18. From *Merceologia* to Cathedral Thinking

Flaviano Celaschi

Department of Architecture, Università di Bologna

I first grasped Alberto Seassaro's early insistence on the concept of *merceologia* (commodity science) at the end of the 1980s, when his research was strongly focused on building production cycles and on the processes of making the city and the territory, understood as a complex, integrated system between industry and culture.

Seassaro was probably realizing that the problem frame was shifting toward a decisive and profound integration of these worlds which, until then, had been studied by separate and non-communicating disciplines: the designer dealt with the definition of the product; industry concerned itself with how to make and distribute it. Two worlds structurally autonomous in thought and in practice.

The design-production sector's ignorance of every social, economic, processual, productive, and technological aspect was offset by the industrial system's complete cultural and economic autonomy, both in construction and in the production of consumer and capital goods.

With the advent of the post-industrial society these lines of reasoning also included the discourse on industrial systems and components for building (a discipline for which Seassaro held the chair,

while still an associate professor, at the Faculty of Architecture of Politecnico di Milano).

These were the early years of insistence on *merce* [merchandise]. It was difficult for me to grasp quickly the profoundly radical scope of the term *merchandise* and its derivatives within architectural studies and research. The use of the word *merchandise* in that context even struck me as almost sacrilegious. Certainly for me who, to pay for my studies, had spent every summer of my high-school years as a sales-clerk in a haberdashery in a mountain village.

Thus, for me, merchandise was a term probably even tinged with a thread of shame for the prosaic nature of a commercial concept, within a forum characterized by the encounter/clash of politics-society-technology-aesthetics-art-power in the production processes of inhabiting, in profound transformation, which at the time attracted my studies and my ambitions, also with respect to my own social mobility. I had not yet studied Marx, nor the many authors recommended by Alberto Seassaro who accompanied me in understanding its reach. I found it scarcely viable, and second-tier, to work on inhabiting as merchandise, and the industrialized building systems and components we were dealing with then seemed to me profoundly different from consumer goods, because they were characterized by B2B business models and thus by the dynamics typical of capital goods, of the construction site, far from canonized compositional morphology, yet authoritative because industrial.

Thinking back to those studies, one is brought to smile – or to weep – today, listening to reportage on contemporary Milanese urban planning in which it is entirely evident that architecture has become merchandise, and the building itself, endowed with an iconic-spectacular form, with a playful, endearing nickname, brought to market by international real-estate brands, permitted and fabricated just in time, moves on the stage of the market exactly like a cult object of luxury merchandise. Thus Seassaro, in that period, taught me to read the building market with the instruments of any other market: the instruments of merchandise, of use value and exchange value, of the society of the spectacle, and of the social and industrial liquidity of globalization.

The concept of *merce* [merchandise] – and, consequently, *merceologia* [commodity science] as a research context, still appealed to me

little, but fortunately it remained in the background of our group work until the mid-1990s. In that period we were already functioning as an articulated research group in which certain role stratifications had formed (always very informal and never imposed).

Note 1.
The sudden passing of Prof. Giacomo Scarpini had a considerable emotional impact on Seassaro and on all of us who esteemed him. In the years that followed, the large group of his collaborators was gradually absorbed, and our working group doubled in size, making it seem, for the first time, unavoidable to attempt some awkward measures of organization and formalization. Two actions to which Seassaro's anarchic spirit was allergic, because any organization and formalization would have ended up freezing a form within a process whose greatest strength lay in its continual dynamism and elusiveness. I think that most of what was accomplished in those years within Politecnico di Milano was possible above all thanks to this corsair dynamic, which kept the numerous contrari from arriving in time to fire on the small flotilla of design, since, when the first slow but heavy broadsides of resistance came, our little vessels were already underway on another course. Thanks to Seassaro's instinct, for several years we managed to turn into guerrilla warfare a war of secession that today I would call aimed at preserving the academic status quo prior to the small revolution of design. Others will speak of Seassaro's innate capacity, and need, to institutionalize and give formal standing to everything that was the fruit of research and thought. The two things are not antithetical; if anything, they fuse into a single, surely rare, soul of an anti-organization institution-builder, in whom the long time of the institution and its sacrality rebelled against the short time of paralyzing organization.

There was a nucleus of professors, colleagues of Seassaro and very close to him, with whom it often happened that we overlapped or collaborated on research and events, teaching and projects (Scarpini, Farè, Levi, Baglioni, and others); a dense network of colleagues in the technological area within national academic networks; the group of *ope legis* researchers who had been working with Alberto Seassaro since the early 1980s (Macchia, Garaventa, Mauri).

These coordinated, day by day, the work of the third tier, represented by the group of doctoral candidates who had begun their path in the early 1990s (Celaschi, Conio, De Paoli, Penati, Collina, and others [1]) and who in turn were the transmission belt toward a nucleus of *new entry* who, progressively – and sometimes temporarily – came on the scene (Ciuccarelli, Olivetti, Bertola, Deserti, and others).

A study on *Sheet Materials* in that period brought me much closer to the elements of *commodity science*; it was offered by Cesira Macchia and Adriana Baglioni for the publication of Zaffagnini's major *Manuale* on building materials and industrial technology. We reasoned about the supply chain which, from the chemically characterized substance, passed through the state of matter and then – with the introduction of the machine and of the technologies upstream of industrial production processes – was transformed into a form suited to become a component of the construction process; namely: the block, the wire, the tube, the sheet, the profile were the plastic exemplification of what I called «l'intelligenza della lastra» [the intelligence of the sheet] (Celaschi, 1997).

I was beginning to draw nearer to the concept of merchandise, in the sense in which it could be expressed at that time. Something (the material), enhanced with industrial design intelligence, became a flexible, interpretable component, as needed, within a value chain that passed through the in-depth

knowledge the designer needed to have in order to proceed along the chain that led to the final form. The designer of the final good, then, did not start from the material but from the form through which it was marketed as available intermediate merchandise. The designer was beginning to realize how important it was to deal with the material, the component, the *tertiarizable* portion, and how that project would affect the overall production system.

Thus there took shape a system integrating *use value* and *exchange value*, intimately bound up with grasping the various levels of *design intelligence* situated – more or less upstream – along the R2B-2B2C value chain, through to the recognition by the resident user of a functionality that is aestheticized and deployable, available to be purchased and experienced.

Precisely in that period, Seassaro began to insist on the need to conceptualize and structure (first culturally and theoretically, then methodologically and thus concretely) a Laboratory of *Merceologia* [commodity science] capable of gathering and managing massive bodies of information (at the time on paper, in the form of product catalogues) on the availability of the various stages of value generation for design steps, tiered and made available to the subsequent level of value generation.

The opportunity that allowed us to give this system concrete – also logistical – form, and to make it a place of research and teaching relations, was the megaproject *Sistema di Laboratori per il Design* [System of Laboratories for Design], which was negotiated and obtained thanks to the considerable efforts of Maria Cristina Treu (prorector vicaria to Adriano Di Maio 2↘) and Alberto Seassaro, then still President of the Degree Course in Design. But before that there occurred what, together with Alessandro Deserti, the executive project mainstay of each of Seassaro's immaterial ideas, we jokingly dubbed *Operation Exodus*, which compelled us, in order to have room to operate as future design researchers, to move en masse from the historic *Città Studi* campus in Milan to the ill-reputed far periphery of Bovisa, outside the so-called *goccia degli ingegneri* [the engineers' drop], thereby in effect also consummating, physically as well, the separation from the

Note 2.
Adriano De Maio was Rector of Politecnico di Milano in the mid-1990s. Under his leadership, with the decisive contribution of Cesare Stevan, then Dean of the sole Faculty of Architecture, which housed the first courses in *Industrial Design*, the pioneering phase of design in Italy unfolded. Maria Cristina Treu's contribution was also decisive in seeking out and making available the development resources for the Bovisa Campus, within the funds earmarked for the decongestion of mega-universities and for the decentralization of Politecnico di Milano's network. Jokingly and in confidence, we called the yellow building of the design campus *PalaTreu*, because that was the period when, in Europe and in Milan, it was customary to give large sports and entertainment buildings the names of official sponsors.

building component of the technology area and generating the first real condition of autonomy, thanks to which the subsequent leaps of growth were made possible.

We might call that act the *second war of secession*, since the *first* had been fought by Lieutenant Seassaro, out of my sight, under the guidance of General Stevan, in the rooms of Commodore De Maio, where the possibility was being understood of a progressively autonomous development of design with respect to the soul of Engineering and of Architecture.

We therefore fitted out a former industrial building of two factory blocks with five floors each at no. 38/A in Via Durando 1↘ 2↘ 3↘ where, before us, pharmaceuticals had been manufactured, making it the home of the Design section of the Department of Technology (previously PPPE: Department of Programming, Production, and Building Design) 3↘. At the fourth floor of Staircase B of the complex, the first furnishings were installed for a library of information on commodities, and a chain of research activities oriented to individual productive sectors was set in motion. Together with Seassaro (with Paolo Ciuccarelli, who shortly thereafter became the first technician of the laboratory of *merceologia*, and with the constant support of Paola Bertola) we then signed the first volume of what was to become a series of studies intended to dismantle and explicate the process of value generation in complex, design-driven productive sectors, such as, for example, the characteristically Made in Italy eyewear district of Belluno and Treviso (Seassaro, Celaschi, Ciuccarelli, 1997).

The laboratory of *merceologia* of Politecnico di Milano was later transferred to the complex at Via Durando 10, disaggregating within what we might define as the explosion of value chains and of post-industrial, globalized, and progressively digitized production that came to be known as *intersectorality* 4↘.

Little by little (for me) the systemic study of production chains became progressively interesting, and I would even dare say attractive, and the Department offered me my first teaching assignment in Mantua in the a.y. 1994-1995, pre-

Note 3.
It is worth recalling that Politecnico di Milano's *Design System* has not always existed. To those who found it already in place, this pioneering reminder of the phase from Secession to Foundation may seem superfluous, but it is part of the reasoning that, in a publication like this, must be made; someone, sooner or later, had to make it. When things are done, one may applaud or criticize, but none of us, not even Alberto Seassaro, had ever before founded a university Department; none of us had ever even imagined that one could realize (also institutionally) an inter-university Consortium pursuant to art. 108 of the 1989 law on the Italian university system; none of us had ever built from nothing a Faculty with five thousand students. In this discussion, space matters greatly, because without space every thought remains theoretical and every person continues to live in their primitive everyday. To design a System like the one we are discussing meant, first of all, turning a set of spaces into a place (that is, a system of productive relations, conceived, inhabited, and lived). The space at no. 38/A in Via Durando, from the top of which (how beautiful the Milan sky is when it is beautiful), beyond the railway belt, on sunny days one could see the crown of the Alps, represented our West Coast of the American continent, a Risorgimento-like expanse of prairies to cultivate and in which to raise minds and produce energy. A wise guide, little fear in the face of the many opponents, including institutional ones, a great deal of desire and toil, and just as much recklessness, did the rest of this incredible adventure.

1. Campus Bovisa in costruzione.
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2. Campus Bovisa in costruzione.
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3. Campus Durando-Bovisa, fotografia degli interni.
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cisely in the subject of *Systems and Components for Building*. This study had led me, under the guidance of Seassaro, to explore classical *commodity science*, which at that time was still a branch of economic studies dealing with tariffs and the buying and selling of goods which, in order to be qualified, had to possess standardized, normed performance characteristics. The major manuals of modern commodity science were divided into homogeneous sections: metallic materials, non-ferrous minerals, timbers, precious metals, and so on, up to agri-food products that fell within the so-called trade in raw or semi-processed materials. We were living, in a very tangible way, through a historical phase in which all this scientific customs-and-value apparatus was dissolving, and the real value impact that interested the industrial designer was shifting a couple of levels downstream: from the study of substances to the study of systems and components, with some drift toward materials which, in effect, as such, pertained increasingly to chemistry and engineering and less and less to design, which possessed neither the competences nor the time to set its action in motion from that level of interaction.

Globalization and the digitization of information were exploding in our hands and, more or less suddenly, within the space of five years we found ourselves no longer able to keep up with the masses of catalogues of materials and semi-finished goods, components and product parts that were reaching us from everywhere.

Meanwhile, it was increasingly clear that the contemporary designer was concerned predominantly with the design of the *commodity-form* 5↘, a term taken from an essay by Maldonado and used to gather into a systematic and substantial scientific effort the dismantling of the basic concepts that Seassaro had imparted to me for years and toward which I felt a classificatory debt: value, needs, exchanges became my bricks for defining a problem-field in which the difference between dealing with objects (things) and with commodities (goods) bought and sold on markets was clear. The difference between *use value* and *exchange value* was clear as well, and so was the centuries-old debate that had arisen between the by-then commonplace supporters of modern functionalism and of the future of modernity, and the nimble postmodern, Situation-

Note 4.
A very topical concept, that of intersectorality, which we had learned from the two sectors that are in Italy intersectoral par *excellence*, namely the automotive sector and the construction sector, which reaffirmed the idea that makes the issue of Trump's customs tariffs incomprehensible and unmanageable, because of the strong interconnection of systems and components, raw materials and materials that the key sectors of the contemporary economy manipulate.

Note 5.
In Celaschi (2000), an introductory essay by Alberto Seassaro retraces the pioneering phases of this research trajectory within *merceologia* at Politecnico di Milano.

ist *surfers* of exchange value, who held that function itself was one of the ways of adding exchange value to things so as to introduce them into a spectacular market circuit of exchange – even in the face of an immanent *happy degrowth*.

We were studying the articulated set of processes that, upstream, dealt with making available to the designer systems and components already endowed with embedded intelligence to orient their action. We were interested in the phenomenon whereby the designer concerned themselves with these, such as, for example, Sottsass designing Abet Laminati's laminates, or the steel-tube furniture district in the Lombardy region; the nineteenth-century manuals of Formenti or Valladier that informed building production on the basis of component formats, following and extending the construction process of Gothic cathedrals, just to name a few examples.

We were studying the articulated process of subcontracting and of the value-chain that drives innovation, rather than suffers it; we were studying *just in time* and its need always to start from an interdependent system of partner suppliers, not subordinate but strategic, for continuous provisioning.

And also for participation in the design and creative process. Meanwhile, the shelves of the commodity science laboratory were filling with catalogues and we with productive relations; the number of published essays was growing 6↘, and contacts with industry and with designers allowed us to add relationships both useful and indispensable to be able to send students for internships within production systems and not only in professional studios. In the meantime, out there, commodities were dematerializing and digitizing to the point of becoming consuming human bodies 4↘ 5↘ 6↘; servitization overtook the purchase of traditional goods; the nature of exchange, encrusted in market exchange, opened to the mix of anthropologi-

Note 6.
See, for example, Simonelli (1997), Penati and Seassaro (1998), as well as the POLI.design series on the Brianza furniture district and the Como silk district, and many other essays that testify to the intense research carried out around innovation processes driven by production systems and by their reorganization.

4. Alberto Seassaro (a cura di), *Ricerche tecnologiche coordinate*. Facoltà di Architettura, Istituto di Tecnologia, Politecnico di Milano. Document→
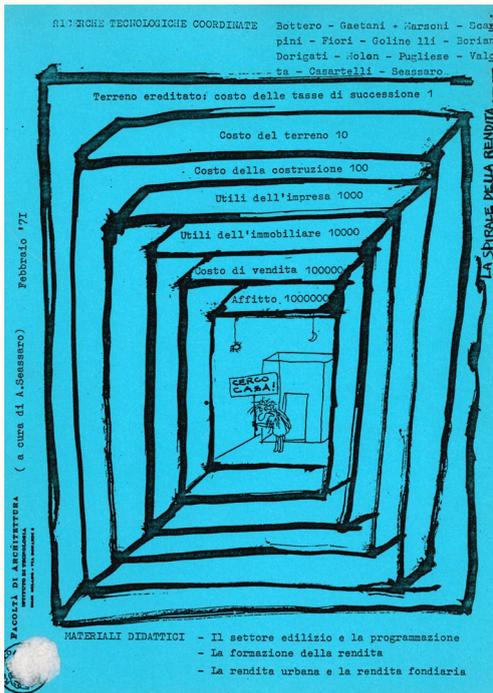
Figure 1.
Cover of the book *Il Design della forma merce* [The design of the commodity form], edited by Flaviano Celaschi (2000).
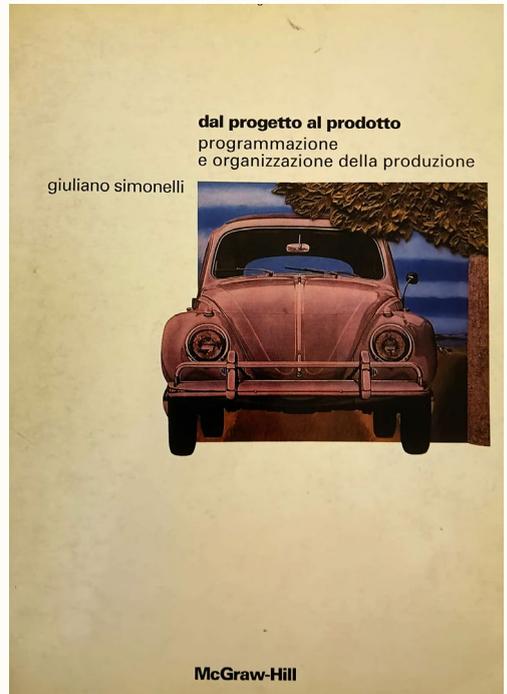

Figure 2.
Cover of the book *Dal Progetto al Prodotto* [From Design to Product], edited by Giuliano Simonelli (1997).
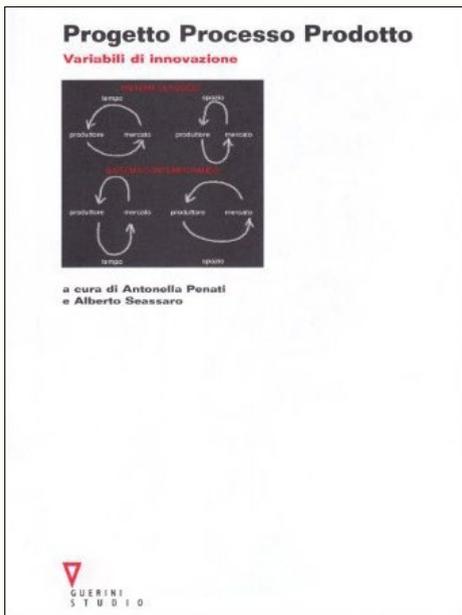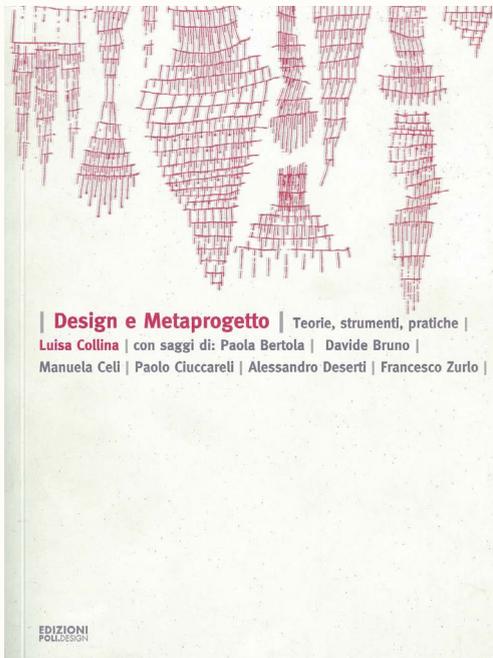

Figure 3.
Cover of the book *Progetto Processo Prodotto*, edited by Antonella Penati and Alberto Seassaro (1998).

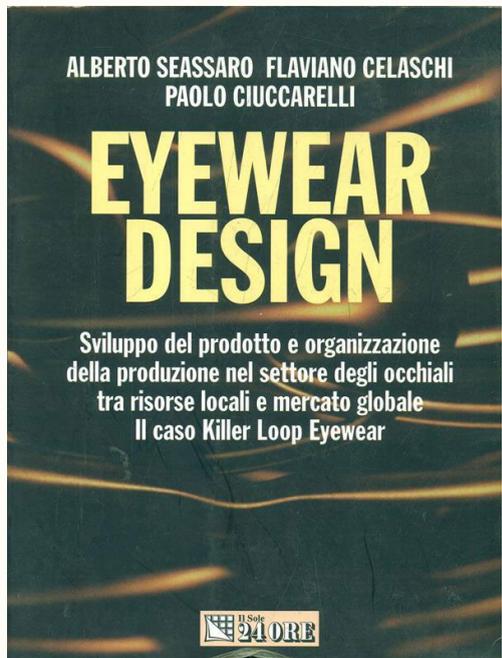5. Copertina del volume *Design e Metaprogetto*.
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Figure 4.
Cover of the book *Eyewear Design*, edited by Alberto Seassaro, Flaviano Celaschi and Paolo Ciuccarelli (1998).

6. Milano Distretto del Design - Sistema Design Italia.

cal exchanges of self-production, barter, symbolic exchange, and all these forms in an integrated way.

Before our eyes the commodity was continually reshaping itself, and so the need to study it and to structure paths and tools of analysis was swelling, splintering into a thousand rivulets. And around what Seassaro had named the *Sistema Design Milano*, professions were evolving; trade fairs were exploding, overturning themselves into the metropolis; the places of real production were being pushed out; the logistics of goods and digital buying-and-selling systems were appearing; entire neighborhoods were being reactivated, populated with cranes and excavations; the flow of students was doubling with the dozens of design schools opening; fashion and design were cementing an alliance never before achieved; hospitality and dining were becoming experience; the service economy – which we called that of the *product-system* – was swelling, producing contradictions and new crises, hiding social fractures, expelling inhabitants, attracting others, and remodelling and resegmenting populations in a new, globalized, post-industrial urbanism. Impossible to keep up with the hundred new research stimuli that were born each season.

In parallel, Seassaro was entering a founding phase of the Politecnico di Milano's *Design System* and, upon this already considerable and substantial (I would say cyclopean) work of systemic construction, of organizations, institutions, structures, bodies, working groups, committees, councils, offices, there was shortly overlaid an equally gigantic labor of opening up problem-fields to be explored in design research as well as teaching: from light as a symbolic and functional form to the material sciences for design, from worker safety and prevention to automatic drawing and then to digital prototyping, until opening – and then staffing, each of these and a hundred other fields with researchers and experts, inside and outside Politecnico di Milano, bringing water to the small motionless pond that was becoming a catchment basin comparable to China's Three Gorges Dam.

A metaphor that helps me convey what it meant to find oneself, at just over thirty, at the center of a cyclopean construction site in which a dam never before attempted was being built, within which to filter bodies of knowledge that even a 140-year-old polytechnic could not by itself satisfy, and which gradually drew in the *Sistema Design Milano*,

the regional Design System, the Italian Design System, and then a system of international schools, to end by building a basin of collection and valorization now estimated as the largest by size and among the top five in the world for quality. But damming a river of such magnitude means diverting the waters and moving vast quantities of earth, excavating and covering, canalizing, motorizing, training workforces, provisioning systems of people. Above all, it means securing resources: when one speaks of doing research in Italy, especially in the humanistic knowledge domains, the problem of the need for continuous and substantial resources that a system of scientific production requires is always underestimated, and none of us had been prepared either to produce or to procure them. I recall only that between 1999 and 2001, with the birth of POLI.design and then of the IN.D.A.CO Department (Industrial Design, Arts, Communication and Fashion), and in parallel with the continuous development of the Faculty, we found ourselves, within 24 months, having to provide the salaries of 64 *collaboratori coordinati continuativi* – the coordinated and continuous staff managing the administrative, organizational, and project machinery – not covered by the university's tenured personnel (excluding researchers and faculty among the tenured ranks, counting only those who worked on the organizational machinery), starting from a single room with two collaborators, a blue Underwood typewriter, and three occasional unpaid volunteer assistants.

We had built what, by European parameters, is called a small-medium enterprise. I did not sleep at night at the thought that the following semester we would need to find the resources to renew so many contracts.

Of that period I remember only, or above all, how much I missed being able to work, artisan-like, day by day on contents and on vertical research, on the writing of papers and publications, on the careful and meticulous preparation of lecture transparencies, or on the careful construction of international scientific relations, not yet aware that what we were helping to build every hour, every day, every single day, was a knowledge system precisely the fruit of the theories and studies we had practiced for years: *Design System* 7↘.

Note 7.
In November 1995 I accompanied, as *portaborse* [aide], Seassaro to an appointment with Milan's newly elected mayor, Formentini. An encounter organized by Prof. Stevan, an old Socialist Party friend of Formentini's from his pre-Lega career. I remember a brief appointment, for the long cadences of Seassaro's prose, paced by the mayor's very packed schedule. In 20 minutes Formentini put a few schematic questions to Seassaro: *What is this design everyone is talking about? What does design have to do with Milan? What can we do, as an administration, to support this?* I do not know whether Seassaro had time to develop his thinking, nor do I know whether the Mayor truly listened. I know only that in 1995 the Mayor of Milan set himself the problem of understanding what design was, and in 2005, ten years later, there existed a *Sistema Design Milano* known and acclaimed throughout the world. This is, in my view, the measure, not only polytechnic, of the value and scope of the Seassaro project I witnessed.

A cyclopean work, like the dam that was taking shape at full scale, as in the fabrication of a huge experimental Synchrotron for particle physics. Our particles were the thousands of students and the hundreds of young researchers, forgive the analogy, they were the bearers of that incredible energy that had to be recognized and extracted in order to be accumulated and distributed, and then channeled into project, profession, research, study.

Alberto Seassaro had imagined, and then realized, a system to transform knowledge into recognizable and transferable value. Little known were countless other incredible projects that no longer exist today, yet cost a heedless quantity of time and energy: the *Polo del Design di Como* [Como Design Hub], devoted entirely to the furniture and textile design districts that had represented the economy of those valleys; the *Casello del Design* at Porta Garibaldi tollhouse, where we won a national tender to manage a Center for the promotion of design in the metropolis of Milan in collaboration with the firm Tecno S.p.A.; the research center for the Design of Cultural Heritage at Palazzo Forti in Sabbioneta, with the design and realization of the first, and at the time only, European center for the digital valorization of historical heritage and of cultural design; up to the *Politecnico del Design*, a public-private company with the Cabassi Real-Estate Group for the joint creation of a recognized International School of higher education in design, a project in which a system-level solution was envisaged for student housing and their sustainable welcome, twenty years ahead of the current crisis of the habitability of Milan.

In 2004, when I left Politecnico di Milano for the first time, we realized that the Bovisa Campus had become, in the midst of Milan's full-on industrial divestment and tertiarization, the only real factory left, where manufacturing was done by transforming metals, paper, fabrics, wood into semi-finished goods and components and then assembling them into products, and by doing the same with the memes of every area of knowledge that could serve to produce project.

In the *Design System* of Politecnico di Milano, finally, everything was there: from the photogoniometric machine for measuring artificial light from designed light sources, to the tanks for simulating the pitching of sailing vessels; from the artistic-graphics laboratory with lathe and presses, to the third-millennium digital studios for movie design;

from the digital theatre for three-dimensional visualization, to the largest fashion-production atelier in Milan. Professional higher-education courses, international seminars, scientific symposia and congresses, competitive European research, global relations, doctoral programs, up to nearly five thousand students per year.

For every strand of knowledge useful to research and to education in design, the entire chain existed: from the extraction of meaning to the final showcase in the form of events, memorable those at the *Casello di Porta Garibaldi* [Porta Garibaldi Tollhouse], complete with DJ set under the incessant rain of the *Salone del Mobile*, from participatory design spaces and focus groups to the digital catalogue for remote fruition.

In *The Pillars of the Earth*, by Ken Follett, the handover from one generation to the next in the construction of a very large Gothic cathedral is recounted, drawing on the system of guild-based transfer of knowledge and the precursors of a proto-industrial system of prefabrication for systems and components. This model has given rise, in recent decades, to the concept of *Cathedral Thinking*, that is, the idea of accepting to take part in a construction one knows one will not live to see completed, because the length of the fabrication process will outlast several generations, exactly as happened with the cathedrals. The concept of *Cathedral Thinking* lends itself to sustainable design, where there is in fact no end of works, every transformation we imagine will, in cascade, generate further ones and will trigger processes that, when they conclude, will immediately set in motion the phase of perpetual maintenance and cyclical readaptation 8↴.

What was already nascent then, alongside the cyclopean dimension, was the immaterial dimension of this System, what today would be called the *digital twin*. A *microphysics of building* (Foucault, 1977) 9↴ that we can today deconstruct and reassemble in order to adapt it to the accelerated and impetuous change of the present, recomposing new overall forms starting from stable components, from constitutive constants, so as to knot new ties between production and fruition of a knowledge system destined to endure over time. The challenge of the ensuing years was that, eluding the *ozi di Capua*

Note 8.
In Milan they say *lungo come la fabbrica del Duomo* [as long as the construction of the Duomo] to characterize a process that is by its nature without an end, in which each participant holds their role for a stretch of time and moves the project forward a few steps, leaving its legacy to others, as in a middle-distance relay.In Seassaro's work of building the *Cattedrale Politecnica del design* [Polytechnic Cathedral of design], I found a strong embrace of this philosophy.

Note 9.
Where structuralists have sought to observe and extract the founding mechanisms of civilizations, and in particular where Foucault has done so for modernity as political thought and as power, there are many ideas and terms that I learned from Alberto Seassaro to handle, theoretically and pragmatically.

[the idleness of Capua], to create the digital dimension of this System and to make it work on a global scale and continuously.

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