RETÍCULES I DIAGONALS

El Pla Jaussely de Barcelona de 1907 i el Pla Burnham de Chicago de 1909

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OVERTURE

This thesis examines the operational similarities between the 1907 Jaussely Plan for Barcelona and the 1909 Burnham Plan for Chicago. Both operations are perceived as analogous in that they are contemporaneous planning proposals, both described in *Beaux Arts* language and which aim to *beautify* and organise the city on the matter of its metropolis-directed traffic. Both plans also confront the complexification of the first city grid structure, the original grid of the American city and the extension grid of the European city through hierarchical organisation and opening of diagonals. Choosing these two examples, with contrasting features as to their respective physical and cultural contexts, allows broadening the study parameters for metropolitan planning.

Process

The study compares the respective, same-scale graphic documentation given that both projects lend great importance to the plan's sketches as a tool for visualising the city's construction on paper. The original plans are compared and interpretative sketches are drafted in which the role of comments is mainly confined to explaining the sketches.

In order to understand both proposals, the first chapter will make a comparative analysis of the form and development of the two cities up to the time when the respective Plans were drawn up, analysing the city's form through its elements, under the themes of *territory and the city, grids and subdivisions, growth and plans*.

The second chapter will focus on a structural analysis of the two Plans.
In the first section, *Functional composition and designs*, the hierarchical organisation of the grid network in the city at the time will be examined, setting forth the analysis as Jaussely and Burnham had done, seeing that both drew up a modification plan – continuing afterwards with the analysis of the drafting of both plans and pointing out their differences along the stages of their drafting process and according to their functional systems.

These parameters have been chosen because they have a fragmentary validity in the problems of the contemporaneous city. An independent interpretation of the systems has lately been emphasised in the urbanistic analysis, given that the size and complexity of the current city has exceeded the possibility of providing a unitary planning response.

The beginnings of this development in urban fragmentation date back to the European avant-guard proposals in the second decade of the 20th century, which aimed at opening up the historical city by introducing freer structures relating to social changes. In such proposals, it was the functional linearity of mobility and its related connection activities, together with the negation of the city – country-side duality and finally the representative building as a social melting-pot, that were seen as the basic elements for breaking up the urban syntax of the hierarchical and closed urban systems.

The hypothesis that the strata must be coherent for themselves is implicit in this study, but what determines and qualifies the project is the synthesis of all these. What is of real interest about the different strata is the concurring or contradictory design, which allows to draft a specific proposal that is open to changes. The compositional scheme, the structure of the city, or a fragment of this, is the sum of different levels or urban systems.
For Jaussely, the various urban levels are not similar but rather supplementary or different. The equilibrium between the various urban centres of the Barcelona Plan is more complex than the Burnham Plan. In the Chicago Plan the various strata persist or reinforce lines or routes around a centre.

In the second section, the comparison will focus on the image of the city proposed respectively by the Jaussely and the Burnham plan. In the section *The Splendour of Barcelona*, we will first analyse Jaussely's more significant designs and detailed, bird's-eye views of the city, which have been integrated into a comprehensive view of the proposal. Subsequently, in *The Chicago sphere*, we will journey across the city through Burnham's

bird's-eye views. With these two examples, we will thus explain the transformation potential of the city during those periods by hierarchically organising the grid system and establishing the diagonal thoroughfares that enrich it.

The cities

In Barcelona, the city's features are set by the dimensions of the Barcelona plan, a rectangular area tending slightly towards the sea, flanked longitudinally by the Collserola mountain range and transversally by the Besòs and Llobregat rivers. The Tibidabo, in the mountain range, and Montjuïc, by the sea, are the two emblematic mountains. The historical urban centre, the first, original Roman site, is successively enlarged until it extends up to the frontal area of the port and develops a polygonal perimeter along the ring-roads that replace the last city walls. A quadrangular network extends from the historic centre to the Barcelona plan. This grid is constructed in the urban centre and is virtually where the extension is superimposed with the nuclei of Barcelona's old neighbouring towns. In Barcelona, deurbanisation is the characteristic feature of its outskirts.

In Chicago, the city's features are set by the absence of any limits, by the immensity of the Illinois plains, the Prairies, which face onto the Great Lake, Lake Michigan. *The Chicago River*, associated with river traffic and trade, is the centre of the city. The grid is already present at the city's origins and extends throughout the territory, and in orientating itself geodesically, it could be regarded as an additional geographic detail. In the city centre the grid is subdivided, densified and constructed. In Chicago the territorial element dominates the city; deurbanisation is tempered in the urban centre.

The plans

Reference to the existing city is evident in the two Plans. Both Burnham and Jaussely superimposed their respective proposal plans on the existing city, issuing their projects as designs for modifying the urban structure.

In Barcelona's urban-development grid Jaussely proposed new diagonal avenues. In the Chicago grid, Burnham's proposal placed a new centre and hierarchically-organised grid arising from that, establishing diagonal, connecting avenues.

Even though both proposals have a unitary concept of the city, in Barcelona new centres grow up in the city's various areas while, in contrast, in Chicago, faced with uniformity, the grid is hierarchically organised by establishing a single centre.

The comparison of the compositional scheme of the urban projects, along with the interpretation of the urban outline offered by each of the proposals, gives us an idea of the city that is represented by each of the respective plans.

On the other hand, the two plans also emphasise restructuring the city as a living body and the rational and productive reorganisation of its functions according to its physical context. Communication networks, the structure of green space and the system of representative buildings are parameters that are studied comparatively in both plans correlating them to public space.

Similarly, in the Burnham proposal, on the constructed urban fabric only public buildings stand out, while the remainder is presented as a unique city with compact rectangular blocks of twelve or six storeys according to the centrality; the Jaussely proposal already sets out a differentiation in the uses, urban fabrics and constructions for the city's various areas.

In both cases, the communication networks contemplate the road traffic and the metropolitan and regional railway traffic. The structure of green areas is set in the local gardens of the neighbouring areas, the district and forest parks, and with regard to the structure of the territory it suggests a concatenation of the metropolitan green area.
The system of representative buildings, in the case of Barcelona, is divided up into various functional centres relating to the character of the city's different areas, while in Chicago, by contrast, the representative buildings are mainly grouped around a single civic centre.

Jaussely wanted to transform Barcelona into the Paris of the South, while Burnham dreamt turning Chicago into the Paris of the Prairies. Both plans put the emphasis on defining the city's image, its streets and its more significant urban elements from a bird's-eye view.

The Paris Model

If we look at the immense Paris plain as it was during the Louis XIV era, a main longitudinal axis can be traced extending in

both directions from the centre and tangent to the river Seine and to the *Île de la Cité*. This rectilinear axis, vast in width and without longitudinal limit, organises the connecting thoroughfares. Throughout the XVII and XVIII centuries, bearing in mind this directionality in layout and establishment, the builder architects of the Bourbon Kings (Colbert, Le Nôtre, Blondel, etc.) carried out a progressive and symmetrical construction of the city's parts on the territory. However, it is around the time of 1850, during the period of Napoleon III, that Paris becomes an urban model to be imitated thanks to a profound physical change brought about by Baron George Eugène Haussmann by connecting new urban points through the opening of diagonal thoroughfares to the old city,

When Jaussely and Burnham were drafting their proposals, Paris had become the capital of the Western world. It was at this time that Eugène Hénard reclaimed the previous architectural and urbanistic legacy and integrated it into his plan for the principal thoroughfares of Paris:
the historical longitudinal axis, Rue de Rivoli, Avenue des Champs Elysées, Cours de Vincennes, forms the basis to The main order and diameter of the three elliptical, concentric ring-roads that are separated by equidistant spaces. The intersection between the longitudinal and perpendicular axes which crosses the river, formed by Bv. Sébastopol, (*rive droite*) and Bv. Saint Michel (*rive gauche*), is the centre of the city.
Starting from this source of coordinates, the principal semi-axes of the ring-roads are established, the first and second ring-roads having distances of 2 and 4 km respectively.
The first ring-road is that of the Grands Boulevards - *Boulevard Saint Germain*, its principal intersections being *Place de la Concorde* and *Place de la Bastille*. At the junctions where one boulevard meets the other, *carrefours à giration* project out.
The second ring-road is that of the *Boulevards exterieurs (rive droite)* and *Bv. Saint Marcel*, and the intersections with the main axis set the multi-radial crossings, *Place de l'Étoile* and *Place des Nations*. The third ring-road is that of the Boulevard des Fortificacions, where the rue future is reduced to the *boulevard à redans*.
The diagonal avenues such as la rue de l'*Opéra - Av. de Clichy, rue Lafayette- rue d 'Allemagne*, etc. complete the traffic scheme.
The triangulations created by the new diagonal thoroughfares and the diagonal circuits of the grand boulevards in the central sections of Paris are exported to the city's outskirts along the territorial axes. The *Bois de Vincennes* and the *Bois de Boulogne*, the great green areas at each extreme of Paris, are urbanised by the triangulations of their paths, as if the triangular forest masses, in reference to the centre, were assimilated to the built-up city blocks.

The innovations of the Paris model, *bv. à redans, carrefour à giration, place de l'etoile, jardins de Champs Elisées*, triangulations in the city and territory, are adopted in city plans throughout the world. In Jaussely's Barcelona Plan, the extension of the formal mechanisms of the city proper to its free areas is applied to *Bois de Sant Pere Màrtir.*
Contemporaneously but moving in the opposite direction, we find the influence of the America *Park Movement* in the concatenation of free spaces in the extension proposals for the city, from small-scale district squares to the great outer parks. Hénard already refers to the landscape interventions carried out in Boston and Chicago in his book *Études sur les transformations de Paris*, on the transformation of the free space left by the demolished city walls or *boulevard des fortificacions*.

A theoretical diagram of the Paris' streets was reproduced in the book the *Chicago Plan*. Transposing this scheme to the Burnham proposal, *Michigan Ave.* would be assimilated into the longitudinal axis of the *rue de Rivoli*, and *Congress Street*, going perpendicular, would be the vertical axis or *Boulevard Sébastopol*. As in Paris, the longitudinal axis of Michigan Ave. is the important one for its territorial size. Burnham, in prioritising the vertical axis and locating the city centre there, exchanged the significance of the two axes.
On the other hand, it is surprising how the location of the river Seine in Paris formally corresponds to the banks of Lake Michigan. The *rive droite* of the Seine follows a course that develops along a broad concavity similar to that of the banks of Lake Chicago. In any case, in Paris the river is not a strong barrier as the lake is in Chicago, and it lacks the enormous scale of a sea-like open space, representing only a width to be crossed like the *Chicago river*. The treatment of the river element within the city is the same in both cases, giving continuity to the streets connecting the two sides to the maximum.

In the Chicago circuits a proposal was made to introduce the 'round- points' or *carrefours à giration* that Hénard had conceived for the first ring-road of the *Grands Boulevards* of Paris.

By contrast, Hénard had envisaged a *street of the future* for Paris, reflected in the American creations of multi-level streets found in New York and Boston. The multi-level street into which the Paris boulevards could be converted led him to design even the multi-level circular crossing (*carrefours à giration*), which was yet to be envisaged in the American proposals.
Taking the opposite direction, Burnham introduced the *boulevard a redans* into his text as a possible solution for the elliptical, transitional grand boulevard or third ring-road, or for other future boulevards of Chicago, the construction of the latter ones intrinsically relating to free space.

Burnham and the Chicago Plan

The origins of the Chicago Plan stem directly from the success of the classical composition of the *World's Columbian Exposition* of 1893, which marked the beginnings of the joint ordering proposals for public land and buildings in the USA. Its location on the banks of the lake, at the Jackson Park, on the southern side of the city, suggested the idea of extending the planned landscape bank towards the north up to the centre, Grant Park, which would improve the shore and the port. This park-extension proposal drafted by Burnham at the request of the Merchant's Club in 1903 , (later, the Commercial Club) would be publicised at a dinner party held at the Auditorium, disseminated in newspapers and journals, and would mark the beginning of the comprehensive remodelling proposal of the city. The project was developed by the Olmsted Bros., sons of F.L.Olmsted who had already designed the location plan for the 1893 Fair.

The Chicago Plan never claimed to be an urbanistic one. It had initially been conceived in 1906 as a proposal consisting of a collection of sketches for an exhibition that took place at the Institute of Art in 1909, accompanied by an explanatory text on the latest innovations in the world's cities and their application in Chicago, a production and commercial centre.
Thanks to the extraordinary organisational skills he had shown as a manager during the 1893 Fair works, Burnham was chosen to organise the Plan, to explain it both to the public and to the city, the *County* and the Federal authorities, and to goad them into the business of constructing an efficient and beautiful city.
In a context of great expansion and demographic growth, the functional harmony of the city would be a great attraction for first-rate citizens and new investments. This was mere no project with a private aim or a simple exercise in *beautification*, but rather, a project that clearly sought to improve the quality of life for the public in the city.
The Chicago Plan was published by the 1909 Chicago *Commercial Club* and offered a complete project for the future development of the city. That same year the mayor set up the *Chicago Plan Commission* with the aim of promoting the Plan.

Daniel H. Burnham (1846 –1912) was already famous in Chicago in 1909 for his prestigious construction and corporate careers.
Having never received a formal academic education, he performed his initial architectural apprenticeship under William Le Baron Jenney, the master architect of the city's first tall buildings, and went on to work successfully with architect Root (Burnham & Root) until the latter died in 1891, after which he founded the company *D. H. Burnham and Company*. He often used atria in his buildings, the typical space of French department stores, in the vestibule of the Chicago office buildings, whether in the *Rookery* (1885-1887), in the local department store *Marshall Field's* (1900) or in the *Railway Exchange* (1904).

Starting from his friendship with Charles Mckim, the Washington architect who had studied at the *École des Beaux-Arts* in Paris and constructed a building for the 1893 Fair, Burnham moved increasingly closer to European practices and French models. The Washington Plan(1902), the San Francisco Plan (1904) and the Cleveland, Manila and Baguio Plans (1905) followed the example of the designs that Haussmann had applied to Paris using the new XIX-century territorial axes and radial-thoroughfare design connecting newly-created classical buildings.

His architectural and urbanistic training were broadened through his travels to Europe, particularly in 1901 during his second seven-week trip, during which he visited various European capitals in the company of Charles Mckim and F. L. Olmsted. In the Chicago Plan proposal, Eugène Hénard's last proposals for Paris can be seen, such as the general traffic scheme with new diagonals at the centre and the new ring-road boulevards, the circular crossings, the bi-level *carrefours à giration* connecting principal intersections of the ring-roads, and reference is even made to the *boulevards à redans* as another model integrating vegetation and residential typologies. We can also see the star-shaped system of squares in the circulatory system, although the integration of the references into the Plan's outlines is quite vague.

To draft the Chicago Plan proposal, Burnham joined up with E. Bennett (1874-1954), who had graduated from the *École de Beaux-Arts* in 1901.
The impressionist views of the Chicago Plan were entrusted to the American muralist from St Louis, Jules Guérin (1866-1946), who had studied in New York and attended the *École* as well.

And with the aim of delivering a valid proposal for the *Civic Center*, Bennet contacted his former fellow student Fernand Janin, a brilliant disciple of Victor Laloux, the most prominent patron de l'École. The tall municipal building, finished off with a dome that Janin had designed as a compositional centre for the Plan, is an extended elaboration deriving from the project of his professor Laloux, Grand Prix de Rome 1878 (a project for a cathedral that synthesised the Paris Panthéon with St Peter's Cathedral in Rome).
Fernand Janin had won a Premier Second Grand Prix 1905 for a design lacking any urbanist element but up to date with the Premier Grand Prix 1903 for a public square designed by Léon Jaussely. And it turns out, surprisingly, that this original scheme by Jaussely is the basis of the great ensemble of five institutional buildings around the square of the Chicago Civic Center that Janin designed for the intersection of *Congress street* and *Halsted street* as a city centre.
While these great designs were being proposed in 1905, the building of a new civic centre or *Federal building* had started on Dearborn road between Adams and Jackson streets, designed by Henry Ives Coob, to replace the buildings of the Town Hall and the Region, that had been damaged by a serious explosion not long before. Although the proposed plan had not yet been formulated, the initiative for constructing more buildings further west had been rejected for financial reasons and because their proximity could have been detrimental to the new location of the centre drawn up in the Plan.

Jaussely and the Barcelona Plan

Léon Jaussely won first prize at the 1902 Chenavard competition with his project for a *public square in the metropolis of a great democratic state*. It was a great beaux-arts composition, like the universal exhibition plans of that time, which allowed him to express the urban concerns of that period. Starting from a project for a square, Jaussely redesigns the ordering of an entire district, that of the Bastille – along Paris' principal longitudinal axis, located symmetrically in the *place de la Concorde* – in its relationship with the centre and its activity layout and social organisation. He installed a central monumental structure there, the Public palace, with a great central atrium framing the principal axis around which buildings were grouped, permitting the exertion of a popular democracy.
The following year Léon Jaussely won the 1903 *Premier Grand Prix de Rome* for a *public square* which developed in detail the *square and public palace* outlined in the proposal for the Chenavard Competition. And, paradoxically, this architectural project became the basis for the composition of the Chicago Plan's civic centre, the central monument of both the city and the territory.

Léon Jaussely (Toulouse 1875 - Givry 1933), a graduate and prize-winner from the École de Beaux Arts, read the announcement for the *Competition for developing Barcelona and its surrounding towns* in the journal *Der Städtebau* when he lived at the *Académie Française* in Rome and, after enrolling, he took part in the competition, and ended up the winner in 1905, under the title *Romulus*.
As with the Chicago Plan, the effect of the Jaussely plan on the central square, even if it is the centre of the entire concentric composition of the plan, is fundamentally architectural, and the *Romulus* proposal for the Barcelona Plan is more complex. Jaussely not only displayed mastery of the Beaux-arts architectural composition, but he also investigated the typological and functional organisational model initiated by J. Stübben. He also showed authority in the typographical integration deriving from his experience at the French school of geography. His model plan proposals and organisation of the functions expressed in Der Städtebau, were adapted to the place with the picturesque sensitivity of the Garden City of Ebenezer Howard and Raymond Unwin. The sensuous designs of the new ring-roads for the Collserola mountains which embrace the new *suburbs - gardens* make these references.

Jaussely proposed the *beaux-arts* planning strategy for Barcelona and exported it to the city. The classical composition with orthogonal axes specific to the built up complexes were applied at the level of the model and central nucleus. On the other hand, the composition of the buildings moved towards the romantic, the *picturesque*. The buildings represented in his views are sketched out as if they were vegetation. Hénard's influence is also present there, in the urbanisation systems introduced to

the city that derive from the territorial ordering of the Paris plain. Jaussely incorporated Hénard's *boulevard à redans* into the Barcelona proposal, into the eastern part of the city, into the Diagonal in the 1905 blueprint and into the Granvia in 1905, keeping it there in 1907.

Throughout the project, one can see this landscape influence, in the transformation of the sea front into a promenade, in the effective contrast of natural views with the new architectural compositions that make them accessible, the city-mountain effect, in such examples as the Muntanya Pelada and Montjuïc. Sometimes a conflict arises between the opening and the closing, between nature and the city. The encirclement of the Gran Via by the Besòs Park with the parterre concavity of the park marks an end to the structuring axis of the Barcelona plan where the connection of the north-east section of the city with the left bank of the river Besòs could have been more fluid.

Just as the Burnham Chicago proposal is the representation of a Plan using an architectural language of order to direct the tumultuous growth of the city; Jaussely devised an urbanist Plan for Barcelona, introducing in his definition the incipient scientific tools of knowledge of this discipline. The planning criteria, urbanist rules, building bylaws of various urban areas, the general budget and its development in stages are all listed in the *Plan's Report*. The handwritten report of the competition (that of the project is lost) is not only of interest for its written list but also for the conceptual sketches defining the proposal. These are made use of in the central chapter of the thesis as basic, synthetic documents which, superimposed over the city's topographical plans, explain the proposal.

In the same way that Eugène Hénard differentiated between the circulatory plan (*Place de L'Étoile*) and representative Promenade (*jardins de Champs Elisées- Les Tuileries)*, Jaussely continued using this fundamental distinction for Barcelona. The Plaça de les Glòries is the great thoroughfare crossing and the *Square Central* is a great landscaped and representative hall – an oasis where the design of the parterres sketches green geometric alignments in the manner of the free islands intended for the scenery of public life and the pleasure of the promenade.
In contrast to Paris, where both the *Étoile* and the *Jardins de Champs Elisées- Les Tuileries* form part of the structural planning of the city and territory, in Barcelona the relationship between these two elements is ambiguous. The enclave of the *Square Central* between Diagonal above and Meridiana below, like a two-way street with the basic, vertical sea – mountain network, in the manner of the Passeig de Gràcia - Rambla Catalunya couple, extends as a new principal axis to at city level, intent on ending the grid of the urban development rather than as a metropolitan-based proposal. A Gran Passeig placed along the Gran Via direction would have reinforced the *central urban nucleus* within the territorial scheme.
With this strategic location criterion, the establishment of the *model nucleus* is put in place in that the orthogonal axes which define the central square are at the same time structural axes of the city.
In any case, in the Jaussely project the attention is focused on the urbanist advances or in the adaptation to the morphological and functional conditions contained in the formal definition of the project. The clear initial structure, the thoroughfare scheme, the new nuclei, is broken up by the complexity of the centre and the detail. The transition between strict *beaux-arts* discipline and free landscape incorporation demonstrates its conflict.

The 1907 project specifies the fabrics of the geographically high-quality areas, the axes of the high-precision planning of the central city and the accurate public-building interventions equipped with decentred *beaux-arts* language.
Jaussely's urbanist work is widely recognised throughout his career. In 1910, he won second prize in the *Greater Berlin Zoning Plan Competition*, under the theme *Urbs*. And in 1919 he won first prize in the *Paris extension and planning competition*, with which he continued the research of his teachers.

THE SPLENDOUR OF BARCELONA
JAUSSELY'S CONSTELLATION

Towards the end of the 19th century, Europe's urbanist treatises were laying down general compositional principles for cities. As we have already seen in the previous section, Jaussely applied these compositional principles to the city of Barcelona, for the planning, the functional organisation and the study of its major traffic routes. This section will examine the various centres established, their inter-relationship and the structural and aesthetic effects arising from their installation in the city.

The topographical survey of 1903, along with the statistics initiated by Cerdà on the city's last 50 years of growth, provides a reliable interpretation of the city. This plan was specially drawn up as a basis for the Barcelona *Concurs d'Enllaços*, a competition to improve the city's communications with its surrounding townships, which Jaussely ended up winning with his 'Romulus' proposal, a work we shall now examine.
The centre of the then-expanding area of Barcelona would be the Passeig de Gràcia - Gran Via intersection. Over time, the City's centre had shifted away from the Roman and Gothic district, moving from the sea towards the mountains, along the city's vertical axis: Plaça Sant Jaume, Portal de l'Angel, Plaça de Catalunya and Passeig de Gràcia.
Jaussely studied the city of that period and likened the layout of its building developments to a hand; the centre - the Old Quarter and Eixample - corresponded to its palm and the surrounding towns would be its five fingers. Grouping various districts together into the same finger was the proposal's first organisational step. By superimposing this scheme onto the map, we can see the scope of the project advanced by the Jaussely Plan and the geography of each of the city's then-existing areas referred to as a finger: 'Lower right' (Sant Martí-Poble Nou), 'Upper right' (Sant Andreu-Horta-Sant Martí), 'Upper centre' (Gràcia), 'Upper left' (Sants-Les Corts-Sarrià), 'Lower left' (Montjuïc-Casa Antúnez) and 'Lower centre' (Old Quarter-Eixample).
This sets the size and shape of the fingers, demonstrating their mutual isolation; in the upper area they are separated by the foothills of the Collserola mountain range. The function specified for each finger are analysed - 'Lower right' and 'Upper right' are for industry, 'Upper centre' for industry in the lower regions and housing in the upper, 'Upper left' and 'Lower left' for commerce in the lower regions and housing in the upper, 'Lower centre' for commerce - and the poor conditions suffered by such housing, except in Eixample, are confirmed given the proximity to industry and commerce.
Jaussely saw the city as the palm of the hand with several urban fingers. From our perspective, this can be construed the other way around, with the emphasis being not on the fingers but on the spaces between them, **the urban interstices**.
These intra-municipal areas, the regions between urbanity and the countryside, were now earmarked for the locations of the new **connecting nuclei**. Jaussely used these interstices to create centrality. The connecting nuclei were installed around the already constructed Cerdà grid, which occupied an area roughly similar in size to that of the ancient walled city, and set their limits to the urban extension layout in the complete Barcelona plan.
In the "Romulus" blueprint plan, we can see in the six fragments of the city's parts designed there how these nuclei stand out for the profusion of public buildings, marked out in black ink, which correspond to the various facilities ensuring good standard of services to the public.

The Plan has a progression, a 1903 interpretation, a 1905 development and the 1907 Plan.
In the 1907 Plan, the city appears as a collection of **urban layouts**. It is the last comprehensive project in Barcelona's urban development history to envisage the design of building lines as a tool for constructing the city. A variety of layouts and "fabrics" set the urban mosaic for Jaussely's Barcelona.
It involves the composition presented here, formed by additional city plans on 1:5000 and 1:2000 scales. This plan introduces a third outer ring-road which exactly defines the limit to the city's growth. There are substantial changes to the new urban layouts, regarding the development, in both the central area and outer crown of Eixample. What stands out is the high quality of drafting in the plan, construed as a tool for visualising the city's building development as a work of art, of each street, block, district and indeed the entire city.
These plans accurately detail the major traffic routes, the various ring-roads and the major diagonal roads, fixing the centre at their intersection and organising the urban structure. The Gran Via appears as an axis of symmetry for the main diagonal routes and an articulating thoroughfare for the layouts in the plan. Diagonal's extensions towards the west and from Meridiana towards the north, over the Travessera, flank and organise the new green patterns of hills.

Further above the grid, over the Travessera, the area's geomorphological influence is evident in its street plans and new urban patterns. As in the plan's layouts, Jaussely keeps the housing typology of Cerdà, utilizing the buildable depth with inner courtyards at the centre of the blocks, and establishes smaller blocks with inner courtyards in other residential areas, applying new urban typologies to the mountain range of Collserola. **The urban green fabrics** are not formed by large plots with representative single-unit houses, but correspond instead to social housing typologies. Plots of land, having a width of 8 metres and length of 24 metres, with semi-detached houses aligned towards the road, a buildable depth of 8 metres and a back garden. Or detached building typologies, in slightly larger plots, with gardens around or flanking one or other of the plot's fences, more or less pulled back from the road's alignment.
New residential areas between upper regions of Diagonal and Meridiana correspond to the garden-city model. The urbanisations of Muntanya Pelada and Montjuïc also correspond to this urban model: a garden-city with the facility standards of an extra residential district. We can see how these small equipped blocks, formed by the trinity tree-lined street - garden - public building, strategically qualify the new residential districts. As we can see in the initial compositional sketches of the plan, in these ideal residential areas, city-scale facilities mean hospitals and cemeteries. Vast green strips of land separate residential areas from those mainly made up of warehouses or industrial complexes.

The fundamental point behind the proposal for connecting Barcelona to its surrounding towns and to the other towns on the Barcelona map is the strategic positioning of new connecting nuclei close to the existing central layouts. These nuclei are placed along the **intersections of the ring-roads** and, through their formal composition, organise the city in their collective whole. They coordinate with the new main ring-road or traffic route, which demarcates the inner regions of the central layouts. Within its polygonal segments, and coinciding with the urban interstices by intersecting with a perpendicular axis, this ring-road creates a principal crossroads which coordinates the city - district. This circuit, which integrates train and road traffic, encircles the city's commercial area and flanks the outer boundaries of the residential areas revivified by the newly-created districts.
The aesthetic effects arising from the rest of the city are fundamental to the study of these diverse centres. In the seven urban layouts studied by Jaussely in detail and incorporated into the general plan, the perspective effects of their streets' structure are examined with the newly-created public buildings and rest of the city in mind. The resulting views clarify Jaussely's conception of "picturesque", the variety and surprising effect of elements to counter the urban monotony. It can therefore be summarised as the affirmation of the centre's special character, the characterisation of its major thoroughfares and the diversity of its perspective effects.

For its formal clarity, we may consider the new consolidation of the left boundary - above the grid, established on the orthogonal intersection of the new ring-road diagonal as **nuclear models**. The ring-road diagonal establishes a north-south garden promenade with strongly architectural character. This diagonal artery acts not as a boundary, but rather as a bridge to the other side. This intersection produces a major crossing. In the intersection of the two axes, a *Square* is created which punctuates this circulatory junction with its monoliths at the city level. This important square contains the district Hall (*Deputy Mayor's Office*). A new passenger and goods railway station, from the left of the suburban development, provides accessibility and vitality to the new structuring urban boulevard. The longitudinal axis connects the new district to the city, while the transversal one organises the street layout and district square where the church is located. The new urban nucleus is an architectural project where the establishment of the blocks' sizes, the planning of the streets and the positioning of emblematic buildings are based on perspective studies.

But if the beauty of the city is determined by an emphasis on the specific character of the various centres, it is the grandeur of the spaces, their relevance in the principal communicating thoroughfares and the public buildings, in the case of the **central nuclei** or city centre, that have to be representative at the city level.
The city centre is established at the point of maximum communication, at the intersection of five diameters or ten radial avenues: the Plaça de les Glòries (an elliptical square of 325 m x 275 m). In fact this circulatory junction is not the centre of the city, the latter being shifted south-west along the Gran Via, closer to the existing city forming the *Central Square*. Jaussely's neighbourhood retains the islands from Cerdà's urban development which set his rational approach against the new '*rich et brillant*' urban centre. The electric railway (metro) has a station in the upper part of the *Square* and next to the Plaça de les Glòries.

This central nucleus is like a nucleus standard *par excellence*, a sum of all nuclei. A large central passenger and goods station located in a large square on the ring-road (the 80 metre-wide Indústria road) ensures railway accessibility at the local and civic level. The station's proximity to the residential districts of the upper side, the connection through the 50-metre wide Lepant street with the *Central Square* and the Station Square's architectural configuration of urban space provide a focal point of great charm.
Nearby, the new cathedral of Gaudí's Sagrada Família is designed as the spiritual focus. A new Social Centre is located along the new diagonal artery connecting the Station Square with the intersection streets of Diagonal - Passeig de Gràcia - Mallorca.

In the full picture of the sector devised by Jaussely, the Meridiana, virtually at the centre, relegates the Plaça de les Glòries to second place. The extended Meridiana (125 m wide with a surface area of 72,000 m2) takes the leading role with the establishment of the *Panteón de los Catalanes* monument, symmetrically flanked on the west side by museum-style buildings and on the east by a large representative building. The facing Pantheon and representative building form an axis that is perpendicular to the Meridiana and provide a secondary, symmetrical composition.
This is an example of the urban complexity which, using symmetrical, Beaux-Arts compositions in the introduction of these architectural groupings into the city, establishes lateral relationships. To confer a suitable leading role on a monument, as in the emphasis of the Town-hall square, in the urban grouping this composition is balanced by another one with outstanding features. The representation of the institutions' power, never univocal, is complementary.
The most outstanding features of the public buildings are the tall and slender towers that proclaim them at the city level. Towers pointed like needles, blazing points which punctuate the symmetrical compositions. The public buildings are mainly of this complex typology, a sum of nave and tower. Where a monument is concerned, only a tower is necessary *(Panteón de los Catalanes)*, where a more functional building is concerned, the symbol of the tower is added to the administrative centre. The railway stations also show this mixed typology, a barrel-vaulted building and a clock tower. Similar to churches, with a nave and a tower. Theatres have a more classical presence, having symmetrical volumetry with frontal aedicules and porticos.

The centre of the Plaça de les Glòries is not the actual centre of the plan, but rather the ***Central Square*** is the centre of the administrative nucleus. Jaussely shows this with his partial bird's eye views that place the *Central Square* in the foreground. This free public space of large proportions (220 m. wide and 175,000 m2 in surface area, occupying the place of a vertical line of urban development blocks) anchoring itself on the upper part to the Gran Avinguda Diagonal and on the upper to the Gran Avinguda Meridiana, and surrounded by more representative public buildings - the Town Hall, Post Office, the Panteón and various Museums - it is the *Agora* of the city.
The public building which faces onto the *Square*, on the narrow side of the coastal strip just below the Meridiana, establishes a central vertical axis with the same directionality of the extended square. This longitudinal axis confirms the anchoring of the *Square* to the two principal diagonal arteries of the city. The Town Hall building, above the Diagonal, with the importance of the NE-SW alignment having already been reduced, is comfortably lined up along its own perpendicular NE-SW symmetry. The views of the municipal building from the Square are axial. The closest views of the *Square* too, with the *Panteón de los Catalanes* on the right side and the Town Hall in second place, are presented laterally according to the "picturesque" view. The towers appear in the last plan; the urban construction benefits the adjacent nature by embellishing it.
All of the views designed by Jaussely are located in **the urban image** of his outlined proposal, unfortunately sixteen of these from the 1907-Plan stage have gone missing. Apart from the views corresponding to the city centre and left nucleus which we have designated as the standard, we can see that other views explore the relationship of the constructed fabric with its neighbourhood and the country-side connection with the various hills, giving continuity to the transfer with the treatments that vary from the monumental stairs and ramps up to the inter-urban road extensions. These maritime and mountain lines are the boundaries of the Barcelona plan with the Gran Via axis of symmetry.

The articulating axis of the plan's layouts or of the plane surrounded by the ring-road is the Gran Via. The Gran Via is already the principal road for Cerdà, but Jaussely gives it even more importance, since it becomes the territorial guiding axis of the whole plan of Barcelona, parallel to the sea and to the pre-coastal mountain range, serving as a connection between the Baix Llobregat towns and those of the left bank of the Besòs,

the objective of the *Romulus* proposal.
Along the Gran Via we can see the diagonal arteries designed by Jaussely, the lower Diagonal and upper Meridiana as the main axes and the other diagonal routes which triangulate the plan. These thoroughfares, that directly connect points and districts, establish the new residential layouts of this north-east section.
To the right of the *Central Square*, the Avinguda de les Glòries widens to 100 m. It is in this section of the city that Jaussely freely triangulates and punctuates the new city. And it is here too that the Paris model, where the city's triangulation extends to the territory, is made more evident. Likewise, in the Gran Via section to the right of the Plaça de les Glòries, we can see how Jaussely tries out the *boulevard a rédans* which combines architectural effects with natural ones, using the alternating teeth of aligned and set-back figures forming squares with large wooded areas. The domes, as the finishing touch to the buildings on the corner, punctuate the boulevard with a rational *picturesqueness*. This avenue ends with the bulky vegetation of the Besòs park and the architectural amphitheatre featuring the *Parterre Final del Parc*. Here architectural and natural effects come together to give a scenographic ending to the Gran Via.

As for the growth or **transformation of the urban fabrics**, the installation of strong, newly-planned connecting nuclei or furnished districts between the Cerdà grid and the surrounding towns, is seen as the most important decision in the new city's coordination proposal.
Jaussely proposed a growth which would be implemented over time in five twelve-year stages, contemplating the period between 1900 and 1960. Despite the vagueness of his perceptions of the future regarding the population, such a long-term planning, having such a defined establishment of location and programme, is astonishing.
Our interpretation of Jaussely is more strategic. The new, furnished districts, coordinated with the basic vitality of the Plan, set the primary urban focal points. The city is completed with new triangular layouts of the Besòs side and with the existing Barcelona layouts transformed through the introduction of vegetation or constructed facilities. These primary, central focal points are supplemented by Barcelona's other metropolitan stars.

THE SPHERE OF CHICAGO
BURNHAM'S SIMMETRIES

In this section, we propose an **itinerary** from the air with a bird's eye view of the Plan of Chicago in an attempt to relate Burnham's urban picture proposal to the compositional drawing tools used to achieve it.

As we saw in Chapter One, Chicago's defining feature is infinity, an infinite horizon, an infinite plain, and an immense lake. The geodesic territorial grid established for settling the land and determining the city's position, approved by the federal government, has a multi-directional and unlimited growth potential.
Between 1850 and 1900, the population of the city of Chicago increased from 30,000 inhabitants to 2,000,0000, making it the USA's second largest city in terms of size. Its geographical location on the Plain of Illinois, at the edge of Lake Michigan, one of the great lakes of this continent, has ensured a permanent supply. First the river and then the railway have been the driving forces of the city's economy.
Within a 60-mile radius of the centre of the city's coordinates, all roads lead to Chicago. Railway lines owned by different companies all reach the centre and occupy large areas of land for the storage of carriages and goods. The city's streets are repeatedly interrupted by the railway, for loading and unloading, and subject to traffic jams caused by carriages and early cars.

The main features of Burnham's initial conceptual view included the 6x6-mile land grid, the Jefferson township, and the introduction of the **focus on the city** of Chicago with direct communication lines with the cities on the plain, coast, and with Lake Michigan. Circular waves were projected across the land and water to give centrality to the grid in a land without limits.

In a more real and close vision, we see how the diagonal streets offering direct access to the centre are complemented by others that bypass the centre with semicircular circuits linking the neighbouring cities to one another. The circuits are accompanied by green belts, which become wider the further away from the centre they go and enter the city through the diagonal streets. The bird's eye view with Chicago in the hollow of Lake Michigan gives geographical naturality or geomorphological congruence

to Burnham's idea of **crowns of centrality**. In these land-positioning drawings, it is as though the omnipotent grid did not exist; it is more a representation of the peaks of a mountaintop cirque.
As the outer circuits exist at almost 80% of their size, the proposal simply gives them continuity by filling in the non-existent stretches. The completed semicircular circuits add to the centrality of the city. The centripetal arrangement of the city extends to the land.

Four basic city planning projects came before the Chicago Plan: the raising of the grid of streets above the plain for drainage reasons in 1840, the park and boulevard system of 1850, the drainage canal to guarantee quality water from Lake Michigan in 1880, and the 1893 World's Columbian Exposition, which planned a part of the city that was internationally acclaimed. After the Great Fire of 1871, more serious thought was given to the idea of developing a plan to organise a city that was already bigger than London and seemed to grow indefinitely.

The 1909 Plan Of Chicago could be summarised as a plan of **landscaped circuits** around the centre with the hierarchical organization of its accompanying grid.
In the centre, the landscaped circuits are seen as the polygonal sum of tree-lined diagonal streets. The green areas are connected to the road circuits as they are transformed into boulevards.
The last urban circuit is semicircular. It is a large, elliptical avenue 30 miles long that forms a continuous crown of sporting and recreational land that stretches from Chicago Avenue to 22nd Street. It was constructed to emphasise the variety of viewpoints with radial roads and connects the big new parks and outer green crowns with the existing parks designed as a system by F. L. Olmsted.
In the outer crowns, the river is connected to the green belts and a natural drainage system is set up. The city is integrated into the landscape.

The green coastal circuit connects with the green circuits by means of the new boulevards and existing parks, and receives the ends of the large avenues that run perpendicular to the Lake. In the city centre, on either side of the axis of symmetry, these large avenues coincide with the orthogonal axes of the polygonal urban circuits.

This **green limit** or linear park is connected to the urban layout by the intersections of avenues E to O of the network. At half-mile intervals, the vertical streets of the grid cross the landscaped coastal strip like linear penetrations.
The linear park with the urban boundary of the coastal circuit is the strip at which the grid disappears before the Lake. It is arranged down two headlands on either side of a small lake that provides safe waters for sailing, viewpoints from terraces, and more natural leisure areas. It also serves as a collection point for the thousands of tonnes of excess soil from the movement of land in a city whose construction is in full swing.

Near the port, the polygonal echoes of centrality become semicircular. Michigan Avenue, the part of the city that faces the Lake and which is visibly parallel to the southern arm of the river, becomes the longitudinal axis of symmetry between the semicircle of the port and the urban layout between the first and second circuits. The second circuit defines the boundaries of the retail and business centre.
Seen from the front, the arms of the second circuit stand out from the composition as they penetrate the water like 1.5-mile long breakwaters. Significant elements in the centre include the coastal park intersection and the long axis of symmetry from E to O, Congress Street, the city's main axis that runs perpendicular to the Lake.
The Chicago River is no longer the city's hinge and is integrated into the left part of the urban façade.
This façade is arranged like an **urban palace**. The garden of the city grows on the water and sketches out its outline on the surface. The semi-circumference enclosing the new marina rounds off the centrality of Chicago.

Looking from above in the direction of the **central section of the urban layout**, we can observe the polygonal square with the obelisk in its centre. This public square is closed in by the most representative buildings: The City of Chicago, The Cook County, and The Federal Government. The buildings are raised on terraces and connected by underground passages. An outer pentagonal polygon allows access to this seal, which is the meeting point of eight diagonal avenues and the E-O main axis of symmetry.

The pentagon of authority is located on the raised terrace and marked by the high dome of the municipal building, the centre of the administrative composition and geographical centre of

the city. The aim of this is to personify civic life and to be a monument to democracy capable of holding large crowds of people, like Saint Mark's Square in Venice.
The Civic Centre, conformed by a series of administrative buildings - municipal, provincial, and state - and whose monumental landmark is the Chicago City Hall building (based on the Basilica of Saint Peter in Rome) was designed not only to dominate the front part of the square, but also to be visible from a distance. The Palace and square for a democratic people is the heart of the arterial network of roads and the **geodesic dome** and soul of the city, the land, and the world.

The front part of this central polygon coincides with the western side of a large polygon of the same proportions, which is the first circuit. The scalar concatenation of symmetrical polygonal circuits reinforces the axis perpendicular to the Lake, intersected only by the monumental building.
The pentagon of authority is located on the apse of the E-O axis or the city's main nave, and the new stations on the western side are located at its intersection with the transversal nave.
The monument is the head of the **central intersection** and contrasts with the low and compact geometry of the triangular vertices of the adjacent layout.
Halsted Street, in the centre of the raised terrace and extended to 20 miles long, and Ashland Avenue, located behind the representative symbol, connect the central nucleus from N to S. If we follow the Congress Street **axis of symmetry** towards the Lake, we can see how it is extended over the river by means of a new bridge.

Two inverse procedures were used in the Plan to add **urbanity**. Burnham seemed to understand that this would not be possible if there was discontinuity. His entire proposal could be summarised as the desire to create urban density, with the introduction of diagonal arteries that created polygonal enclosures limiting the location of uses in the centre and beyond the elliptical semi-avenue by creating crowns of centrality.
The aim was to limit the expansive force of the grid with progressive **polygonal limits** in order to construct a dense and volumetrically important city centre. This procedure, which was based on the expansion model of European cities, the process of knocking down city walls, is applied here with the opposing aim of constriction.
Probably because of this, there is a disproportionate emphasis on progressive centrality, on symmetry as a hierarchical and closed method of composition, on the large scale of the centre and on the monumental building, which was the first independent skyscraper of Chicago, as a symbolic landmark of the city's future power.

We have seen the function of belts as a way of controlling urban expansion to create density. The other mechanism used gave **continuity to the grid network** by eliminating interruptions caused by natural elements or transport lines. This is the reason for the systematic extension of the orthogonal streets of the grid every ½ mile and the selective extensions connected with the centre.
To give continuity to the streets and to improve the flow of communications, Burnham suggested grouping railway station terminals on two sides, one to the west and the other to the south of the city, and organising a system of loops (raised and underground in the centre and at ground level in the rest of the city) in successive tangencies that also established the areas of centrality.
In the city centre, **the river** was integrated into the grid network. Access at water level was created by quays. Above, bridges join up with each street from E to O and N to S of the network. Three major new bridges were built over the river: Congress Street, Twelfth Street, and Michigan Avenue. Because of their position and size, these became new river squares.

Highlights of the procedure for achieving urbanity included the construction of public buildings with **urban crossroads on different scales**, the great administrative intersection, the cultural crossroads, the crossing of the two main axes at the source of their coordinates, and the river crossings.

If we stand facing west in the main square and look to the left down the diagonal avenue of the first circuit to the closest roundabout, we come to Twelfth Street (first expansion of the E to O grid) which, en route to the Lake and just after crossing the river, houses on its right the southern-side stations and leads into a series of blocks further down, at the **cultural crossroads** of the city.
This crossroads and general view of the centre-right of the city is the most axial of the Plan of Chicago. Even the street's occupation by public buildings is asymmetrical in shape and volume. The two theatre buildings are orthogonally positioned,

one looking out on to the great Twelfth Street, splitting it en route to the Lake, and the other looking out on to the main axis of Michigan Avenue, and conform the urbanity of the crossroads. The profuse plantation of trees lining Michigan Avenue and the decorative richness of the Beaux-Arts architecture produce a wonderful effect that contrasts with the rationality of the primitive intersection. This square, where we find the diagonal streets of the first circuit and the coastal diameter of Michigan Avenue is the main crossroads on the southern side.

We continue our tour north along the **front diameter** of the composition of the Plan or Michigan Avenue. This great avenue is the city's Lake façade and the main axis connecting traffic between the northern and southern sectors of the city. To the east, a large, elongated square in the form of an exedra running adjacent to Grant Park is the orthogonal centre of the semicircular base and crossroads with the Congress Street axis of symmetry. In the general view, we can observe the volumetric uniformity of the grid based on the repetition of the Chicago block. The parterres of Grant Park are arranged in quadrangular variations of this. The Chicago River is cut across by a series of bridges that give continuity to the streets of the centre. The city's buildings are not part of the project; they are the negation of public space and hence simplified in the image as repetitions of the unit to infinity.
The large square of Michigan Avenue, on the other side of the urban façade, is limited by the façade of the Field Museum and packed with people. This building, located on the longitudinal axis of Grant Park, together with The Art Institute and the series of representative buildings used for art, literature, and science, makes up the intellectual centre of the city.

Burnham suggests purchasing land for potential new public buildings and to build them as the needs of the city grow. The guarantee of their location in ideal parts of the city in terms of formal composition and geographical relevance would afford them the right symbolic value. So, while the Chicago Orchestra, the Art Institute, the Crerar Library, the Universities... all afford spiritual content, the Plan studies how to add notably to cultural life through representative buildings.
The southern view of the entrance to the Michigan Avenue Bridge reveals the linear proposal for crossing the Chicago River. The construction of this grid leap connecting the southern and northern sides of the city is one of the most positive proposals of the Plan of Chicago.

In the view from the east bank of the river, we can see the meeting point between the northern, southern, and eastern branches of the Chicago River, **the river square**. The Chicago River that created the city is a landmark of the landscape that has been transformed into an urban landmark. The perimeter and orthogonal links between the city's grid and its original means of communication integrate the river intersection into the urbanity of the grid.
The proposal of the elevated riverfront boulevard for light traffic and pedestrians is complemented by loading and unloading lanes at quay level. With the added continuity of the layout, the river becomes a connective element, another road of the city.

Crowds and pedestrian traffic at the crossroads of streets E to O clog up the great Michigan Avenue, the main north-south axis of the city centre. The proposal reinforces the extension of the axis over the Chicago River and the land connection by means of the coastal circuit. The latter becomes the basis of the city's general traffic system, which joins the three separate parts of Chicago. Its expansion and the comparison with parallel streets in the east and west underline its indisputable authority as the longitudinal axis. Michigan Avenue, which cuts across the Chicago River and looks out on to Lake Michigan, with views as far as the eye can see, is the **structuring linearity**, the straightforward length, the emblem of the Plan and the city.

EPILOGUE

Reflections on the potential of plans in city transformations.

The city and its grid

In American cities, we find the centre where the grid has reached its maximum subdivision. The idea behind the grid is to allow a new city to be located in the vast territory and to determine the finest possible network of streets that will create a block, split land into plots, and allow for building.
The dimensions of these original plans are visible to the naked eye: 1/2 x 1 mile in the original Thompson's Plat of Chicago from 1830. Here, the meeting point of the three branches of the river determines the centrality, the position of the original plat. The next stages of planned growth – Kinzie's Addition and the Wolcott Addition – are also intersected by the river, the main means of communication at the time across Lake Michigan.
When the city was in the 'township' unit situation (6x6 miles) of the first 'Early Landholdings in Chicago' plan, a subdivision of the 1x1 mile unit into ½ x ½ mile was suggested. This meant that the ½ x ½ mile network defined homogeneous block areas and hence, pieces of city with different morphological features.

In European cities, however, the use of a single grid was determined by studying which network best suited the city centre, creating the best distribution of flow, the grid of streets and, at the same time, the best block that would allow optimal subdivision of plots and construction.

The fact that Barcelona and Chicago used the same square-shaped 133 x 133 m or 1/12 x 1/12 mile block came about because of the idea of an unlimited expansion of the grid in all directions. In the municipal area of Barcelona, it was to be extended to the whole plain on a slight slope towards the sea until it reached the neighbouring towns. In Chicago, this size of block was increased to units of 1/2 x 1 mile alongside the first subdivision plan. The measurements of these two grids for these two cities were developed in around 1850 when, apart from the tram and railway, carriages were the main means of transport.

The automobile was introduced at the turn of the century, when the Jaussely and Burnham Plans were put forward. The ½ x ½ mile grid was extended and given continuity; thus, the characteristic unit of the Chicago network is ½ X ½ mile, which is sufficient for general traffic and a series of built-up blocks with the same plan measurements. When the grid of reference is not the origin of the city, as is the case in the USA, but rather an extension of the latter, as is the case of Barcelona, the main orthogonal roads are not equidistant and their hierarchical arrangement responds to criteria of connecting parts of the city and territorial connection.

Diagonal streets

We can differentiate between three types of diagonal street: the old Indian trails existing before approval of the grid, which continued to have a structural function after the grid was established; direct freight routes to and from the centre, forming part of a 45° grid that was superimposed on the original, and the series of diagonal roads that formed part of the new circuits around the centre.

We have seen that the diagonal streets themselves do not produce centrality. The closest example is that of the isotropic grid conformed by the 45° diagonal lines superimposed on Chicago's former grid of 1x1 mile.

The determination of an axis is what establishes the subordination of the diagonal lines; the centre that they refer to. Therefore, we can distinguish between two basic types of diagonal: those for distributing extensive flows, and those for directing, which form circuits around a centre.
Since the diagonals of the new, 45° superimposed grid were based on those complementing the existing diagonal streets in the area, some at 45°, others at 30° or 60°, that led to the meeting point of the three branches of the Chicago River, the original crossroads of the city, a superimposed diagonal network is set up, adapted to the place in which an axis of symmetry is implicit.

If the circuits were only made up of diagonal lines in the 45° network, even if it were the adapted network, they would not have the maximum force of enclosure. It is through the continuity between the diagonals of the 45° grid and the diagonals of the orthogonal grid that the circuits are transformed into enclosing rings that create crowns of centrality.

Centres

The laterality of the new main centre of Barcelona was due to its displacement to the north-east on the territorial axis of the Gran Via rather than the vertical axis of the city or Passeig de Gràcia. The Plaça de les Glòries is the city centre. The new city

of the north and east gravitates around the great crossroads of the Gran Via, articulating Jaussely's new interconnections. This centre, when looking at the city as a whole, is the main centre, but other centres appear around the hubs of communication in which 9 or 8 diagonal avenues are found, or 8, 7, or 6 radial avenues in other points, like stars balancing out the constellation with the central nucleus of the old quarter and the Eixample, the former limited by the diagonal streets of the first ring roads and the Eixample integrated with it by Plaça de Catalunya.

In Chicago, Burnham establishes a vertical axis and locates the new main centre on it, further west, as the apex of the first circuit. This decision brings with it a concatenation of symmetrical lines where the centralities are either on the front-facing diameter or arranged symmetrically in a fan-shape from the centre.

Grid and plans

Instead of adapting the original grid, Jaussely determines two contiguous, linear sides as the basis for the new city. The coastal side and the mountain side. These sides are also qualified by their function: the coastal side for trade, offices, and industry, and the mountain side for residences. The Gran Via, the transversal axis of the city and the Plan of Barcelona implicitly becomes the most important avenue, as Cerdà had envisaged.

The adaptation of the Plan by folding in the two sides, leaving the higher residential side in the north-west quadrant to coincide with the steeper and hillier areas, reinforcing the main role of the oblique lines of the Diagonal and the Meridiana, both as geographical connection lines and as organisational guidelines for the new grid.

Jaussely limits Barcelona's original grid to the 'Low centre' area, at 2.5 times the size of the old quarter and with new grid lines producing blocks closed off from the rest of the Plan. The isotropic rectangular grid of streets that distributes the flow down the two sides and between them in the model drawing is fragmented and displaced by the angle of the sides in the adapted version. Cerdà's original grid already established an early game with a grid of more than 45°, in which the two main roads – the Meridiana and the Diagonal - cross at the same point on the horizontal axis of the new city or Eixample.

Limits and urbanity

The first plan of the city of Chicago, 'Thompson's plat', sketches out the virtual limit of the axes with the coordinates 0,0; Madison, State. Obviously, since the Chicago River was the main line of communication, the riverfronts in the north and west delimited the first subdivision. The city had a single enclosure in which to develop and this gave rise to a condensed activity that produced growth, building density, and urbanity as it expanded.

Since the isotropic grid is, by definition, indefinite, the only way to produce density is to establish a ring that would be difficult to intersect, in the style of old city walls or the island of Manhattan. When the possibility of construction is unlimited, even in the centre, free plots are reserved.

The compact-city image that Burnham sought for Chicago required enclosures, circuits formed by diagonal roads that were part of the 45° grid and which reinforced the closure with the orthogonal lines of the original network. Based on the model of Paris, the world capital at the time, growth would take place in the style of a historical city with a slow growth over 2,000 years, but in this case at breakneck speed guided by the diagonal streets.

Jaussely uses Cerdà's main diagonal roads, the Diagonal and the Meridiana, as his first movement, with their exceptional orientation of a 45° angle to the grid, and he uses these same N-S, E-O guidelines to define the boulevards of the second ring roads, which, together with their complementary perpendicular roads, determine the new connecting nuclei. These 45° intersections of the original grid forming an equipped square are the centres of urbanity in the picturesque proposal. Roads running parallel to the basic and complementary perpendicular roads define the upper network characterising the new grid. When one of these 45° centres or intersections requires more relevance, new radial roads are added that connect it directly to other points of interest.

A single, original grid is transformed into a sum of grids. The orthogonal grid, the 45° grids and their angular variations all determine the collage of grids of the Jaussely Plan.
Multiple views are obtained of the monumental buildings from the different diagonal streets; they do not have a single façade, but instead multiple faces, and the laterality of these views produces an effect of fleetingness and surprise.

Plans and city

In the origins of the city of Chicago, when it was decided not to extend the city's development to the square mile units of Canal Land, construction focused on the original part of the Chicago block. When permission was given for the whole grid to be built on, construction spread quickly. The specific mechanism of the circuits with the city's expansion was difficult to put into practice. The other procedure to produce urbanity, that of affording continuity to the network, proved to be more fitting. Burnham's suggestion of opening up LaSalle Street was along this line of thought, as was that of the new Michigan Avenue bridge, which gave continuity to the Lake façade.

It is always useful to make a strategic reading of the city or its parts before starting on a line of project. Burnham underestimates the role of the main route and border of the Chicago River when he suggests a centre located outside the original area. Similarly, the force of expansion of the Prairie grid made it difficult to create circuits that would promote density in the city centre. Locating a dense urbanity along the Lake façade, reinforcing the boundaries of Grant Park with public buildings, would probably have been more in keeping with the city's lines of force. Its identity would have been emphasised more by highlighting the infinite linear continuity of Michigan Avenue, which connects north and south with the boulevards of the coastal parks that form part of the system of empty spaces at the heart of the city's growth control.

Chicago's qualitative leap in urban position during the first half of the twentieth century was linked to an increased awareness of the forces of the city created by the Burnham Plan, revealing Chicago's possibilities of becoming an international capital. Urbanity eventually gave continuity to the network. To highlight the specific characteristics of Chicago, its defining formal features are the Lake façade, the landscaped shore, metropolitan connectivity down the length of the Lake and outer circuits, the park system, the development of the river, and the grid.

Jaussely's proposal for Barcelona helped to transform the city. The current General Urban Planning Project follows similar structural lines to the Jaussely Plan Report and there is also an emphasis on road systems, public parks and facilities, all of which are down to his influence.

In Barcelona, the conflict between the existing diagonal roads or old streets and the original, superposed grid is still appreciable in some eastern parts, where the buildings that already stood before the planning took place block the passage of grid-based streets. Nonetheless, the expansive force of the grid up to Besòs beneath the Gran Via, save a few small fragments, has been superior.
New centres of urbanity or smaller nuclei have sprung up in the east and west, in line with Jaussely's positioning, shown by upside-down crosses on the original grid. However, the main feature of his proposal was that of counteracting the levelling force of the grid, reinforcing the uniqueness of the parts of the city with environmental features and specific typologies. The buildings, on corners, in squares, in the triangular blocks of the Diagonal, are topped with domes and other types of ornamental finishes. Next-generation urban tissue was constructed; the garden cities at the foot of Tibidabo, in Sant Gervasi, Parc Güell, and La Salut are just some examples. And the two ring roads were laid to accompany this new urban tissue from above and below.

This swing between classical and romantic, Cerdà and Jaussely, the norm and the exception, urban tissue and monuments has taken place in Barcelona over alternating periods, adding tension to the city's buildings.
Jaussely's compositional freedom limits the grid, establishing diagonal ring roads, strategically positioning the intersections of axes, laying down landscaped routes between the urban tissue of hilly areas, creating panoramic terraces, and connecting the ends of the city diagonally.
It shows that the elements of the city's construction are its streets, its avenues, its various fabrics, and its parks and monuments; elements that need to be recognized before we can dive in to make our proposal freely using criteria of formal organisation. The strength of the geomorphology of the land combined with the previous and new urban layouts is what determines Jaussely's urban form. This projection on different scales, on the metropolitan scale, on the scale of fabrics, on the scale of its buildings, and the application of this development rationale to a plan, will have great future potential when the city finds the right cultural, political, and economic moment in time.

SUMMARY

Jaussely's 1907 Plan of Barcelona and Burnham's 1909 Plan of Chicago are similar beaux-arts proposals designed to organise the city formally and functionally during its transition into a metropolis. The city grid hierarchically organizes its streets and introduces diagonal roads, so as to generate structured and representative growth.
The study compares the original plans and interpretative drawings on the same scale.

The point of reference is the Paris model and Hénard's plan of main roads. Paris has a longitudinal axis that is the city's main avenue and the main territorial axis, which, reinforced by the city's most representative public buildings, becomes its backbone. The axis of vertical symmetry organises the diagonal ring roads. Both in Barcelona and Chicago, the location of the civic centre along the complementary vertical axis - rather than on the main longitudinal axis - weakens the territorial connection.
In the case of Barcelona, reinforcing the longitudinal axis of the Gran Via with other facilities and, in a design in which diagonal streets play the leading role, converting Avinguda Diagonal into the emblem of the Plan and city would have added more structure. Chicago's Michigan Avenue has become the structuring axis that gives continuity to the Plan.

A prior reading of the city is essential if we are to make a strategic proposal that will coincide with the city's lines of force.
The grid unit used in Barcelona is the same as the original block of Chicago, 133 x 133 m or 1/12 x 1/12 mile; Cerdà's blocks have the same measurements as the Chicago block.
The basic grid unit used in Chicago is 1/2 x 1/2 mile, which produces areas of city with blocks of the same size, cut off by streets from the main road network. This corresponds to 6 x 6 blocks of the central quadrangular area of Barcelona cut off by main streets.
When a grid-based city changes scale, the diagonal streets become the streets that articulate the city with the territory and allow it to develop.

The birds-eye views and fragments of perspective study drawings are placed in Jaussely's plan. The six plans from the 1905 competition and the numerous plans from the 1907 project and its general interpretative view allow us to observe the complete proposal.

Jaussely structures the urban tissues of the plan and fabrics of the hilly areas around the main avenues, Diagonal and Meridiana, using an exceptional angle of 45° to the rest of the grid. With these N-S and E-W grid lines, he defines the diagonal ring roads that, together with the perpendicular streets, determine the new connective nuclei. These intersections form a built-up square and are the centres of urbanity of the "picturesque" proposal. When one of these intersections requires more relevance, new radial roads are added that connect it directly to other points of interest. The monumental buildings have multiple façades and the laterality of these views produces an effect of fleetingness and surprise.

Burnham's visions create an itinerary of the city with a bird's eye view. An attempt is made to limit the expansive force of the grid by using progressive polygonal limits around a main centre with complementary symmetrical centres, as a way of constructing a dense and volumetrically significant central nucleus. In the Chicago Plan, the diagonal streets introduce the territorial connection; these are rapid freight lines from the centre that form the polygonal circuits to divert incoming traffic. Streets of the 1/2 x 1/2 mile grid are reinforced to ensure linear continuity in order to generate urbanity. Emphasis is placed on the landscaped shore, the park system, and the connectivity of the outer circuits.