

Upcycling Architecture in Italy since 1945

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Towards an Architecture of Upcycling?

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This book is the outcome of a two-year research project entitled *Upcycling Architecture in Italy. Forging and Promoting a Renewed Building Culture*, whose main objective is to analyze, articulate, and disseminate the theory and practice of upcycling – understood as a distinctive form of building material reuse – within contemporary historiography and design culture.

Funded by the European Union through the Next Generation EU program within the Italian PRIN 2022 PNRR research scheme, the project has been carried out by four research units: Politecnico di Torino, Sapienza Università di Roma, Università degli Studi di Roma Tor Vergata, and Politecnico di Milano.

More specifically, this volume examines the recent history of Italian architecture since 1945, tracing a trajectory from postwar reconstruction to contemporary design practices through the specific lens of upcycling and the related concept of Design for Disassembly (DfD). The topic and approach of this research entail a series of terminological, chronological, and methodological challenges that must be addressed at the outset in order to frame the discussion that follows.

First and foremost, the very term upcycling – which emerged in the context of post-industrial processes of the 1990s and has become

increasingly common in the fields of circular economy, systemic design, and various strands of design culture – admits multiple definitions and interpretations, particularly when applied to architectural and construction practices. From our standpoint, this flexibility – and, in a sense, its productive ambiguity – offers a remarkable semantic and operational potential. Yet such potential rests on a clear premise: the notion of upcycling as the pursuit of strategies for reusing existing matter as a critical alternative to the relentless production of the new, with the aim, in each case, of generating added value.

This conceptual framing also underpins the chronological scope and methodological approach adopted in this study. Both are closely tied to the operational evolution of industrial culture in the building sector, after the end of World War II in 1945 and throughout the second half of the twentieth century, and to the concurrent abandonment of long-standing practices of material reuse – not only in construction, but across multiple spheres of production.

The attempt to trace practices of reuse – or forms of upcycling and Design for Disassembly *ante litteram* – throughout this period has required both empirical investigation and conceptual reflection. In this process, the remnants of a vanished building culture have intersected – and, in many respects, been challenged by – the logic of industrial assembly and disassembly that, from the avant-gardes through the economic boom and into postmodernity, came to shape the very notion of modern construction.

Here lies both the challenge and the promise of the historiographical reinterpretation proposed in these pages. Situated between *bricolage* and Design for Disassembly, between postmodern *spolia* and the rethinking of industrial design – from everyday objects to the built environment – this study seeks to trace and analyze both the explicit and the latent dimensions of design culture over the past eighty years.

The aim, one might say, is to outline unconventional trajectories from which new insights for alternative historiography and contemporary practice may emerge. This is pursued with due caution toward the various forms of anachronism inevitably produced by the retroactive use of such a neologism, yet with an openness to

the productive possibilities it entails. Indeed, the very flexibility of the term – and the discrepancies between its contemporary and historical meanings – make it possible to recognize exploratory approaches in the past, as well as their resonances in the present.

Within this interpretive framework, the main but not exclusive questions guiding this volume – set against a provisional historicization and conceptual examination of upcycling in architecture – may be formulated as follows:

- While the history of twentieth-century architecture has largely been framed through a dichotomy of destruction, reconstruction, and modernity, is it possible to reinterpret it by tracing design and building practices that resonate with what we now define as upcycling and Design for Disassembly (DfD)?
- Can the early postwar period be understood as a pivotal moment of reassessment and renewal of long-standing practices of circularity – bridging the gap between premodern traditions, driven by necessity and scarcity, and the contemporary theoretical framework of reuse-based architecture within a structural condition of material surplus?
- Can we identify pioneering – albeit anachronistic – examples of upcycling within Italian modern and postmodern architecture, in which design practices generate value beyond simple reuse and promote the creation of meaning and quality within a building's circularity? Do these experiences suggest possible directions for advancing current upcycling debates through reflections on *modern spolia*, the practice of conceiving architecture through its elements, and the use of history and memory as design materials?
- Can the second half of the twentieth century – marked by the massive industrialization of the building sector – be examined as a critical juncture in which the concept of optimization first crystallized within construction processes, thereby establishing the foundations for systemic–environmental design and its gradual, if tentative, integration into architectural discourse?

- How might a critical reassessment of the ambitions and failures of building industrialization's unfulfilled potential – particularly its focus on component repertoires and on assembly as a semiotic device (the notion of architecture as *opera aperta*) – serve as the historical, theoretical, and methodological basis for contemporary DfD and upcycling practices?
- What future trajectories might the Italian construction industry pursue to meaningfully influence contemporary architectural production – moving beyond the mere display of bricolage-based processes and instead establishing upcycling as a systematic, industrialized, and widely adopted design and building practice, as is already occurring in other European contexts such as Denmark, Belgium, and Switzerland?
- How does upcycling relate to processes of heritage-making and preservation, particularly with regard to the controversial heritage status of late twentieth-century industrialized architecture, which is largely characterized by the assembly of building components?

By engaging with these questions, this book seeks to encourage both historiographical and theoretical renewal through a design-oriented lens, with tentative extensions into the field of experimental preservation. First, it contributes to a more nuanced understanding of architectural modernity – one that is neither wholly constructive nor entirely destructive, but inherently multifaceted and ambivalent. Second, it seeks to address a long-standing gap in the historiography of reuse and circularity by tracing their persistence and possible transformations through the years of unprecedented economic growth, mass industrialization, and the early globalization of architectural culture. In this way, the book aligns with a wider scholarly endeavor to reframe the history of the recent past from its peripheries, uncovering episodes and strategies of critique and resistance to hegemonic practices and imaginaries.

What emerges is an original narrative of Italian architecture over the past eight decades, enriched by an openness to recent best practices developed in other European contexts – one that highlights

lesser-known experiences and reconsiders familiar cases from a renewed perspective.

This alternative reading of Italian architecture in the second half of the twentieth century tentatively weaves together diverse material histories that are often examined in isolation despite their deep interconnections. These include: the industrial reuse of rubble; assembly-based design processes extended to radical ready-made concepts; the negotiation between tradition and modernity; the use of modern *spolia*; memory and the notion of reversibility in preservation; and the practice of conceiving architecture and design through their components and elements.

In doing so, this volume offers a possible interpretative framework for the current rise of cradle-to-cradle architecture, drawing upon and critically reactivating the legacy of a controversial modernity.

Structure of the Book

The book is structured in five sections. Each section comprises a thematic essay, authored by the section's coordinator, and five case-study sheets focusing on related Italian examples. These sheets have been written by members of the research team as well as by scholars with specific expertise in the selected topics. This collective structure reflects our commitment to making the project a truly collaborative endeavor.

In principle, the five sections follow a chronological order, spanning the entire timeframe of the book and revealing key theories and design practices of reuse and circularity from the mid-1940s to the present. Yet, in tracing precedents and examining their long-term legacies, the chapters often overlap chronologically and resonate thematically. Taken together, they offer multiple, parallel narratives of architectural modernity and interconnected perspectives on a continually evolving landscape.

The first section, devoted to the reuse of rubble, is curated by Alessandro Benetti. It investigates whether – and in what ways – the specific conditions of war, marked by scarcity and urgency, fostered a circular approach to construction that included the salvaging of debris.

The essay traces the trajectories of rubble, understood as displaced material, from its original pre-destruction contexts through the various stages of management to its post-reconstruction destinations.

The discussion begins by outlining the national regulatory framework and the main actors involved. It then examines the types of salvaged rubble and the logistics of its transportation, disposal, and storage. Subsequently, different practices of rubble reuse are identified and classified for both earthworks and building construction sites, ranging from recycling and repair to reuse and, potentially, upcycling. The essay concludes by proposing that World War II constitutes not an isolated phenomenon but part of a much longer history of rubble reuse following catastrophic events – such as earthquakes – a history that continues into the present.

The second section, coordinated by Ilaria Giannetti, questions the alleged novelty of Design for Disassembly (DfD) within design practice and culture. The essay argues that even a cursory examination of the full set of DfD principles – without delving deeply into the history of construction – inevitably recalls, through the rough transposition of the industrial manufacturing approach of *Design for Assembly* (DfA) to the building sector, the theoretical and methodological efforts of the late 1960s to establish a “*component-based architecture*”: the never fully realized apex of construction industrialization.

Building on these premises, the section first explores the micro-histories of building industrialization in Italy between 1945 and 1975, highlighting early approaches to DfD through an analysis of the theoretical frameworks and design experiments underpinning “*component-based architecture*.” At the same time, it opens a further perspective on the process of heritage-making of industrialized buildings by proposing an experimental preservation framework grounded in the principles of DfD.

The selected case studies bear witness to the theoretical attempts to integrate industrial culture into architectural discourse between 1945 and 1975, and to the material dimensions of assembly- and disassembly-oriented architectural and technological design that have characterized industrialized construction since the postwar period.

The third section, coordinated by Gabriele Neri, investigates Italian experiences of the 1960s and 1970s that anticipated contemporary practices of architectural upcycling. This was a period marked by profound conceptual transformations and radical oppositions within the architectural field. The essay focuses on eccentric forms of design and architectural thinking that emerged during these pivotal years – situated between the mature reassessment of prewar design culture and a far-reaching critique of the entire architectural system, between the optimism of the economic boom and the social and energy crises of the 1970s.

Among the case studies, the Garelli House, a small Alpine dwelling by Carlo Mollino, is presented as an example of an unconventional negotiation between tradition and modernity – both technical and aesthetic – achieved through processes of dismantling and reinvention. The essay also examines the assemblage of ready-made components available on the market in the functionalist-oriented work of the Castiglioni brothers, within the rapidly evolving field of industrial design. Finally, the third part of the essay reveals multiple strands of thought, research, and practice of reuse that characterized the radical architectural culture of those years.

The fourth section, coordinated by Josep-Maria Garcia-Fuentes, investigates the practice of *modern spolia* and the ways of thinking architecture through its elements in twentieth-century Italy. The country functions as a privileged laboratory for reflecting on contemporary upcycling and on its strong connection to preservation. The essay analyzes the works of Piero Portaluppi, Luigi Caccia Dominioni, and Carlo Scarpa to demonstrate how *spolia* and existing buildings can be upcycled through design authorship, going beyond purely symbolic or ideological purposes. It then addresses the emergence of postmodern concerns with authenticity and historical interpretation, which further raise the question of reversibility, explored in the works of architects such as Marco Dezzi Bardeschi and Francesco Venezia. Finally, by discussing Rem Koolhaas's Biennale exhibition *Elements of Architecture* (2014) alongside his ongoing interest in heritage and preservation, the chapter broadens the connection between *spolia* and architectural

elements, and suggests ways to develop further the current design explorations on upcycling.

To conclude, the fifth and final section by Alberto Bologna reflects on the expressive codes of cradle-to-cradle architecture in contemporary practice. The essay highlights how today's prevailing patchwork aesthetic often risks compromising *firmitas* – constructive integrity – in favor of a merely ornamental *venustas*. It argues that genuine design progress requires salvaged materials to assume a renewed and durable constructive role, which in turn calls for the adoption of design protocols where the DfD approach is conceived as an integral principle. Recognizing the marginal position that Italy still occupies in this regard, the essay presents several recent buildings from Northern and Central Europe as best practices – examples that combine constructive rigor with expressive experimentation. They demonstrate how upcycling can and should evolve into a sophisticated design tool: one that moves beyond the visual idiom of *bricolage* and establishes resource circularity as an intrinsic standard of a responsible built environment, while simultaneously fostering an architecture of high expressive quality.

In line with these ambitions, the volume concludes with an afterword by Pierre Chabard – architect, critic, and historian of architecture and urbanism – who has long engaged with these issues. His contribution expands further the conceptual horizon of upcycling beyond the theoretical and historiographical reconstruction offered in the preceding chapters. By returning to *Usus/Usures* (2010) exhibition curated by Rotor's practice and to the subsequent evolution of his works, Chabard elucidates the theoretical and aesthetic stakes of material reuse as both a methodological shift and a cultural provocation. His reading demonstrates how upcycling – far from being reducible to pragmatic salvage or circular-economy compliance – articulates a profound reorientation in the understanding of architectural time, authorship, and value. In doing so, the text introduces to the Italian architectural milieu a critical and operative perspective that has played a pivotal role, on the European stage, in advancing the intellectual and practical frontiers of design with the existing.



Chabard's essay does more than conclude this book: it reopens it. It invites readers to measure the historiographical insights proposed here against the radical potential of contemporary design practice, and to recognize in upcycling not only a necessary response to planetary urgency, but also a generative aesthetic and disciplinary horizon – one capable of unsettling inherited certainties, reframing material legacies, and envisioning an architecture whose future is inseparable from its past.

Orizzontale.

A Practice Based in Rome

Constructing Temporality

Luca Reale

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If the difference between *upcycle* and *recycle* lies fundamentally in the re-signification of construction waste, rather than in its simple reuse, we can argue that Orizzontale's work extends this approach to public space in a kind of "urban upcycling." Orizzontale is an architects' collective, founded in Rome fifteen years ago. It is composed of Jacopo Ammendola, Juan López Cano, Giuseppe Grant, Margherita Manfra, Nasrin Mohiti Asli, Roberto Pantaleoni and Stefano Ragazzo, all of whom graduated from Sapienza University of Rome between 2010 and 2015. Their work spans architecture, landscape, public art, and self-construction. Orizzontale adopts a design approach that prioritizes the relationship between urban contexts, inhabitants and "latent" spaces – which their interventions activate or anticipate – with the aim of generating new connections and opportunities within the city, often operating in transitional or "meanwhile" periods; this is not just a technical phase, but the opportunity for a community-building process. Orizzontale's interventions, almost always located in public space, thus tend to transform a place, promoting flexible ways of use and "accustoming" the city to new possibilities of using urban space: they represent, after all – going beyond episodic or

"tactical" solutions – a complementary and more sustainable urban strategy than traditional, typically top-down regeneration policies. The city's neglected spaces are returned to the collectivity by "extracting" stories, communities and traces from the memory of places. Their work is therefore not a true upcycle, but rather a transformation and sometimes ephemeral re-signification of space, prior to materials. To achieve this, the architects of Orizzontale almost always assume responsibility not only for the design, but also for the realization phase of the project.

The construction period is a crucial time, because it brings designers to be fully aware of the materiality and costs of the process, triggering a dialogue with inhabitants and potential users of the works during the indispensable and sometimes prolonged stay on site. This outcome is certainly reinforced by the use of self-building – a practice that entails spending an extended period on site and being directly involved in the realization of the project – not only by the architects themselves, but also by residents, administrators, associations, and students. By activating a sense of belonging and participation, the spaces thus transformed gain added value: more alive, meaningful, and functional, they are perceived by the inhabitants as their own, fostering new relationships and a strengthened sense of community. In this shift of attention from the object to the context, the target of their work is never exclusively aesthetic, playful or social, but always aimed at the reactivation of a passive or discarded space. The architect, they argue, is thus like a diviner – someone who must "succeed in finding resources and energy flows buried deep in the ground, invisible from above."

Among their projects, one in particular explicitly adopts an upcycle process: the 8 ½ installation, created in the summer of 2014 in the urban space in front of MAXXI in Rome. The project was the winner of YAP MAXXI, a program designed to promote and support young architecture, organized by MAXXI in collaboration with MoMA/MoMA PS1 in New York, Constructo in Santiago de Chile, Istanbul Modern in Turkey, and MMCA National Museum of Modern and Contemporary Art in Seoul, South Korea.

8 ½ is a large theatrical machine that inhabits public space. Realized over four weeks – two of which took the form of a construction workshop open to



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40 students from across Italy – it is based on an arena: a restful, shady and social space – and a wall that can be entered and climbed. Especially at night this wall interacts with the city, becoming a true landmark. Standing eight and a half meters high, the wall is constructed with modular wooden frames covered with handcrafted beer kegs, which had been recovered and stored during the previous winter. These kegs are used as light fixtures, each containing an LED to create a dynamically controlled wall.

The installation was designed specifically for the space in Piazza Boetti but could be easily dismantled, transported, reassembled in new configurations, and flexibly adapted to different sites. It is above all the lamp system that transforms the waste into something new, of greater value and interest.

Once the summer season ended, the 312 light modules – each made by reusing a transparent plastic beer keg – were disassembled, and the upcycle process continued with the creation of a design object that serves simultaneously as a seat, a lamp, and a support surface. The lamp and the anchoring systems are derived from original parts of 8 ½, while the lamp

Fig. 1

Orizzontale, 8 ½, Yap MAXXI, 2014. Piazza Boetti with the interactive wall during the day. © Alessandro Imbriaco, 2014.

Fig. 2

Orizzontale, 8 ½, Yap MAXXI, 2014. Students during the workshop in June 2014 © Francesco Russomanno, 2014.

Fig. 3

Orizzontale, 8 ½ Lamp. © Alessandro Imbriaco.



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holder system was created by modifying the original beer keg caps and integrating the wiring.

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