

CITY ACUPUNCTURE: THE SUSTAINABLE DEVELOPMENT OF THE BALANCED CITY IN POST-INDUSTRIAL AGE

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ABSTRACT

After the Franco dictatorship, a new chapter occurred in Barcelona's Democracy. As having fully understood the spirit of Cerda's planning, the participants in Barcelona urban planning creatively started to use a treatment called acupuncture in the city, which has the same spirit as traditional Chinese medical science, and revived the ruined city, gradually gain back the balanced and sustainable management of the city.

The thesis introduces the problems Barcelona met in the post-industrial age and the corresponding solutions, mainly focuses on Barcelona city renewal in the 80s, and tries to explain the relationship between traditional Chinese medical science and city acupuncture, which will be the clue of the thesis. The thesis will be described in three chapters, human body and city under the view of traditional Chinese medical science, acupuncture therapy and the Barcelona model and sustainable development of the balanced city.

Key words: city disease, city acupuncture, traditional Chinese medical science, the Barcelona model

BACKGROUND

In the early 1800s, Barcelona entered the industrial age and became Spain's principal industrial city which was known as "the Catalan Manchester". With economic development having a strong impact on the city waterfront, Barcelona's coastal location, as a geographical advantage, resulted in massive construction of ports and industrial facilities, warehouse and factory's occupation of the waterfront as well as serious pollution in the coastal region. During Franco's dictatorship (1939 - 1979), pursuit of economic benefit and profits was placed far beyond the attainment of city space quality. As a consequence, at the end of the dictatorship, all of Barcelona's waterfront areas were occupied by docks, industrial facilities, highways and railways, which forming a fault zone between the city and the sea, the city faced an awkward situation which rendered the coastal city unable to reach the sea.

In 1976, when the dictatorship was over, the first elected city government was born in Barcelona. During that time,) the city was eager to get rid of the political alienation from Europe, economic poverty and people's conservative thinking pattern. Meanwhile, the city was going through industrial reconstructing and also faced counter-urbanization trends. Since the early 1970s, industrial crisis intensified: urban unemployment increased, industrial departments were adjusted, reorganized and relocated to the city fringe, and the tertiary industry and service industry started to occupy the former industrial area, thus effecting a large-scale adjustment of urban industries and their corresponding city spaces. These measurements caused the formation of large-scale adjustment of urban industry and relevant urban space. In order to meet the new demands of economic development, the government began to adjust land policy as a means of promoting the redevelopment of the abandoned or underutilized land in the city center. In addition to the industries' relocation to the city fringe, counter-urbanization phenomenon is also reflected in the migration middle's class migration to the suburbs, decay of the city center, as well as deterioration of the central physical environment and population composition. These changes were also a reflection of Europe's transformation from the industrial age to the post-industrial age.

1. HUMAN BODY AND CITY FROM THE PERSPECTIVE OF TRADITIONAL CHINESE MEDICAL SCIENCE

1.1 The cause of sickness

According to "The Medical Classic of the Yellow Emperor", disease "is caused by either Yin or Yang", it means that it is related to the balance of Yin and Yang. Another saying from the famous book goes like this "Obtaining balance, Qi becomes positive energy; however, if the balance is lost, Qi turns into negative energy." Here, Qi signifies various movements in natural and life processes. Any imbalance in those movements is called "Evil Qi", which can be further divided into "Outer Evil Qi" and "Inner Evil Qi", the former denoting imbalance of movements in natural process like wind, cold, dryness, moisture, heat and fire, while the latter referring to that in life processes such as cold, heat, emptiness, fullness, anxiety and moisture. What is of concern here is movement patterns, inter-relations and imbalanced state, rather than some specific physical pathogenic factor, some change in structure and function or the so-called etiology and pathology in western medicine. Traditional Chinese medical science holds that the imbalanced state is the fundamental cause of diseases. Therefore, in medical treatment, the emphasis should be put on the adjustment of this state. As long as balance is restored, disease will naturally disappear.

From the perspective of traditional Chinese medical science, one hundred years ago, when he had just started his city planning, Cerda was dealing with a vast plain with several sparsely-located unknown villages and an old city severely damaged by industrialization, its limited space was unable to meet the rapid expanding life demands of the increasing population. In essence, the city had lost its balance of Yin and Yang and its Qi of blood turned inharmonious. Over a hundred years later, the Barcelona government was faced with a similar problem: in its transition from an industrial age to a post-industrial one, the city center was decaying, its physical environment and population structure were getting worse and the city's development was "sick".

1.2 The principle of acupuncture and moxibustion

With a history of thousands of years, acupuncture and moxibustion, as an effective therapy, has long spread to the whole world. This special treatment is based on traditional Chinese medical science's theory of Meridian system and acupuncture point. The meridians and its collaterals belong to the Zang-Fu organs interiorly and extend to the extremities and joints exteriorly integrating the Zang, the Fu, tissues and organs into an organic whole, by which they transport Qi of blood and regulate Yin and Yang, keeping the functions and activities of all parts of the body in harmony and balance relatively. As we can see, the human nervous system is composed of two parts, one being central nervous system, and the other peripheral nervous system. However, only when acupuncture, moxibustion, or other purposeful stimulation is applied to some specific parts of the human body, can high-level reaction occur. These parts are called acupuncture points, which act like sensors in cybernetics.

The mechanism of acupuncture and moxibustion is to realize the interaction between acupuncture points and "Qi" in the surroundings through stimulating the acupuncture points and inputting information, so that the body's transportation ability of Qi of blood can be adjusted and mobilized. This process can be seen as information therapy. One of the main functions of acupuncture and moxibustion is to stimulate the "Sensor". Once the human acupuncture point is damaged, partially or completely loses its functions and fails to act as a sensor, the human body will be unable to function properly. To cure this condition, the acupuncture points should be activated and restored to its normal functions, then various organizations of the body can start working again. This is the so called "Unchoke the meridian, active the Qi of blood, and regulate Yin and Yang." in traditional Chinese medical science.

If a city is likened to a human body, "acupuncture points" can also be seen in the body of city. In the Barcelona Model, acupuncture points play roles as urban public green space, public buildings and courtyards of the Manzana while people are the Qi of blood of the city. In the case of city acupuncture and moxibustion, the fundamental purpose is to make the Qi of blood run smoothly in the city, that is, to provide the citizens with a comfortable and happy life, thus the city's "container" and "energy" can be balanced between Yin and Yang. Therefore, we call Barcelona's urban renewal plans in the 1980s acupuncture therapy. In retrospect, it has achieved two results: first, acupuncture points have been stimulated and restored to their functions-inner courtyard public spaces are rebuilt; second, meridians and acupuncture points have mobilized various human organizations, thus curing the diseases-residents' life quality and neighborhood relationships have both been improved.

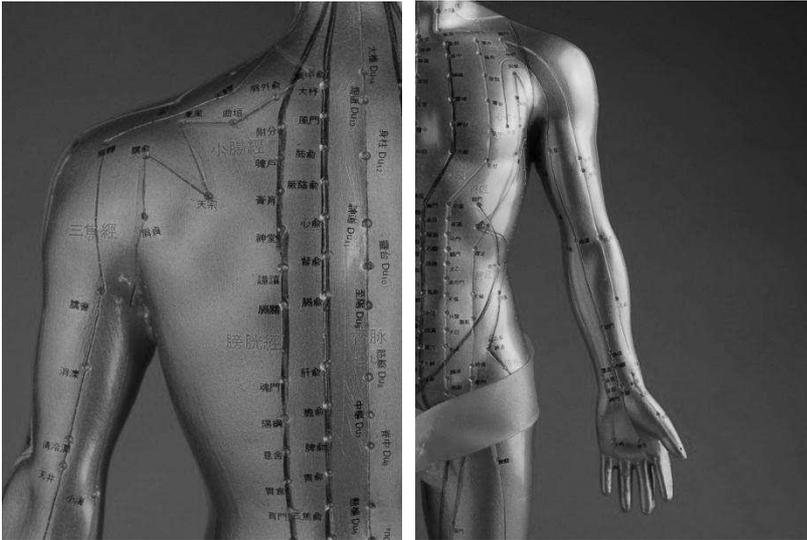


Fig1, Meridian and acupuncture system in traditional Chinese Medical Science

(<http://www.nipic.com/show/1/22/4a2f79a1d505d43b.html>)

2. ACUPUNCTURE THERAPY AND THE BARCELONA MODEL

After Industrialized of Barcelona, several problems have become in the city, the problems can be seen as tumors of the city, which block city's acupoints and meridians. The phenomena made the city condition worse and worse. Narrow streets, poor sanitary conditions, buildings height up to 5-6, public squares losing, disease spread, population booming, all these came out together made Barcelona a sick city.(Fig 2)

Barcelona's modernization since Franco's death in 1975 and the democratic local elections of 1979 has been shaped by three distinctive phases of urban transformation, a stable governance model and the shifting weight of the private sector's influence in policy choices (Table 1). In this section we discuss the development of the city's urban regeneration strategies, paying particular attention to the changing relationship between culture, governance and urban transformation and the implications for redistributive social citizenship.

Table 1. Phases of urban transformation in Barcelona since 1979

	Role of Culture	Governance	Inclusivity/Redistribution
Phase 1	Foster democratic urban Catalan identity and civic pride	Dialogue with citizens	Provision of collective, public services such as schools
			Provision of new public spaces (democratization of urban spaces)
			Provision of public housing
Phase 2	Architectural expression and urban pride	Consensus	Provision of civic centers and libraries
	Marketing the city for the Olympic Games		Renovation of museums

	Role of Culture	Governance	Inclusivity/Redistribution
	Promoting urban lifestyles		Renovation of cultural infrastructure (e.g. theatres)
Phase 3	Functional tool	Hegemonic; top-down organized participation	Top-down organized festivals
	Support 'knowledge economy' and cultural industries		Promotion of 'interculturality'

The process has quite a strong connection with the therapy of acupuncture in traditional Chinese medical science, in these three phases, at the very beginning, a “look, listen, question and feel the pulse” process was conducted to investigate and get to know the true demand of the citizens. Then after the whole investigation and provision, the government renovated several points like libraries, civic centers, museums, etc. It shared the same value standard and methodology which use smaller scale and particular points to active larger scale areas with acupuncture therapy.

Since this kind of similarity, the Barcelona Model has a special relationship with Chinese acupuncture therapy. (Fig 3)

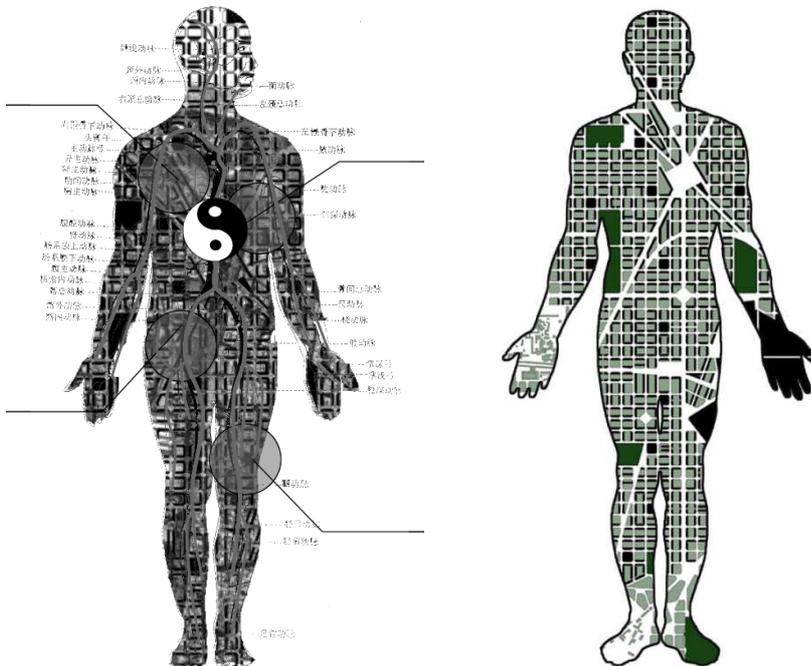


Fig2, Block of acupuncture points and main and collateral channels in Barcelona

(Drawn by the author)

Fig3, Combination and connection between the meridian and acupuncture system and Barcelona

(Drawn by the author)

3. ACUPUNCTURE POINTS, MAIN AND COLLATERAL CHANNELS AND ZANG-FU – A PROCESS OF ACUPUNCTURE

Under the direction of the initial idea of city redevelopment, the city redevelopment conception has initiated Barcelona's transition from an industrial city to an international tourism and cultural city. The process consists of three main periods, these three periods actually reveal the main idea of the city renovation, use points to stimulate lines, then to promote areas:

1980-1985: The work on the improvement of the city fabric was started, especially with the emphasis on the transformation and rebirth of urban leisure space. The goal is to focus on planning squares, streets and parks with the view of improving the quality of urban life and at the same moment to set rules and invent new technology in this entirely new field.

1986-1992: The 1992 Olympic Games is a catalyst for change in the city's urban planning. The mega-event made it possible to reexamine city problems and carry out larger scale projects. Since small projects cannot solve problems in urban structure and regional infrastructure construction, the designers, when planning the location of the Olympic facilities and infrastructures, worked most cautiously to meet the specific demands of the city and the special requirements of the games.

1993-present: The construction of a pan-regional city on the basis of two previous stages.

3.1 Acupuncture points - Small-scale public space

In Cerda's Barcelona plan, per 400 squares (20 x 20) was made as a city district which should have a separate Central Park, central Hospital or other important public facilities. Then each city district was further divided into four occupied 100 (10 x 10) squares sub-districts which have independent commercial service facilities, such as market and so on. Each sub-district is divided into several communities occupying 5 x 5 grid owning independent cultural and recreational facilities, such as schools and community centers, etc. Only one-third of each square is building coverage, namely 5,000 square feet meters of land area for the construction and the remaining part can be the inner courtyard and different forms of garden. This concept shapes a "Residential – Schools – Medical Centers – Public Space" system, based on this system and principal, emphasized the different scales in the region, interspersed different sizes and characters public spaces in a microscopic layer to solve the needs of different levels, and foreshadowed for future's city renovation and city acupuncture. (Fig 4) These different characters blocks became acupuncture points in Barcelona's redevelopment in 1980s. (Fig 5)



Fig4, Different scale public spaces in Cerda's Barcelona plan

(Drawn by the author)



Fig5, Acupuncture points in hand in Chinese traditional medical science

(<http://www.jiujiuba.com/xxpict2/zhishi/20071111134970.jpg>)

Acupuncture points of the city are its public spaces which must be improved and repaired so as to provide a more comfortable, humanized environment for the residents live around. From 1981 to 1991, with the aim of restoring and extending the vitality of city center and neighborhoods, Barcelona adopted the “Acupuncture Therapy” whose strategy was to first deal with small and medium-sized public spaces and gradually transformed Barcelona into a living-friendly city. The method of starting with a single point is called “Acupuncture Therapy”, which signifies the planning of some specific points rather than comprehensive planning. Clearing up a square, constructing a pavement, building up a school, establishing a museum, planting some trees alongside the dark and dilapidated streets, refinishing architecture façade, or designing some monumental architectures, all these measures meant to enhance the city comfort and beauty. This planning was then only a theoretical draft, but now it has become what is known in Europe as the “Barcelona Model”.

Oriol Bohigas, former director of Barcelona Urban Planning Bureau, said: “We were doing some specific planning which could be partially implemented at that moment. This also means resolving the imperative, which ensures citizens getting better living environment without too much idealism.”

3.1.1 Rebirth of the deserted corner – Parc Girona

Located in a high-density low-income residential area, Parc Girona, originally a military camp, had become a temporary parking place for the local residents after years of desertion, where the remaining space was filled with all sorts of waste.

Architect Jordi Farrando who was responsible for renovating the place hoped the area could accommodate a variety of activities. So in his proposal, different areas are created where children can play on the grassland, adults can chat in the shade of trees, and teenagers will be able to play football and basketball in open spaces). Large-scale ramps connect streets of different levels on both sides of the park. On the one side of the ramp is street, on the other, lies the future Residents’ Activity Center. In between the streets on both sides, a chain of platforms are set so as to solve the problem of different levels. Flowers and various kinds of plants

are planted in these platforms which not only make the park far more colorful but also bring elegant scenery in four distinctive seasons. (Fig 6)

In Farrando' eyes, it is the people who use the particular areas that are the true owners of parks and public spaces. As a circulation, they also bring different variety of changes, the wearings and the activities will inject new vigor and vitality into the park.

Thus, a former deserted corner, and thus becomes a friendly neighborhood park, the design approach is worth pondering over and over again. The secret seems to be creating spaces, rather than building piles of useless and complex shapes, dealing with simple and durable construction materials as well as planting vegetation that changes shapes and colors with the passage of seasons. In fact, numerous Barcelona's public spaces are designed under such principles.



Fig6, View of Parc Girona and the ramp

(http://www.mimoa.eu/images/13081_1.jpg)

3.1.2 Implantation of the open space - Parc de l'Estació del Nord

This place turned out to be the north railway station, and now it is planned as a gymnasium and activity center. The original small plazas and orbit space surrounding the station have also been transformed into the most important activity places for the residents nearby.

Barcelona municipal government has successfully converted this free space into a park. The philosophy behind the design is quite straightforward: devoting large areas to grasslands and trees so that the park can have many open spaces where various activities can take place. Here becomes a paradise for children and puppies where they can have a safe place to play and relax. (Fig 7)

Complex facilities and complicated construction materials are invisible in the whole park, but simple idea brought about unexpected result – a cordial and comfortable civic park. These seemingly ordinary and simple

parks have virtually improved everybody's life.



Fig7, The big grass area in Parc de l'Estació del Nord

(http://www.eventrocks.com/assets/parc_estacio_del_nord_18614.jpg)

3.2 Main and collateral channels - City roads

In acupuncture therapy, Acupuncture points is not enough to allow the operation to city more efficient, transportation system as main and collateral channels of the city, is the carrier of Qi of blood. And it needs supports by well-functioning acupuncture points to revitalize urban areas which will give new vitality to the city. So at the time Barcelona's city planners found the crazy constructed roads in the early age have bitten and torn the communities in city which always drove pedestrians desperate, they decided to execute a policy to reduce the traffic lanes. They foresaw the importance of city's main and collateral channels. (Fig 8,9)

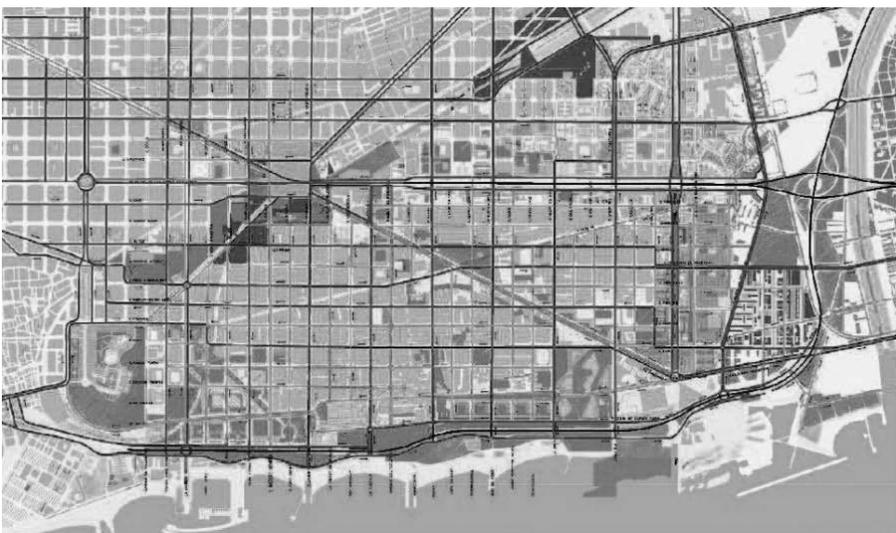


Fig8, Main and collateral channels of Barcelona

(Joan Busquets, Barcelona: the Urban Evolution of a Compact City, 2005)

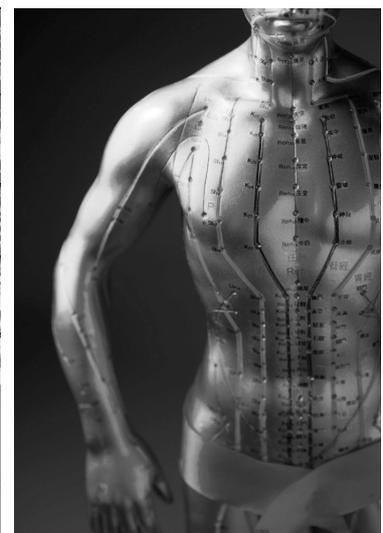


Fig9, Main and collateral channels in Chinese traditional medical science

(<http://www.nipic.com/show/1/22/3a697f4abd9b4e34.html>)

The general method is to build a pedestrian lane in the center of the traffic, decorated with exquisite street furniture and children's playing facilities where nearby residents can carry out various activities. With this approach, the government again created a large number of open spaces for its citizens, made the traffic lanes more humane and significantly improved the cityscape. Throughout Barcelona, the application of this method can be seen everywhere in the middle of the roads.

Thus, the government turned the cold and dangerous streets into a warm and safe pedestrian space. These pedestrian lanes, combined with the ubiquitous small parks and plazas, changed the feature of the city thoroughly and improved citizens' living standard substantially.

Joan Clos, the Mayor of Barcelona, said: "We believe, to the general public, the most important public policy of the government is to take care of the quality of public space. Mr. Serra who has been the Mayor for three terms, Mr. Maragall and I totally experienced five-terms as the Mayor, during the time, over four hundred public spaces were created approximately. This kind of public space improvement plan should not be temporary but continuous. It is an ongoing process, a sustainable project, and it should never be finished."

3.2.1 It is the people who are the masters of urban space – “Calle Brasil” renewal project

With the popularity of automobiles, urban public space is increasingly invaded by cars: Street space was turned into traffic lanes, and city plazas were changed into parking lots. Facing the overwhelming traffic noise and car exhaust, people found themselves at a loss and had to put on breathing masks and walk nervously along the street edge. What is forgotten seems to be: people should always be the main body of a city.

Calle Brasil was originally a 50m wide trunk road. Since 1996, construction work has been underway: the former 26m wide traffic lanes in the middle of the road were turned into a three-level construction, the ground floor being the fast trunk road, the middle level a parking lot, while the top, which is 16 meters above the original road, being well-paved pedestrian lanes with grass, trees, rest benches and children's playground. Some ground traffic, which is small in number, is divided into the single-lane streets on either side of the pedestrian lanes. The scene unfolds like this: The traffic, which was originally dashing madly on the road, are now directed underground. (Fig 10) Only a few cars are passing by on the single-lane roads (with speed limit). Pedestrians are walking in the middle of the road lightheartedly, accompanied by wind blowing over branches and birds singing mildly. Now, people have truly become the masters of the street space. How wonderful everything is! The renewal of “Calle Brasil” is a direct demonstration of people's courage and creativity to change the overcrowded city traffic trunk.

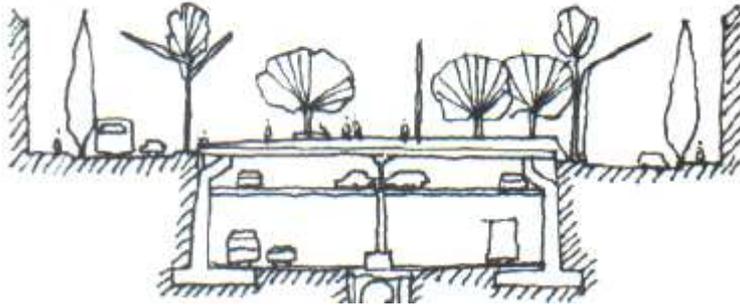


Fig10, Sketch of calle Brasil section

(Source: www.bcn.es)

3.2.2 Open the city to the sea – “Moll de la Funsta” renewal project

As a coastal city, Barcelona’s waterfront area was all occupied by docks, industrial facilities, highways and railways in the industrial era, which formed a fault zone between the city and the sea, leaving the densely-populated old town virtually no chance to get access to the sea. With the aim of directly connecting the old town and sea as well as setting up some public activity space along the coastline, Barcelona municipal government completed the planning in 1982 and, from 1990 to 1993, accomplished the renewal of the coastal avenue “Moll de la Funsta”.

This is the key project in the whole coastline reconstruction. After the renovation, Moll de la Funsta’s function as a main traffic road was reserved, but its transporting capacity was reduced and part of the lanes were capped by roofs. Further, the section of the road was rebuilt, connecting the city traffic to the waterside pedestrian area. All these measures have combined to create a public leisure space with graceful waterfront scenery. (Fig 11)

Finally, in designing the transition from the downtown area to the coastal region, architects have used platforms of various levels. In essence, a former industrial area has been transformed into a humane urban activity space.



Fig11, Views before renewal (left) and after renewal (right)

(Source: www.bcn.es)

3.3 Zang-Fu – Large scale city areas

Besides acupuncture points and main and collateral channels of a city, cities also need larger scale areas to achieve a good circulation, these regions are connected by acupuncture points and main and collateral channels in the thinking of Chinese acupuncture therapy, these regions can be recognized as Zang-Fu, which is usually referred to our organs which are directly related to human health, as we can see, for a city, especially in the renovation of Barcelona, to update these regions is particularly important. (Fig 12,13)

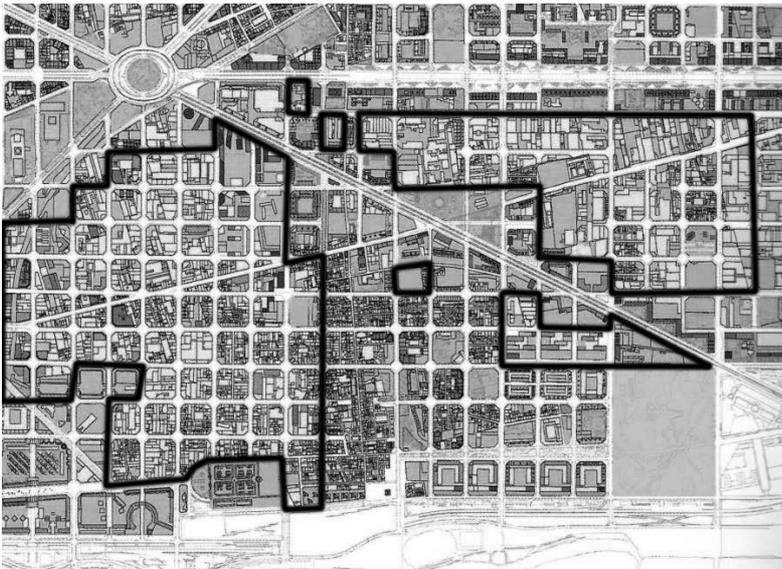


Fig12, City areas in Barcelona

(Joan Busquets, Barcelona: the Urban Evolution of a Compact City, 2005)



Fig13, Zang-Fu in acupuncture therapy

(<http://img.zhzyw.org/2010051315510186277.jpg>)

In the process of Barcelona's industrialization, the favorable "waterfront" condition led to continuous expansion of ports, piers and industrial facilities as well as the constant increase of their traffic connections. Especially, during Franco's Dictatorship (1939-1976), the pursuit of economic efficiency and profits was placed well before the attainment of urban space quality. As a consequence, at the end of his rule, all coastal areas of the city were occupied by docks, industrial facilities and traffic lanes.

Due to its special geographical position and other features, the waterfront project is particularly significant for the city's development pattern, structure and its modernization drive. The project serves as a breakthrough point in the city's renewal process and a key acupuncture point in its progress.

Taking advantage of the 1992 Barcelona Olympic Games, the city, as one of the major measures of its downtown renewal project, transformed its "acupuncture points". In line with the basic principles of road structure and neighborhood characteristics in Cerda's extension area planning, architects extended the traffic grid southward to the sea and enlarged the neighborhood area. In this way, not only the large scale buildings were inserted into the city grid decently but also the traditional city fabric and street scale were protected well. Meanwhile, in the spirit of "open the city to the sea, the waterfront areas once occupied by ports and factories were turned into delightful hydrophilic platforms and elegant beaches, offering the citizens a high quality

public space and better living standards.)

3.3.1 Continue to open to the sea – the golden opportunity of the Olympic Games

It is the second period for Barcelona's urban policies started with the city's 1986 nomination to host the 1992 Olympic Games. While Barcelona had already embarked on its physical renewal, the Games provided the necessary public (national and regional) resources to finance the city's large-scale public works projects. For too long the city had been a passageway for tourists heading to the beaches, and politicians recognized that Barcelona's role as a modern city and tourist attraction had to be expanded to provide a new economy. By introducing the Plan for Hotels in 1988, the City Council laid the foundations for a future tourist industry (interview with José Acebillo, urban planner, 3 May 2010).

Jesop Acebillo, who was Barcelona's urban development planner said: "The city needs modernization. We must proceed to the next stage and we need a larger-scale improvement plan." In 1986, Barcelona was elected the host city for the 25th Olympic Games, which was undoubtedly a golden opportunity for Barcelona to have a substantial transformation.

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Making use of such a mega event as the Olympic Games, Barcelona, in the spirit of "open the city to the sea", started with the Olympic village and the Olympic Port. The city of Barcelona mobilized all resources to further reform and development of the city, and a significant city reborn was undergoing.

The Olympic village and the Olympic port were planned and designed in 1986, and the construction work was completed in 1992. The site is located in a deserted old industrial area in the waterfront area. The place once had a military fortress and some factories where the railways blocked the way to the sea, forming a "back" of the city.

The project involves a series of important processes: the removal of the coastal railway lines, the transfer of the ring expressway to the underground; treatment of sewage discharged into the sea, and the construction and maintenance of the new beaches. Many related service facilities, hotels and restaurants were also relocated to this area, so that the whole region developed vigorously and became an emerging urban recreation area and tourist site. When the Games were over, the apartments in the Olympic village which had become sought-after estates facing the city's middle class served as an engine for the development of the waterfront residential area. The Olympic port was practically transformed into a private yachts wharf for the city's high-income class. In a word, the whole region has become one of the city's iconic sceneries.

There are several other waterfront reconstruction projects in the same period: Old port highway project (Fig 14) – the subsidence of part of the ring road by the old port, making it possible for pedestrians to walk from the

old town to the seaside; Barceloneta pier promenade street project – being part of the old town reconstruction project which also includes the old port highway project. This promenade street becomes the city center’s entrance to the seaside.; Barceloneta coastal avenue project – reconstruction of the former running-down coastal residential area in the waterfront area, creating several waterside public activity spaces of diverse functions. These projects connected different types of public space along the seaside – the old port, Barceloneta residential area, the Olympic port, New Ikaria and Beauty harbor. These projects have shaped a continuous waterfront interface starting from the old port, making the area the most impressive public space in the whole city.



Fig14, Planning of the Olympic port

(Source: www.bcn.es)

3.3.2 Reshape the city as a whole space – extension of avenue “Av Diagonal”

After the Olympic Games, Barcelona continued to play an active part in engaging in or hosting international mega events as a means of enhancing the city’s charm and world status. In line with this guiding principle, in 2004, Barcelona held the first session of the World Cultural Forum, which promoted another round of large-scale waterfront development projects.

The Forum’s main venue was set up at the estuary of Besos River, at the end of the city’s main axis-Avenue “Av Diagonal”. For this occasion, Barcelona built a conference center, a zoo, hotels, new marinas as well as a new university campus. The city also turned the existing sewage treatment facility into a solar power plant. The power plant in used would be blocked up and transformed into other facilities. Beyond that, Barcelona also established a high-speed railway station, expanded the airport and the port area had been moved to the western suburbs, made the information and tertiary industry the city’s core business, and last but not the least, extended the convenient and efficient public transportation network (mainly referring to the subway and light rail network system) as a key step in the strategy of the metropolis’s sustainable development.

After the “World Cultural Forum”, the city’s main axis –Avenue Diagonal, was extended to the beach. (Fig

15) The venues and cultural facilities in this region are still in use, and this place has, due to its special location at where the starting point of the urban waterfront meets the endpoint of the Diagonal Avenue, become a popular tourist site and an important node in the city overall structure. After integration, the city's original debris area was reincorporated into the city overall space structure. Until this moment, Barcelona had obtained a continuous waterfront public space as long as 4.5 kilometers and accomplished the renewal of its overall urban space structure.

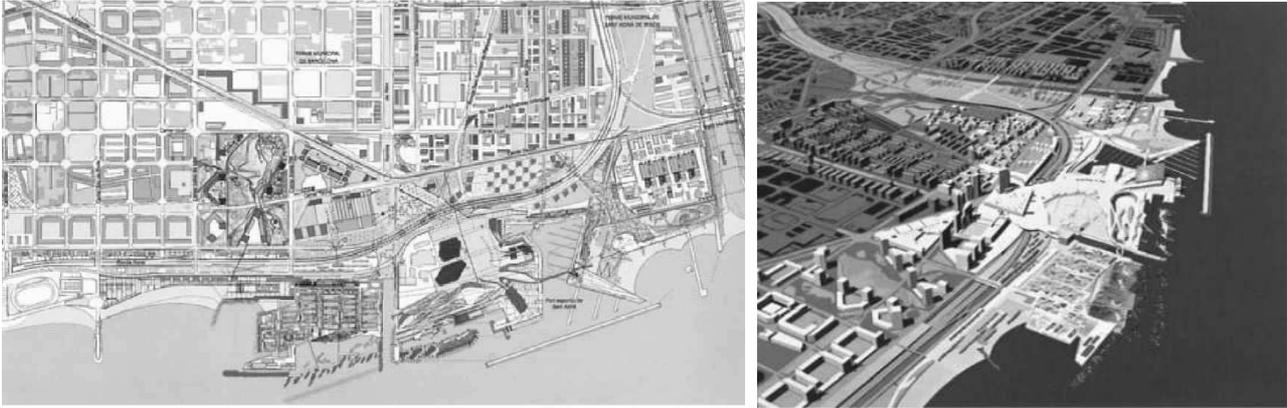


Fig15, Planning of the extension of avenue “Av Diagonal”

(Source: www.bcn.es)

4. SUSTAINABLE DEVELOPMENT OF THE BALANCED CITY – THE BACELONA MODEL

It must be a perfect sustainable city that cares about everybody's dream city life, promises each citizen a happy urban experience and ultimately honors its word. In accordance with Cerda's ideal in the 1800s, the city took a great opportunity of the great evolution in society creating the transition from the agricultural society to the industrial society, injected humanistic feelings into the decaying Barcelona, created friendly and kindly city space, turned the citizens into real masters who can live happily in this city that gives priority to their demands. It can be said that Cerda had laid the most basic and important foundation for the city's thrive in this one and a half century. In essence, Cerda's development ideas can be generalized as focusing on the people and creating happy citizens.

With the wheels of history rolling on, Barcelona has come to the transitional period from the industrial age to the post-industrial age. Various conflicts and contradictions emerged and intensified gradually, city's existing physical environment and infrastructures were far behind the actual needs of the people. Citizens' wonderful city life was nowhere to be found. The city was in bad need of renewal.

Joan Clos, mayor of Barcelona, said: "We have to continue Barcelona's transformation from an old industrial city to a new city, a city which is not crowded and has slightly outward expansion. But the process of the expansion should be careful. In the process, nature and city's heritage should be well protected. In other words, we are thinking about sustainable development issues. How to keep the city growing? How to make economy, labor and everything else grow? But let us not decrease the quality of the city. The city should live forever."

Growing up in Cerda's ideal city, and inheriting Cerda's ideal social pattern, people in Barcelona created a brand new Barcelona Model to rebuild the aging city. With the target of "return the city space to the residents",

Barcelona continues its renovation of the dotted urban leisure space, the linear city roads, and the surface-like waterfront area. The city has endowed its outdoor space with more leisure functions and snatched itself back from the roaring machinery to give it back to the citizens. The residents can now enjoy sun, breeze and the sea to their hearts' content.

Similar to the operating principle of acupuncture and moxibustion in traditional Chinese medical science, Barcelona started with dots and gradually transformed lines and surfaces, which, ultimately, made the whole organism (the city) balanced between Yin and Yang, achieving what traditional Chinese medical science calls "strengthening the positive and eliminating the evil" as well as "promoting health and curing diseases".

City acupuncture therapy regards city as an organism, in the process of the city's rebirth and development, manages to locate the city's meridians and stimulate its acupuncture points, that is, it carries out a small-scale interference to some specific locations, activates their potentials and promotes their renewal and development, which can have a positive effect on the larger urban region as well as cure some of the city's diseases.

For the city which can be seen as collection of living organisms, if its meridians and acupuncture points are eliminated, what is left is its Qi of blood which maintains the city's normal operation. On the surface, the city acupuncture therapy is applied to urban space, neighborhood and grasslands. However, in the final analysis, it is dredging the city's meridians and Qi of blood, in other words, dealing with people's living environment. Only when the people's daily life is improved, the basic human need is satisfied, can the city maintain its balance between Yin and Yang and have a long-term sustainable development!

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