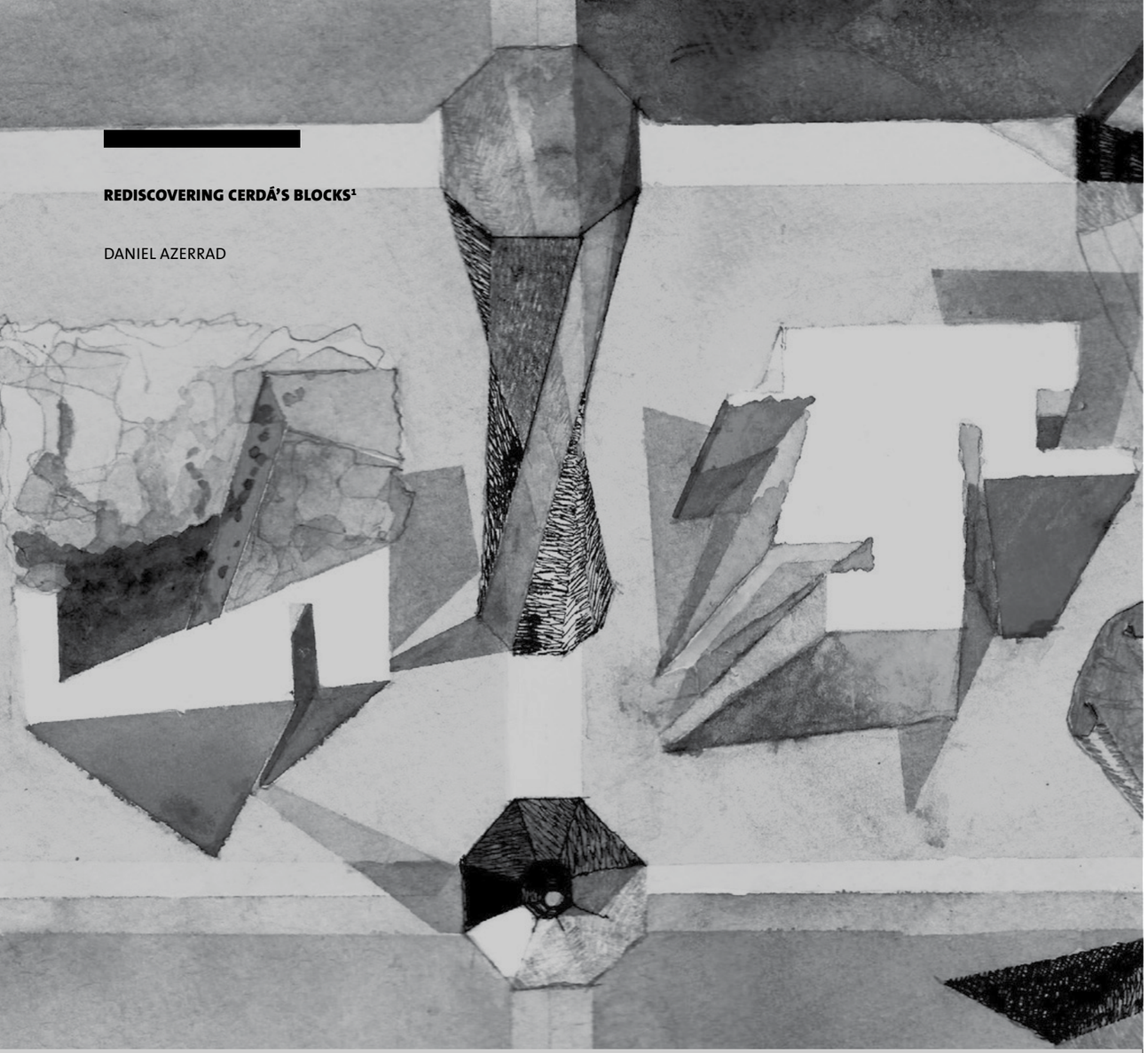

REDISCOVERING CERDÁ'S BLOCKS[1]

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Abstract

As ancient as the human imagination, the urban grid plan preceded even the first 'polis' grid designed by Hippodamus of Miletus in ancient Greece. To this day, the use of a basic orthogonal system of streets and blocks that enclose the living space has been a starting point given to the continuous interpretation in urban history. For over 3,000, years the vitality of the grid cities has attested to the most unique approach to urban planning. Despite the simple rules of creating the grid lines – or, perhaps, because of it – these cities have a rich variety of historical, economic, social, ethnic, technological and architectural changes. This flexible urban stage is capable of adapting and reinventing itself time and time again and by its very nature proposes creative solutions. The openness of thought in our understanding of the implications of the past, the present and the future of the urban grid is, therefore, a prerequisite for enhancing the flexibility of the grid.

When studying these matters the article will focus on the urban plan of the Barcelona extension by Catalonian Engineer Ildefonso Cerdá, as well as in the urban manzana (the Spanish term for the basic urban block in the cities of Spain and Latin America) as part of the entire grid plan. When we study the entire *Eixample* ('extension') district, each manzana can be seen as a basic unit that repeats itself and creates the entire urban mosaic. At the same time, this unit can also be seen as the DNA of the grid plan. Therefore, in analyzing the quantitative and qualitative parameters of one block – such as private and public spaces, residential typologies, architectural languages, zoning, the various skylights, attitudes towards the streets and green spaces – we are able to understand the city itself.

The text will be accompanied by impressions of ink and watercolors of Barcelona. This personal interpretation of the 'Eixample' is at once intuitive, abstract and emotional. Lines, colors, proportions, volumes and time spans constitute an understanding of reality that exists only within the limits of my paper. Through them I am assisted in discerning, redefining and rendering hidden layers in the urban grid of Barcelona. In the words of Jean Baudrillard, "... illusion is the law that drives the universe... reality is only the exception!..." (Baudrillard, 2010, n.p.).

> "For everything to be new, I required words that needed to be invented" – Ildefonso Cerdá (quoted in Armesto, 1980, 94).

"Para ser todo nuevo, han debido ser las palabras que he tenido que invertar" – Ildefonso Cerdá (in: Armesto, 1980, 94).

Introduction

The Grid

The grid is an urban idea as old as the human imagination. The idea of using the basic orthogonal street system that produces residential blocks started with the Hippodamus of Miletus, one of the first polis cities of ancient Greece, and continues to the present day. The urban grid is a starting point and foundation for the interpretation and analysis of urban history, as well as for urban research of many professionals [**Fig 1**].

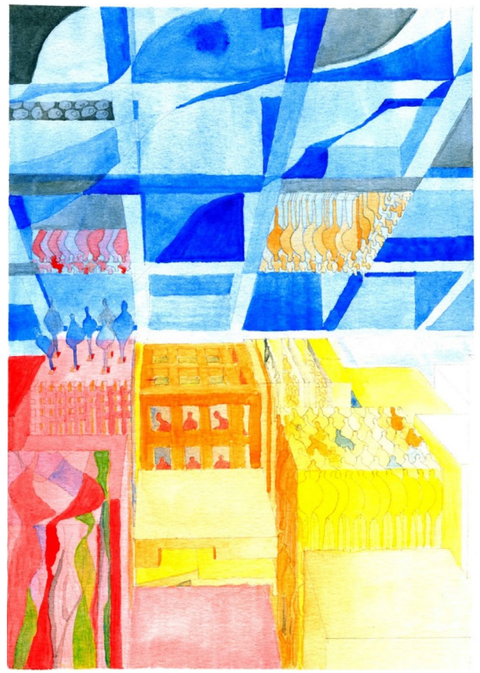


Figure 1
Grid City – Buenos V: Personal Commentary (watercolor on 300 gr paper; Daniel Azerrad, 2010)

Vitality

The grid cities have existed as an urban outline for more than 3,000 years, and have a very particular and unique approach to the concept of planning. Despite the simplicity of the fundamental rules of these areas – or, actually, because of them – they have been able to encompass historical, economic, social, ethnic, technological and architectural changes.

Grid cities are a flexible platform capable of adapting to great changes, and reinventing themselves over and over again by means of that same potential of creative solutions. The necessary condition for this flexibility and openness is the ability to relate to the grid as the product of a historical process, while at the same time holding on to the willingness to accept the changes and dilemmas relevant to urban life during the coming centuries.

Barcelona

The city that I have chosen to present in this essay developed following rational events that took place in a large part but not all of it. Barcelona is the product of a rational planning process that architects later integrated into, in order to design objects; but the foundation and history were born out of ancient ideas and events from the world of architecture. Ildefonso Cerdá, a Catalonian engineer, was the "all powerful" father of the *Eixample* in Barcelona; (*Eixample* in Catalonian is the term for the extension of the plan in Spanish cities that began in the middle of the 19th century (see below).

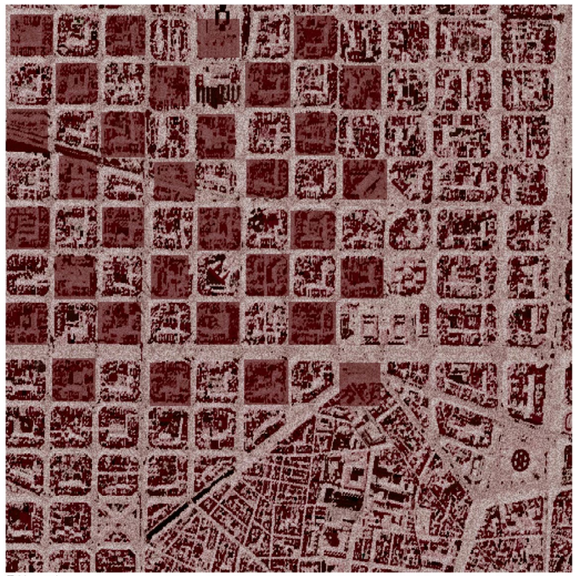
In the urban grid, each block is part of the whole, and can be understood as a basic unit, the replication of which produces the urban carpet, or the DNA of the square grid. Analyzing the quantitative and qualitative parameters of one block and its private and public aspects – such as the different typologies of the dwellings, the architectural languages, the uses, the scale, the connection with the street and the attitude toward the open spaces – it is possible to understand the city itself.

There is nothing more impressive than flying over the skies of Barcelona and discovering the 'game board' of urban complexes, organized according to the art of Cartesian geometry, combined with the production line of the "Ford" car factory – in other words, pure rationalism [**Fig 2**]. Each block is aligned with the other, and space separates them. The distance between the blocks is identical, and they never touch each other. From an aerial view, all the urban complexes look equal, perfect. It appears that the complexity of life has disappeared from

the city, and it is seemingly impossible that two individuals, two events, or two places will not be identical. This is how the city is perceived from above.

Once our feet touch the ornate concrete floors another facet of the city will be revealed to us. The streets intersect with boulevards of trees, the blocks cross narrow alleyways – a rich urban celebration enhanced by the experience of wandering through it. Over the years this urban block has become one of the more recognizable symbols of the city of Barcelona.

Figure 2
Urban Chessboard (Photoshop manipulation – Daniel Azerrad, 2011)



Tablero urbano

Genesis

Some historians believe that the establishment of Barcelona is attributed to the Phoenicians but, in fact, it was the Greeks – who conquered the city after the Phoenicians – who left behind the first characteristics of the classical culture. The Romans, hundreds of years after

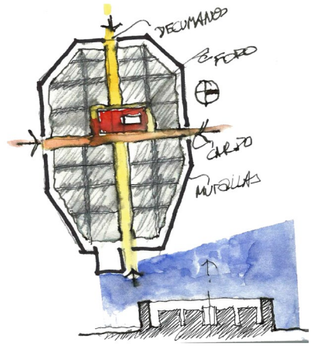


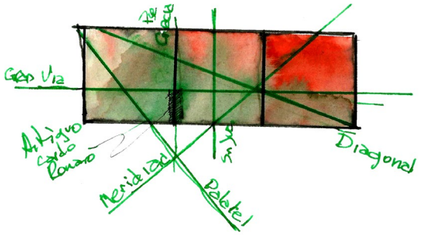
Figure 3
Barcelona during the Roman occupation (watercolor and ink on paper, Daniel Azerrad, 2011)

the Greeks, strengthened the roots of classical Europe in Barcelona and in the Catalonian people. Although Barcelona did not play an important role in the local system when it was under the rule of the Roman Empire, it received the status of a city for the first time. A wall outlined and defined its area, the cardo and the decumanus sketched the system of axes with the temple and the forum at crossroads, and the dwelling places (or the "insulae") filled the spaces – all of which, together, gave it the typical Roman urban structure [**Fig 3**]. The most powerful and influential Roman Empire in history gave Barcelona not only its initial urban structure, but also the solid ground on which it was able to develop its own history.

Engineer

Ildefonso Cerdá y Suñer, the father of the *Eixample*, was born in 1815 in one of the suburbs of the province of Barcelona. Sixty years of his life are remembered as ones of ideological momentum and social commitment to the community and the concepts that developed over the years. As a politician, engineer, economist and city planner, he wrote "Theory of City Construction" in 1859 and "General Theory of Urbanism" in 1860, thus creating the intellectual foundation for a plan that is now named after him, and which made him one of the first theorists of modern urbanism [**Fig 4**]. Cerdá's engineering degree directed him to public life through work in public bodies or through fostering a social political career. In 1855, while working for the municipality, he developed the initial plan for the extension of the city, and

Figure 4
Cerdá's original plan from 1859 and an outline of its main components (above: drawing of the author. Below: image in the public domain)



Refundacion de Barcelona – plano de Cerdá, 1859

in 1859 the Spanish Minister of Housing commissioned a study to find a solution for the extension of Barcelona.

At the same time, a committee of the municipality of Barcelona organized a competition to plan the extension of the city, which was won by the Architect Rovira y Trias. The winning plan was influenced by the urban concept of the "older sister" – Paris – while in the master plan presented by Cerdá, all the urban ideas he had developed during his twenty years of research were expressed. The Housing Minister from Madrid was delighted with Cerdá's plan and he accepted it; and even ruled that Trias' alternative was irrelevant; a legal order forced Barcelona to accept Engineer Cerdá's plan. Despite the size of the historic city, Cerdá transfers the weight of the new city eastwards, and the Meridiana breaks the boundaries of the rigidity, the climax of passion in the color stains, hoping that the eyes will be turned toward noble Paris and the uncompromising connection of the Catalonian nation with that European nation. Trias, who was supported by the municipal authority, withdrew from the project. This decision by the city of Madrid insulted the honor of the Catalonians twice: once, when the "agronomist engineer" was appointed as the planner of the new and extended Barcelona and thus severely damaging the Catalonian community of architects; and secondly, it was not the Catalonian establishment who determined how the city would expand and who would expand it, but the "Castizo devil"[2] who dictated their future to the Catalonians, and also in building the shape of the city. Due to this double humiliation, the inhabitants of Barcelona turned their backs on the Cerdá *Eixample* for decades.

Bourgeoisie

At the end of the 18th century, the bourgeoisie was an important part of Barcelona's society. Due to the convenience, the economic peace, and the political and intellectual powers which were the part played by the bourgeoisie, it had a great influence on cultural and social life as well as on the development of the city. The bourgeoisie managed to find sources of economic wealth and speculation in the lands close to the city wall.[3] These lands provided them with sources of economic profits, while at the same time allowing them to leave behind them the medieval city, which had become poor and neglected. The Catalonian financial and industrial bourgeoisie invested a fortune in turning the city into a European gem. The local government returned the favor by implementing the city extension plan, which was based on the principle of equality of opportunity – each street would be identical to the other, and each property would be equal in value to the other [**Fig 5**]. "The liberal bourgeoisie was

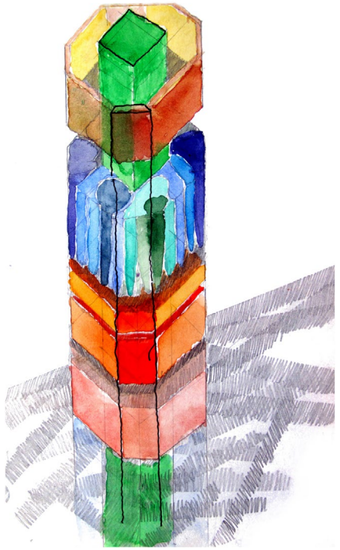


Figure 5
Eixample X (watercolor and ink on paper, Daniel Azerrad, 2011)

perceived as being the great builders of the cities, and although their artistic beliefs were not directed high, they were greatly admired for their ability to organize cities in accordance with the principles of collective profitability" (Chueca Goitia, 1982, 184).

Density

At the end of the 18th century the city of Barcelona grew within its boundaries – walls that did not allow it to expand widthwise but only upwards. The streets were covered with houses that had been built like bridges over narrow, dark alleyways. The Industrial Revolution reached the streets of the city. The characteristics of industrialization were felt in every open space and in every corner; the industrial chimneys, the smoke and pollution were seen everywhere and looked like scorched trees, like hell. In the middle of the 19th century, 190,000 people lived in Barcelona on an area of 1,055 acres, while in Paris there were 1,175,000 inhabitants on an area of 19,300 acres. The density of inhabitants/ km² in Barcelona was 43,041, compared with only 15,602 in Paris. Faced with this reality – without any privacy nor fairness – the demolition of the wall and the construction of the "New Barcelona" were an existential necessity. Thus, in 1854 the city walls were destroyed.

113 X 113

The Eixample is composed of blocks (each such block in the cities of Spain and Latin America is called a manzana) of 113 x 113 meters. The corners of the block are truncated at a 45-degree angle and are 19.8 meters long, thus extending the exterior of the block [**Fig 6**]. The intersection of the blocks creates an octagon that allows a wide field of view for movement. The original design of the block dictated two sides open to the street, creating a green open space system that would connect it to the street. Due to the urban growth and the real estate speculation, all the sides of the block were built: the completion of the façades and closing the block off from the street created inner courtyards. Each block was divided into plots of 200-240 square meters each.

There are three typologies of a block in the *Eixample* [**Fig 6**]:
1. **The regular block:** characterized by mixed usage – large public and residential buildings. It is most the common in the urban layout of the *Eixample*.
2. **The block with passageways:** the pattern of the blocks that preserved the 'soul' of the original block, but allowed for passage through the block, between narrow passageways for pedestrians and between secondary traffic arteries for vehicles.

3. **The super block:** two or more blocks grouped together; not intended for residential purposes but for public buildings or factories, which create a unique plot.

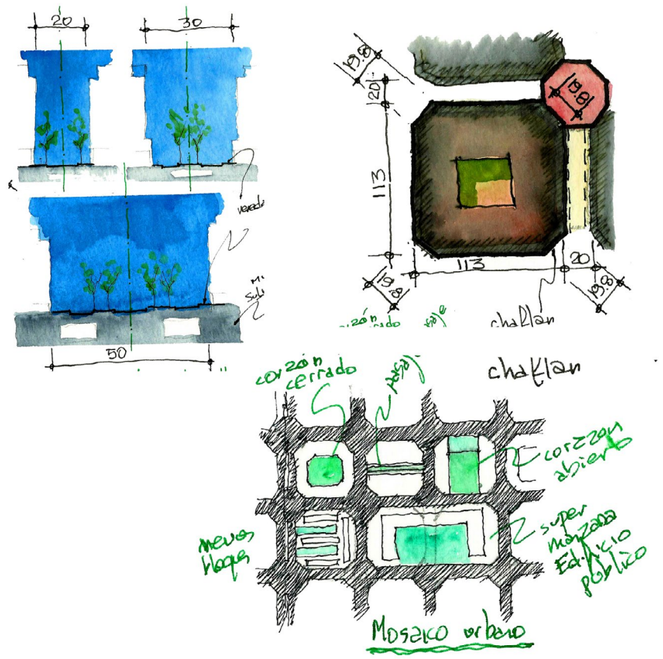


Figure 6
Urban mosaic – the block and the cross-section of Cerdá's street (watercolors and ink on 300 g paper; Daniel Azerrad, 2011)

Cerdá defined three types of streets: 20, 30 and 50 meters wide [**photograph 6**], creating a certain hierarchy of volumes and movement. The pavements of 5 meters wide separate the street activity area to 50% for pedestrians and 50% for vehicles (in streets which are 20 meters wide). 51 streets lead from the mountain to the sea, 23 from east to west, parallel to the sea, and 3 streets are diagonal.

The large, wide boulevards, such as El Paseo de Gracia, Gran Via or El Paseo de San Juan, are the urban axes connecting the Gothic city, the *Eixample*, and the quarters such as Gracia, Poble Nou or Poble Sec. The three diagonal axes, called Diagonal, Meridiana and Paralel, welcome visitors to the city and lead them either to the Old City or to the sea. The ring roads were created from the area left after the destruction of the ancient walls that had bordered the Old City.

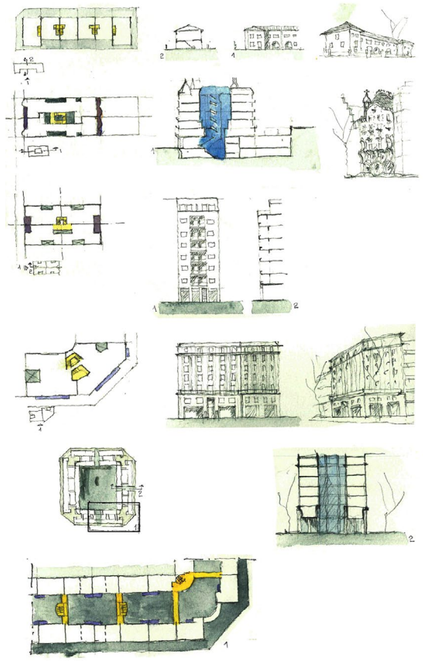
At the beginning of the initial urban organization, the block was designed to be five stories high and to spread over 50% of the area of the plot. A hundred years later the block and the percentage of the ground cover were among the highest in history. With the return of Spanish democracy and the restoration of the Catalonian government (La Generalitat de Catalunya) at the end of the 1970s, Barcelona began a social and political revival known as the political and economic "renaissance" of Catalonia. In light of this, the necessity of renovating the *Eixample*, while preserving and developing it in accordance with the principles of Engineer Cerdá, was acknowledged. Therefore, the city's planners once again adhered to the regulations of height and density that had been customary during the late 19th century and a revival of the city began and lasted for about twenty years.

Girona Street

The *Eixample* is a kind of residential apartment laboratory: it started with the first "palaces" of the Catalonian bourgeoisie, and continues with the contemporary communal housing projects [**Fig 7**]. The 'palaces' are large houses that stretched across the entire plot. The "family" lived on the ground floor with double ceilings and a noble atmosphere. The palaces were outlined by a main façade facing the street and another façade – domestic in nature – facing the inner courtyard. The upper floor was divided into tiny apartments and used for rental. This history of these modernist estates is actually the history of the bourgeoisie.
The modernist palaces were divided over and over again. The small illuminated courtyard, where visitors were received before they reached the access shaft, became the source of light for new families who settled in the apartments on the upper floor. The ground floor, which had in the past been the 'soul' of the family, was later divided into rooms for rent, and in this way the private world became a microcosm of society.

In 1960, the Law for Horizontal Property (Condominiums) was enacted, enabling land registration for the upper floor of every property and, in the wake of its regulation, residential apartments were built for sale rather than for rent. As time has passed, communal housing and new

Figure 7
Residential typologies in Cerdá's plan (watercolor and pencil on 300 gr paper; Daniel Azerrad, 2011)

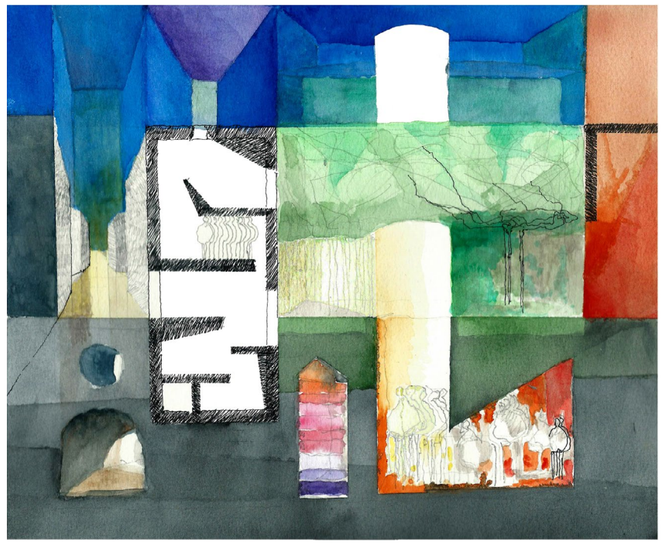


typologies were created, which emphasized the passage of air and the entry of light into the housing units. Some of the blocks even included social residential units.
The history of dwellings is the essence of life. The buildings and public spaces in the city create the stage for the urban celebration, whereas in the private sphere, in the residential area, the essence and soul of each family are woven.

Urban Matryushka[4]

The block in Barcelona is an infinite reservoir of worlds that are intertwined, a kind of urban 'matryushka' [**Fig 8**]. It seems that the outer layer of the residential block envelops the

Figure 8
Urban Matryushka – personal interpretation (watercolor and ink on 300 gr paper; Daniel Azerrad, 2011)



volume of the complex with rational completeness, which is the brainchild of the engineer who designed it.

The space enclosed by the outer shell was designed with the best and most fertile imagination for a variety of uses and experiences: occupancy, production and study. The layers allow the individual to forget the city without borders, to enter the private world and look down on a new, intimate and quiet city that surrounds the core of the block.

The rational path, well planned by Cerdá with its above-ground light, has become a free, magical world, between the shadows, sometimes dark and sometimes fascinating, in the urban basement in the depths of the earth. The centers of the blocks have changed their character throughout history. Those that were created as green areas were dried and filled with roofs and workshops. They were sold, destroyed and privatized, and at the end of the second millennium were renovated and restored to their original function – the creation

of open spaces in the city. The block is not only what we see and what we perceive, but also a plethora of small and compact cities that can be rediscovered, a virtual reservoir of space that will be realized in the following centuries.

Analogy

Cerdá defined the methodology of his work as "analogous," and added that "everything related to urbanization must start by meticulously observing the presence of the individual, because the analogy reveals the needs of the community, even the most complex; because in the end a community is nothing more than a collection of individuals". This mode of thought, which looks for similar characteristics in different places or in different people, provided a kind theoretical reference to providing a solution to the system that sought to become a city. The units at the level of the microcosm, those who defined the 'house/room' system as a kind of urbanism on a small scale, were also the ones who created the totality on a larger scale – in other words, the block-street-intersection system.

These units are based on the same needs of "motion" and "standstill". Behind the abstractness and monotony that is discernible at first glance from the *Eixample* lies a complexity, the purpose of which is to enable each person to create the platform of his identity; to allow each institution the space to abolish its monumentality; and allow every architect to reconstruct the new representative shells that characterize each block.

Ideology

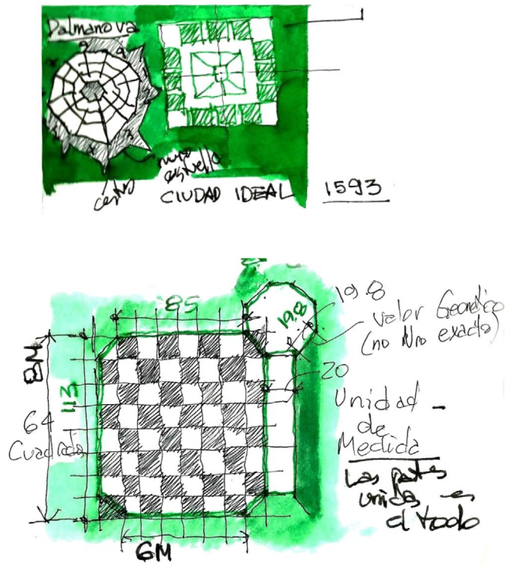
From the perfect vision of his rationality the Catalonian knight set out to discover the essence of the new divine city. It was the same past vision that was reborn in the writings, ideas, and Renaissance theories of Leon Battista Alberti, who led Cerdá to design a perfect plan – a combination of the mystical faith in the Vitruvian values of geometry, the worship of science, and the belief that creating a new urban order is the perfect formula for the ideal city [**Fig 10**]: "A renewed geometrical creation of the world which, during the period of the urban resurrection, will constitute the initial basic reference which has universal validity and is highly important" (Armesto, 1980, 102).

The basic unit representing the DNA of the new Barcelona is the product of rational thinking, but it was not drawn with a protractor or a measuring tape – rather with the help of the heart and the conscience. Cerdá was a surveyor, so he began to implement the topographical plan of urban extension by studying every grain of soil and learning the exact distances of the natural boundaries surrounding the Old City.

Cerdá's important decision to start the creation of the block (known as *manzana*) came after he had studied the cities built during the Renaissance; the plan for the city of Palmanova in Italy [**Fig 9**]; the Greek cities and Etruscan Rome; the old colonial cities of America and the blocks of Manhattan; and also the cities of Vienna and Berlin.

The "re-creation" required a new terminology, so Cerdá did not use the name *insula* (a term mentioned in reference to Roman dwellings) but gave it the name *manzana* (borrowed from the Spanish term *manso feudal*).[5] In the course of time, the name changed from 'urban manzana' to manzana (that is to say, 'block'). The manzana is a sort of flat urban 'carpet' that covers the entire urban area up to the city's natural and historical boundaries.

Figure 9
Above – Palmanova (Italy) and the ideal city; Below – geometric analysis of the block in the new Barcelona (watercolor and ink in a sketchbook, Daniel Azerrad, 2011)



So, although the plan is almost 'abstract', Cerdá rejected "the idea of the artificial border because it is contrary to the 'cultural' characteristics of the area". The number 8 [**Fig 9**] played a crucial role in the geometric design of the structure of the *Eixample*, especially in the design of the block: 8 sides of the block, 8 sides of the intersection array, and the length of the urban plan is 8 km. in total.

After defining the width of the street as 20 meters, the unit of the block used by the compass creates a side which is 19.8-meters wide, a side which defines a 14.14-meter module on each side in the 64 squares of the block. In this way, each block forms 113 meters, alongside the façade of the block which is 85 meters long. The result is total geometric identity between the three components that characterize the *Eixample*: the block, the orthogonal intersection, and

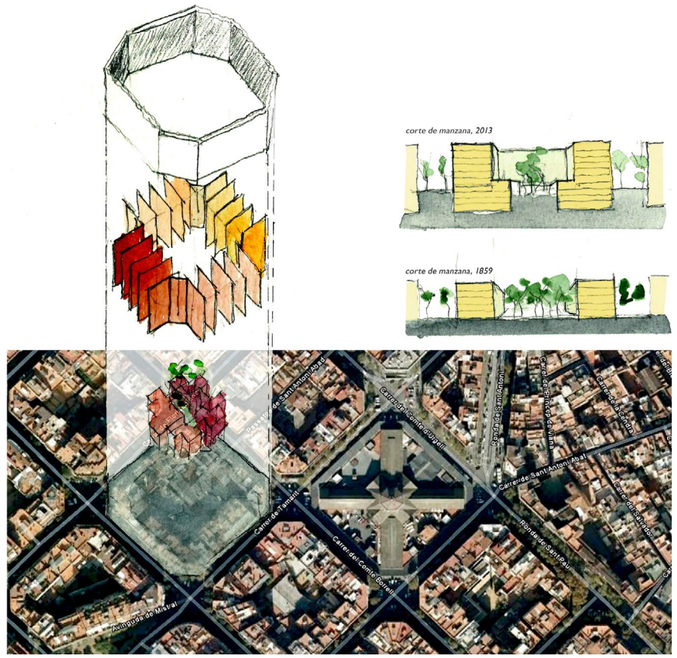


Figure 10
Cerdá's Block – Parallel Systems (watercolor on Google Map; Daniel Azerrad, 2011)

the street: "Not only did the block contribute to the architectural creation of the city, but also the street and the intersection of the streets played a special and significant architectural role" (Armesto, 1980, 102).

DNA

The block of the *Eixample* is a thick shell that contains the private life of the city and distinguishes between two distinct spaces: one – external, public, monotonous, and intended solely for the purpose of movement, assists in the actual structure of the grid for a sense of orientation; and the second – internal, disorganized, inanimate, in which it is possible to express individuality [**Fig 10**]. By offering a perfect rational system that guarantees a new, egalitarian urban reality, full of light and abounding with green areas, Cerdá tried to place the individual in the center. He established a system of basic assumptions that would prevent the capitalist unions – with political and economic power – from deciding on the development of the city in the future. In his almost divine vision in terms of his attitude towards science, geometry, modernity, and technological progress, he believed that appropriate urban infrastructures could prevent future crises, and could establish a city without a sense of disorder and uncertainty, and reduce human suffering. Cerdá's perseverance in this belief helped make his idea tangible. Assisted by the inherent legality of the grid system, and the lessons learned from the past, the fanaticism of the fundamental principles that he established prevented deviations and repetition of other historical errors. Such mistakes have resulted in cities such as London or Paris containing special intersections of complexity and progress, crises and recession – the factors that enrich urban public life.

Urban reconstruction activities undertaken at the start of this new millennium, such as the "22@Barcelona" project (a combination of Cerda's urban grid with historical routes) or the renovation of the block centers in the Sant Antoni library project or the Joan Brossa courtyard, for example, are some of the most important contributions to Barcelona of Cerdá blocks in the new millennium.[6]

Conclusions

Urban areas

There are historical secrets in Barcelona. From its inception until the beginning of the third millennium, its blocks were a inexhaustible treasure of stories and memories. Small urban villages are woven into every Catalonian block – among them the residences, shops, and tables

on the pavements which appear to be waiting for another cup of coffee to be laid upon them – wrapped in a scattering of green, in shadows and rays of sunlight from the Mediterranean Sea. From a distance the modules look small and neatly arranged, like a chess board, but when you walk through each one of them you can distinguish very different and varied worlds.

Time

Time is the most rigorous judge of urban history. Over the years there have been many attempts to critically examine the weak points and the strong points of this urban planning and grid. Cities that have an urban grid structure maintain the same level of relevance now as on the day they were created. The ability to produce a neutral unit which can duplicate itself helped, in a sense, to allow organized growth into urban developments where these models were adopted. At the same time, the ability to intervene in the design of each block created the necessary flexibility to reinvent it time and time again [**Fig 11**].

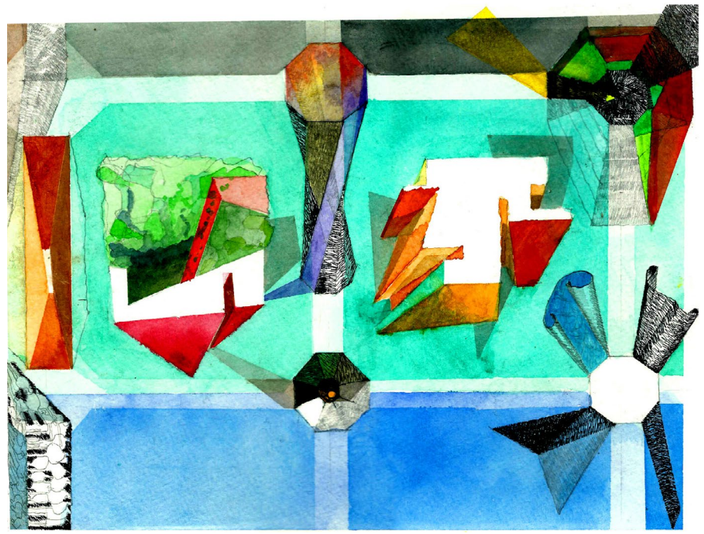


Figure 11
Barcelona and more Barcelona – personal interpretation (watercolor and ink on 300 g paper; Daniel Azerrad, 2011)

Realization of visions

Barcelona is the outcome of a vision and the belief that design decisions formulated by Cerdá will be implemented as a new urban shape – more innovative, healthier and more adaptable to the trends and revolutions which have advanced the world technologically, intellectually, politically and socially.

Undoubtedly, the work of research and literature developed by the Catalonian designer, Cerdá, was expressed in his master plan. In the work of town planning there is always a certain degree of fear that some of the basic assumptions may be wrong. According to his worldview and work method, Cerdá believed that by means of his drawings and writings he could include all of the city's growth options. The decision to allocate the work of planning the urban grid to Cerdá – work that was almost sacred – left both on the paper plans and in reality, a city that is amazing in its rationality. The large boulevards, their connection with the Old City and the small villages, the large blocks surrounding large public buildings or parks, were a method by which to challenge regularity, but not only in planning the urban grid but also in the freedom that is to be found in certain places by noncompliance. Thus, this layout became not only an urban reference point for Barcelona as a whole, but also a reference point for the content of the urban grid itself.

Notes

1. Translation from Spanish and editing of the Hebrew version: Architect Lilach Gibori.

2. Castizo, that is, from the province of Castilla, the most dominant and influential province of the Iberian Peninsula. In 1469, with the wedding of Queen Isabella I of Castilla and King Ferdinand II of Aragon, the glorious period of Castilla begins. It gradually became the most influential empire in the world after the discovery and conquest of America (1492), and within its metropolitan borders its language and culture were enforced – an influence that is felt until today. On 11 September 1714, Catalonia that had enjoyed autonomy, defeated by the "Guerra de Sucesion", and by thus its autonomy was lost and totally dependent on the central government of Madrid (Castilla). On this day, the Catalans celebrate the "national holiday".

3. On the part of the bourgeoisie, land speculation was a simpler way to become economically wealthy than the "adventure," – in other words, leaving for America and creating wealth at the expense of local Indian tribes, as the bourgeoisie of previous centuries had done.

4.A series of hollow dolls made out of wood, nestled inside one another. Its name is originally from the Russia *matryushka*, while in Israel it is known by the misleading name *babushka*.

5. A group of plots of land granted by the feudal lord. In the middle of the plots were the houses of the servants who worked their land.

6. "22@Barcelona" is an urban planning project initiated by the Barcelona municipality which was intended to transform 200 acres of Poble Nou into a productive and innovative district with modern public spaces to centralize the strategies of high-tech activities, residential and public buildings. The Sant Antoni Library, a project of the RCR Architects Office, and the Joan Brossa courtyard are also attempts by the municipality to return the center of the blocks to all residents of the city by building public buildings or establishing public parks.

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