

2.

HISTORICAL EXPERIENCES

The role played by extreme events in the initiation of trial-and-error processes characterizing the development of urban models has often been underestimated. Destruction and reconstruction have been extraordinary experimental chances, but an ordered tale of the different strategies and solutions tested has yet to be fully told. The critical redrawing of the most relevant case studies, and the comparative analyses of the processes in quantitative and qualitative terms, can initiate a necessary research effort to explore which (and how) past solutions can still be valuable benchmarks for the future. Only one certainty emerges: the unprecedented scale of current phenomena calls for innovative solutions capable of actualizing the lessons from the past.

HISTORICAL EXPERIENCES



2.1 REASSESSING RECONSTRUCTION

All Saints' Day in the year 1755 marked a ridge in urban history: the great city of Lisbon, Portugal, one of the global metropolises of its era, was completely destroyed by an earthquake and the resulting tsunami (SHRADY 2008). The terror generated by the event would deeply influence the most important thinkers of the time: Voltaire dedicated a key chapter of his masterpiece *Candide* to it, Jean-Jacques Rousseau used it as an anti-urban argument against the concentration of population in cities, while Immanuel Kant published three books on the subject, marking the establishment of scientific geography. The cataclysm left centuries-long traces in European science, social life, religion, and philosophy: cities could face complete annihilation at any given moment, so the design and planning community needed to develop systems for prevention and reconstruction. Over 150 years later, at the end of World War I, the biologist and urbanist Patrick Geddes would call for the establishment of a "science and art of reconstruction" in his book *Ideas at War* (GEDDES AND SLATER 1917). Despite the increasing number of cities destroyed by war and natural disaster in the long twentieth century, this cry was to remain unheard: while the field of emergency developed clear operational frameworks and dedicated institutions, reconstruction has never been able to fully become an independent discipline and remains subdivided among multiple experts and across different fields of study.

Nevertheless, it is worth noting how destruction has become a stable presence in architectural and urban discourse: "the twentieth century turned out to be the most destructive in human history. Between 1914 and 1970 especially, physical damage to the built environment was enlarged, dispersed and routinised so far and wide that it became a new architectural category in the public imagination, and an unavoidable datum of global historical thought" (ALLAIS 2018). The importance given to issues of destruction is clearly shown by the relevant bibliography, which in recent years has been devoted to the subject of reconstruction, with a focus shifting from the construction of a historical perspective (HIPPLER 2014) to the issue of cultural identity and heritage preservation (BEVAN 2006;

BOLD ET AL. 2017; ALLAIS 2018); from geopolitical and economic reverberations (COWARD 2004; IKLÉ 2005) to the use of ICT tools for investigative purposes (WEIZMAN 2011, 2018), and to military tactics adapted to urban planning (PORTEOUS AND SMITH 2001; FRANKE 2003). In the field of urban studies, extensive research (mainly devoted to post-World War II Europe) has attempted to construct an organized history of reconstruction processes (MAMOLI AND TREBBI 1988; DIEFENDORF 1990; COGATO-LANZA AND BONIFAZIO 2009; JOHNSON-MARSHALL 2010; COHEN 2011; DÜWEL AND GUTSCHOW, 2013; MORAVÁNSZKY 2016) and to explore the different design approaches in terms of urban and architectural strategies (VALE AND CAMPANELLA 2005). Despite this massive research effort, a work capable of identifying and establishing a scientific approach able to describe and evaluate the different types of urban metamorphosis following extreme events is still missing. In order to begin the difficult process toward the establishment of a “discipline of reconstruction,” we desperately need to construct the lenses through which to read past and current dynamics.

2.2 TRANSFORMATION MAP

The analyses of urban metamorphosis caused by destruction and reconstruction, carried out through critical redrawing, has never been conducted in a systematic way. In order to fill this relevant void in literature, we have rediscovered, actualized, and applied a representation method for the description of urban transformation as defined by Leonardo Benevolo (BENEVOLO 1971, 1991) in both his history books and his urban designs. By applying this same method to a large group of case studies, it is possible to build a framework for understanding urban metamorphosis that avoids hasty classification into rigid categories and instead allows the wide range of micro-variations and chances to emerge. Retracing the transformations not only allows one to witness past experiences but also builds an operational tool for understanding today’s urban dynamics, with the final aim of orienting future intervention strategies, which permits a stratification of knowledge.

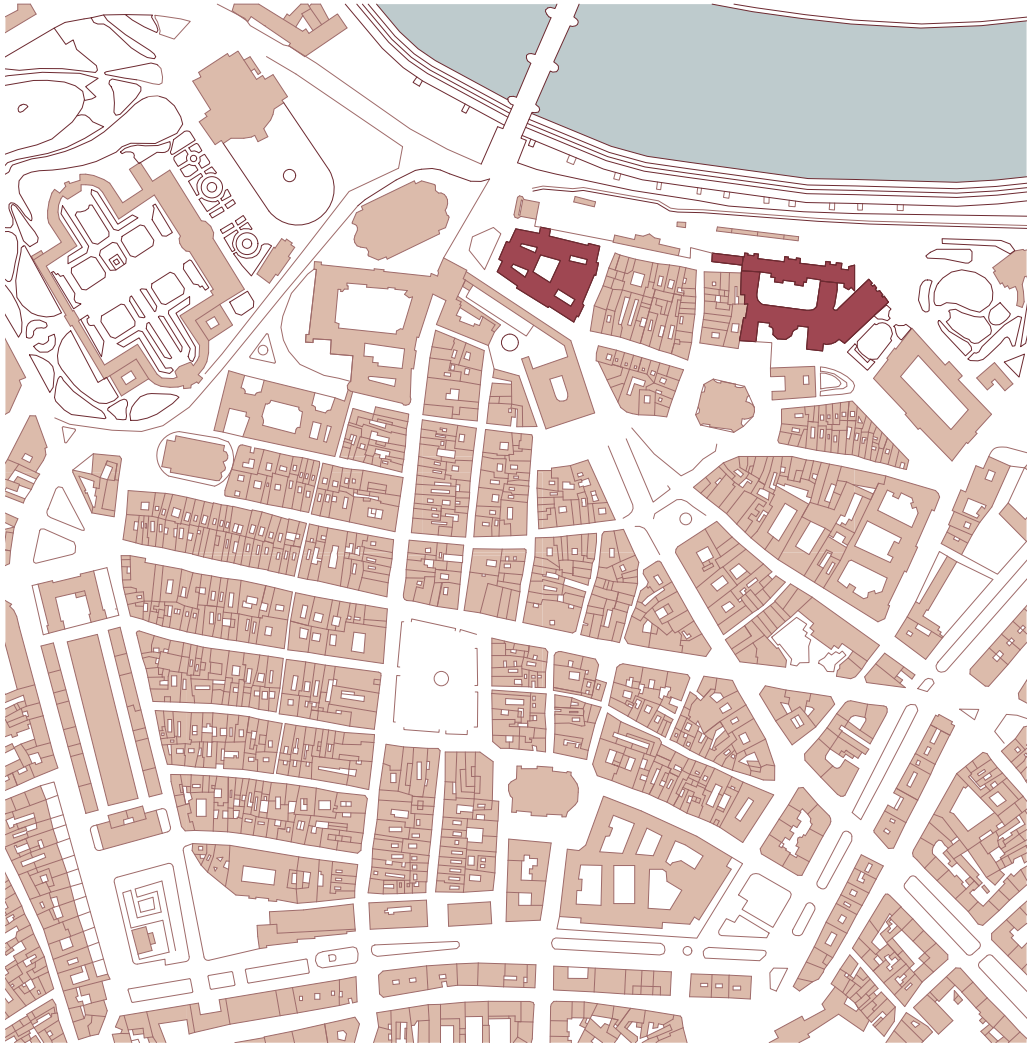
It is a question of relocating architecture among the components of daily life, as a technique for juggling the limitations of space and time, fully comparable with all the others and already containing within it the reason for an extraordinary responsibility: the long duration of its artefacts with the multiplicity of relations that they entail (BENEVOLO 1988).

This type of analytical approach is defined by Benevolo as a screenplay of physical transformation, where architectural projects or urban environments are described and defined through all the specific characteristics of the object and its context, as would happen in a screenplay for a film or a theatrical production. The most important screenplay written and drawn by Benevolo is the illustration of the design processes that led to the current configuration of Piazza San Pietro in Rome, presented in *Casabella* no. 572 in 1990 (BENEVOLO 1990). His screenplay identifies three key moments in the history of the

**TRANSFORMATION
MAP**
DRESDEN


On February 13 and 15, 1945, the city of Dresden, Germany, known as the Florence of the Elbe, was heavily damaged by four allied raids. The city was famous for its extraordinary baroque monuments, such as the Zwinger and

the Frauenkirche, ensconced in a dense and cohesive urban pattern of row houses defined by the controlled application of strict building regulations. The Allied bombing and the subsequent neglect by the postwar German


DRESDEN / DEU 1945

Destruction map. Destroyed and preserved buildings.

Democratic Republic (GDR) government, which restored only a few selected buildings, led to an overall state of abandonment of the historical core. In 1989, with the end of the Soviet era, the city reinitiated the reconstruction

process, which symbolically terminated with the second inauguration of the Frauenkirche in 2005. The transformation map shows the complex entanglement of temporal and spatial layers, with damaged buildings

immediately restored after the war, others rebuilt over a longer time frame on the same site and in the same way, and a complete alteration of the minor urban texture around the monuments, with new building types.



DRESDEN / DEU 2005

Reconstruction map. Preserved and reconstructed buildings.

- _ Preserved buildings
- _ Destroyed buildings
- _ Reconstructed buildings
- _ Reconstruction on destruction

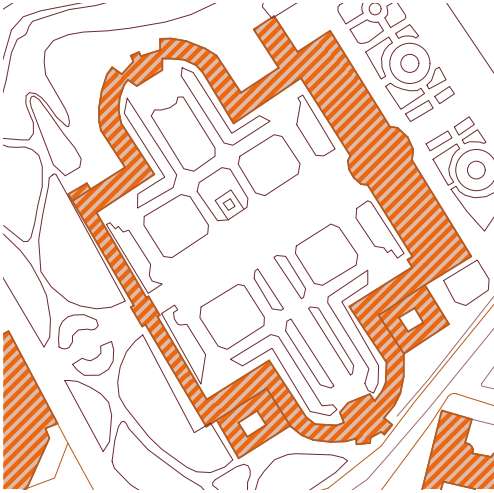
2_ HISTORICAL EXPERIENCES



DRESDEN / DEU 1945-2005

Transformation map. Destroyed, preserved, and reconstructed buildings.

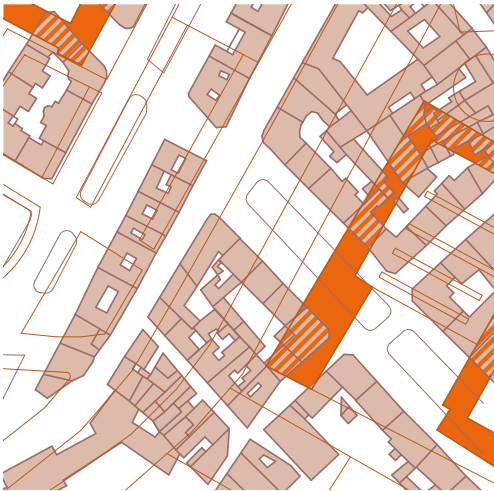
- A.** Destroyed and reconstructed buildings. Reconstruction on the previous building footprint.
- B.** Preserved buildings. Consolidation works.
- C.** Destroyed and unreconstructed buildings. Non-reconstruction.
- D.** New buildings. New reconstruction outside the previous footprint.



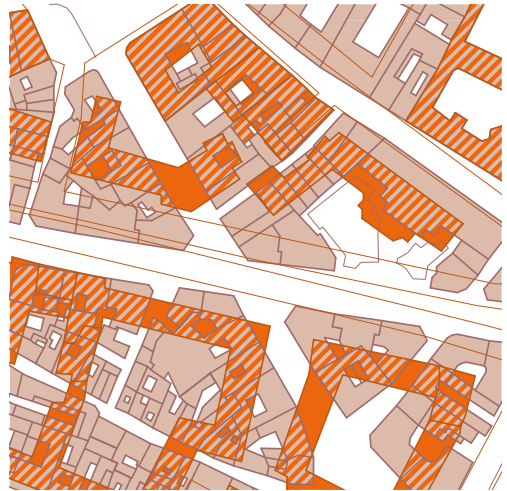
A.



B.



C.



D.

urban complex: the condition of the square before Bernini's project, the completion of the colonnade with parallel arms and the definition of the ovoid square by Bernini between 1662 and 1670, and the current conditions following the demolition of the Spina dei Borghi and the construction of Via della Conciliazione on a project by Marcello Piacentini and Attilio Spaccarelli completed between 1937 and 1950 (BENEVOLO 2004). The three phases are not only described and documented but also drawn at the same scale and with the same type of representation in order to eliminate any discrepancies given by the different drawing styles. The method of analysis allows one to understand the reasoning behind each design choice that cannot be explained through a simple observation of the current state.

The final drawing proposed in *Casabella* is the key element of the analysis, the transformation map: it superimposes the conditions before Piacentini's intervention onto the current one and shows with only three layers the complex intertwining of urban continuities and interruptions. The drawing has only three colors: red buildings are unchanged during the two periods, yellow ones are demolished, and blue ones reconstructed; yellow and blue dashed shows the structures rebuilt in a previously occupied area. The sum of these temporal and spatial layers is a powerful tool for the understanding of urban metamorphosis. Time becomes a design factor like space, and the representation of the different intervals contributes to the understanding of the evolutionary process, but above all of the visible structure, which is only the current concretization of complex phenomena that could, and still can, radically change the urban environment. The transformation map tool identified by Benevolo was applied to a series of case studies encompassing different types of extreme events. The systematic drafting of transformation maps makes it possible to compare the spatial consequences on the urban fabric of the various pressures and of reconstruction strategies. The transformation map, and the temporal plates used to create it, is a precious design tool starting from the idea that the future structure can be inserted organically within the historical series by assuming the sum of the transformations, and not just their visible result, as the starting point of the design action.

2.3 CLASSIFYING RECONSTRUCTION

Once the redrawing of case studies has been carried out, it is necessary to construct a classification system capable of confronting and evaluating the results of the different strategies adopted. However, the different time frames, conjunctural economic and social conditions, make any attempt at systematization extremely difficult. Marcello Mamoli and Giorgio Trebbi, in their work *L'Europa del Secondo Dopoguerra* (1988) within the seminal series *Storia dell'Urbanistica* published by Laterza, proposed a possible classification. Published in 1988, the book remains one of the most updated instances of comparative research in the field of urban design following conflicts. However, the categories individuated are purely storiographic and based on archival

research and personal judgment; and most of the research work focuses on the planning rather than on the concrete results of urban metamorphosis. It is necessary to develop an alternative quantitative classification mechanism capable of confronting evolutions in the urban patterns and to identify the key parameters that constitute the working tools for the modification of the built environment.

Mamoli and Trebbi's subdivision is made up of four categories, imagined for World War II Europe but potentially applicable (with minor adjustments) to other effects resulting from extreme events:

a.

AS IT WAS WHERE IT WAS

In cities that carefully maintained heritage and memory by reconstructing the same urban pattern with same building types (St. Malo, Münster, Warsaw, Florence, etc.).

b.

CONTINUITY BETWEEN TRADITION AND INNOVATION

An innovative compromise that while mandating the urban pattern inserts new building types within a vision of modernization and functional improvement (Amiens, Caen, Lübeck, Terni, Milan, etc.).

c.

RUPTURE WITH THE PAST

A denunciation of destruction as an irreversible loss leading to a new urban pattern defined with new techniques yet with similar building types (Hannover, Frankfurt, Livorno, Coventry, etc.).

d.

PROGRAMMATIC INNOVATION

In the few cases where reconstruction has been seen as a chance for true re-foundation with a completely new urban pattern and new building types (Le Havre, Rotterdam, etc.).

Despite the valuable effort, this classification fails to fully equip designers with clear evaluations of the results of each approach that can act as an engine for future reconstruction efforts facing current urban pressures.

In order to construct a qualitative tool for designers, we have developed a mathematical method for evaluating and comparing different cases based