), the

social concerns that gave birth to the counterculture in the 1960s in the United States (Chapter 1), or the current environmental issues (Chapter 3). Similarly, the interest of architects or engineers in certain materials or techniques often refers to specific constraints or opportunities, whether economic, social, political, environmental, intellectual, or technological: the development of steel in the building sector in the case of Wagner (Chapter 5); post-war economic constraints in the case of Isler (Chapter 4); or again, in several of the cases discussed, ecological concerns and in particular a sustainable use of resources (chapters 7, 8, 10). In some chapters, the context discussed is central to the argument. Considering self-help construction in the context of the Global South, for example, highlights the discrepancy between imposed and chosen practices (Chapter 11). Similarly, questioning the opportunities of raw-earth construction in the socio-economic and demographic context of Oman sheds light on the very different way in which these techniques are currently often valued in Western countries (Chapter 10).

Several chapters of this book also inform us about the roles of the different actors involved in making and, at the same time, about the relationships between thinking and making that are at work. Architects' engagement in making does not necessarily result in ensuring them a wider role (making by themselves); making can also imply forms of collaboration between those involved in design and construction (Chapter 7). In most of the cases of design-build pedagogies discussed here, students are producing finished objects. When Charles Moore's students at Yale designed and built for an impoverished community (Chapter 1), or when the Bauhaus workshops delivered consumer goods meant for the market (Chapter 2), students were themselves making instead of involving other actors (builders, craftsmen...). They therefore excluded other actors such as architects or professional designers, contractors, workers, or industrialists. Other studies gathered here show that making does not always promote a radical redistribution of the roles and hierarchy among actors. The implementation of reclaimed materials, for example, does not necessarily contribute to merging the figures of the architect and the craftsman, but rather implies the emergence of new and additional actors with a specific expertise (Chapter 8). Similarly, digital manufacturing does not fundamentally modify the role of the architect, but on the contrary, amplifies his prescriptive function, further reducing the workers' room for manoeuvre (Chapter 9). Therefore, the convergence between thinking and making does not automatically favour the greater involvement of the construction professionals. However, some of the other cases discussed in this book show that the opposite can be true. Some design-build pedagogies consider making as means for students to put themselves in the shoes of builders and craftsmen, and experientially develop a better understanding and empathy with them (Chapter 3). Thus, engaging in making can lead to thinking differently about what is designed and prescribed, in order to better take into consideration the conditions of implementation, both human and material (thinking with making in mind), and to think differently

about the possible exchanges between designers and builders (making and thinking together).

Finally, several chapters force us to reconsider certain preconceptions surrounding making in architecture. The idea, for example, that the practices generally associated with making imply *de facto* a greater continuity between design and construction, a more direct, less mediated contact with the material, is questioned. The use of reclaimed materials does not override the prescriptive or even normative arsenal that presides over the choice, preparation and use of the material, among other things for insurance purposes (Chapter 8). Nor does digital manufacturing abolish the gap between design and construction. It does so only at the price of an increased standardization of this relationship, which contradicts the ambitions of the proponents of these technologies (Chapter 9). Moreover, some authors show how making is sometimes idealized, and how such views can amount to the neglect of some of the political, economic or legal aspects of the practices under scrutiny. By recalling that self-help construction is generally undergone because it is imposed by precariousness, the authors of the last chapter invite us to avoid any decontextualized idealization about this phenomenon, for instance in relation to its emancipatory capacity (Chapter 11). By analysing the difficulties of promoting raw-earth construction among the qualified workforce of Oman for its manual or haptic aspect, the assumed virtues of these so-called 'low-tech' techniques appear less shared than presumed (Chapter 10). More broadly, the idea that the practices associated with making are an alternative to the industrial world and the logics of the market is questioned (Chapters 2, 10).

This book is intended to be exploratory. Through the compilation of stories, it lays down a few milestones to approach the growing prominence of making in architecture, which we have seen manifesting itself for several years now, in various forms and in various fields. If it reflects a certain enthusiasm for making in architecture, a greater appreciation of the act of building, of craftsmanship, of materiality, this book also aspires to problematize this trend. On the one hand, the book intends to highlight some of the merits of making in relation to the upheavals it can generate in the field of architecture. Some chapters warn, on the other hand, against a fantasized glorification of making, and invite us to question hasty conclusions about its virtues. More than the phenomenon itself, it is the scope and diversity of the questions raised by the convergence between design and construction that are highlighted in this book. The thread running through the book is the transformative potential of making in architecture: its promise of other possible relationships to materials, techniques, actors, the construction economy, and most crucially, the environment.

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