

Hymn to Progress: Pier Luigi Nervi's Burgo Paper Mill

Simone Marcolin and Diletta Trinari

I

Arriving in Mantua from Rocca Sparafucile, in the magnificent medieval skyline that surrounds the shores of Lago di Mezzo, it appears an eye-catching graft of modern architecture. On the northern side of the lake, facing the ancient city, Pier Luigi Nervi's Burgo paper mill stands in the middle of vegetation, with the peculiar profile of its 47 meters high concrete pylons supporting the steel and glass facade of the factory. It is a unique building in the Italian and international panorama of the 1960s, that yet today appears as a typical product of its time—the years of the “Boom”—characterized by a particular vivacity in the relationship between architecture and engineering.¹

The Italian economic miracle has been a moment of extraordinary economic and technologic growth that imprinted the national history after the end of the Second World War. It has been a moment of deep social transformation, which probably modified Italian society more than any other period of analog brevity.² In only thirteen years, between 1950 and 1963, Italy ceased to be an agriculture-based economy, becoming one of the most important European industrial leaders. In parallel, this marked a golden age for the architectural scene, characterized by an outstanding cultural rich-

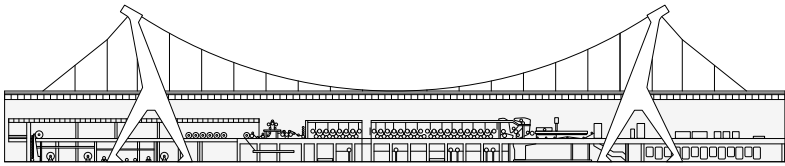
ness, animated by an incredible sequence of talented characters—among others Giancarlo de Carlo, Figini e Pollini, Ignazio Gardella, Adalberto Libera, Giovanni Michelucci, Carlo Mollino, Luigi Moretti, Pier Luigi Nervi, Carlo Scarpa, Vittoriano Viganò—that made Italy become one of the most vivid and articulated centers of the international architectural culture.³ It has been a season that left significant traces, still readable in the Italian contemporary landscape and deeply rooted in the self-definition of the Italian architectural identity.

What makes architectures of this time particularly interesting, apart from their overall quality, is their way of witnessing the raise of a nationally-spread culture of construction, shared by architects, engineers, developers and industries in the post-war reconstruction. A conscious way of conceiving architecture in an era of technological advances, which embodied not only the possibilities of progress as a naive creed or goal to achieve but one that developed the tools to deal with the cultural, constructive and functional needs of the design process. In this context, Pier Luigi Nervi has been one of the key figures in practicing architecture as such a process. Along with Giorgio Morandi, he has been the most important Italian engineer of the 20th century,

3 Pippo Ciorra and Jean-Louis Cohen, *Zevi's Architects: History and Counter-History of Italian Architecture, 1944-2000* (Roma: Quodlibet, 2018).

1 Sergio Poretti, “Cartiera Burgo, Mantova 1960-1964”, in: *Casabella*, 651-52 (December 1997-January 1998), pp. 96-107

2 Eric J.E. Hobsbawm, *Age of extremes: The short twentieth century, 1914-1991* (New York: Vintage Books, 1994).



1. Simone Marcolin and Diletta Trinari, Longitudinal section showing the position of the Beloit machine, July 2019

4 G.E. Kidder Smith, *The New Architecture in Europe* (Cleveland: Meridian Books, 1960), p. 160.

5 Pier Luigi Nervi, *Nuove Strutture* (Milano: Edizioni di comunità, 1963), p. 7. (translation by authors)

6 Pier Luigi Nervi, *Nuove Strutture* (Milano: Edizioni di comunità, 1963), pp. 7–8. (translation by the authors)

7 Pier Luigi Nervi expressed the need of a general revision in teaching and practicing architecture to answer the question raised in architecture by modernity:

“For an efficient education of structural designers able to face the great problems of tomorrow, I think it should rise a proper university specialization course to which both architects and civil engineers, graduates, should be admitted. The courses, which could be biennial, should include both technical and static theoretical studies, and formal studies,

with the research about the relationships that have always linked constructive and aesthetic expressiveness.”

Pier Luigi Nervi, *Nuove Strutture* (Milano: Edizioni di comunità, 1963), p. 9. (translation by the authors)

respected by his colleagues and defined by the critics as a “giant in a land not unfamiliar with giants”.⁴

Pier Luigi Nervi summarized his intents in his book *Nuove Strutture* published in 1963. With the definition of *architettura strutturale*, he described a way of conceiving and practicing architecture risen consequently to “the contemporary appearance of three factors only apparently independent from each other, that are: the specificity of the construction science’s theories; ... the industrial and cheap production of materials with high mechanical properties such as iron and reinforced concrete; the emergence of new constructive themes characterized by a larger and larger dimension, such as train stations, airports, industrial buildings, stadiums, great halls for spectacles and high-rise buildings.”⁵

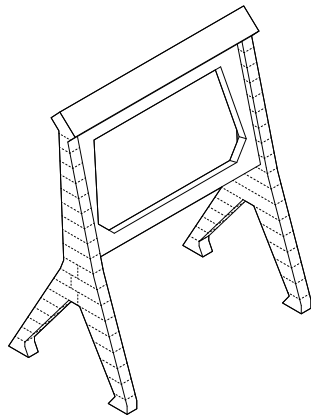
In this context, *architettura strutturale*, unlike “formal architecture,” assigns a primary role to the structure, its material and static function, which, according to Nervi, has a “great potential, an intrinsic formal richness”. Beside this, “materials, statics, constructive technology, economic yields, functional necessities, are the vocabulary of the architectonic speech.”⁶ The synergy between the formal aspect, the static problem and the cultural scenario, together with the proactive approach of facing the new challenges of the architect-civil engineer, constituted the bases to deal with the architecture of the future.⁷ In its conceptualization, construction and perception, the Burgo paper mill was an outstanding example for these new types of architectures.

II

In 1960 the Burgo Group, at that time Italian leader in this sector of the paper industry, faced the necessity of building a new factory, hosting an exceptional machine for paper production engineered by Beloit. Covering the entire production cycle along a unique sequence of more than 100 meters, the machine was the largest model in Italy and one of the most ad-



2. Simone Marcolin, The Burgo Paper Mill with the renewed glass facade, July 2019



3. Simone Marcolin and Diletta Trinari, Axonometric view of the reinforced concrete double trestle, July 2019

vanced all over Europe. Hence, Pier Luigi Nervi was asked to create a container more than 200 meters long and 30 meters wide to host the machine. This spatial configuration was apparently achievable with a linear series of load bearing portals, but not suitable for the purpose, due to the Burgo Group's further request of complete spatial freedom for a possible expansion of the factory.

The futuristic plan of the Company was in fact to line up several Beloit machines of the same size, creating parallel production lines—a plan that was not implemented in the end. Thus, the basic request of the project was to design a covering system, allowing a free facade for the span of at least 160 meters. After several attempts, Pier Luigi Nervi, along with the engineer Gino Covre, agreed on a structure based on the principles of a bridge, with a suspended steel roofing supported by means of four reinforced concrete double-trestles tie-beams. These were placed, shaped and dimensioned in order not to affect a future expansion.⁸ Behind the continuous facade of steel and glass, 22 meters below the roofing, a plinth on two levels supported the continuous machine.

In 1964, the Burgo paper mill was a hymn to progress. An outstanding piece of architecture, embodying the most advanced features of concrete construction and steel engineering on its outer shell and an innovative approach on industrialization with its machine inside. An architecture reaching beyond the radical *mise en oeuvre* of Louis Sullivan “form follows function”⁹, merging them in a unique indissoluble continuum. Without the building the machine could not have operated, and without the machine the building would have never been built. Furthermore, the paper mill was not only a magnificent example of industrial architecture, but also a symbol of the complex and articulated project of modernity for the Italian society, based on the raise of a shared progressist vision of future.

⁸ Paolo Desideri, Pier Luigi Nervi jr and Giuseppe Positano, Pier Luigi Nervi (Bologna: Za-nichelli, 1980)

⁹ In 1896 Sullivan coined the maxim in an article titled “The Tall Office Building Artistically Considered”, in: Lippincott's Magazine (March 1896): pp. 403–09. This became a principle later, widely associated with late 19th and early 20th century architecture and industrial de-sign in general.

10. Emanuele Salvato, "Mantova, la crisi dell'editoria costringe alla chiusura la 'cartiera dei giornali'", *Il Fatto Quotidiano*, 15 January 2013

11. Zygmunt Bauman, *Liquid Modernity* (Cambridge: Polity Press, 2012), p. 2.

13. In an article published after the collapse of Morandi Bridge in Genova, Pierpaolo Tamburelli describes the dramatic event to trigger a wider analysis of the state-of-the-art of architecture in the Italian context. The article opens arguing that the bridge was an architectonic symbol supported by a brave project of modernity of Italian society as a whole, while today in Italy lacks the optimism to practice architecture as such a process.

See Pierpaolo Tamburelli, "Quel ponte era bello", *Il Foglio*, 22 August 2018,

12. Jacopo Giliberto, "L'industria della carta riparte e riconverte verso gli imballaggi e il riciclo", *Il sole 24 ore*, 18 May 2018

III

On February 9, 2013 the Burgo paper mill closed its doors and ceased the production permanently after 59 years. The shift of goals and necessities delineated by digitalization, made the factory and its production process obsolete and unsustainable. Due to high maintenance costs—in particular costs related to high energy consumption—within the last three years of production, the mill registered economic losses of approximately one million Euros per month.¹⁰ The paper mill, a product of progress itself, betrayed by the unpredictable course of progress.

In his book *Liquid Modernity*, Zygmunt Bauman affirmed that "forms of modern life may differ in quite a few respects—but what unites them all is precisely their fragility, temporariness, vulnerability and inclination to constant change."¹¹ He provided an analysis of modern society, portrayed as a culture suspended between the search for radical change and the need for order to rationalize and measure the world. In the unfulfilled objective of Modernism to obtain total control over the dynamics of evolution of the world stands the real essence of the Burgo factory. In a monumental way it embodied a radical synthesis of the ideals of society and technology of its time, which is the very reason for its decay nowadays.

No room is left for the Mantua paper mill, in the era of digitalization, globalization and smart-city values such as flexibility and sustainability. It is not a coincidence that there are no paper mills existing in Italy anymore with an equivalent production cycle of the mill in Mantua.¹² Pier Luigi Nervi's factory is an 8000 square meters building facing a complex process of transformation into a paper recycling plant today—the refurbishment of the building started in 2016.

Despite the controversial situation of the factory—the conversion process is facing bureaucratic lags and stops—what did not vanish, yet, is the symbolic power and its ability of recalling a specific era of Italian

modern history. The symbolic value of buildings like the paper mill cannot be questioned in absolute terms, what makes them valuable is the prominent role they still have in the characterization of Italian architectural identity. Therefore, the focus shouldn't be the monuments of *Movimento Moderno* and their physiological obsolescence, but the lack of meaningful alternatives proposed by contemporaneity to substitute them in the definition of a notion of identity. A statement that may sound excessively severe towards the interpreters of the new generation of architects but that overcomes the sphere of architecture and the presence or rather the absence of "nice" buildings in the Italian contemporary scenario. What lacks in this context is a shared vision of contemporaneity, of progress and future, a common plan to understand the direction to be taken in a brave and optimistic process of renewal in architecture.¹³ In this context, the Burgo paper mill, charged with meaningful symbolic value, still constitutes an interesting way into a possible new architecture of progress. It may not serve as a formal or functional reference but as an eloquent example, able to recall the interdisciplinary and cultural process at the base of its innovative conception.

Pier Luigi Nervi's building provides a reference to understand how such a synergy between architects and society as a whole—that goes far beyond the single field of action of architecture—may constitute the primary condition at the base of an architecture of progress.

Simone Marcolin is an architect and photographer. He studied architecture at Politecnico di Milano, from which he graduated in 2017.

Diletta Trinari studied architecture in Milan and Berlin. She graduated from Politecnico di Milano, where she is currently enrolled as a teaching assistant.

In 2018 Marcolin and Trinari moved to Barcelona, where they are currently working in the field of architecture and editorial projects. Their main interests range from analytical reading of space through research and photography to the creation of spatial systems and artifacts to interact with at various scales.