

The Pragmatic Construction of London

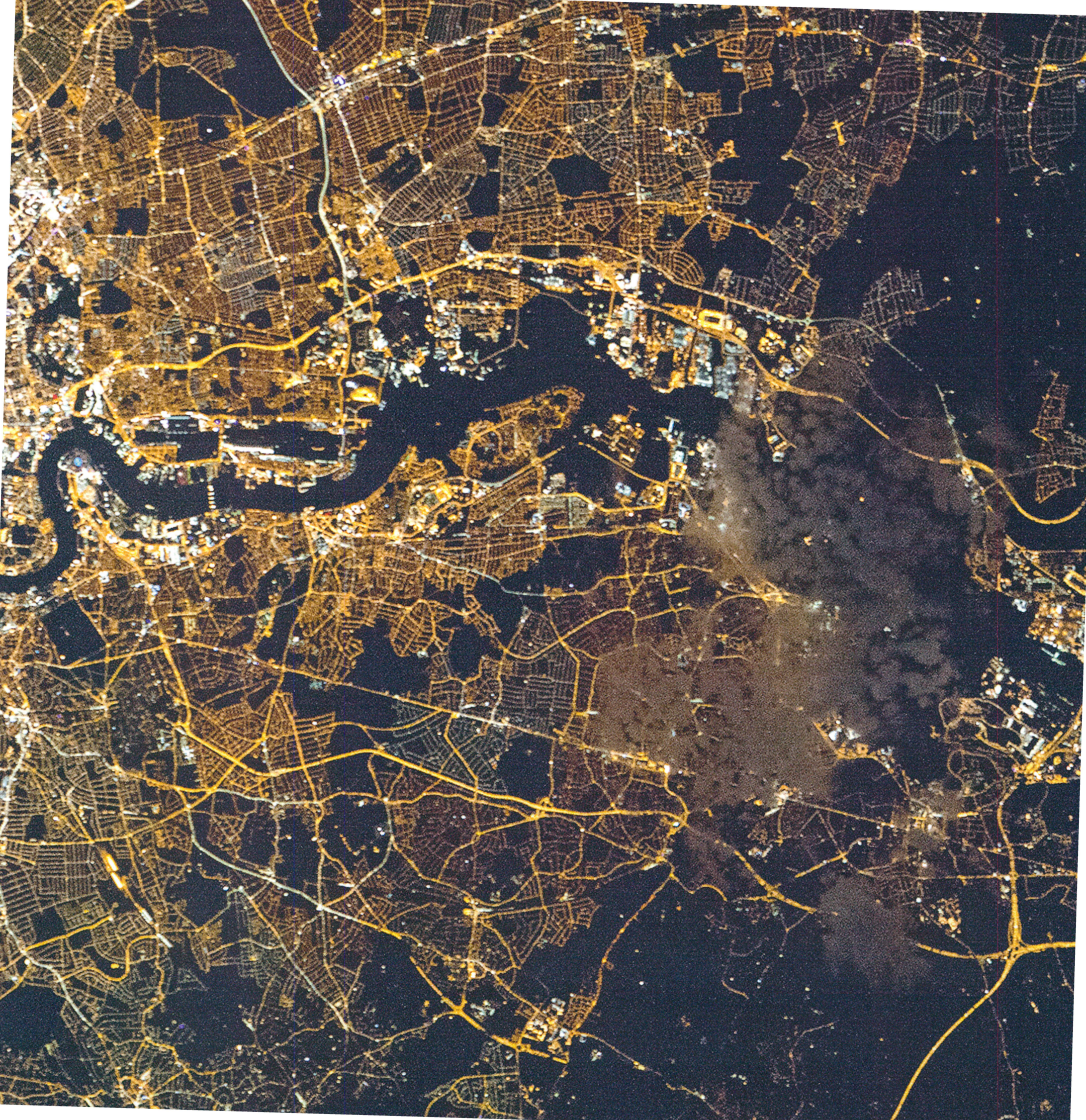
THE PRAGMATIC CONSTRUCTION OF LONDON

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ACS
ACTIVIDADES DE CONSTRUCCIÓN Y SERVICIOS





Anyone who comes to London for the first time is fascinated by its size, its architectural versatility and its undeniable charm. The British capital combines that traditional nineteenth-century atmosphere of its neighborhoods, churches and palaces, heirs of an empire that spread throughout the planet, with the modernity that makes it one of the most innovative and dynamic cities in the world, favored by its condition as Europe's first financial place.

Strolling through its hidden streets or leafy parks, entering the modern buildings of the financial and business center of the City, crossing its amazing bridges over the River Thames, immersing yourself in its extensive Underground network or visiting its prestigious museums give an idea of the vitality the city breathes, where different cultures mix, multiple languages are spoken and different nationalities coexist. London, more than life, has a soul.

This London soul is reflected in its landscape, as this new book from the ACS collection dedicated to the main cities of the world tries to capture. *The Pragmatic Construction of London* describes, in a concise and entertaining way, the evolution and urban growth of the city from the mid-nineteenth century to the present, with the important changes experienced as a result of the industrial revolution born in Britain two centuries ago, the economic and social development of the last century, and the globalization of this century.

The ACS Group, through its various construction and service companies, has also contributed to the transformation of London during recent years, especially its Underground transport network with the construction of several sections of the Crossrail link as well as the renovation of several stations of its famous suburban railway.

If you intend to visit the city, I advise you to take some time to read this book first. It will undoubtedly enrich your stay in the wonderful city that is London.

Florentino Pérez
President of the ACS Group

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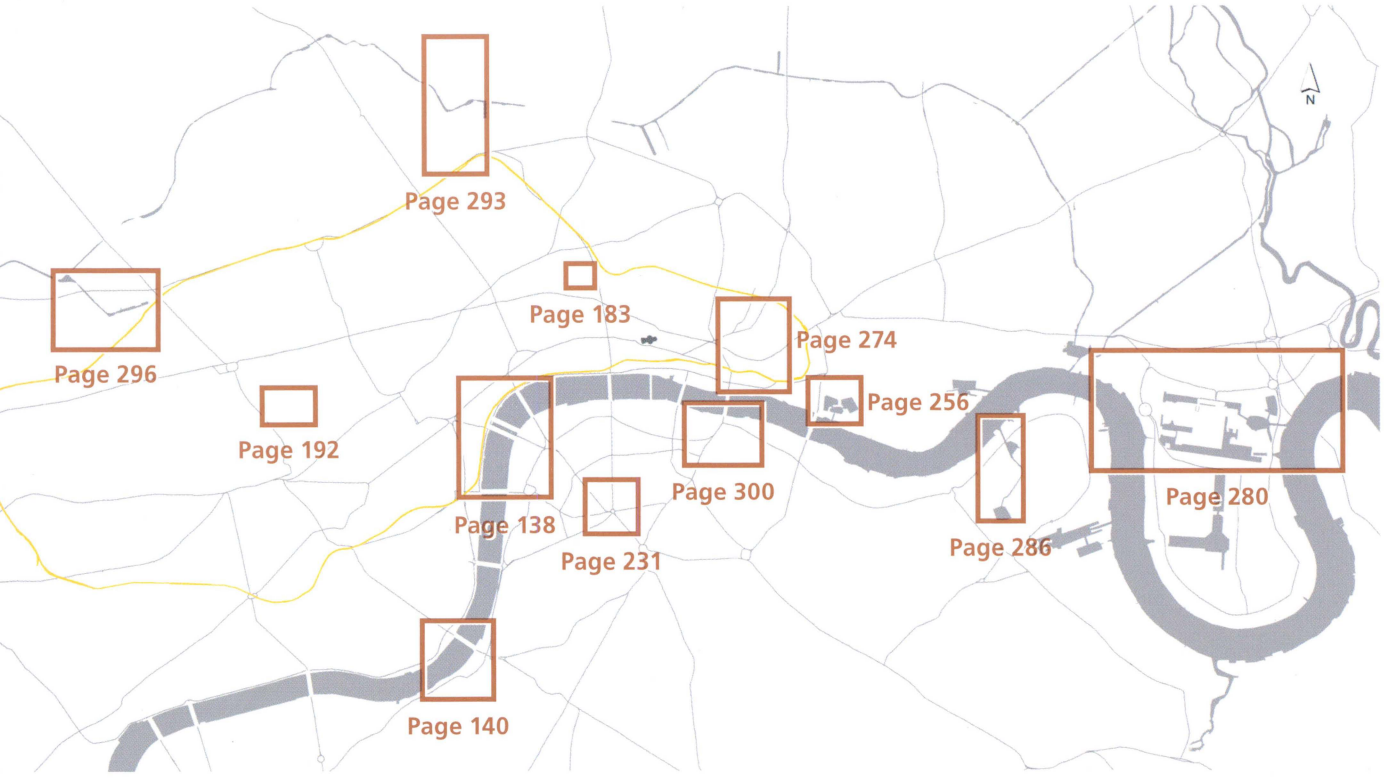
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Google earth

1 | Introduction

Page 4-5: London at night [NASA, ref iss045e032242]

London has been written about thousands of times. As an ancient, extensive and populous city, it has been the motif and inspiration for poetry, drama, stories and essays. Each period of its history, place of its geography and characters have been watched, analyzed and described from a variety of perspectives, then narrated, drawn or photographed in thousands of books. In its many bookstores there is always a large space full of books about London itself.

A conceptual obstacle, perhaps less evident, but formidable, must be added to the difficulties of covering so much information. Having been written about thousands of times, London has served as a basis for establishing urban and transport concepts and theories, which are key to understanding the city, so it would be tautological to explain the city through them. Maybe they could be useful for another city, but not for London.

Paraphrasing William James in his 1907 lectures on Pragmatism, *the world of the street is multiple towards infinity, muddled, muddy, full of pains and vacillations. The world where we intend to introduce* 'the philosophy of the city or the built' *is simple, clean and noble, classically structured, without the contradictions of real life.*

But, far from being a description of this real world, it is rather an addition built upon it, a sanctuary where the rationalist fantasy can take refuge, fleeing from the confused and gothic character of mere facts. It does not constitute an explanation of our concrete universe, but a substitute, a remedy, an evasion.

In London, theory's inadequacy to explain the city becomes evident and, all the more, the aspiration to predict or direct its growth. This should not be understood as a defeat, but as a challenge. It is a matter of developing a vision of the city, precisely from the facts, looking for the reasons and contradictions of what has been, without trying to adjust to what should be or could have been.

Parallel to these first two obstacles, a self-imposed difficulty arises, which derives from the focus of this collection of ACS books. They are not history books, nor catalogs of works, nor tourist guides, but rather they try to offer a synthetic vision of the built. And that's never an easy task, but it gets complicated when the information is overwhelming and the basic concepts revolt against themselves. It is necessary to make choices, but any selection must offer a significant image or representation of the city as a whole, not just of a partial aspect or specific area. And as we hope to enter into the city of today, the first thing is to decide how this story should begin.

Choosing a beginning is always arbitrary, but this book 'must' begin exactly in 1848. Many things happened in London soon before or after that year, which are often taken as chronological references of major changes in the city and country. It's not as if in that particular year one single event so important as to obscure the others occurred. But it was a key year because many things ended. And its choice is due more to the accumulation of abandoned ways than to a hypothetical stop or change in the pace of innovation begun in 1789. In fact, many treatises consider that the so-called Second Industrial Revolution, whose term went on until 1914, began in 1850. The official doctrine centers the cause of that Second Revolution in a new series of technical developments that led to greater technological and economic progress.

It is not a matter of downplaying inventions such as the transatlantic cable of 1866, the Bell telegraph of 1875, the Benz combustion engine of 1885, the Wright airplane of 1903, or the Ford T model of 1908, usually cited as the most significant ones. But what is relevant for London, what left a decisive mark in the city, was the protagonism of how it extended that industrial model based on the innovative techniques of the first half of the century, into the country and the world.

The city was already big in the 1840s, but in that decade it enters an economic cycle of capital accumulation that accelerates its growth, adopting what will be its final configuration. And that happened in the only metropolis in the country because, as Eric Hobsbawm states, *only one economy was effectively industrialized by 1848, the British, and consequently dominated the world* [64:168].

Once the beginning is set, the most significant themes and periods must be selected to understand the city. For this, four relevant epochs relevant to its formation have been distinguished. In each one of them a theme close to the world of construction has been selected and each theme has been concretized in a constructed element, although antecedents and consequences are included and other significant topics are mentioned.

We understand that these themes 'represent' each specific time and the type of work is capable of 'illustrating' its contribution to the construction of the current city. This procedure is inspired by the scientific discipline known as *Landscape Ecology* [49], where a territory is carefully observed, its main elements are identified and the most relevant are considered in depth to establish its structure and functioning.

The chosen themes correspond to dates and concepts used by the English historian Eric Hobsbawm (1917-2012), which are appropriate due to the materialist nature of his history, the role given to the industrial revolution, and the prominence of London. The sequence of revolution, empire, modernity and globalization that star in the titles of his four books,[1] is used here to order the book, but lags when it comes to analyzing their effects on the construction of London.

After this introduction, the second chapter considers the effects of the industrial revolution, centering on the railways as the backbone of mobility, and chooses *the station* for its maximum significance to the city, over locomotives, roads, or the processes of construction of its great works. It tries to explain the station's raison d'être and its role in the structure and functioning of the city, which is important as a fundamental part of its mobility and its capacity for reference and identity, as it is the most visible expression of the railway system.

The third chapter refers to the legacy of the empire, focusing on *the river* as the origin, border and boulevard of the city by way of docks and bridges capable of generating a built landscape: essential for the functioning of the city and for its imaginary. By providing longitudinal and transversal links, these constructions extend the city, provide new routes, eliminate borders and recover the river as a corridor. This multiple presence and functionality also includes its central role in the sanitation of all of London, control over which was decisive for health and the urban environment, and later used as a model in all the major western cities.

The fourth chapter considers the proposals of interwar modernity, concretized in the use and appearance of *the street*, which is a permanent problem in London, because there was never enough space for vehicles or pedestrians, but offer a 'sample book' of architectural styles and urban theories. Its ancient and crowded roads and streets, illustrate the radical opposition of the city to the automobile, the greatest emblem of interwar modernity, while revealing itself as a ubiquitous showcase of social inequality, aesthetics and uses, persistent but also capable of generating variety without destroying coexistence.

The fifth chapter reflects London's current status as a *global city*, which seeks to increase its density without spreading outwards, redirecting itself towards the financial, leisure and tourism services it offers to the entire world with telecommunications and airplanes. A densification in large office areas, equipped with good accessibility, ever higher and the cause of its changing skyline. Even though all this seems to lead to a certain banalization of the urban landscape, with façades, shops and restaurants, 'repeated' in all neighborhoods and 'identical' to those of other cities.

The shadow of the relationship between center and periphery, which is an essential feature of any great city, glides over the images and texts of the whole book. But, although it has been routinely labeled as a polycentric city, London has a center clearly defined by a string of railway stations, linked by an underground circular line. Its paths can not be seen and its stations are hidden behind the façades of large hotels, but its interior becomes conspicuous for everyday use and its position becomes a reference, thanks to the famous Tube Map, the underground map that governs the spatial image of the city.

That central city is supported by the Thames, on whose banks it was born, which limits it, travels through it and gives it access to the sea, from where its wealth entered and where its waste goes. Between its docks an enormous mass of water moves, renewed twice a day with the tides, and boats move. Its great width turns the river into a boulevard of the city, its banks into its best showcase and its route into the most precious promenade, but without limiting it thanks to bridges that link the banks but are also milestones of its course and referents of the adjacent neighborhoods.

It is true that the avenues and large squares are scarce, the roads are narrow and the sidewalks are crowded, but it is in the street where the strong character of the city shows itself and where its inequalities are evident. From its streets emerges the contagious energy that spreads through the city, although it does not reach the monotonous and straight streets with good houses located in the western zone, where there is little to see and less to do. From this luxurious emptiness, private cars take over, parked in front of houses or clogging lanes, but absent in the crowded eastern area.

In that periphery connected by the railroad less than an hour's drive away are the large gathering spaces for leisure and sports, and nuclei of residences where millions of people prefer -or have to- live instead of in the center. And from that center, London extends to the world, previously with boats from the river and today with planes from its five airports, to become one of the most visited destinations in the world.

Although it takes a long time, it is relatively easy to reach London's many places, but more difficult to get into their interstices, understand how they juxtapose with each other, assimilate how they relate. The new coexists with the old, takes advantage of it and feeds on its symbolic capacity, but the old regains vitality by incorporating elements of the new. You can not talk about mixing, because everything follows its place, it does not lose an iota of its character, it is only enriched by the adjacencies.

Nor is it plausible to apply the idea of 'collage' because there is no purpose or intention, there is no will to contrast things, it just happens. If possible, of course, there is critical judgment. Sometimes the result is correct and sometimes it is a simple disaster, but it will always be a posteriori judgment, an external assessment, not the result of a prior or premeditated will. The designers of these spaces, who are never fortuitous, know how to take advantage of what there is, by way of a persistent exercise of pragmatism.

Like the previous ones, this book is indebted to many people, among whom I wish to single out Professor Antón Capitel, who I visited the city with years ago when he spent a sabbatical there and to whom I owe -by acceptance or rejection- many ideas about London. Also Simón Salvador, architect resident there since graduating from university, who has provided me with data, images and even his texts on what is now brewing in the city, and with whom I have shared walks, dinners and long discussions. I thank Katarzyna Blackman for her contribution and sociological comments on the effects of the attacks in the city. Like other times, I thank the road engineer Guillermo Vázquez for his careful reading, comments and corrections of the manuscript. Also the architect Carlos Ferrán, former resident and good connoisseur of the city, to whom I owe a critical reading of the book from his long experience, which I deeply appreciate.

As always, the book has been possible thanks to the support and help of the usual group of collaborators, Patricia Hernández-Lamas, Beatriz Cabau, Óscar Castro, Santiago González Alonso and Antonio Sarabia, indispensable in the treatment of data, plans and images. For personal reasons, beyond their will and mine, I have been forced to travel alone most of the time, which has meant more travel and a slower and more reflective work pace, although perhaps more exhausting than in other years.

London is overwhelming but addictive. The further one enters it, the more city there appears to be discovered and the more attractive it becomes. Probably, those who read these lines will have visited the city, perhaps several times. I encourage you to come back and let yourself be carried away along any of the tracks suggested in the book, without worrying about how far or into the unknown they take you. You will enjoy it and you will want to come back.



2 | Metropolis of the Revolution

The Railroad. Stations

Unreal City,
Under the brown fog of a winter dawn,
A crowd flowed over London Bridge, so many,
I had not thought death had undone so many.

T.S. Eliot [42:65]

Crowds, Extension and Mobility

Huge and full of automata, / the soul of the modern city / is due to public transit. // A variegated city / of organic forms that / facing the boundaries that separate, / chooses the railways that join. // Density, height and congestion / need a mobility that is key for the city/ and in London is driven by private interest. // Its foundation evolves into three nuclei plus a river / that produce a complex administration, / an amorphous structure,/ and a large city, but overcrowded,/ with precarious healthcare, / with hospitals to alleviate misery, / and a control that generates repression.

Industrial, Not Proletarian Revolution

Proposals for electoral reform / to improve the power sharing in the City. // The meetings generate a geography of the revolution, / where decisive events occur / and the political climate attracts Karl Marx. // Power uses technology to stop the revolution / that passed from proletarian to industrial in 1851 / and it produces benefits and prosperity, / with the engineers as protagonists / who were popular heroes.

Railway in London

Railway leads the Industrial Revolution / and turns London into the Railway Metropolis. // A 'British' revolution, specific in time and place / due to cotton capital accumulation, / whose surpluses are invested in the railway / and generate the greatest engineering achievement in history. // Everything was cooked in London / and had started there. // The first two railway lines / ended up in the abutments of the London Bridge / to take goods from the port to the city. // In addition to the financial opportunity, / building railroads raises taxes / and building stations diversifies employment / with engineers, builders and architects. // First construction company. // Proposals for the railway traffic of the 1850s: / Crystal Way, Moseley, / Boulevard under Glass, Paxton, / a line to connect all the stations, / leaving a poorly accessible center without Underground tunnels, / that could be used with electrification, / achieving more reliable, faster and more profitable trains, / in tunnels that penetrated the city. // A later example, the Victoria Line. // Collateral damage by the tunnels, / even with current methods.

Victorian Stations

The station represents the company and the city / for which a picturesque eclecticism was coined. // After using sheds dressed as buildings, / the Euston portico explores and fails with the monumental/ and causes a debate between function and monument. // Growth requires adapting the plan to the function. // The hotel mediates between the station and the street / and it is presented as a railroad façade. // A mediated relationship, with diverse results. // Articulate the façade/ or get a front relief / does not mean giving more attention to the city,/ although there are some more elaborate solutions. // Outdated architecture and incipient engineering. // Victorian structural engineering. // The GWR has no place for Paddington, 1832, 1854. // The second Euston Station, 1849. // The third Euston Station, 1962. // The first relevant station. // Remodeling of King's Cross, 2016. // Structure of the Concourse. // The façade has finally been uncovered,/ while the square in front fills with things. // The largest glass cover for trains. // St Pancras becomes International in 2007. // Complexity and confusion in Victoria. // Liverpool Street, less structural and more decorated. // Columns, papyrus and bunting, around / a functional lobby and open to the street. // Complex stations and knots. // Patrimonial pride.

The Network Structures the City

Structuring stations / looking for a place to enter, / through agreements and provisional measures, / underground railways, / that are the first in the world. // The idea of a circular line emerges / from the pioneer Metropolitan Railway / and it is the germ of the network structure, / fixing the image of the city. // In fact, the prohibition defines the center, / travel defines the limit, / and the order and hierarchy of the stations / defines the center of London / and the structure of the city. // The complementary mesh of the Underground / becomes important with transfers / and get functionality and efficiency / with its spatial distribution in the city. // Comparison with other countries. // The most used stations. // London is built by regulating private interest. // The station as an image of the industry / brings a not very modern aesthetic / but it responds to a calculated pragmatism.

Crowds, Extension and Mobility

Huge and full of automata,

Eliot saw London as a *gigantic, unreal* city. *A city populated by millions of living dead, reduced to mere automata because of its moral hollowness and its isolation from what was once sacred*. He did not see a city full of dreams, but rather a daydream in itself, a nightmare. In his poem *The Waste Land* from 1922, London embodies for T. S. Eliot inner *void, dehumanization*, *barrenness* in human life. In the city that Eliot contemplates that *there are bridges, streets, squares, monuments, buildings, and even a river called Thames*; but it is *a devastated territory, in which the same men have frayed life; in it, nothing can thrive. We are all dead.*[1]

the soul of the modern city

With the penetrating title *The Soul of London*, Ford Madox Ford had already expressed his concern in his 'survey of a modern city' from 1905. He was looking for the soul, the spirit, the raison d'être of that vast and densely populated expanse of buildings, understood as 'modern' insofar as it produced both attraction and fright at the same time. He gave enormous value to the question of getting to and moving about in the city, to the point of saying that *the product of the quality of rapid transit is London itself*. Ford gave great importance to what today we would call the mobility of the city. The crowd had serious problems moving about the city, even by foot [47:46].

is due to public transit.

Perhaps all big cities are dead, or soulless, but London stands out on account of its response to the surplus of surface and population that leaves them empty and takes their life. In a pragmatic manner, London understood that the city could improve if everyone could move to and within it to meet each other and live together. But it did not try to do it like the rest of the big cities: it said *no* to private vehicles and bet quietly, systematically and consistently on public transit. And, in doing so successfully, London owes its current form and functioning to that public transit whose backbone is the railroad.

A variegated city

Ford was not the first nor last to notice the permanent variegation of a city so attractive for people of all races and conditions. Artists such as Gustave Doré try to visualize the presence of crowds that work, move about and observe, and understand it as a defining feature of the city. His engravings are never empty views, they are full of people, often in movement [39]. Poets such as Eliot try to grasp the essence of the city in its most peculiar manifestations, always starring the crowd [42]. Urban planners of scientific vocation such as Patrick Geddes search organic reasons for the form and functioning of the footprint built by such a vast population:

Greater London with its vast population streaming out in all directions east, west, north and south flooding all the levels, flowing up the main Thames valley and all the minor ones, filling them up, crowded and dark, in the map because of its population *and leaving only the intervening patches of high ground pale.*

of organic forms that

The acceptance of the metropolis as an entity scarcely delimited by natural boundaries entails a new conception of the city, quite removed from the walled medieval city, from the juridical limits of citizenry of the Renais-



Liverpool Station

sance or the drawn sophistication of the Baroque. This new entity tries to limit itself, it accepts growth as a vital element that shapes it as if it were a living organism. Geometry ceases to be the discipline to enclose and channel the city, which requires more open formal models. Geddes does not even think the 'octopus' analogy, structured in core and tentacles, is sufficient; he prefers forms devoid of any spatial organization:

Here, then…we have…the only, fairly accurate picture of the growing of Greater London. This octopus of London, polypus rather, is something curious exceedingly, a vast irregular growth without previous parallel in the world of life perhaps likest to the spreadings of a great coral reef [50:26].

For Geddes what is really important is the functioning of that creature, overcoming administrative limits with real connections between its branches: *for most practical purposes [London] is obviously a vast new unity, long ago well described as "a province covered with houses." Indeed a house-province, spreading over, absorbing, a great part of south-east England.*

facing the boundaries that separate,

chooses the railways that join.

It is impossible to understand or plan it by admitting the administrative boundaries as borders. It is necessary, on the other hand, to erase the lines that separate and hold onto those that 'unite,' that is, those that facilitate its operation: *instead of the lines of division we have new lines of union: the very word "lines" nowadays most readily suggesting the railways, which are the throbbing arteries, the roaring pulses of the intensely living whole* [50:27].

As Georg Simmel had asserted ten years before, *the city exists only in the totality of the effects which transcend their immediate sphere. These really are the actual extent in which their existence is expressed* [114:10].

Density, height and congestion

London had been growing year by year more congested, without its insufficient urban fabric of streets being put in question. *Originally there had been the Tower, a fortress-village with a walled town of mud huts round it, its roads mere footpaths, its space circumscribed enough. As the town grew*, continues Ford Madox Ford, *more important feudal nobles built palaces on the banks of the stream, crowds vast for their day came on foot or horse from the surrounding country or in ships from outer Europe.*

The difficult mobility drove the construction of taller buildings, favoring density as had already happened in the oldest civilizations. In London the same thing happened, with the peculiarity that the river always had a double and important role: as a relief to move by boat and as a privileged place to locate the best buildings.

The houses of London, indicates Ford, *climbed skywards along the narrow lanes – 'Elizabethan' houses, half-timbered, climbing up to six, eight and ten storeys, the upper ones bulging out and almost touching overhead to gain in the air the space that had to be ceded to foot traffic on the ground. Near the river were the houses of the 'comfortable' classes. These palaces of the kings and the great houses of the nobles crowded the face of the river that their owners might keep their private barges and have their own water gates. The others at the public stairs called 'Oars!' as to-day we call 'Cab'* [47:49].

they need a mobility that is key for the city

The streets were not enough for that crowd sheltered in the city. It was difficult to travel, not by car or buggy, but by foot. Streets were literally packed and with the general population increase caused by industrialization, *mobility became the key to the new city and the way to provide it had a fundamental impact on its form* [36:34].

The railway was revealed as the first technological resource to facilitate mobility and in many European cities led to the realization of urban plans to guide its growth. In London, where the railroad had been born, it was not the public authorities that drove it, but private companies seeking benefits. Their legitimate interests clashed with the - also legitimate - landowners and the role of government was to arbitrate conflicts.

and in London is driven by private interest.

The national government, the municipal and the institutions were basically controlled by the landowners, who managed to impose themselves on the interests of the railway industry and prevent any planning. As a result, the city was decisively configured as multipolar. However, as the railroad was revealed







Hertford Road Stables

as an excellent investment opportunity for their capital surpluses, the landowners noted its progress.

The successive laws enacted to channel these conflicts of interest resulted in a network of railroads and stations that, over the years and reforms, established the urban structure of London.

London was born as a gradual grouping of three ancient cities located on the banks of the Thames. To the north arose first the City, the city of the bourgeois and merchants, which is linked by means of a street called The Strand, with the nearby Westminster, located upstream on the same shore, the city of the king and the government.

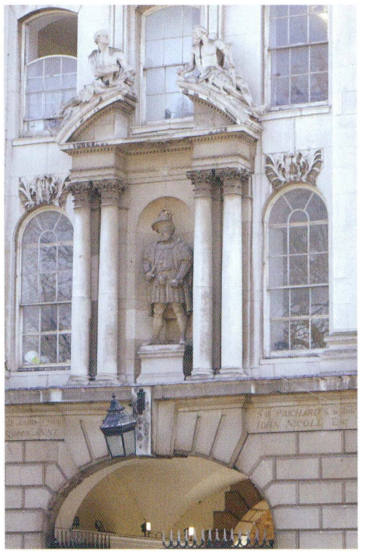
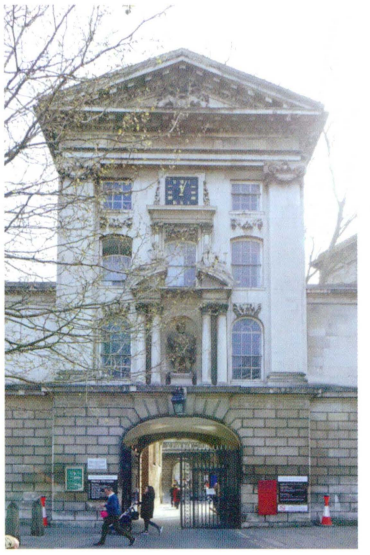
Its foundation evolves into three nuclei plus a river

The construction of London Bridge since the Roman foundation of Londinium -then the City- gave rise to the Southwark nucleus on the other side, on the south bank of the river. Born as a suburb of the City, but consolidated as a neighborhood and then a city with a cathedral, bishop and town hall, it joins the City and Westminster to form London.

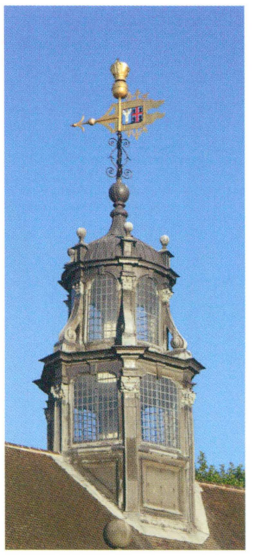
Subsequent additions of other parishes or built nuclei, like Chelsea and many others, extended the limits of the city giving rise to a multipolar metropolis, encompassed in major administrative areas such as London County Council or Greater London Council.

that produce a complex administration,

That long process maintained certain local administrative institutions of the merged nuclei, which generated a complex global system of government,

St Bartholomew's Hospital

St Thomas' Hospital

impossible to address here, but to which one must go again and again to understand situations, shortcomings or actions of planning or construction.

an amorphous structure,

As Antón Capitel sums it up, *London is the sum of many nearby towns, which over time were added, and this explains its structure, somewhat amorphous and random, without geometric layout, huge, full of green spaces and very low density. In addition, London has a great river, the Thames, so wide as to be a port that, in the absence of another layout, is its primary structural feature. The river did not have a central condition -that today it is reaching- except as border.*[2]

and a large city, but overcrowded,

At the beginning of the 1800s the population and size of London amazed all visitors: in twenty years, the population went from one million to 1.6 million inhabitants. In 1827 the German poet Henrich Heine writes, *London has surpassed all my expectations in respect of its vastness, but I have lost myself. Blackened by coal smoke, the houses at the end of every Street were barely visible in the winter months, because of the all-pervasive fog* [51:99].

Coal smoke, fog, and sanitary conditions made the crowded environment of a crowded city worse. The poet points out a still noticeable tension when one visits or thinks about the city almost 200 years later. It is the amazement of the look before the great and magnificent, accompanied by a discomfort at being there. When this contrast, felt by the individual, moves and nourishes the crowd, discomfort turns into protest: London was already a center of wealth and power but, as the seat of the national government, it was also the main focus of dissent and radicalism.

Population in millions of inhabitants

Year	500	1000	1500	1600	1700	1800	1900	1950	2000
Paris	0,05	0,10	0,18	0,33	0,60	0,75	3,75	6,20	9,80
London		0,01	0,10	0,15	0,55	0,86	6,51	8,20	7,75
Moscow				0,10	0,15	0,50	1,17	4,85	10,13
Berlin				0,01	0,07	0,27	1,89	3,34	4,10
New York							4,20	12,46	17,36







Guy's Hospital

In London, cholera was pandemic for long periods, such as 1829 to 1851, with strong outbreaks in 1832, when it claimed 6,500 lives in the city, that amounted to 55,000 throughout the country, and in 1849, when it took another 14,000 lives. The city reacted by advancing a public health law in Parliament in 1848 and choosing as its first Medical Officer of Health a St John's Hospital surgeon, named John Simon, who showed great ability to carry out health reform. *Gradually, the city's dirty party gave way… Led by Simon, the City rode out two cholera epidemics with conspicuous success and emerged as a shining example of sanitary progress* [102:297].

with precarious healthcare,

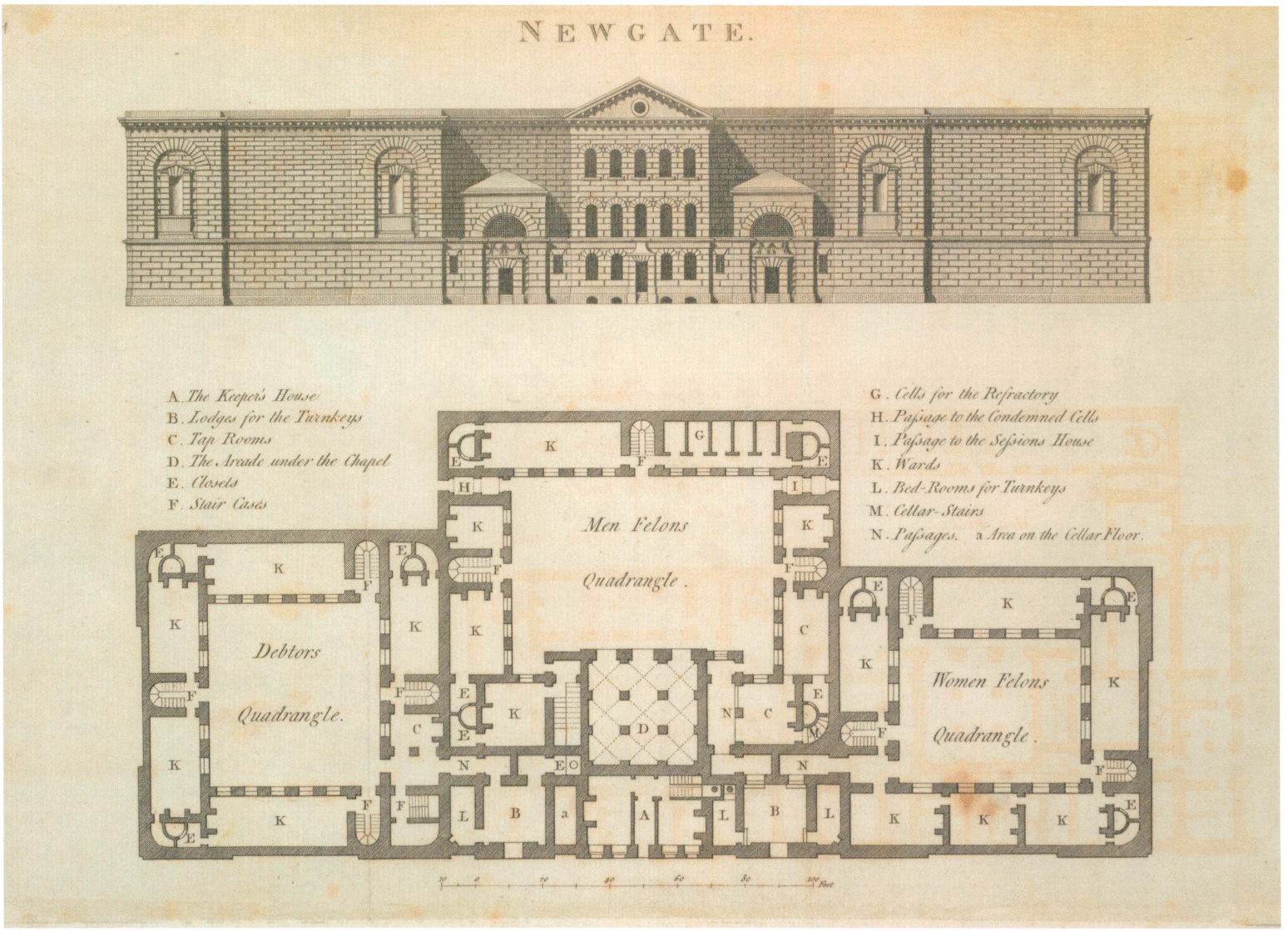
The next cholera epidemic in London in 1854 -which claimed 230,000 lives in Spain- centered on a particular area of Soho, around Broad Street - now Broadwick Street. The system allowed Dr. John Snow to link the origin of the disease to a public source located there and that discovery led to the creation of the Metropolitan Board of Works in 1855 to solve the sanitation, with the engineer John Bazalgette in front, whose role is detailed in 3.3.

In 1844 the influential medical journal *The Lancet*, created in 1823, claimed that the hospital system in England was essentially bad. *The hospitals were charitable institutions that could only relieve a certain amount of misery* [108:3].

with hospitals to alleviate misery,

In London, the system relied on old hospitals; among them, St Bartholomew's Hospital, known as Barts, is the oldest in London and next to the church of St Bartholomew the Great (1123) is located in Smithfield. It emerged in 1123 and was refounded in 1546, although its main buildings were completed around the 1700s. St Thomas' Hospital of Southwark had a similar evolution, as it was founded in 1215, re-founded in 1551 and rebuilt in the early 1700s.

From the 1860s, several Southwark buildings were torn down to make way for the railroad and the rest merged with Guy's Hospital. St Thomas' moved to new buildings on the Albert Embankment, opposite Parliament.



Newgate Prison, plan published in 1800 [British Library, Grace Collection]

and a control that generates repression.

Controlling a city of that size required a high level of repression and regulation, especially with the English, then well known in Europe for their combativeness. *Those who controlled the wealth and the power of the city ensured that those who did not were aware of the penalties for infringement of legal codes*. Repression was met by resistance, and prisons loomed large in the popular imagination, especially Newgate, located in Old Gate, and now headquarters of the courts, but also those of Fleet, Clink, Bridewells and others spread over Clerkenwell, St Giles or Southwark. *It was very easy to get into prison if you were poor, and pretty easy to be hanged* [51:3 and 75].

Already before the beginning of the century, the English government had to deal with the overcrowding of inmates. Alleviation of the saturation of prisons and prison ships was attempted by banishing the convicts to the United States, until the proclamation of independence, and then to the newly discovered Australia, where Sydney was founded as a prisoner colony. The idea that these convicts were political prisoners, or even dangerous assassins, spread for a while, but half of them were under 25 years old and almost all of them were punished with excessive penalties for theft and common crimes against property, according to a very strict criminal code [10:31].





New Court

The Royal Courts of Justice-Old Bailey

Industrial, Not Proletarian Revolution

Overcrowding, repression, overcrowded prisons, harsh working conditions and a hostile urban environment coexisted with an antiquated system of government that was unable to cope with the new situations produced by the nascent industrial revolution. One of the earliest reform proposals focused on Parliament's electoral system, chosen only by landowners and urban or rural tenants with contracts of more than 50 pounds. Industrialization generated a type of wealth that was not represented in the system, but the proposals did not question the fact that the voters had to be owners but rather the type of property to be taken into account, challenging land as the only source of wealth.

Proposals for electoral reform

Sometime later the issue of the circumscriptions arose, seeking a representation of nuclei and cities more adjusted to the population. By the 1800s, cities such as Leeds, Manchester, Birmingham and Sheffield had no representation, while the universities of Oxford, Cambridge and Dublin had five MPs (Members of Parliament), and other old centers with a few dozen voters received two MPs per constituency.

London was different. The City was one of the largest constituencies, with four MPs for 8,000 voters called 'livery' for membership of a professional association (heirs of the old guilds), while Westminster with 18,000 residents had two MPs, like Southwark. The city of London, with its long history of struggles for self-governance stretching back to medieval times, was a long way short of a full democracy, but it was still more democratic that practically anywhere else in the Country [51:100].

to improve the power sharing in the City.

In London, moreover, the national government coexisted with a local government of ancient origin that encompassed the surface of the primitive medieval city, now equivalent to the financial center of the City of London. That government of the City represented the mercantile interests of the merchants and industrialists of the area, but had no power over Westminster, where the national government was located since the seventeenth century, or over Southwark, located on the other side of the London Bridge, nor over the territories located outside the old walls.

In addition to being limited spatially, its power was also limited to certain issues, and conflicts with the national government and the Crown were frequent. However, there was a basic rationality that allowed maintaining that power structure, because the Crown needed its money and the City needed guarantees of control of the environment where it got that money, with business, industry and commerce [51:5].

The meetings generate a geography of the revolution,

To the traditional discontent over the form of city government, radical reform initiatives were added, such as the self-managed proposals for production and exchange that arose around the ideas of Robert Owen at Spa Fields in 1821. Or the *Westminster Committee* of 1807 that, promoted by the radicals and supported by some newspapers, brought together shopkeepers, merchants and small producers to get representatives in Parliament. On the other hand, among the new industrial workers the idea that it was necessary to organize to gain strength was beginning to spread, but it will take a few decades to come to fruition.

First political support emerged in newspapers such as the *Political Register* in 1815, societies or clubs of more or less formal political action appear or revive, such as the *London Institute*, the *British Forum*, the *Athenian Lyceum*, the *Polemic Club*, the *Socratic Society* or the new *Robin Hood Debating Society*. Regular political meetings are organized in classic pubs such as the *Crown and Anchor Tavern*, in new venues created for them, such as the *Dissenting Chapel* of Archer Street or Hopkins Street, or the network of agrarian clubs like the *George* in East Harding Street, or the *Mulberry* in Moorfields.

These meetings of activists coexist with the masses in marches, processions and demonstrations, held on dates and places that leave marks in the city: the meetings at *Spa Fields* in November and December 1817, the demonstrations of *Palace Yard* in 1818 and *Smithfield* in 1819, when the leaders have to shout from the windows of pubs or taverns, like *Merlin's Cave Tavern* in Spa Fields. To this are added the conspiracies, of greater risk for their fragility in the face of informers, such as the one dismantled in *Cato Street*, near Edgware Road in 1820, which ended with the conspirators in the Tower of London [51:103].

where decisive events occur

The city had always been the front of political mobilization, but the new industries of massive using coal or cotton did not have in London the central role achieved in Manchester or Leeds. It grew as fast or more than those industrial cities but, before the explosion of public transport, its expansion was creating relatively isolated nuclei, *without a pan-metropolitan sense of collectivity.*

In the North, the Midlands, Wales or Scotland, the old chartism was demonstrating great activity with the proliferation of reformist proposals. But what happened in London reached another projection. On June 9, 1836, a meeting





Tavistock Street in Covent Garden

Quo Vadis restaurant - Karl Marx, Dean St.

takes place of a few friends at 14 Tavistock Street in Covent Garden, where they decide to found the *London Working Men's Association* - LWMA, which soon becomes the cornerstone of chartism.

In that headquarters the six points of the People's Charter are agreed: the universal vote from the age of 21, its secret nature, the end of the qualification of owner to be MP, the remuneration of MPs, and the equal representation of the constituencies. The document is signed in a decisive meeting of six MPs and six other chartist leaders, on June 7, 1837 at the British Coffee House in London.

Ten years later, London is again the scene of decisive confrontation, in the climate of the commercial recession of 1847-1848, when the revolutions in Europe, beginning in February in France and spreading to Berlin, Vienna, Milan and other cities, took place. Crowded protests multiply, marking moments and places like Kennington Common, Bethnal Green, Somers Town or Paddington. Some decisive ones, such as the one of May 29, 1848 from Clerkenwell Green to Trafalgar Square, which marks the definitive fall of chartism.

and the political climate attracts Karl Marx.

After the fiasco of Berlin, Karl Marx arrived in London in 1848, where he believed there was an ideal situation to spread his ideas among workers unhappy about their working conditions, and that same year he published his *Communist Manifesto* with Engels there. He will live in the city until his death, for 33 years, first in a room on Dean Street, in Soho, now occupied by the restaurant Quo Vadis, and then in a more secluded house in Maitland Park, in Hampstead, now demolished. He meets with friends and activists in the pubs of Soho and Tottenham Court Road, in Covent Garden establishments, and in taverns like The George Inn or The Anchor in Southwark [51:105 *et seq*].

Power uses technology to stop the revolution

The possibility of a proletarian revolution begins to circulate around the city and attempts to counteract it with a great idea, the celebration of a Universal Exhibition to sing the glories of the Industrial Revolution and transmit its benefits. In the words of Juan Benet, *it was a question of setting up a showcase where the order and solidity enjoyed by the islands were shown, in contrast to the fragility that the European courts had exhibited in the face of the revolutions of 1848* [15:99].

After convincing Prince Albert to lead the initiative, the city manages to realize its purpose and open the exhibition in just two years. It was a record time for a new and far-reaching initiative, but the fear of revolution was real - in the broadest sense of the word - and was linked to an abstract fear of the multitude. In the *Arcades Project* (G9,3), Benjamin collects a letter from Prince Albert to his mother in 1851, where he writes:

The opponents of the exhibition are hard at work.... The foreigners, they cry, will start a radical revolution here; they will kill Victoria and myself and proclaim a red republic. Moreover, the plague will surely result from the influx of such multitudes and will devour those who have not been driven away by the high prices on everything [17:316].

that passed from proletarian to industrial in 1851

The enormous success of the exhibition triggered economic expectations, inaugurating an era of unprecedented prosperity. The industrial revolution proved to be stronger than the proletarian revolution, and its effects managed to eradicate it. Marx was then interested in the investment fever of those years and locked himself in the British Museum to write *Capital*.

With time, the date of the disappearance of the revolutionary threat in all Europe was fixed at 1848, when Marx recognizes that in London the conditions for the revolution did not occur. That marked the beginning of a new era, whose first splendorous construction was Crystal Palace, dedicated precisely to extolling the achievements of English technology and prosperity, arising from the other revolution, the Industrial Revolution.

Although its immediate influence was minimal and its modernity was suspended (see 5.5), the building and the exhibition changed the city, the country and the direction of the world. The iron inheritance in Coalbrookdale and the steam engine generated a frenetic pace of innovation, materialized in a time of unparalleled realizations.

The Universal Exposition of 1851 decisively marks the character of the following epoch, when the anguished side of modernity seems overcome and one enters the pursuit of progress. Although one speaks of a unique Victorian engineering, whose echoes will not be extinguished until the construction of the Firth of Forth Bridge in 1889, after 1851 everything is different.

and it produces benefits and prosperity,

In 1859, Charles Dickens takes stock and qualifies the change: *It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity ... in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.*[3]

In the second half of the century, peaceful and prosperous, British engineering lost its initial impulse. The ingenious solutions, the audacity, the sense of direction, genius, gave way to complacency, purification, the repetition of schemes, the many benefits. The dissociation of theory and practice begins, of project and construction, specialization appears. Juan Benet picks up the repercussions in London:

Progress would become the religion of the time, the trademark of the British spirit, its best export product ... London was already, of course, the capital of that spirit, the Rome of the new religion, the nerve center of that trade. However, the palpable evidence and the physical features of that progress, as well as the new industrial artifacts on which it rested, were slow to reach the capital, to which they gained access, well into the second third of the century, by a long and slow detour [15:45].

At the end of the 19th century British engineering fades, losing its undisputed previous primacy. The center of interest of bridge construction is clearly moving towards the great American metal bridges, relying on the fantastic achievements of Eads in Missouri and Roebling in Brooklyn, and the first babblings of concrete by European builders [4: 62].

with the engineers as protagonists

However, during the golden age, the 'Great Age,' the champions of that progress were the engineers, who first became influential people, then subjects of the great transformations, until upon their death they became true heroes of the country. The names of the engineers linked to the construction of stations, bridges and the railway itself are well known, but less so those related to supply and sanitation, such as Joseph Bazalgette or the architects fully involved in ports and other public works, but they will have to wait for the next chapters.

It is necessary to mention here their two great predecessors, John Smeaton, the first to call himself a civil engineer, and Thomas Telford, builder of roads, canals and ports throughout England, master above all others and author of some of the most attractive proposals of London.

In those years, however, this great generation of engineers ages rapidly. It is quenched by its own energies, *rendered unusable by the pressures of the new world that they themselves had helped to create*. Brunel, Stephenson and Locke die within a few months of each other between 1859 and 1860, and with them the faith in human ability to impose itself with nature, through scientific and material progress.

who were popular heroes.

They were true heroes, with immense popular prestige despite their failures or weaknesses, which made them more human and more understandable. When Robert Stephenson dies in October 1859, *the whole nation mourned him. By special permission of the Queen, his funeral cortege passed through Hyde Park on its way to Westminster Abbey where his body was buried beside Thomas Telford, and the whole route was lined by silent crowds. In his home county, all shipping lay silent on Tyne, Wear and Tees, all work ceased in the towns and flags flew at half mast. In Newcastle his 1,500 employees parade through the streets to a funeral in which a whole town participates. It was as though a king had died, but where was his successor?* [110:161].

Crystal Palace, Paxton, 1851

There is a certain unanimity in considering Crystal Palace as one of the most important buildings in the history of construction. It was finished in time for The Great Exhibition of 1851, using iron and glass in such a way as to inaugurate a new way of building that will transform the world. However, the choice of the author and the construction system did not derive from the goodness of the project, nor from its adaptation to the spirit of modernity that permeated that exhibition.

Everything was more casual. The contest of projects convened in 1848 for its realization was abandoned, because it seems that there were no factories in London capable of supplying the enormous quantity of bricks necessary for such a gigantic building. The possibility of using iron arose from the place where it was to be built, Hyde Park itself and the precedent of the great greenhouse built at Chatsworth for the Duke of Devonshire by his senior gardener Joseph Paxton.

Paxton was asked about the possibility of building a similar construction for the exhibition: he soon presented a project that, according to the notes of Walter Benjamin (*Arcades Project*, G2a8), *provided for fireproofing, plenty of light, and the possibility of speedy and inexpensive assembly, and it prevailed over those of the London Building Committee* [17:300].

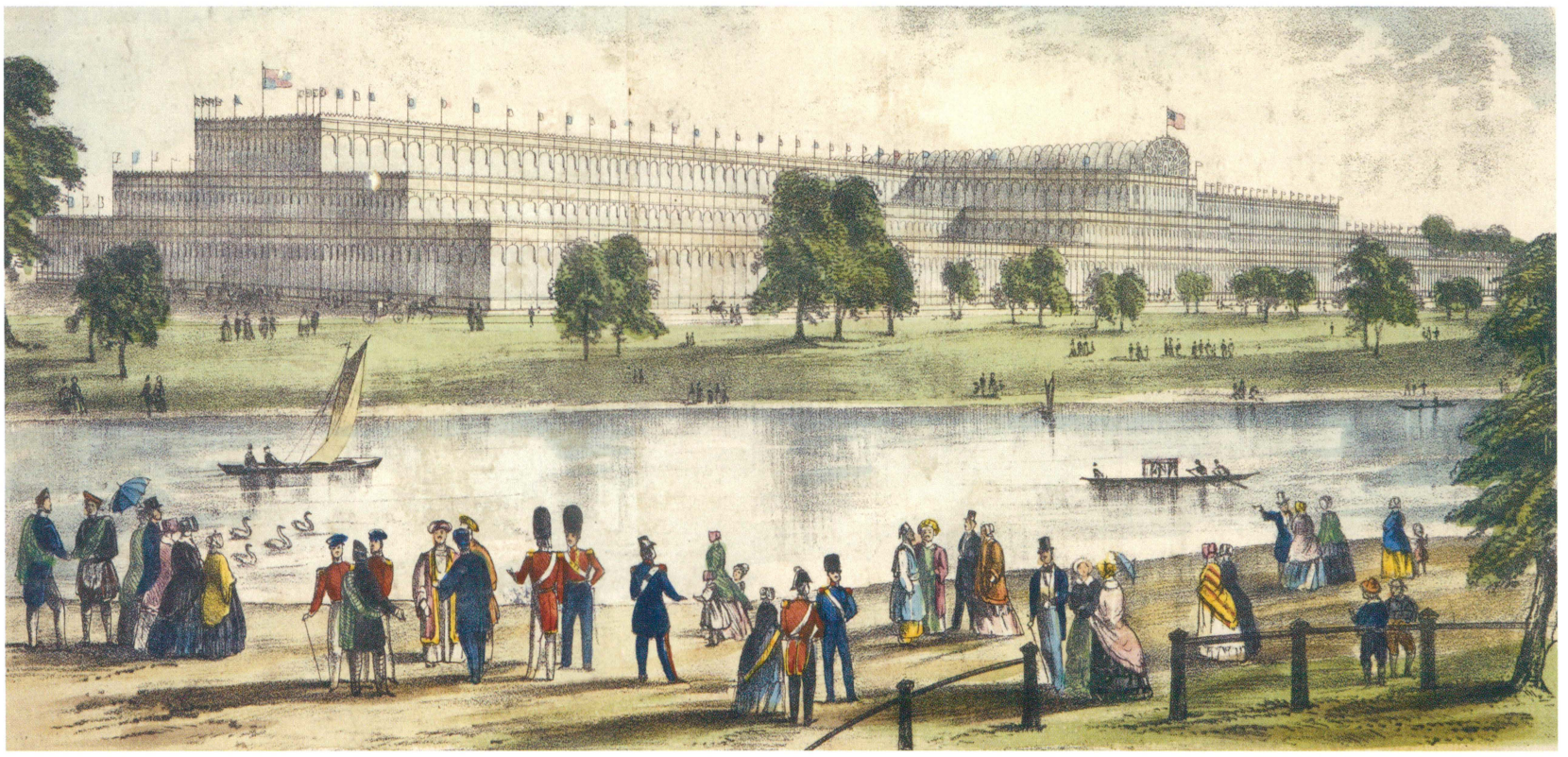
In July 1850 the Illustrated London News *published his revolutionary design for an immense exhibition hall of iron and glass. Construction began in Hyde Park in September. By January 1851 the number of men employed rose to 2,112. They fixed 2,300 cast-iron girders on to 3,300 columns, and emplaced 900,000 square feet of glass, mass-produced in standard units, into 202 miles of wooden sash bars… It was dazzling* [102:354].

In February 1851 it was opened to the public, registering an average daily attendance of 40,000 visitors, including Queen Victoria who visited it 34 times, after having made eight other site visits, accompanying Prince Albert. In total, six million people visited that 'galaxy of splendor,' of which 165,000 had traveled to London on rail trips organized by Thomas Cook.

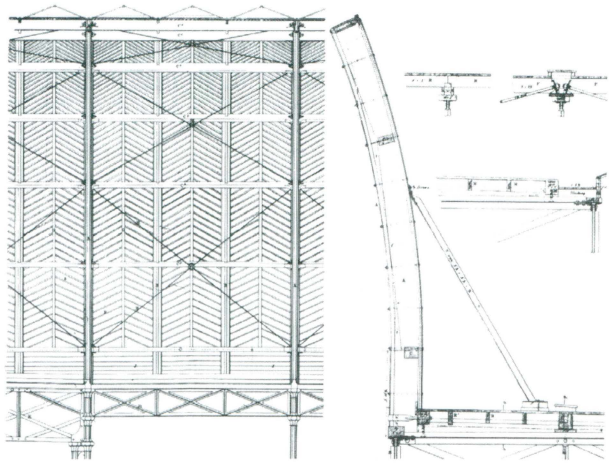
'Thirty years ago,' The Times *declared, 'not one countryman in one hundred had seen the metropolis. There is now scarcely one in the same number who has not spent a day there.'* Porter says that, *as usual,* The Times *got its figures all wrong, but the general point was true.*

Everyone made money, Porter continues, *-business people, the government, and even the Exhibition Commissioners, who used the profits to turn South Kensington into a cultural quarter. The Exhibition attracted working-class and middle-class alike, and all the dire fears of vice and revolution proved unfounded. So popular was the Crystal Palace that resistance developed to its removal. A company was formed to re-erect it elsewhere, and Sydenham was chosen* (see 5.5) [102:291].

The experience of its construction in central London in record time by the gardener Joseph Paxton was decisive for the iron structures in the buildings. With columns of cast iron, lattice beams for slabs and ceilings, and wooden and iron arches for the main nave, established according to an impeccable modular system, this



Crystal Palace, Hyde Park, London: view across the Serpentine, 1851 [©RIBA Collections, ref.68916]

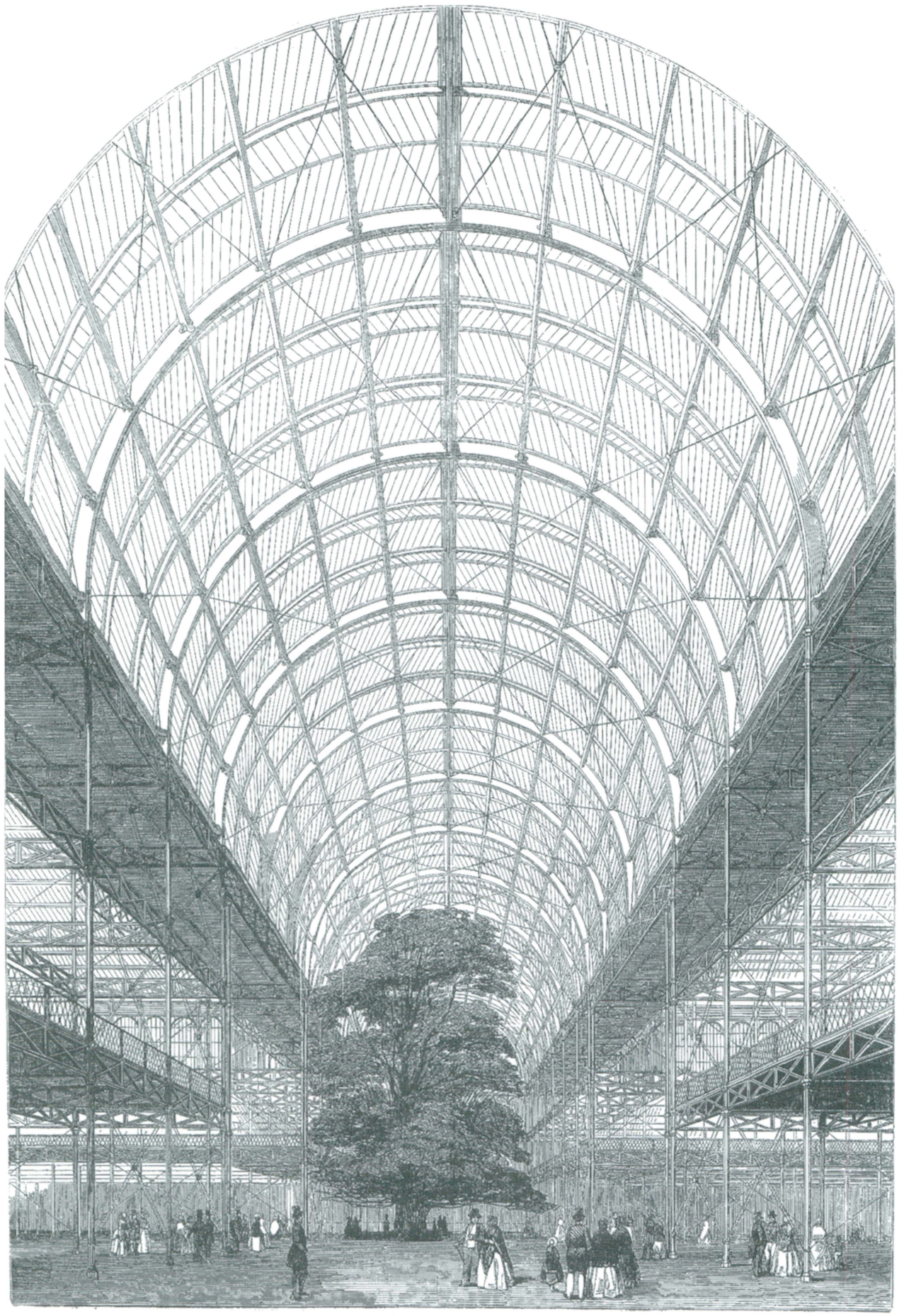


specialist in greenhouses established the principles of the skeleton metal structure. Principles that already included the systematic bracing of the porches by means of diagonals and a very strict modular discipline.

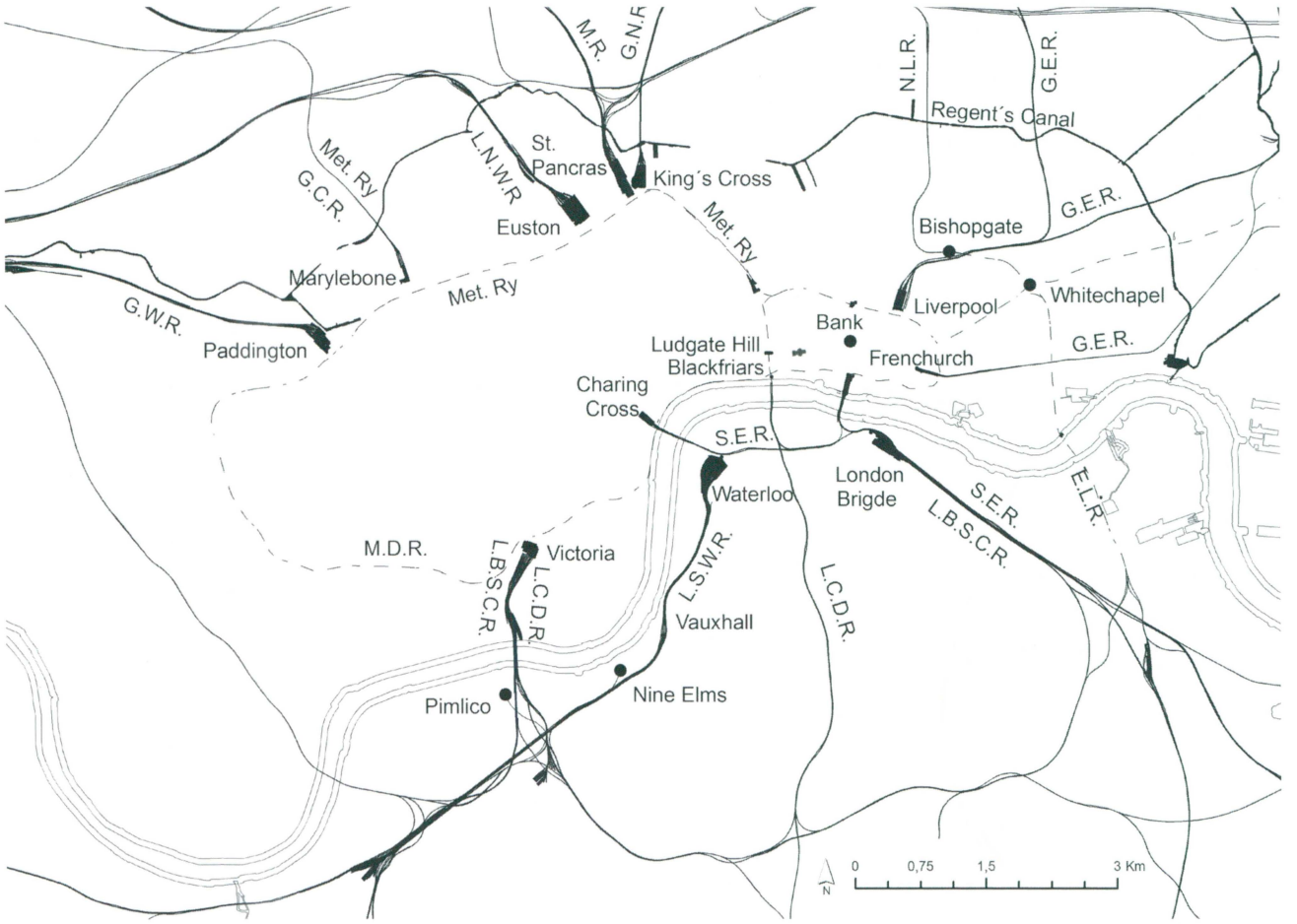
In his memorable *Eisenbauten* (Iron construction) of 1907 [90], Alfred Gottfried Meyer points out in particular three large constructions as an emblem of the role of new materials. Crystal Palace in London, the Galerie des Machines in Paris and the Eiffel Tower are the three fundamental milestones that respectively indicate the future of the building, the roof and the tower.

In them, and for the first time, the new materials demonstrate all their potential to overcome the history and permanently alter the course of construction. Thanks to iron and glass, they manage to transform traditional architectural spaces, eliminate their statism, extend what has been built outwards and allow the reciprocal entrance of the landscape into the building.

The height of the central body of Crystal Palace, the gradation of the sides and the high transverse nave have a function similar to those of the low side aisles of the Galerie des Machines de Paris, helping the space to escape through the new bays and the transparency of the crystal. In the Eiffel Tower, it is no longer the space but the air itself that penetrates and escapes through the steel filigree of the latticework. In their own way, each of them points out a new relationship of the constructed with its context that will mark a 'modern' way of doing things.



Crystal Palace (Paxton,1851) [87: photo 28, 58]



Stations and railway lines, 1968

Railway in London

Railway leads the Industrial Revolution

Meanwhile and in parallel, the effects of the Industrial Revolution have started to change the world and begin to be noticed in London, where railways will play a leading role: their stations are analyzed here, explaining their evolution, their reason to be and their role in the structure and functioning of the city.

The usual description[4] of the Industrial Revolution does not explain why it took place in England, nor the real role of railways in its progression: it is assumed that they are a simple product of technological advances, whose economic consequences produce important social changes. From there, the story focuses on when it all began, what the consequences, sometimes tragic, were, and if it really was a revolution or a simple change of pace in technological development.

and turns London into the Railway Metropolis.

However, to understand the city of London, which became known as the Railway Metropolis, it is essential to delve into the real role of the railways in the evolution of events. And it will be the historian Eric Hobsbawm who reflects in depth on the causality of each one of the factors of that chain and relates its real progression with the country, the city and the concrete moment of its appearance.

In his essay *Origin of the Industrial Revolution*, Hobsbawm examines the reasons commonly used by historians to justify one such 'revolution.' He



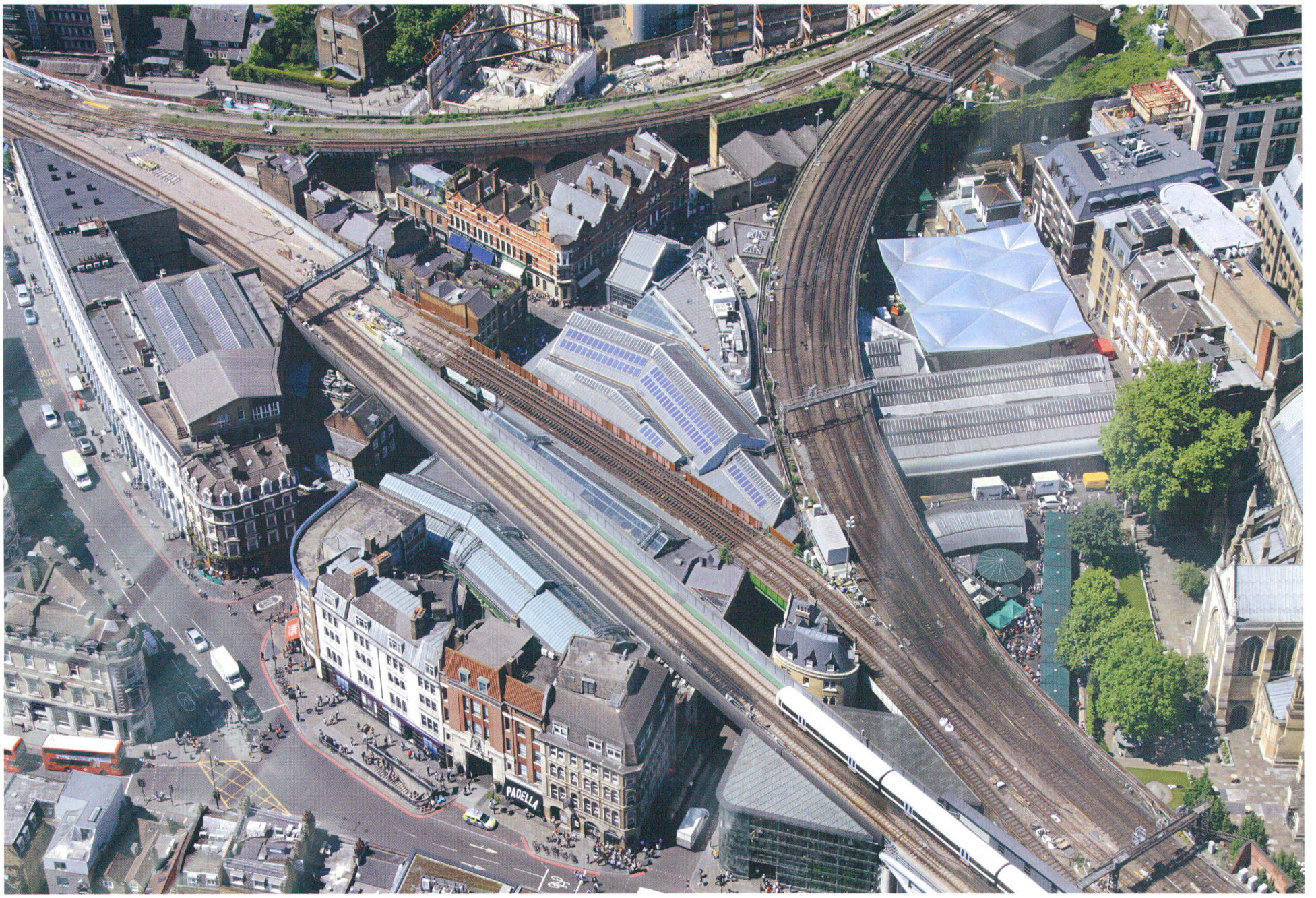
Every day London [39:163]

begins by reviewing the arguments against the existence of a true industrial revolution, showing that it was not a mere acceleration of economic evolution, but something much more important. Then he dedicates himself to refuting or considering insufficient the commonly mentioned causes of its appearance.

In the first place, he considers it indispensable to accept that: *the British industrial revolution is not a general problem: on the contrary, it is a specific problem, for three reasons: 1) it is the problem of an individual country, in a particular situation; 2) it is not only the problem of 'economic development' but also unforeseen and revolutionary 'takeoff'; 3) is no longer the problem of an industrial revolution in undefined social conditions, but in the social conditions of capitalism*.

A 'British' revolution, specific in time and place

Immediately afterwards, *in no other country (of comparable extension and population, at least) the farmers and the producers and merchants of small mercantile activity were eliminated to such an extent; in no other country was the urbanization so complete, nor economic liberalism accepted with so few objections* [65:93].



Railway yard from the Shard

Then he discounts that the British technological revolution is due exclusively to scientific discoveries, to technical inventions [p.94], to the apogee of the capitalist spirit [p.95] or to economic development [p. 96]. Neither can the demographic variable be considered as the cause of its permanence [p.99], nor agriculture, nor the mere existence of a massive increase in demand due to overseas trade [p.100]. Nor, finally, can it be based exclusively on the greed of investors' profits [p.101], a hypothesis that he finds more solid but that cannot explain the enormous force of the phenomenon.

due to cotton capital accumulation,

In order to explain the magnitude of the British technological revolution, he considers it fundamental, on the other hand, to highlight the particular reasons for the occurrence of two decisive economic phenomena: the initial take-off and the scope of capital goods.

Regarding the takeoff, he points out *the role of absolute primacy that the cotton industry played in the industrialization of Great Britain and the importance of the international economy in this process*. Between 1820 and 1860, exports of British cotton fabrics to Europe increased by 60%, but those destined for Latin America, the United States, India and China multiplied by ten, from 70% to 950% of European consumption.

In terms of obtaining a sufficiently large capital base, the limited demand for iron, caused by machinery or for military purposes, was not enough to make the industry grow by an order of magnitude. The progress that led to overcome the threshold of one million tons of iron occurred in the mid-1830s, mainly by the construction of railways, *whose capacity to consume iron and steel -in relation to time- is practically unlimited* [65:109].

However, Hobsbawm continues, neither the demand for rail transport, nor the expected profits, nor the hackneyed 'railway madness' can explain the unforeseen explosion of railway investments, which absorbed the annual capital surpluses of the 1830s and 1840s.

whose surpluses are invested in the railway

From that observation, he reverses the terms and raises a more suggestive hypothesis: *Would it not be reasonable to argue that the railways were created by the pressure of the accumulated surplus, unable to find an adequate outlet in existing industries, unable to absorb new capital?* And then he clinches: *from the point of view of the investors, if the railways had not existed it would have been necessary to create them* [65:112].

In another of his books, Hobsbawm makes a global assessment of what the construction of railways entailed. By 1875, the world had 62,000 locomotives, 112,000 wagons and almost half a million freight wagons, whose transport capacity was 1,370 million passengers and 715 million tons of goods, equivalent to about nine times the average annual sea transport of the decade. In quantitative terms, the 1850s and 1860s were the first really significant era of railways.

and generate the greatest engineering achievement in history.

The construction of the great trunk lines naturally gained the most publicity. It was indeed, taken as a whole, the largest body of public works and almost the most dazzling achievement of engineering known to human history up to that date. As soon as the railroad left the uneven topography of England, its technical achievements became more remarkable. Roads climbed to unprecedented heights and, once there, penetrated into large tunnels to link the cities, decisively contributing to the construction of the world. The first of the great alpine tunnels, the Mont Cenis one, was begun in 1857 and finished in 1870, and its 12 km shortened to twenty-four hours the trip to Brindisi [66:55].

Everything was cooked in London

And all this was 'cooked' in London, where capital was attracted by the business opportunities generated by iron, locomotives, coal, ports, railways or iron bridges. The economic activity around this set of materials, techniques and management capacity extended to the country by rail lines from London stations, or was exported to the whole world from the ports of the Thames.

The bridges were manufactured and pre-assembled in large workshops in Birmingham, Liverpool or Newcastle, although they were contracted, de-

signed and directed from London, where they returned fragmented into pieces that could be transported by rail to be shipped to Bilbao, India, the United States or Australia. The workforce also traveled, with engineers, businessmen, foremen and English laborers who staged or collaborated closely in the construction of lines around the world.[5] When the shipyards and factories of London were located in other places and countries,[6] the city maintained its financial and management capacity to continue doing business around the world, first as the capital of the Empire and then as a global city of commerce and tourism.

and had started there.

The germ of the technological and investment acceleration favored by the railways was located, as it could not be otherwise, in London itself. There were the capital, the talent, the entrepreneurial capacity and the workforce but, above all, there was the opportunity capable of initiating and driving the process, which was rooted in the appalling mobility conditions of the city. With narrow and crowded roads, the only relief was found in the river and canals, whose margins accumulated all economic activity.

When the railway era began, London was already the largest and most populous city in the world. It was densely built on flat land around the primitive nuclei of the City and Westminster, located on the north bank of the river, with a marginal area on the other side of the river, in Southwark. It stretched five to eight kilometers north to the Hampstead hills, encompassed the Roman port to the east and opened to open field at Marble Arch to the west. In 1840, the population of 2.2 million inhabitants more than doubled that existing at the beginning of the century.

The first two railway lines

The first railroad in London was the Surrey Iron Railway, a horse-drawn streetcar built to carry goods to the Thames, which had been authorized by Parliament in 1801. In fact, it was the first public railway in the world and its route operated on the banks of the river Thames from Wandsworth to Croydon, a distance of about 13.5 km, to service the many mills and factories located on the course of the Wandle River.[7]

The first steam railroads were born with a suburban vocation, such as the London & Greenwich Railway -LGR- line of 1838, which ended at London Bridge Station, next to the south abutment of the bridge, and the London & Blackwall Railway -LBR- of 1840, that did so in Fenchurch, near the north abutment. Both were built on brick vaults to minimize the occupation of farms and properties, better solving the crossings with streets and roads. They linked the London Bridge and the port areas of both banks located downstream of the bridge, to transport their goods to the nerve center of the city.

they ended up in the abutments of the London Bridge

London Bridge Station was inaugurated in December 1836 by the Lord Mayor of London, although it was somewhat beyond his jurisdiction, and the event was attended by 2,000 people, despite its small size. It was little more than the termination of a long 800-arch viaduct, with the vestibule and offices below. The LGR line did not reach Greenwich itself until two years later and there was talk of making a large triumphal entrance arch that was never built. But there was enough vision to buy more land than necessary in London Bridge, with capacity for eight tracks.







London Bridge Station (1836) - old viaduct with later Underground entrance

London Bridge Station in 2017

London Bridge Station and Shard





Fenchurch Street Station

Local plan two stations and routes

Nowadays, the most glittering station in London is about to be inaugurated, fitted exactly in the old plant by means of innovative design and construction solutions. It fits into the Shard, the 310 m high skyscraper -the tallest in London- designed by Renzo Piano and built between 2003 and 2012.

Fenchurch Street Station (1841), now a small station sandwiched between large office blocks that extend also above it, was the first station located on the north bank and, therefore, in the interior of the City. From there, it was not necessary to cross the London Bridge to enter the city. It is a clearly urban building, with a classical façade, symmetrical, with a row of tall windows in the upper part coinciding with the lobby and a long and narrow entrance canopy, with wooden slat skirting making a wavy drawing of picturesque air.

The first two railroads in London were isolated examples, but not for long. Neither of them would justify the 'railway age' in London, and even less in the south of England. This is an important point, because it wasn't the railways of London that changed the course of history and the development of the conurbation; those that made the big difference were the railroads built around London to 'feed' the city.

to take goods from the port to the city.

As for their design, not these, but the later stations lack interest, with their functional trusses to cover the platforms that, as pointed out by Prof. Carroll Meeks, *coming so long after the Crystal Palace, they can hardly be considered an example of its influence, though they represent the lesson which might have been learned from it* [88:85].

Even valuing all this, *is to risk understating their importance*, Wragg emphasizes, since *the railways were not simply a means of transport for London; they were also a business and financial opportunity*. As the historical synthesis of Hobsbawm mentioned above gathered, the railroads played a great role in the development of the British financial system, and it was their insatiable thirst for investment that served as a stimulus to the development of the stock market and strengthened the concept of anonymous society, together with the limitation of liability of shareholders.

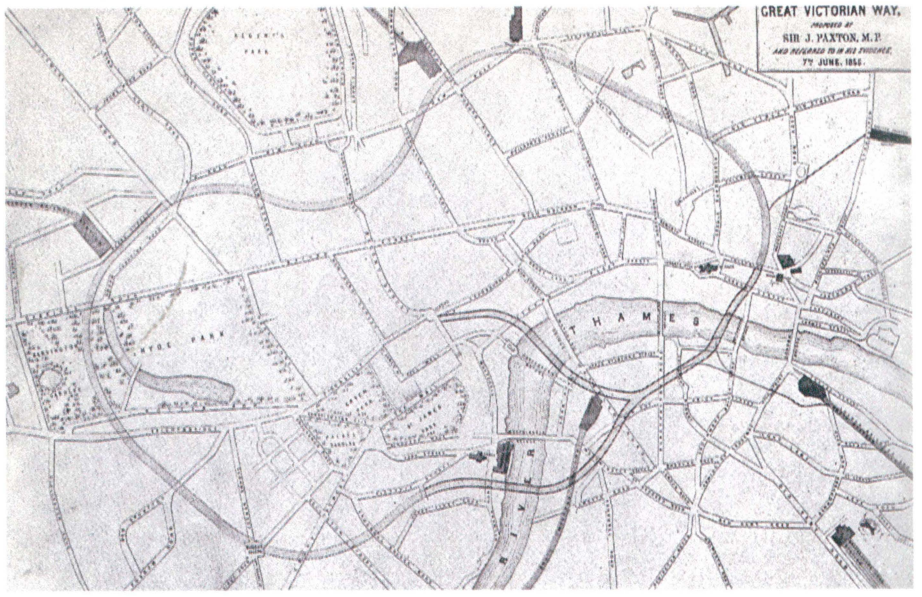
In addition to the financial opportunity,

Moreover, being developed by private interests, they had to be regulated and, strange as it may seem today, when large public subsidies were poured into the railways, they had to be taxed [145:2-20]. Despite their elevated construction, the pass bands caused a huge upheaval, demanding demolitions and displacements of thousands of residents. The construction of the London terminals was as conflictive as an airport in modern times, with increasing difficulty as they approached the more populated interior. The arrival of the London & South-Western Railway to the Waterloo terminal, which was then very small and was located south of the river in an area not overly populated, required the demolition of 700 houses (see page 225).

building railroads raises taxes

Many prestigious English civil engineers participated in the design and construction of the railway and London stations. In principle they were hired by the concessionaire companies of the different railway lines with responsibility for the whole line, but one of their tasks of greater relevance

and building stations diversifies employment



Plan of the Great Victorian Way, Paxton, 1855 [Report from the Select Committee on Metropolitan Communications. London, House of Commons 1855]



View from The Shard

was the design of the *Termini* stations, where the company's services ended. With their realization began a golden age of construction, and the professional opportunities of working in it multiplied, increasing the number of people dedicated to this industry, as shown in the table.

Technicians dedicated to construction in London

	1841	1851	1861	1871	1881	1891	1901
Architect	516	1,114	1,459	1,928	2,067	2,024	2,459
Builder	1,613	2,938	3,845	5,657	7,342	8,866	16,486
Civil engineer	237	824	1,268	1,868	2,223	2,329	2,629
	2,366	4,876	6,572	9,453	11,632	13,219	21,574

Source: [35:26] and own elaboration

with engineers, builders and architects.

In general, the engineers worked as a team looking for contractors for the specialties, although construction companies capable of providing all the necessary trades and services were also created, from the conception of the work to its delivery once finished, and some of them were also constituted as developers.

A good example are the Cubitts, three brothers linked to the world of construction. The eldest, Thomas Cubitt (1788-1855), was one of the great builders of London, responsible for large housing developments in rich neighborhoods of Belgravia, Pimlico and Bloomsbury, including Gordon Square and Tavistock Square for a group of owners that included the Duke of Bedford. He also built the east façade of Buckingham Palace

The second, William Cubitt (1791-1863), was also a contractor, first together with his brother and later as head of the company. He built the new Covent Garden in 1830, the Fishmongers' Hall in 1834 just upstream from the left abutment of the London Bridge, and the portico and the old terminal of Euston Station in 1837. He was a Member of Parliament from 1847 to 1863 and Lord Mayor of London from 1860 to 1862.

The third, Lewis Cubitt (1799-1883), was a civil engineer, with several important achievements to his credit, such as the London Bridge Station of 1844, the terminal and several buildings of King's Cross Station in 1850, and many rail bridges in South America, India and Australia.

Thomas Cubitt was the first contractor to accept full responsibility for the work, instead of employing casual labor and specialized subcontractors. In addition to his carpenters, he hired bricklayers, bricklayers, blacksmiths, plumbers, glaziers, plasterers, paper-makers, painters, weavers, slaters, laborers and transporters, organized in groups under the direction of his specialists.

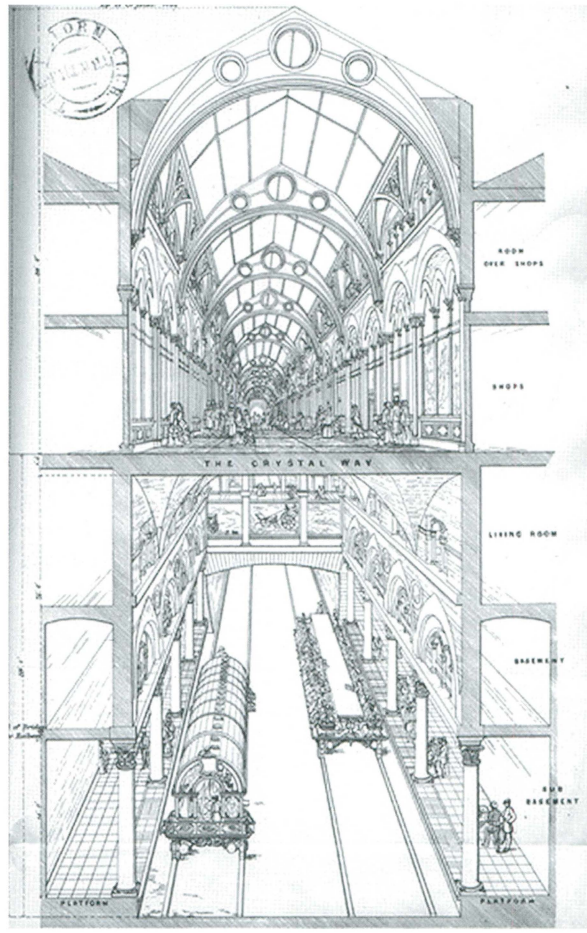
First construction company.

To equip his company in London, Cubitt built piers, workshops, a cement factory, a foundry and a ceramic factory, on 10 ha of land on the banks of the Thames. He built many works, taking responsibility for the development of entire areas, leasing the land, planning streets and drains, hiring architects for the projects of the buildings and building and decorating a large part of them with their own workers [35:27].

A report by the Metropolitan Communications Commission of the 1856 Parliament called attention to the population growth of the city, which had doubled in 40 years, whose internal mobility needed to be addressed.

Proposals for the railway traffic of the 1850s:

The traffic generated by that population was added to that of the passengers arriving from the suburbs to the new railway stations. About 11 million passengers per year (Mpax/year) arrived at the London Bridge one, to Fenchurch Street about 8 and more than 3 Mpax/year to Waterloo.



The Crystal Way, Moseley, 1855 [Report from the Select Committee on Metropolitan Communications. London, House of Commons 1855]

The great Crystal Palace did not have great effects on the stations, but it inspired some proposals regarding the railroad tracks, where the inertia of the styles and the attention of the architects was quite minor.

Crystal Way, Mosley,

The same Commission seriously considered several radical proposals, such as the 'Crystal Way' of the architect W. Mosley, which proposed a raised railway about 3.6 m above street level, from St Paul's Cathedral to Oxford Circus, with a branch to Piccadilly Circus. The structure supported an iron and glass roof over the tracks, with a walk and shops on each side.

Also Joseph Paxton, after his enormous success with Crystal Palace in 1851, had presented a similar proposal titled 'Grand Girdle Railway and **Boulevard under Glass**,' to solve the problems of traffic in the streets of London. Paxton had observed in 1854 that it took less time to go from Brighton to London Bridge Station, than from London Bridge to Paddington.

Boulevard under Glass, Paxton,

His proposal was to build an 18.5 km railway, on the ground but covered with a five-story iron and glass structure, which linked all the London stations and crossed the river three times. The glass cover was to avoid the dirty air of London, presumably because the smoke and steam generated by the trains within the arcades were considered more acceptable than the fog, soot or stench of the sewers to the outside (see 3.3).

In addition to these radical proposals, the commission opted for all known modes of transport, recommending the removal of all road and bridge tolls, the construction of new metropolitan rail lines to cross the city, and the

a line to connect all the stations,

Metropolitan Railway connecting all terminals in London, entrusting all this to the designated *Metropolitan Board of Works*, which the commissioners had to transform into [61:164].

Undoubtedly it was a proposal of the maximum interest because, when connecting the terminals, this line would favor the distribution of the travelers that arrived at London towards the particular destinations of each one distributed throughout the city. This could lighten the traffic of cars, carriages and other tow vehicles through the always crowded streets of the city. While this materialized, the stations surpassed the character of provisional sheds and constituted themselves as complete buildings, with enough space to meet the growing passenger traffic.

leaving a poorly accessible center without Underground tunnels,

Before the ring materialized, to travel to the center from the stations of the crown it was necessary to walk or rent a carriage, car or horse tram, to reach the final destination. The definitive solution came from the hand of another great innovation, the electrification of the railways and as a direct consequence, the possibility of operating in underground lines.

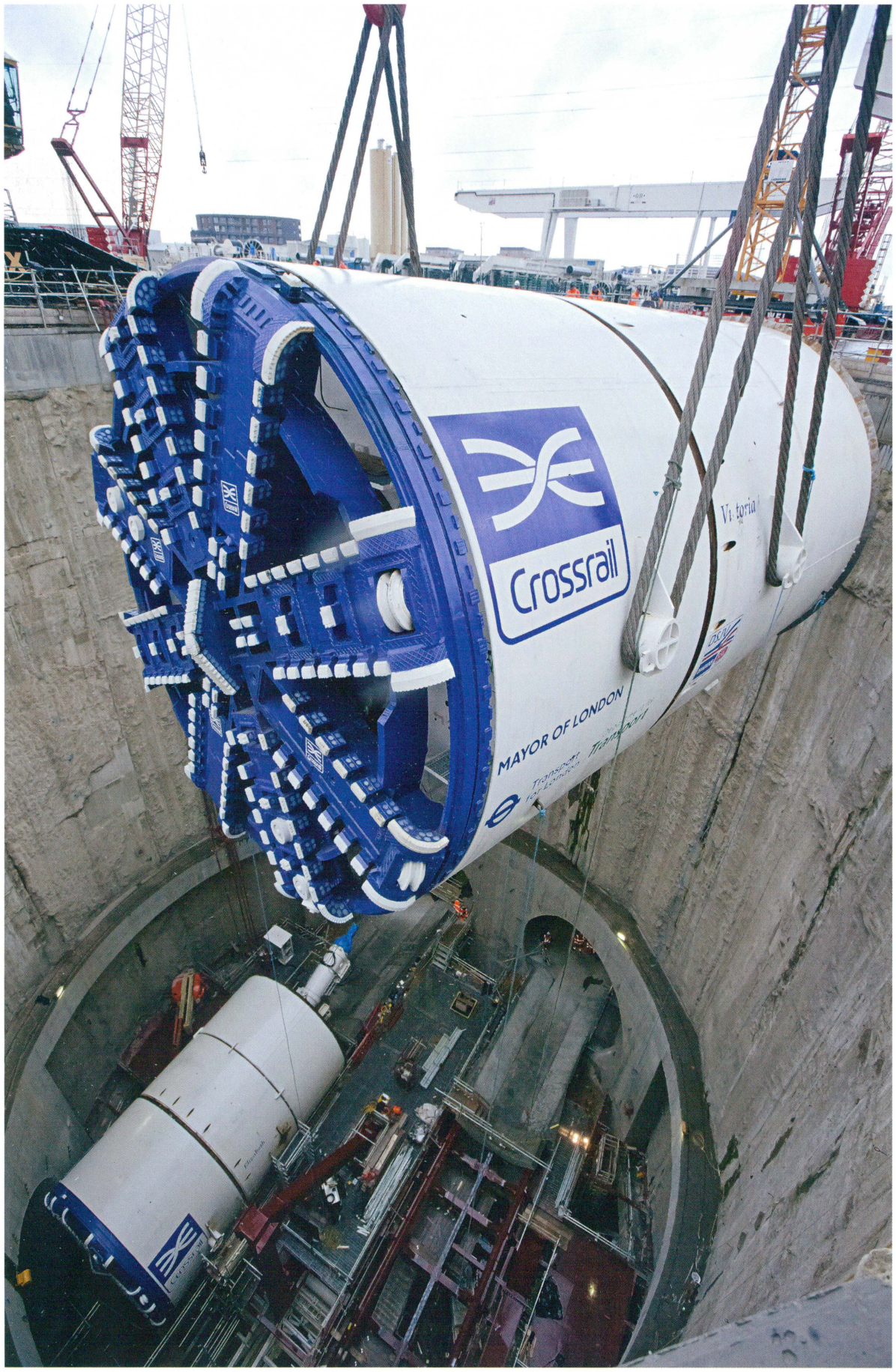
The first tunnels were built following the paths of the streets as far as possible, digging a ditch and covering it with a slab later (cut and cover). The following ones had to consider the crossings with the lines in operation and to be placed below them without possibility of being excavated with that technique. However, what delayed the proliferation of underground lines was not so much the technique but its enormous cost, several times higher than with ditches, and the difficult extraction of smoke and steam from the trains. The solution arose with the use of electricity.

that could be used with electrification,

Electrification began to prevail in the lines south of the Thames around the 1920s for purely commercial reasons. Electric trains accelerated and braked faster than steam trains, which was a great time saver in the commuter trains with many stops and improved the productivity of trains and employees, in addition to making them cleaner than steam. Some trains began to use self-propelled electric units, such as in the Underground, which could operate by pushing or pulling, which avoided turning the locomotives at the end of the journey.

Electrification made even more sense in the suburban lines, with very frequent services between little-separated stations, while the steam continued to be used to operate more distant services. The best power technology then available was the third rail at 750 volts direct current, although that meant having electrical substations every few kilometers to lower the voltage and convert the alternating current to continuous.

In general, the northern lines served longer distance traffic and their owners had less interest in capturing commuter traffic, which was less well paid. Only a few services to Liverpool Street and Fenchurch Street stations, normally more congested, were electrified. With the catenaries, the voltage could be increased and the substations separated more, with the 25 KV standard by 1956 [112:4].



Tunnel boring machine and Crossrail tunnel

Double Crossrail tunnel



achieving more reliable, faster and more profitable trains, in tunnels that penetrated the city.

In the late 1960s, almost all commuter services south of the Thames and most of the lines completed at Liverpool Street, Fenchurch Street and Euston stations operated with multiple-drive units that, compared to their steam predecessors, were cleaner, more reliable, faster and cheaper to operate. Long-distance lines took longer to electrify and most went through the intermediate stage of diesel locomotive traction.

With the creation of the Green Belt and the New Towns, the transportation of a large volume of daily passengers (commuters) to greater distances became a profitable business and the number of travelers exceeded 100,000 per day and now exceeds 500,000. In reality, the New Towns were designed so that their inhabitants could reside and work there, but with faster and more frequent trains, most of the workers found better jobs in the city with reasonable travel times. To avoid the failure of New Towns and reduce the pressure on London residences, the government forced lowering even more the tariffs of subscribers, which consolidated the daily displacements.

With the increase of daily passengers the pressure to distribute them better through the interior of the city increased and the only possibility to not congest the streets more were the underground services. But their usefulness lay in the possibility of building new links between different areas of the city, without disturbing the urban fabric and without altering the buildings.

In 1943, however, the County of London Plan tried to put lines and stations under ground, with the intention, not so much to improve transport, but to avoid their presence in the streets. The basic idea underlying the plan was that the presence of the trains at or above the streets, with their noise, fumes and vapors, was annoying and it was a case of getting them out of the way. To do this, it proposed putting the stations of Waterloo, London Bridge, Charing Cross and Blackfriars under ground and linking them through an underground loop, which would have been enormously

expensive, in fact completely impracticable, by specifying a minimum of six routes and slopes greater than those allowed. In any case, its construction would have interrupted rail services for years or decades and simultaneously hampered the streets with the works [112:4].

The Victoria Line emerged to fill an obvious gap in the network, the distribution of travelers arriving at four of the 13 largest terminals in London, King's Cross, St Pancras, Euston and Victoria stations. It also allowed exchanges from three other lines to the congested Liverpool Street Station and later to Waterloo and Vauxhall [112:10].

With the support of the Labor Party and the reticence of the Conservatives, the Victoria Line was opened in sections from 1968 to 1971, while its layout underwent successive changes trying to reduce costs or improve social and urban benefits. Several technological innovations were also applied, including the first complete Underground line to use automated driving, with advantages of speed and capacity by more systematically controlling acceleration and braking. The line was the first to operate with only one operator on board, which became widespread at the end of the 1980s, and also the first to provide ticket vending machines.

In many stations of the Victoria Line, schemes were developed to simplify transshipments on a single platform, avoiding stairs and walks through connecting tunnels, even if this meant the construction of new tunnels to divert some of the directions of the other lines. According to Schabas, *hundreds of thousands of London commuters benefit every day from his efforts [Rockwell]; he has literally saved billions of minutes of people's time* [112:11].

Underground lines are still the best solution for mobility, but their construction is a delicate and expensive issue. As has been already seen, even the construction of the subterranean sections of the Metropolitan Railway, carried out in open pit with ditch and cover, demanded the closure of entire streets, creating considerable congestion in the side streets. However, that type of construction was only viable if the streets were reasonably wide and straight and the tunnels shallow.

Over time, the tunnels were built with safer procedures, generally based on the use of 'protective shields,' such as the one invented by Brunel in the Thames Tunnel. But the problem remains in the construction of the equally deep stations, of a three-dimensional complexity only approachable with a step-by-step excavation and with enormous shoring precautions. Even so, there was damage to the surrounding buildings.

In fact, even with the sophisticated current methods used to build the new Underground tunnels, damage still occurs in nearby buildings. The construction of the Moorgate-Liverpool Street station for Crossrail affected the building next to the planned Broadgate Entrance in May 2017. The rounded corner protruding from the building began to fall, then the entire façade was cracked and from one day to another was covered with scaffolding. It does not seem easy to avoid material damage, but the sophisticated control and warning systems manage to minimize them and, in most cases, avoid personal injuries.

A later example, the Victoria Line.





Crossrail Broadgate Entrance - construction

Moorgate-Crossrail Station in Liverpool Street

Collateral damage by the tunnels,

even with current methods.



Old Euston Station - portico, 1837 [88:fig17]

Victorian Stations

Railway stations are valuable buildings for the city, beyond their position in the plan and their structuring role. As frequent or daily entry doors used by citizens, they assume double representation. On the one hand, the railway company that ended its services there; on the other hand, the city that received travelers and facilitated the continuation of their journey.

The station represents the company and the city

Conscious of the importance of this double meaning, the developers of these buildings had to face a new program, which linked the industrial world of the machine with the vital area of the city. They needed the joint work of two professions, engineers and architects, who had at their disposal two very different materials, classical stone and modern iron. This collaboration was faced with different levels of commitment, from the simple adjacency of two very different buildings, something quite frequent, to a rarely achieved unitary synthesis. And its result, of diverse fortunes, found a peculiar way to show its novelty to the city in the varied sample of styles available in the 19th century.

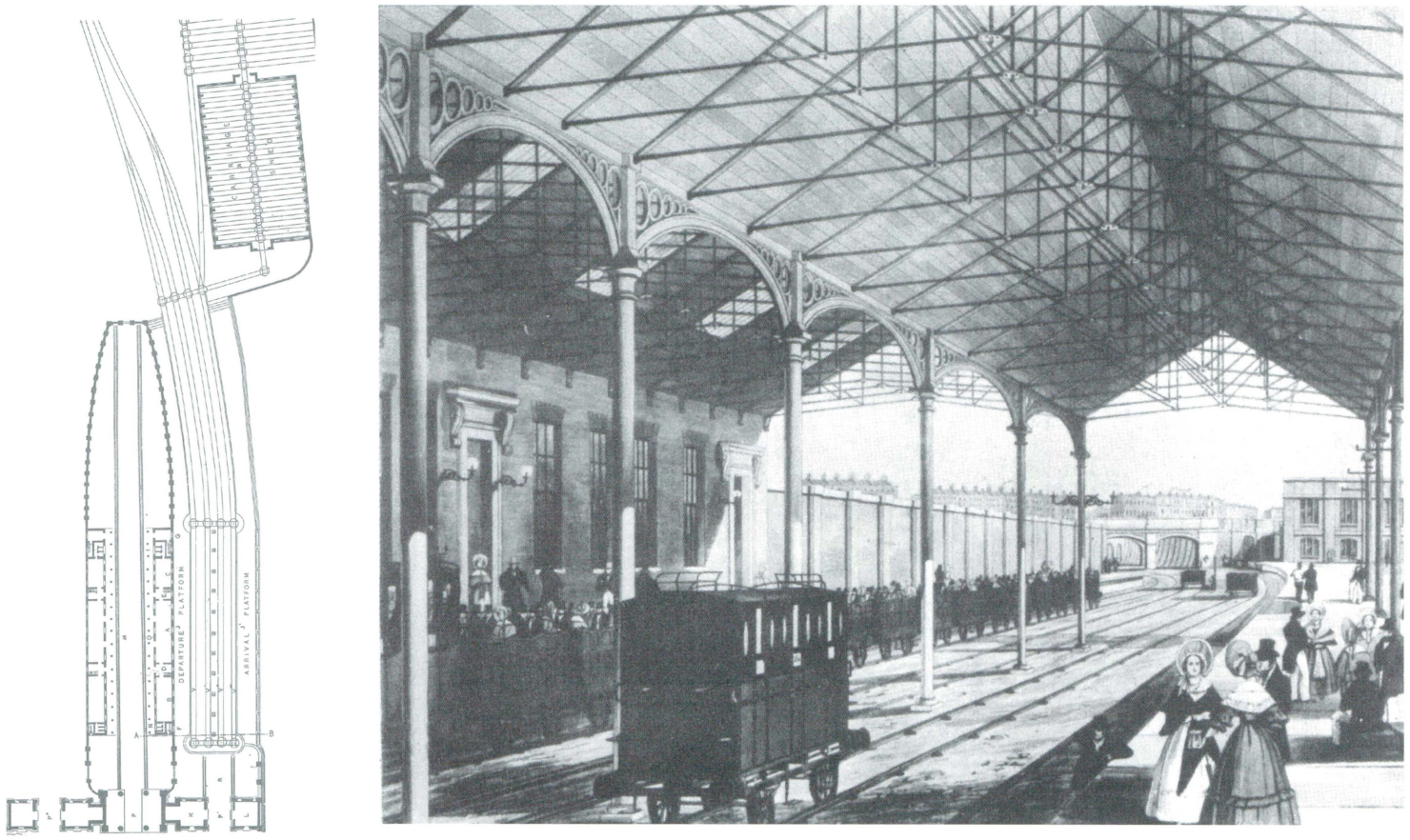
for which a picturesque eclecticism was coined.

In his architectural history of the stations, Professor Carroll Meeks detects five aesthetic qualities shared by these buildings built after 1840: the varied, moving, irregular, intricate and unequal, which he understands or synthesizes as a picturesque style. And he considers it eclectic, in that it contains elements or Greek, Roman, medieval, Renaissance and even romantic details, sometimes with exotic additions.

Their combination in a picturesque eclecticism derives in a scarcely subtle, if not brazen, style that fitted well with the popular and unsophisticated taste of the new upper classes of the industrial age. In that combination, throughout the 19th century the principles of picturesque controlled the architect's arrangement of masses and silhouettes, while the changing concepts of eclecticism suggested the shapes of his arches, roofs and towers [88:25].

After using sheds dressed as buildings,

With that attire, the stations tried to show the magnificence of their functions and their owners, wearing imposing buildings mainly dedicated to offices and hotel services. In fact, except in the case of Waterloo Station,



Old Euston Station – plan and roof, 1837 [88:fig9 and 15]

whose building was dedicated to the company's offices, the main façade of the great London stations was occupied by a hotel, with the dimensions and regularity of the large buildings, dressed with some compositional joy over the top cornice to attract the attention of the public.

The first stations were just elementary sheds to protect passengers and merchandise from the weather, placed parallel to the tracks. When it came to the end of the line in the city, they used to be enriched with a building or entrance portico that opened onto a plaza or esplanade. This practice of railway companies required large urban spaces, as happened in most European cities.

In London, the first Euston station responded to this compositional scheme of the three functional elements: building, shed and entrance to the city. The directors of the London and Birmingham Railway - L&BR and its architect Philip Hardwick decided to endow their terminal with an identical meaning to the old entrance doors to the city. In principle, there was an agreement to share a station with the Great Western Railway-GWR in Euston, given the price of the land and the occupation restrictions. But it was a temporary contract and the Great Western decided to build its own terminal in Paddington, then far from central London.

the Euston portico explores and fails with the monumental

The project consisted of an elongated central hall, with sheds on the roads on each side and a monumental portico to cover the front of the three buildings. In principle, only the L&BR shed located to the east was built, leaving the foreseen GWR one for a later extension, but the great portico of Doric



The Great Hall, Euston Station, London, 1950s.
[© National Railway Museum / Science &
Society Picture Library, Image N° 10305173]

character was completed in 1839, two years after the opening of the line. The colossal entrance, formed by a central portico with three smaller pavilions on each side for bus, mail and parcel offices, was disproportionate for the two small and barely pretentious buildings located behind. The walk from GWR to Paddington unbalanced the set even more by subtracting the original symmetry [56:31].

The railroad world applauded this monumental character, but the dimensions of the columns and the height of the lintels seemed as excessive as their cost of 35,000 pounds (3.6 million in 2017) and led to a wide debate. For Francis Whishaw, one of the early authorities of English railroading, the Grand Doric Entrance to Euston Station is perfectly allowable since it is the key, as it were, to all the railways of London. The builder William Cubitt boasted that a good station could be built at King's Cross for less than the cost of the ornamental archway at Euston Square.

and causes a debate between function and monument.

For the medievalist Henry Noel Humphreys, the works of the London and Birmingham line - L&BR eclipsed the aqueducts of Rome, but he *questioned, however, whether magnitude alone made for architectural grandeur and he had doubts about the gateway being suitable*, preferring Stephenson's engineering to that architecture in terms of 'fitness.' Half a century later, politician and railway historian William Mitchell Acworth commented on the influence of *national character* in *the execution of the whole*. The toughest attacks came from renowned critics: John Ruskin *found nothing to admire* and, for Augustus Pugin, *the architects have evidently considered it an opportunity for showing off what they could do instead of carrying out what was required* [88:40].

But the increase in rail traffic soon showed the inadequacy of the vestibule parallel to the platforms. The simultaneous reception and dispatch of several trains required the installation of a bundle of parallel platforms, and the use of high-power locomotives imposed the creation of a wide, ventilated and breathable space with the boilers running.

Growth requires adapting the plan to the function.

In the stations of greater traffic, the access to the most remote platforms forced surrounding the bundle of routes and generated agglomerations in the head. Brunel's invention to pass on the tracks with retractable walkways in nearby Paddington did not solve the obstacle of detained trains. With the experience of Euston, the following stations, including its extension, arranged the vestibules at the head of the platforms, with raised walkways between them towards the center of the station. [88:60].

Fixed the functionality of the circulations, the plan had to resolve the relationship of the building with the urban environment around it. Again, Euston's solution failed to prevail, because the land was expensive and companies didn't wanted to invest more, nor was the city willing to dedicate large spaces to accesses to the stations.

The hotel mediates between the station and the street

A common solution was to enclose the railway device, with its iron and glass structure, in a traditional stone building, usually dedicated to company offices and hotel uses. The technical world of the railways was hidden from the city, which only received a four or five-storey façade, necessary to overcome the



St Pancras Station - turrets





Paddington Station Hotel

Victoria Station Hotel

height of the vaults. Those trips in the first railroads were slow and travelers demanded rest at their completion. Thus, these Termini stations were obliged to have a hotel, then a substantial and inseparable part of the trip itself.[8]

The Charing Cross, Liverpool Street, Paddington, Baker Street, Waterloo stations respond to that pattern and, above all, St Pancras (1868, 1873), the only case where the cover was designed before the architect of the station -the famous Sir George Gilbert Scott- had been selected.

The curved façade of the hotel and the tower crowned with gables, pinnacles and attics give a certain fantasy quality to the silhouette of the roof. It stopped being a hotel in 1935 and turned into the company's offices until its complete rehabilitation in 2011 as **Hotel St Pancras Renaissance** [98:43].

Little by little a mediated relationship was imposed by the interposition of the hotels between the halls and the street, as happened in Liverpool St, Paddington and St Pancras. Charing Cross station was an intermediate solution, since it had a small square in front of the hotel, where an obelisk was located, capable of generating a visual opening towards the station or, if you prefer, to the hotel itself, as it is necessary to pass under it to leave from the lobby of the station to the outside.

The result was diverse. The first rail hotel in Euston was comfortable, no doubt, but not opulent. The Great Western Railway, with its **GWR Hotel in Paddington** (1853), pointed the way towards an increase in grandeur when it decided to rebuild its London terminal. Isambard K. Brunel, *the driven force behind* the GWR and the long-range iron steamers, thought that a large hotel would be a good starting point for transatlantic travel, by train and boat, from London to New York[9] [98:16].

The GWR Hotel was followed five years later by James Knowles's monotonous Grosvenor Hotel (1862) at Victoria Station, with palatial-sized rooms.

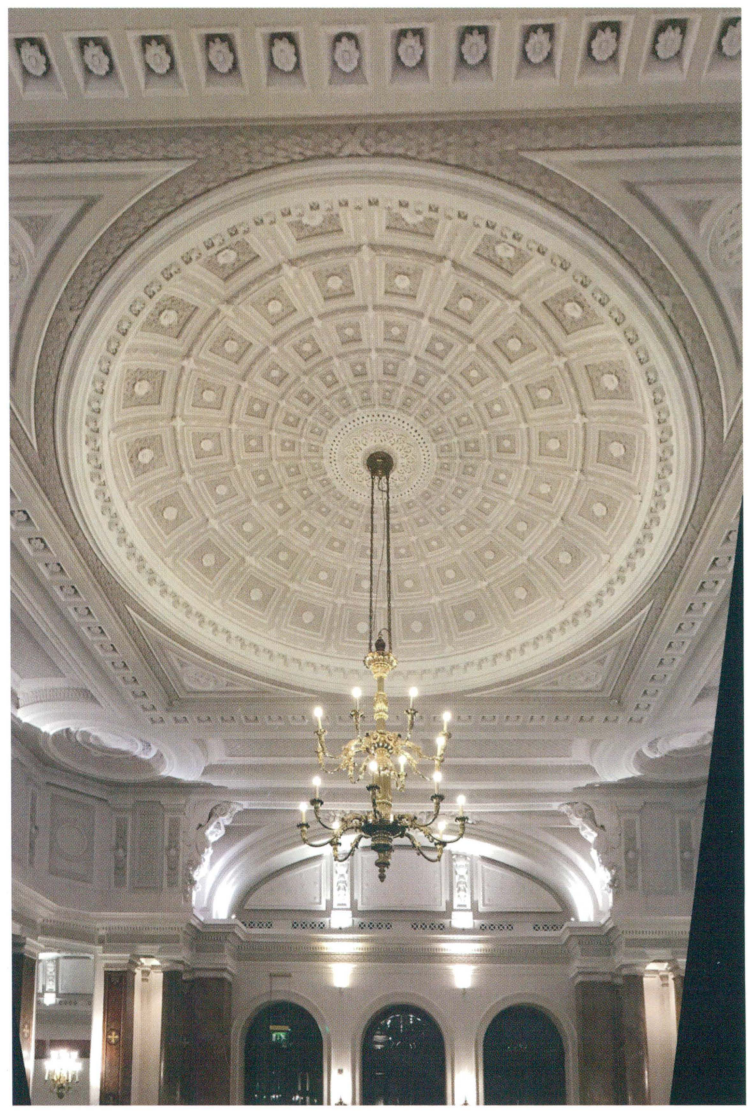
and it is presented as a railroad façade.

A mediated relationship, with diverse results.

Articulate the façade







Charing Cross Eleanor Cross in the Strand

Charing Cross - Ballroom

or get a front relief

The **SER Charing Cross Hotel** (1865) belonged to the South Eastern Railway-SER and, with its 250 rooms, was so successful as to be extended in 1878 with a new annex, linked to the hotel by a pedestrian walkway at the first floor level, on Villiers Street. It was designed by Edward Middleton Barry, in French Renaissance style, occupying the east and north façades of the station lobby.

The current north façade of the Amba Hotel towards The Strand and St Martin-in-the-Fields maintains a couple of galleries. The ballroom, which has retained its decorated ceiling, was once the Betjeman Restaurant, in honor of the poet Sir John Betjeman, who described it as *the most finely appointed dining room in London*.

The powerful horizontal lines of the façade contrast with the tall and slender replica of the cross in the front yard. Also designed by Barry, *this bit of fakery* marks the site of an original Eleanor Cross, long lost. In 1933, the Charing Cross Hotel passed to the Southern Railway. During the Second World War it suffered damage in the bombings and the two later floors were rebuilt with a flat roof, depriving its silhouette of *turrets, dormers, chimneys and pavilions* that previously gave its elevation a strong character [98:13].





Liverpool Street Station - Great Eastern Hotel

The **GER Liverpool Street Station** for the Great Eastern Railway was designed by Charles Barry Jr, with a 1903 extension by Robert Edis. It has a large tower on the corner of Liverpool Street with Bishopsgate.

Sometimes, the magnificence of the elevations of the great hotels remained a spatial and urbanistic enhancement to the delivery of the whole station to the city. Without much foundation, Geddes attributes the poor result to the developers of the stations, companies and engineers fundamentally dedicated to their functionality for the trains, paying little attention to the passengers,[10] unlike their European colleagues [50:195].

With this, Geddes ignores that European stations are financed by the public treasury, while the English stations are developed by private companies, forced to control the costs to remunerate their shareholders. It is therefore a case of two different systems of construction of public works, with different results but not much attributable to the training and interest of British engineers, whose work seems much more worthy precisely for that reason.

does not mean giving more attention to the city,





Marylebone Station

although there are some more elaborate solutions.

In **GMCL Marylebone**, the city is present in the design, as the brick façade joins the low-rise building with the great hotel of the same style, located on the opposite sidewalk by means of an iron and glass pergola.

The **GNL Hotel in King's Cross**, for the Great Northern Railway, has an atypical plan with a rounded shape, whose concave side defines a specific area of the station in front of the powerful presence of the neighboring façade of St Pancras. Its geometry has suggested the creation of the new hall at King's Cross, called The Rotunda, which is detailed below.

Outdated architecture and incipient engineering.

As the stations grew, they became too complex to be seen as a whole. It was not clear if the shed, the terminal or the hotel, when there was one, should dominate. The engineers built the roofs and the architects the lobbies and the hotels. At the beginning it was a priority to solve the problems of plan and structure, allowing the elevators to take care of themselves, since each station had to respond to particular circumstances and restrictions, with results not largely transferable.

Perhaps for this reason, the greatest attraction and interest of the Victorian railway stations lies in the wide interior spaces for trains, whose demands for height and breadth were only manageable with the use of iron and glass. There were antecedents of that combination of new materials and processes





Paddington Station II

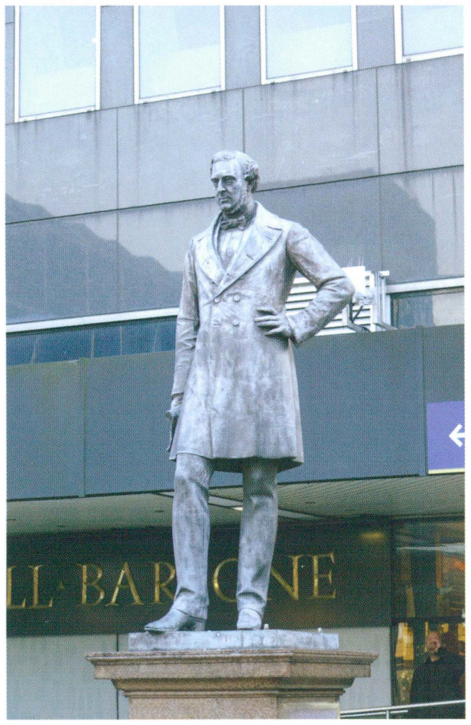
in some recent greenhouses, but it was a new way to build and it was necessary to innovate by trial and error.

In the 1840s, two large structures were developed that put in place new techniques of testing and construction processes, later used in the stations. Britannia Bridge of 1848 and Crystal Palace of 1851 accelerated a competitive race, which was already running at a rapid pace, focused on technical advances without style and appearance having significant repercussions. Starting with them, and systematically, the London stations resolved the structures of their large naves to house the trains with the use of iron. English engineers learned how to use it by developing new lattice types to get the largest spans.[11]

Victorian structural engineering.

By 1835, when the construction of the first section of the Great Western Railway - GWR line began, the location of the station had not yet been chosen. Isambard Kingdom Brunel, engineer of the line, tried to reach an agreement with Robert Stephenson, engineer of the London & Birmingham Railway - L&BR, to share the station in Euston, but he did not manage it and in 1937 the first Euston Station, mentioned before, was realized. For its part, the GWR could not afford the cost of the land near Euston and built a temporary wooden shed for its roads 2.13 m wide that Brunel preferred to the 1.43 m standard width [56:11].

The GWR has no place for Paddington, 1832, 1854.





Robert Stephenson in Euston

Euston Station - entry by New Road

Euston Station - vestibule



In 1851 Brunel began designing a new Paddington II with the architect Matthew Digby Wyatt and commissioned the project of the hotel to the architect Philip Charles Hardwick.[12] For one critic, *it is a light and elegant design, but also an extremely sound and functional piece of engineering*. Although Brunel had collaborated with Paxton on Crystal Palace on some themes of detail and industrial manufacture of the pieces, a certain Moorish look came to Paddington due to the influence of Owen Jones, director of the interior architecture of the Universal Exhibition, hired for the decor.

If Paddington was Brunel's station, Euston is that of Stephenson, responsible for the London & Birmingham Railway-L&BR, which merged in 1846 with the Grand Junction and the Manchester and Birmingham Railways, to create the London and North Western Railway-LNWR. To cope with the increase in traffic, the company expanded Euston station with new buildings, including the Great Hall, designed by Philip Charles Hardwick, son of the author of the portico, which was demolished in 1867 [96:115].

The second Euston Station, 1849.

Like the portico designed by his father, the Great Hall was brilliant, but nothing practical, and was immediately criticized because *comfort has been sacrificed to magnificence*. It was the largest room in the station, combining a vestibule and the waiting room, but it was too large and interrupted the flow of the station, and both were demolished in 1962.[13]

The new station, designed by the architect of the company R. L. Moorcroft and inaugurated in 1968, is far more functional than the previous motley collection of buildings on the site, but as architecture it is dull and uninspiring. There is no real sense of arrival, however you approach Euston... and you will find no clear entrance route to the station. The space in front of the entrance is obstructed by a series of office blocks of the company and the only allusion to the railway is a statue of Robert Stephenson at the side of a small square. The interior lobby is small and bland, with no place to sit, so it is always motley and with people sitting on the floor.

The third Euston Station, 1962.

Of the second station there are only two booths at the entrance to Euston Road, where the statue of Stephenson was originally, but a large part of the original ashlars of the portico have been discovered in a channel of the Lea River, and were rescued by British Waterways in 2009, and a Euston Arch Trust was created to campaign for the restoration of the portico and to *restore to London's oldest main line terminus some of the character and dignity of its great neighbours* [56:32-35].

King's Cross station, 1852, was designed and directed by the engineer Lewis Cubitt with the support of George Turnbull, civil engineer of the company Great Northern Railway - GNR. Undoubtedly, King's Cross is the railway station of greatest interest among all of London. Its presence, on the outskirts of the old city, defines the meeting point between all modes of transport of its time, bringing together the street, the road, the canal and the railway. Beside it is located St Pancras, another great railway station with which, despite there being no physical contact of passage or corridor between the two buildings, it is the most frequented London transport hub.

The first relevant station.





King's Cross Station





About 2 km north of the Roman wall, between New Road, 1756 (see 4.1) and Regent's Canal (1820), the main station building faces north to focus on the Great Northern Railway tracks. The main cover of the station is 250x65 m, 22 m high and covers eight platforms. Unlike the other stations, its two parallel vaults of iron and glass cross the façade and show its functionality towards the outside. The station is not hidden behind a hotel, here placed on the west side, but reveals itself through a brick façade, with two large arches and a small central tower with the required clock, flanked by two lower and recessed side buildings so as not to disturb it.

The design of the 2016 remodeling, by John McAslan & Partners-JMP, reorients the station to the west, improves its functionality and cleans the 1852 south façade, previously hidden by different additions. The western vestibule involves the most striking change, because it reorients the operation of the station towards St Pancras and opens it to the outside to fit in the new residential developments and offices to be created in the area[14] (see 5.2).

The new semicircular hall, called the Concourse, is covered with a dome about 20 m high and covers the 150 m length of the western elevation of the building with grade I protection, creating a new entrance at the level of the mezzanine to the north end of the western lobby.

The restoration includes the revelation of the daring architecture of the original south façade, re-glazing the north and south porches and restoring the platforms. The two semicircular vaults have been lined with rows of photovoltaic panels along the running skylights. A new glass walkway crosses the main nave, replacing the old one, and gives access to the platforms and the mezzanine hall.[15]



King's Cross Station

Remodeling of King's Cross, 2016.



Concourse, King's Cross Station

Structure of the Concourse.

In this new extension of King's Cross Station, which links it to St Pancras, all the structural engineering of the last quarter of a century comes together. In the new **Concourse**, the undulating lines of the terrace recall the Eduardo Torroja Frontón Recoletos gallery. The branched and arborescent forms of the perimeter supports recall the stacks of Jörg Schlaich. The decomposition in triangles or rhombuses of the roof recalls the architecture of Nervi in the Palazzetto dello Sport and the covers of all his other work. The Calatrava trencadis appears covering difficult surfaces.

However, the glass panel that links this large semicircular hall with the old façade of the station is deliberately neutral, with a structural solution of mullions braced by straps in the form of a blade without any formal pretension. The arborescent central pillar of this new structure is placed on the axis of a ledge of the old station without approaching its brickwork. In this central place, the roof opens as a semicircular skylight to illuminate the side façade of the old station.

The façade has finally been uncovered,

On the main façade of King's Cross Station, so praised by Condit and the critics of the Modern Movement as an anticipation of the ability to reveal to the exterior the shape of the iron roofs of the interior of the station, the previous adhesions have been removed and cleaned with a simple cantilever run like a porch. However, the placement of the entrance to the Underground station that serves St Pancras and King's Cross jointly renders comprehension of that façade difficult, by occupation of the points of view.[16]

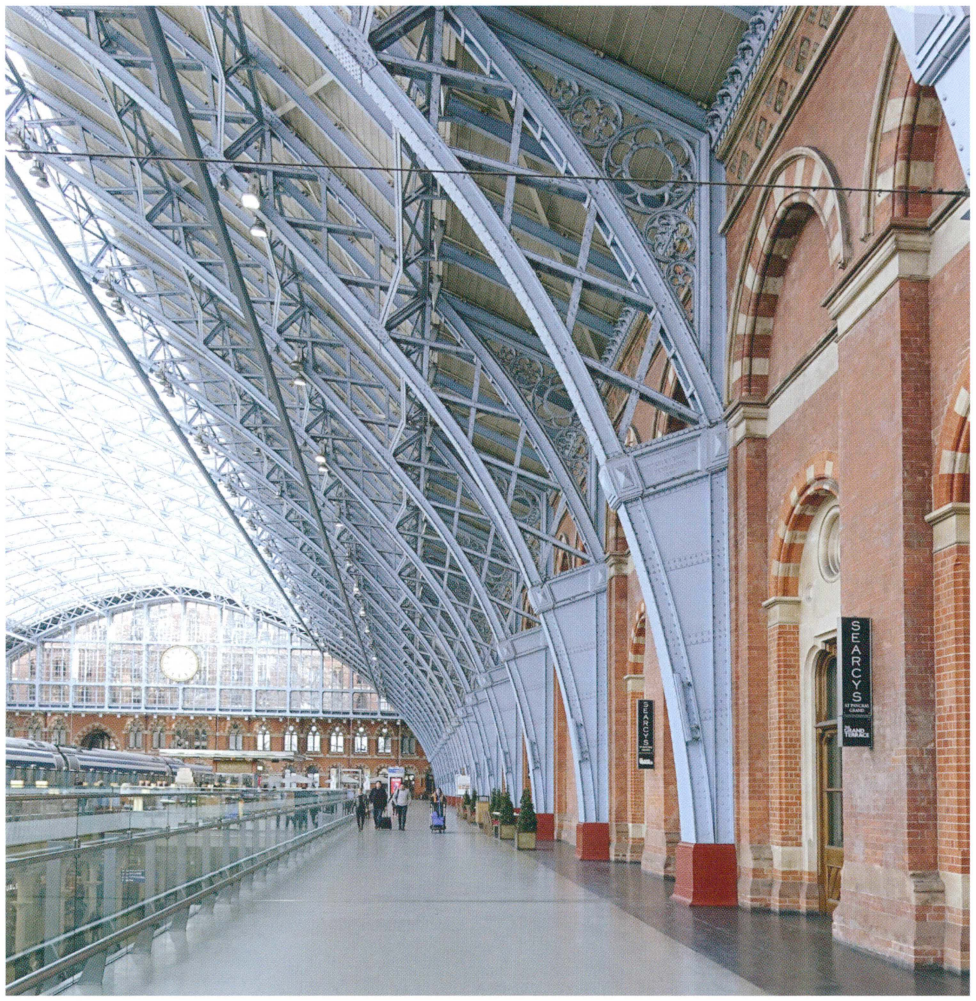






Concourse,
King's Cross Station


DENT
SEARCYS





St Pancras Station

The profusion of bollards and benches seems to delimit a rest area separated from the flow of sidewalks, but responds to the now essential security barriers. Made of concrete and steel and strongly anchored in the foundation, they try to avoid attacks by vehicles at high speed. Some sculptures are added to the design, that have now become unavoidable in the public spaces, without any reason.

while the square in front fills with things.

Next to King's Cross is **St Pancras** station, serving the Midland Railway-MR. Until 1857 the line did not manage to get its tracks to London and used the tracks of the London and North Western Railway -LNWR.[17] Before reaching the building, the tracks cross Regent's Canal and this requires raising the level of the station between 4 and 5 m above the ground, generating a basement that was used as a warehouse for beer.

The largest glass cover for trains.

Designed by engineer William Barlow and architect George Gilbert Scott, St Pancras is radically different from its neighbor in terms of design, functionality and appearance. In order not to complicate the support of the roof over the basement, Barlow -helped by the engineer Rowland Ordish- decided to cover the entire width with a single vault of 74 m span, with arches in iron lattice every 9 m and secondary structure of iron and crystal, which was the largest of all the stations in his day. The upper slab of the basement, where the tracks are supported, was made with columns and cast iron beams. Its classic design surrounds the iron and glass deck of the trains with the huge red brick hotel

St Pancras becomes International in 2007.

already mentioned, that completely hides the train nave, and is endowed with a high level of comfort, with new services such as boat-train.[18]

After a long debate, in 1990s St Pancras was chosen as the only station to receive the new high-speed services in London.[19] To accommodate the 300-meter Eurostar trains, a new flat-roofed roof was created, attached to the existing one to the north. Initially, the station was going to have thirteen platforms that were accessed by a bridge, then replaced by an access below.[20] To improve lobbies and circulation an interior patio was opened, incorporating part of the old basement into the great space of the old vault.

Faced with the richness of that space, the new station is nothing more than a mere extension of its platforms, with an aesthetically debatable connection to the exquisite rear gable of Barlow's cover. The flows of passengers and vehicles, on the other hand, are very well resolved in the transition zone, where an enormous space has been gained for restaurants and stores that alleviates

Victoria Station



the poor initial resources of St Pancras. In addition, access to the station, previously constrained by the narrow exits under the hotel, has been significantly improved on the west side.[21]

The complexity of private interests and the official regulation which developed the current Victoria Station explains the confusion of its perception.[22] When the station was built in the 1890s, the others had already been completed and its designer, Charles Langbridge Morgan, was able to face it with greater knowledge of the great flows of travelers, merchandise and vehicles. However, it is still a difficult station to read.

The structural system of the roof is formed by cable-stayed arches with a curved brace, kept in an arched position by means of radial hangers that link it to the upper arch. The system is efficient in terms of the use of material, but the visual superposition of several contiguous arcs 'clouded' the space. Currently, the area of the station is under full reform.[23]

Complexity and confusion in Victoria.

Victoria Station







Liverpool Street Station

Liverpool Street, less structural and more decorated.

Columns, papyrus and bunting, around

With a less ambitious cover than the one of St Pancras, but with greater plan possibilities is **Liverpool Street Station**: its structure was designed in 1874 by the firm Fairburn Eng. Co and the architect Edward Wilson in charge of the whole building. The result renders evident the role of Wilson, since the cover, although questionable from a strictly structural point of view, is part of the building in an integral way.

Its lobed shaft columns are topped with capitals of papyriform style, inspired by the temples of Karnak and Luxor, which support a range of cast iron brackets with solid edges with a central triangle filigree, whose mission is to reduce the light to be saved by the main arches. The roof areas located on the corbels are opaque and the glass only appears in the central fringes of the span, so that the differences between enclosure and structure, between the thick factory walls and the faint glass sheets, are attenuated by the more complex texture of the corbels.

The general appearance is very loaded, but also surprising thanks to the play of colors used to paint the casts: their dark blue beaded with fine red lines to limit the white filigree is typical of the purest essences of Victorian aesthetics. Only gold is missing, perhaps considered unsuitable for a building that is functional as a station, although they can be found in even more industrial buildings such as the Crossness and Abbey Mills pumping stations (see page 127).





Liverpool Street Station

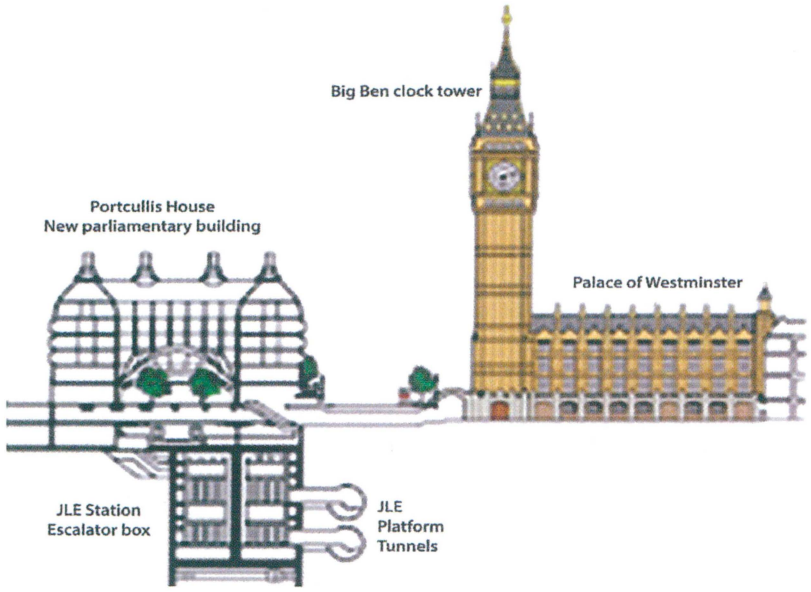
The station has undergone many reforms, some successful, such as the lowering of the level of the lobby, which allows to better organize the entrances from the street and the accesses to the platforms and the Underground, and others of worse taste such as the contrived architecture of stores and corridors from the balcony over the lobby, which will soon be replaced.

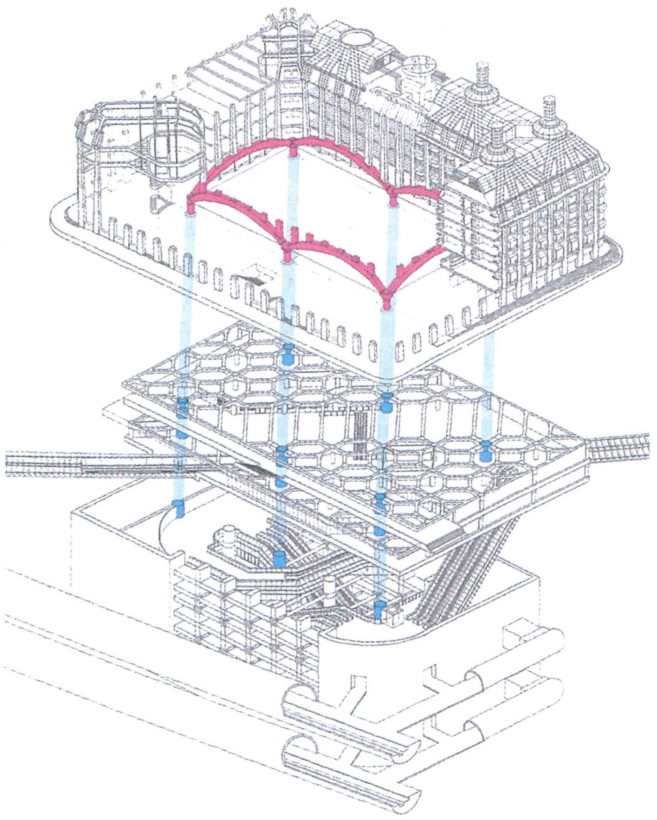
a functional lobby and open to the street.

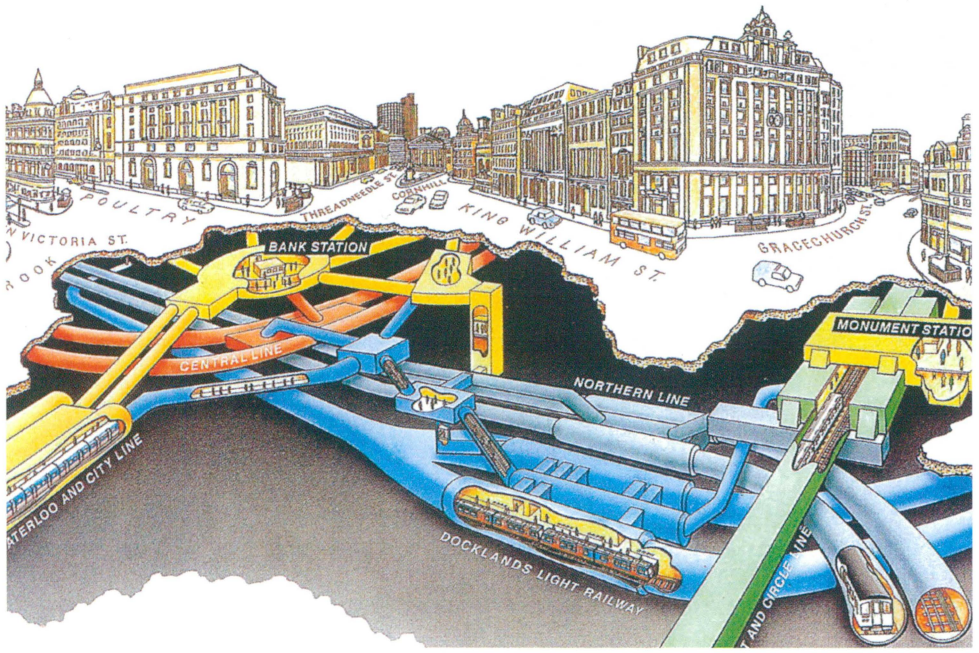
The replacement of the doors of the station by diffuse doorways, based on glass and openings, capable of achieving a transparency between interior and exterior that completely changes the normally closed relationship between the stations and the street, is also very successful. People enter and exit through several entrances without the need to go up or down steps while shops and terraces connect freely to both spaces. However, the old and monumental portals, with their load of towers, pilasters and staircases seem to have no remedy and are narrow, ornate and even more pretentious with the current arbitrary additions.

There is another series of somewhat smaller stations, with scarce external presence but important for the operation of the network, due to their location or connections, such as the Bank - Monument Station complex, where three subway lines intersect, the Central, District & Circle and Northern Lines, to which must be added a railway branch to Waterloo Station and the start of the Dockland Light Railways, in a narrow site and surrounded by large institutional buildings, such as Mansion House, the Bank of England or the Stock Exchange, and a multitude of office buildings.

Complex stations and knots.







Westminster Station [112:121]

Bank & Monument station plan [112:46]

Patrimonial pride.

For its part, the Westminster Station contains the accesses to the surface Circle & District Lines and the deep Jubilee Line, and is located right next to the Houses of Parliament and Big Ben tower. To solve the misgivings about the security of the institutional buildings generated by the proposed expansion, and obtain the necessary permits, it was necessary to build a huge bombproof concrete slab on the station and offer a large building on top of it, intended for offices for parliamentary groups, with chronic shortages of space and budget.

These railway stations constitute one of the main assets of London. All European cities and many American cities have a large sample of large institutional more or less neoclassical stone buildings. London is not the exception, and probably tops the list in number, size and magnificence of that type of building. But none of them fits better than the stations to the criteria of patrimonial value elaborated by Alois Riegl as early as 1903, when the need to protect monuments became evident [107].

The debate about their attire and the biased assessment of their modernity continued to be active but, despite criticisms of their appearance, *romance has always endowed the railroad with a mixture of wonder, astonishment, and awe. Its buildings were becoming the symbol of the age* [88:39]. And above their aesthetic appreciation, they managed to win the appreciation of Londoners, who use and show them with pride.

The question of whether railroad stations were architecture of engineering continued to be discussed. The pages of the Building News *recorded some of the anguished debate*, but without detracting from their unmistakable role in the city and their typological contribution and structure.[24] In 1875, when the great London stations were already built, it claimed that *"Railway termini and hotels are to the nineteenth century what monasteries and cathedrals were to the thirteenth century. They are truly the only real representative building we possess... Our metropolitan termini have been leaders of the art spirit of our time."*[25]

The Network Structures the City

These magnificent and admired stations played a decisive role in the formation of the urban structure of the city, arising from their position, enhanced by their prominence in daily mobility, reinforced by the below-ground connections of the Underground and decisive in the definition of a center, both geographical and identity.

Structuring stations

As we have seen, all this was not the result of a preconceived plan or scheme, rather it arose from the agreement or confrontation between particular interests, whose abuses of power were tempered by the local or regional authority and by Parliament itself. However, the pragmatism and concerted interests that emerged from the fierce competition between companies became a coherent and efficient Underground and railway network.

In addition to working well, that network has structured the city, has provided it with a center, a perimeter ring and access to its large area of influence. And it has provided London with an explicit set of vital references for its inhabitants, capable of 'ordering' an extensive metropolis in a shared imaginary of places and relationships.

The mentioned stations did not appear on their respective sites in a planned manner. Each company had to make its way to the center of the city and its real problem was in the search for a possible way of access.

who are looking for a place to enter,

Protests and relocations aggravated the difficulties of the companies in locating their terminals. Landowners saw the price of their plots drop, threatened with expropriation to make way for the railways, and they opposed them entering the city. Parliament, then still controlled by owners of urban land and agricultural estates, enacted a law to that effect. From then on, as Schabas says, the railroad layouts could not be planned, they had to be 'found.'

The companies had to improvise, since it was useless to go and look for travelers to other cities if they could not be left in the center of London. As we have seen, some lines tried to share a station, as occurred at Euston, others built temporary stations while finding a site and resources for the definitive one, as in Paddington. Some were built quickly, others took many years.

through agreements and provisional measures,

Once the location was defined and the lands for the station were obtained, the extension of the lines from their provisional completion in the open field to those sites saw itself obliged to run through built-up areas. The commotion and disturbances organized by the extensions of the South Eastern Railway from London Bridge Station to Cannon Street and Charing Cross, from Midland to St Pancras or the London & South Eastern to Waterloo, *all told of a city bursting at the seams* while surface traffic was still as slow, difficult and expensive as always. The river provided some relief, but it did not reach large areas of the city [145:75].

The first proposal to build a railroad under the surface arose in 1830, with a scheme to unite King's Cross with the City, then impracticable but of great strategic sense. It was recovered in 1851, as part of the *Railway Terminus and City Improvement Plan* proposal, conceived by Charles Pearson, City Solicitor. It consisted of a new Terminus station and a 30 m wide elevated road over factory arches, from Farringdon Station to King's Cross. The viaduct created a

underground railways,

tunnel of sufficient width to house six railway lines, although it did not define how it would manage to enter the stations.

The idea was recovered by a more practical and more commercially sound proposal, which immediately attracted the interest of the companies. It consisted of an underground line between Paddington and King's Cross that continued then towards Farringdon, following Pearson's idea. The first section ran under the broad and relatively straight New Road, with half the cost of the tunnel-viaduct and allowed the GWR to continue their trains from Paddington, located within the city but somewhat far away, towards two other stations and the center of the city.

that are the first in the world.

Over time, the proposed railway took the name of Metropolitan Railway and after overcoming a couple of sections of great difficulty in the construction of the tunnel, in 1863 the service between Paddington and Farringdon passing through King's Cross was inaugurated. The tunnel was enabled with double gauge, to allow the passage of GWR trains but in 1867 the width was unified to be able to widen the platforms, which precipitated the rupture between the two companies.

It was the first underground line in the world and was very successful from the start, both because of the novelty -perhaps somewhat uncomfortable- of traveling underground and because of the functionality of the connections between stations. The company earned money and progressively extended the line to Hammersmith and Harrow on the Hill to the west, and then to New Cross in 1884, thanks to an agreement with the East London Railway to use its tracks.

The idea of a circular line emerges

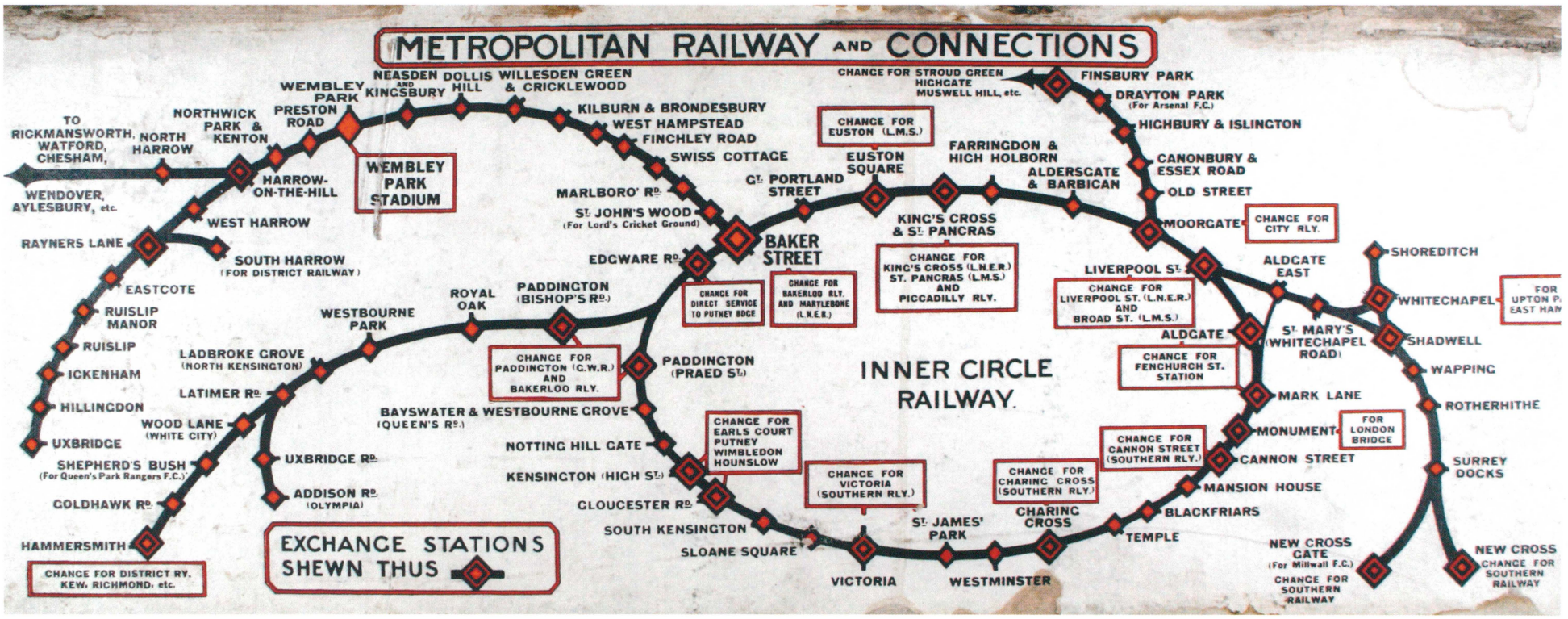
The final idea was to create a circular line around central London along with the Metropolitan District Railway, which would connect all London stations located north of the river. That idea of a circular line had arisen in the House of Lords, when they were trying to recover the proposal of a single central station for London. The company 'appropriated' it, using it in its maps and propaganda as an attraction of the multiplicity of its destinations.

This publicity facilitated the sale of homes that the Metropolitan Railway developed through a series of subsidiary companies in the land purchased near the future stations of its unstoppable expansion, with a business model later adopted in many cities. This practice made popular the nickname of Metro-land that the company later adapted as Metro-land to use in its promotion campaigns [145:79].

from the pioneer Metropolitan Railway

In a concise and schematic way, the 1925 Metropolitan Railway network scheme contains an ellipse, called the *Inner Circle Railway*, from which four curved branches emerge. The western branch has 11 stations, the northwest 24, the north 5 and the east 6 stations; while the central ring has another 27, which gives a total of 73 stations. The scheme distinguishes the stations with links, 6 in the branches and 14 in the ring.

For its part, the map of 1938 is drawn on a geographical basis with the streets, the river and the other railway lines, without distorting them, where the company's network stands out in red above the others. The role of Baker Street Station is clearly central to this railroad, since the longest branch with the largest number of stations starts from there. The lines of the Metropolitan Railway do not close the central ring, but if they are considered together with



Metropolitan Railways, network in 1925
[© TfL from the London Transport Museum collection]

the so-called Tube & District Railways in the legend, the *Inner Circle* is already complete.

The scheme of a circular line that connects all the railway stations is the germ of the final structure of the network, due to its capacity to grant different roles in its operation. The ring, now called *Circle Line*, is the basic figure that orders the general scheme of the network, collected in the famous *London Tube Map* and has an enormous importance in fixing the image of the city.

and it is the germ of the structure of the network,

As Kevin Lynch explained in his famous *The Image of the City*, after his studies on the perception of the city centered on Los Angeles, Boston and New Jersey, initiated in 1953 after a long trip through Italy, the new concept of 'imageability,' defines the quality of a physical object to evoke an image of strong character in any observer. Throughout his book, Lynch demonstrates the potential value of this concept to guide the construction and evolution of cities, and that London Tube Map can be considered one of the best examples of this theory [86].

Attention to image issues came into being in 1916, when Frank Pick, head of advertising for the London Passenger Transport Board, commissioned Edward Johnson to label the stations. Johnson's proposal was the red circle with a blue band with the name of the station in white. In his *Historias de Londres*, Enric González collects some words of the clairvoyant Frank Pick: *A high level of design of things is essential for a lasting prestige and, therefore, for the good functioning of the public service* [53:166].

fixing the image of the city.

In 1933 Harry Beck was entrusted with the realization of a comprehensible diagram or map of the underground network with all its lines - each with its color - stations and connections. The original preserved in the Victoria and Albert Museum has been updated promptly with all the extensions and later new lines.

Beck managed to make it more readable by using only straight stretches in horizontal, vertical and diagonal directions at 45 degrees from each other, and altering the distances to balance the center lines with the peripheral branches, which seemed to bring the suburban stations closer. With this, the center was fixed definitively and the role of the circular line became indispensable as a limit and connection

In fact, the prohibition defines the center,

According to the above, it can be concluded that prohibiting the stations from being established within the center, had an important, although not intended consequence, because it ended up defining the center of London since, in short, the railroad is the only way efficient to move around the city.

You do not need several confluent avenues in a large square to visualize the center: it is much more effective, as Lynch said, to 'see the city' outlined in the Underground map. Neither is it necessary for the ring to materialize in the form of roundabouts or bypasses, since the rosary of stations of the current Circle Line does not need links, it is enough to see them linked in that map or related in the list of destinations of each platform, visible in all stations.

travel defines the limit,

For its part, the *limit* can also be traveled and as effectively as in a bypass. It is not necessary to know which are the streets under which the line runs, because knowing the sequence of stations is enough. And these Underground stations are not visible on the surface, where only the ones named after the railway stations emerge, usually connected to them by underground corridors or corridors.

and the order and hierarchy of the stations

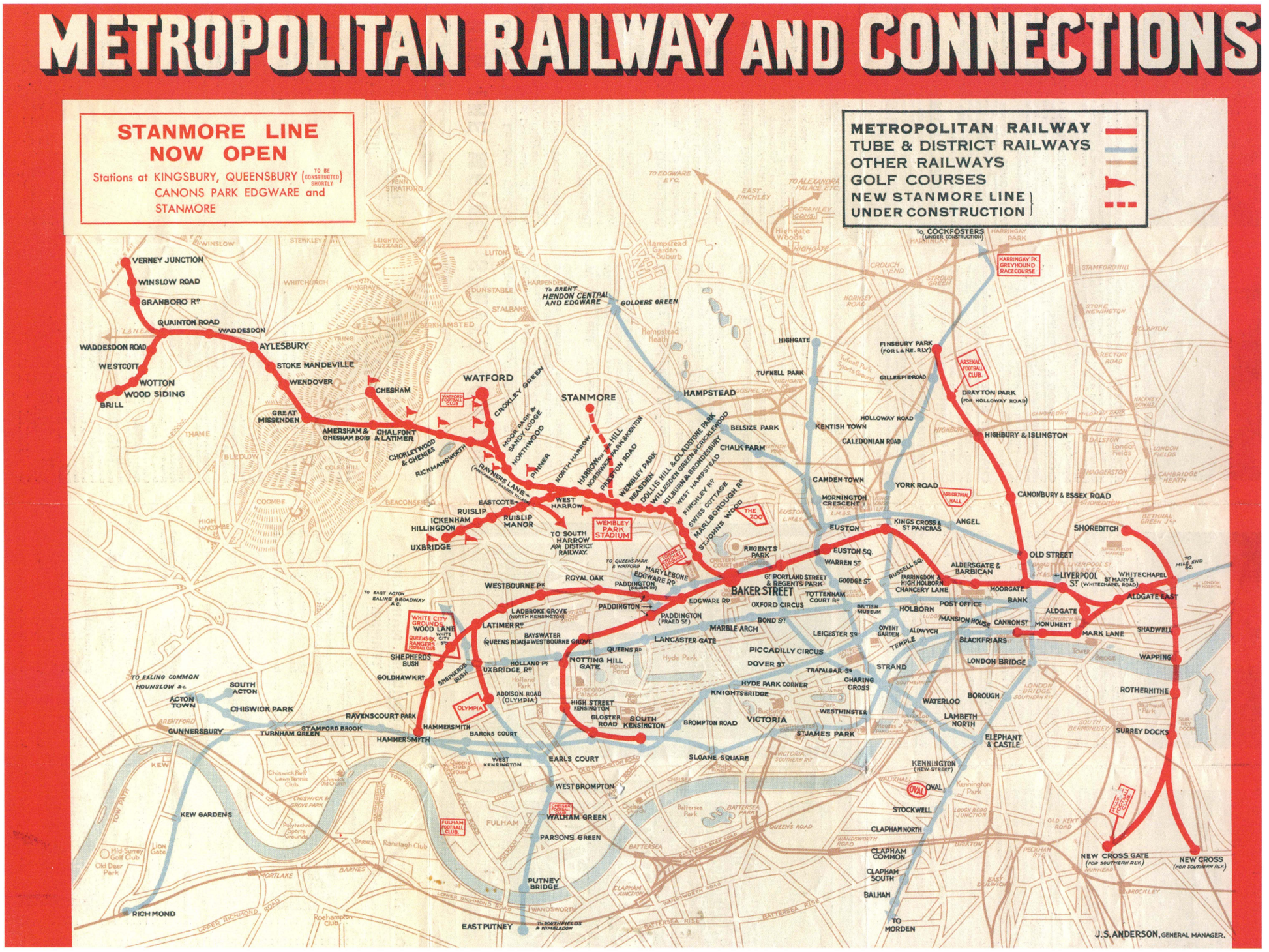
That defines a *hierarchy* of the ring stations, since those located in the stations acquire more importance and visibility. With this, the contribution of the ring to the structure -not of the network, but of the city itself- is enriched by highlighting the points where the center is related to the outside, with the suburbs, the satellite cities and the entire region.

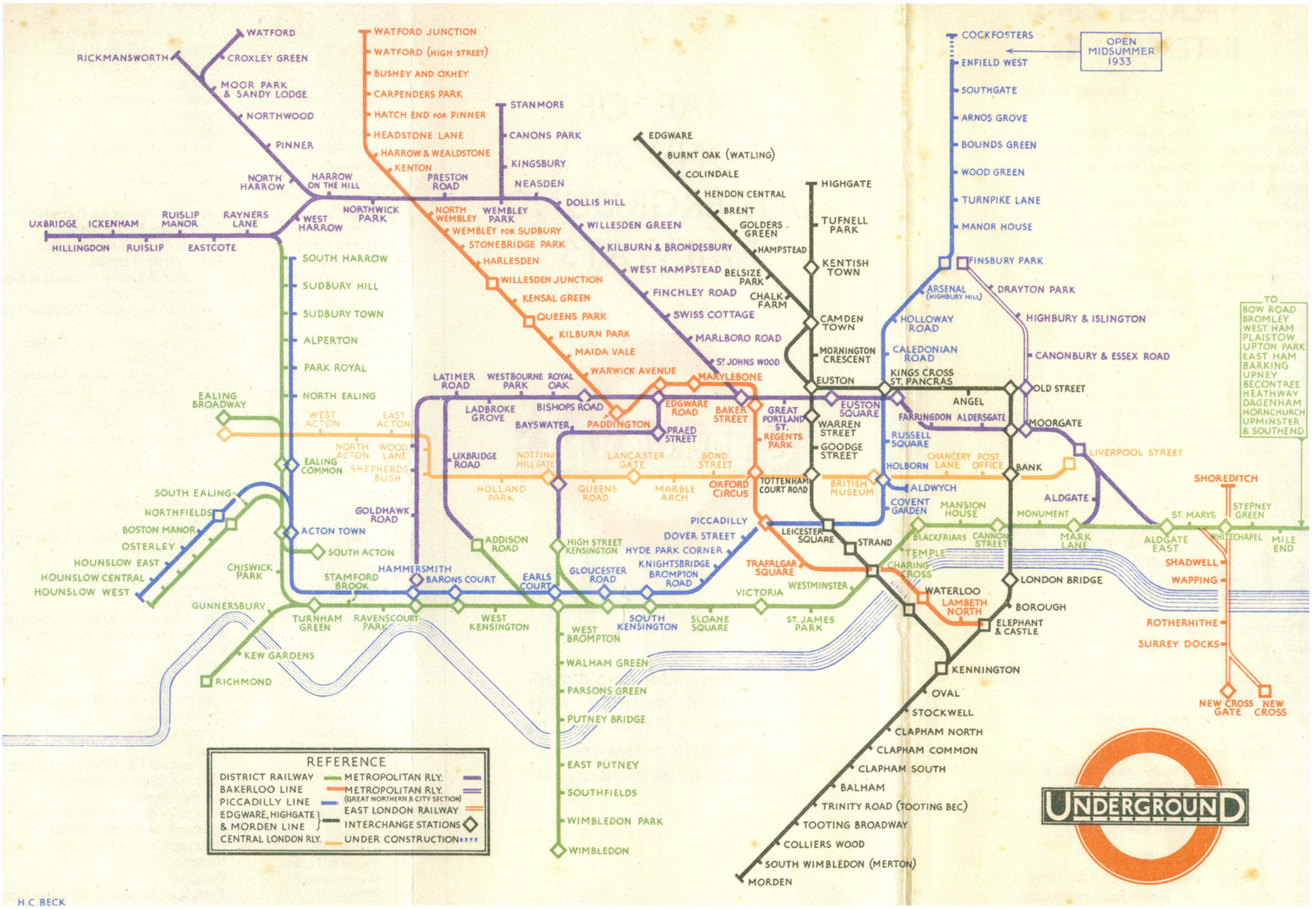
defines the center of London

With the landscape ecology,[26] you can deepen the elements of the landscape to include the whole to analyze its functioning. Without pretending all that depth, it is enough to list as **nodes** the stations of Paddington, Euston, St Pancras & King's Cross, Liverpool Street, London Bridge, Waterloo, Charing Cross, Victoria; as **edge** the Circle Line, or better its suggestion through the superficial presence of its stations; as **center** the area enclosed by that edge without forcing its limit condition and attending more to its centrality for Greater London.

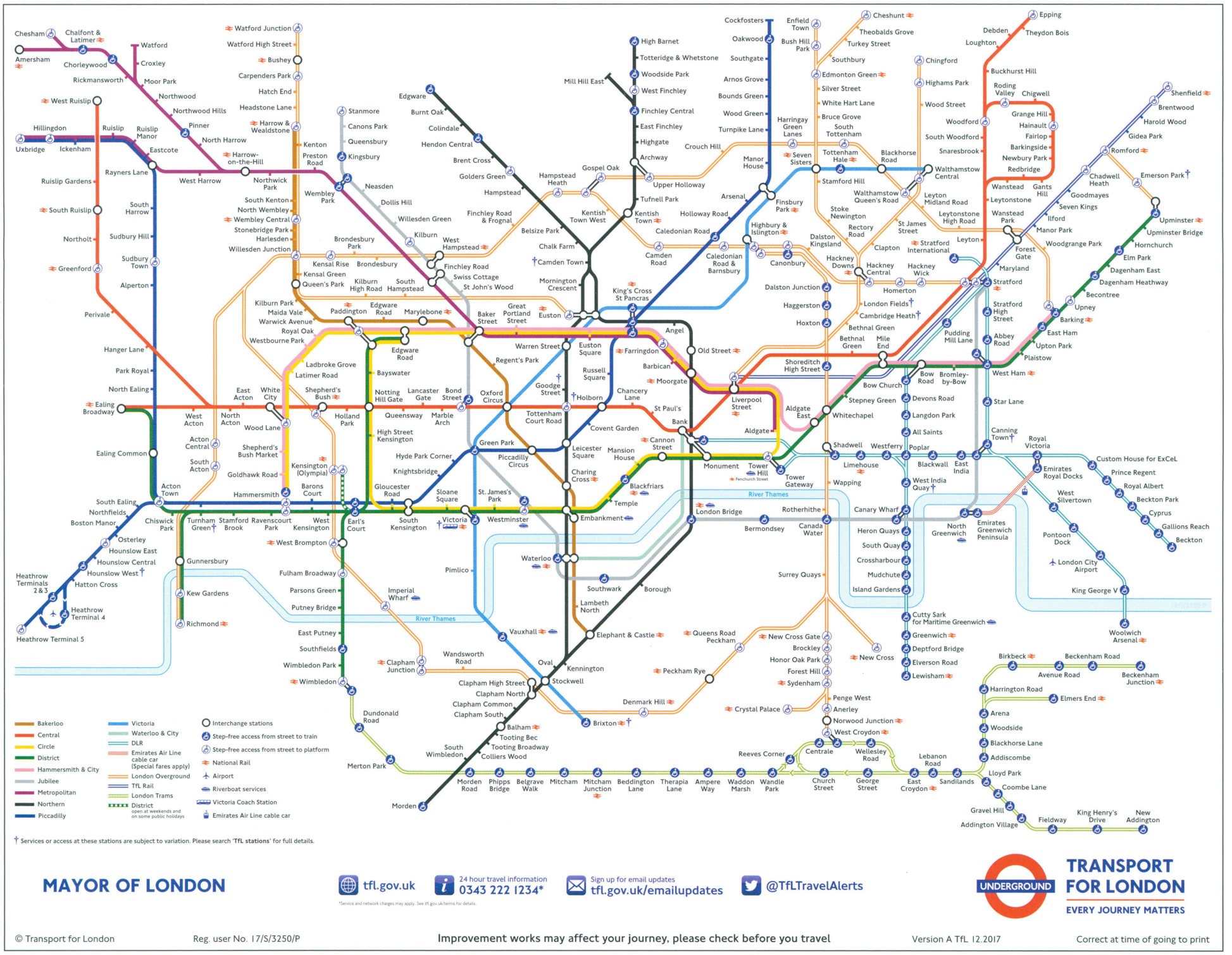
These railway stations are the points where hundreds of thousands of daily passengers disembark in the city, who are dispersed by the Underground lines into the area enclosed by the Circle Line stations. It is within that area where all the significant concurrency spaces of the city are located. There are no precise limits and there are obvious exceptions, such as Canary Wharf or the vicinity of London Bridge Station, but the city understands that area as the center, which is the best connected.

In addition to these basic nodes it is convenient to highlight the role of the external stations of Waterloo and London Bridge, clearly differentiated by their position on the south side of the river with **concentration** and **rupture** functions to feed the Underground network and channel part of the traffic to Charing Cross and Cannon Street, already located in the ring; and to a lesser

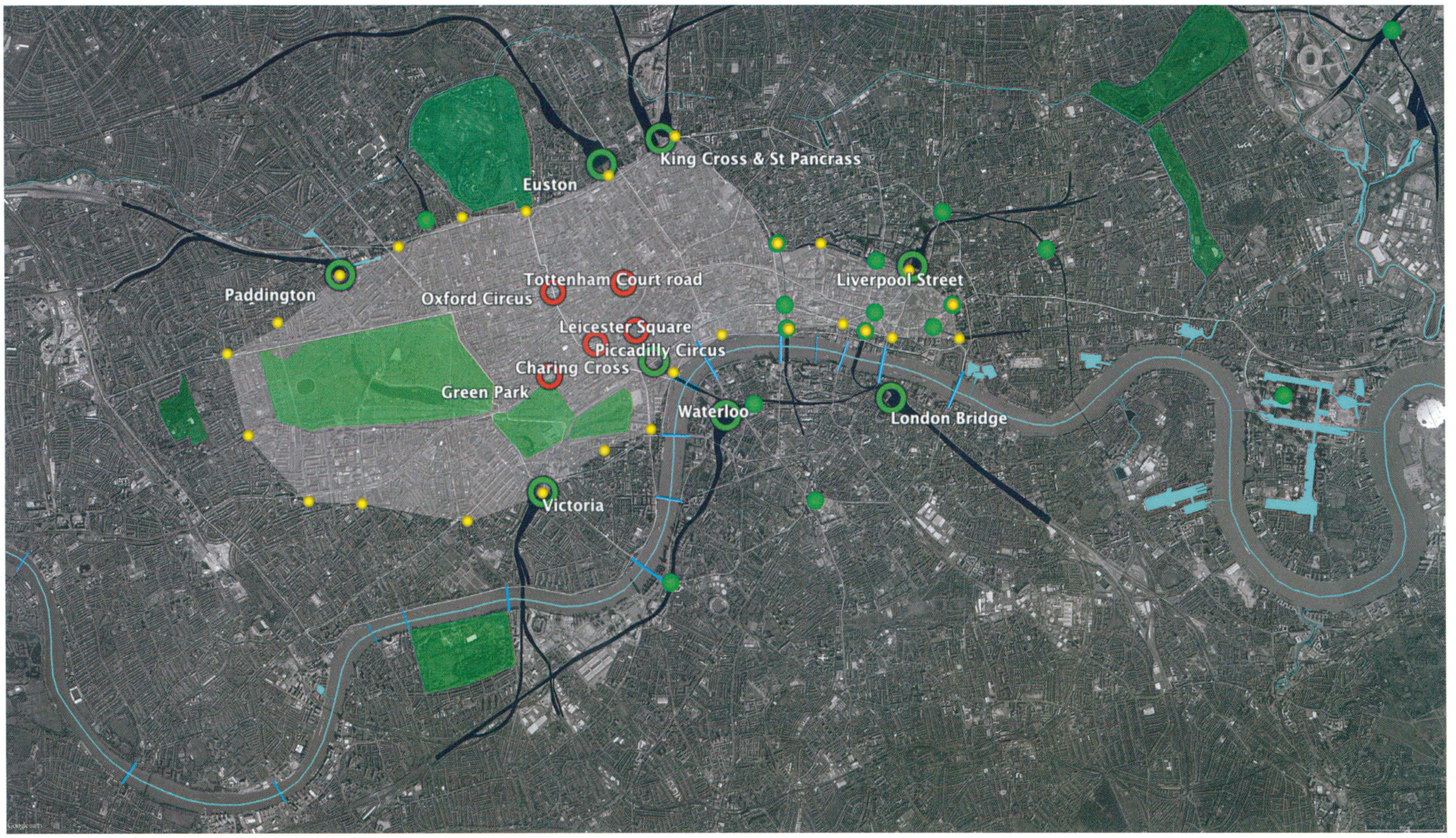

METROPOLITAN RAILWAY AND CONNECTIONS
STANMORE LINE
NOW OPEN
Stations at KINGSBURY, QUEENSBURY (TO BE CONSTRUCTED SHORTLY)
CANONS PARK EDGWARE and
STANMORE
METROPOLITAN RAILWAY
TUBE & DISTRICT RAILWAYS
OTHER RAILWAYS
GOLF COURSES
NEW STANMORE LINE
UNDER CONSTRUCTION
VERNEY JUNCTION
WINSLOW ROAD
GRANBORO R.D
QUAINTON ROAD
WADDESDON
WADDESDON ROAD
AYLESBURY
WESTCOTT
STOKE MANDEVILLE
WOTTON
WENDOVER
WOOD SIDING
CHESHAM
BRILL
GREAT MISSENDEN
AMERSHAM & CHESHAM BOIS
CHALFONT & LATIMER
CHORLEYWOOD & CHENIES
RICKMANSWORTH
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CROXLEY GREEN
MOOR PARK & SANDY LODGE
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NORTH HARROW
HARROW & WEALDSTONE
PRESTON ROAD
WEST HARROW
TO SOUTH HARROW FOR DISTRICT RAILWAY
WEMBLEY PARK STADIUM
STANMORE
WEMBLEY PARK
NEASDEN
DOLLIS HILL & GLADSTONE PARK
WILLESDEN GREEN & CRICKLEWOOD
KILBURN & BRONDESBURY
WEST HAMPSTEAD
FINCHLEY R.D
GOLDERS GREEN
TO BRENT HENDON CENTRAL AND EDGWARE
HAMPSTEAD
SWISS COTTAGE
MARLBOROUGH R.D
ST JOHNS WOOD
THE ZOO
REGENT'S PARK
BAKER STREET
MARYLEBONE
EDGWARE R.D
PADDINGTON (BISHOPS RD)
PADDINGTON
PADDINGTON (PRAED ST)
WESTBOURNE P.K
ROYAL OAK
LADBROKE GROVE (NORTH KENSINGTON)
LATIMER R.D
BAYSWATER (QUEENS ROAD) & WESTBOURNE GROVE
WHITE CITY GROUNDS
WOOD LANE
QUEENS & RANGERS ROYAL CLUB
SHEPHERDS BUSH
GOLDHAWK R.D
UXBRIDGE R.D
HOLLAND P.K
NOTTING HILL GATE
QUEENS R.D
LANCASTER GATE
MARBLE ARCH
BOND ST
OXFORD CIRCUS
PICCADILLY CIRCUS
DOVER ST
HYDE PARK CORNER
KNIGHTSBRIDGE
ADDISON ROAD (OLYMPIA)
OLYMPIA
HIGH STREET KENSINGTON
GLOSTER ROAD
SOUTH KENSINGTON
BROMPTON ROAD
VICTORIA
ST JAMES PARK
TRAFALGAR SQ
STRAND
CHARING CROSS
WESTMINSTER
LEICESTER SQ
COVENT GARDEN
ALDWYCH
TEMPLE
BLACKFRIARS
LONDON BRIDGE
WATERLOO
BOROUGH
LAMBETH NORTH
ELEPHANT & CASTLE
KENNINGTON (NEW STREET)
OVAL
STOCKWELL
CLAPHAM NORTH
CLAPHAM COMMON
CLAPHAM SOUTH
BALHAM
TO MORDEN
HIGHGATE
TUFNELL PARK
GILLESPIE ROAD
FINSBURY PARK (FOR L & NE. RLY)
ARSENAL FOOTBALL CLUB
DRAYTON PARK (FOR HOLLOWAY ROAD)
HOLLOWAY ROAD
KENTISH TOWN
CALEDONIAN ROAD
BELSIZE PARK
CHALK FARM
CAMDEN TOWN
YORK ROAD
HIGHBURY & ISLINGTON
MORNINGTON CRESCENT
EUSTON
KINGS CROSS & ST PANCRAS
ANGEL
EUSTON SQ.
GT PORTLAND STREET & REGENTS PARK
GOODGE ST
WARREN ST
RUSSELL SQ.
FARRINGDON & HIGH HOLBORN
CHANCERY LANE
ALDERSGATE & BARBICAN
MOORGATE
BANK
POST OFFICE
HOLBORN
BRITISH MUSEUM
CANNON ST
MONUMENT
OLD STREET
LIVERPOOL ST (WHITECHAPEL ROAD)
WHITECHAPEL
ST MARY'S
ALDGATE
ALDGATE EAST
SHOREDITCH
MARK LANE
SHADWELL
WAPPING
ROTHERHITHE
SURREY DOCKS
NEW CROSS GATE (FOR SOUTHERN RLY.)
NEW CROSS (FOR SOUTHERN RLY.)
CANONBURY & ESSEX ROAD
HARRINGAY PK GREYHOUND RACECOURSE
To COCKFOSTERS (UNDER CONSTRUCTION)
EAST FINCHLEY
TO EDGWARE ETC.
TO ALEXANDRA PALACE ETC.
CRANLEY GDNS.
Highgate Woods
CROUCH END
STROUD GREEN
HORNSEY ROAD
HARRINGAY PARK
STAMFORD HILL
STOKE NEWINGTON
CLAPTON
RECTORY ROAD
HACKNEY DOWNS
HACKNEY WICK
HOMERTON
DALSTON
LONDON FIELDS
HAGGERSTON
CANBRIDGE HEATH
SHOREDITCH
BETHNAL GREEN
TO MILE END ETC.
Hampstead Garden Suburb
Hampstead Heath
Tufnell Park Sports Ground
GOSPEL OAK
Kensington Palace
Albert Hall
Buckingham Palace
Hyde Park
Holland Park
Round Pond
St James's Park
Victoria Station
Victoria Coach Station
Victoria Underground Station
Victoria Southern Rly
Westminster Abbey
Houses of Parliament
Tower Bridge
London Bridge Southern Rly
Southwark Park
South Bermondey
Kennington Park
Oval Cricket Ground
Lough Boro Junction
Old Kent Road
Peckham Rye
Brixton
Clapham Junction
Battersea Park
Battersea Rise
Wandsworth Road
Lower Richmond Road
Upper Richmond Road
Putney Bridge
East Putney
To Southfields & Wimbledon
Queens Park & Watford
Chiltern Court
Baker Street Underground Station
Regents Park
Euston Underground Station
Euston L.M.S.
Euston Square Underground Station
Warren Street Underground Station
Goodge Street Underground Station
Tottenham Court Road Underground Station
Oxford Circus Underground Station
Bond Street Underground Station
Marble Arch Underground Station
Lancaster Gate Underground Station
Queensway Underground Station
Notting Hill Gate Underground Station
High Street Kensington Underground Station
Gloster Road Underground Station
South Kensington Underground Station
Knightsbridge Underground Station
Hyde Park Corner Underground Station
Piccadilly Circus Underground Station
Leicester Square Underground Station
Covent Garden Underground Station
Aldwych Underground Station
Temple Underground Station
Blackfriars Underground Station
Mansion House Underground Station
Cannon Street Underground Station
Monument Underground Station
Mark Lane Underground Station
Tower Hill Underground Station
Aldgate Underground Station
Aldgate East Underground Station
Shoreditch Underground Station
Whitechapel Underground Station
Liverpool Street Underground Station
Bank Underground Station
Moorgate Underground Station
Chancery Lane Underground Station
Russell Square Underground Station
Holborn Underground Station
Post Office Underground Station
Farringdon Underground Station
Angel Underground Station
King's Cross & St Pancras Underground Station
Mornington Crescent Underground Station
Camden Town Underground Station
Euston Underground Station
Chalk Farm Underground Station
Belsize Park Underground Station
Hampstead Underground Station
Golders Green Underground Station
Swiss Cottage Underground Station
West Hampstead Underground Station
Finchley Road Underground Station
Wembley Park Underground Station
Neasden Underground Station
Dollis Hill Underground Station
Willesden Green Underground Station
Kilburn Underground Station
Brondesbury Underground Station
Kilburn High Road Underground Station
Queen's Park Underground Station
Kensal Green Underground Station
Willesden Junction Underground Station
North Harrow Underground Station
Harrow & Wealdstone Underground Station
Preston Road Underground Station
West Harrow Underground Station
Rayners Lane Underground Station
Eastcote Underground Station
Ruislip Underground Station
Ickenham Underground Station
Hillingdon Underground Station
Uxbridge Underground Station
Ruislip Manor Underground Station
Northwood Underground Station
Pinner Underground Station
Moor Park & Sandy Lodge Underground Station
Croxley Green Underground Station
Watford Underground Station
Chorleywood Underground Station
Rickmansworth Underground Station
Chesham Underground Station
Amersham & Chesham Bois Underground Station
Chalfont & Latimer Underground Station
Great Missenden Underground Station
Wendover Underground Station
Stoke Mandeville Underground Station
Aylesbury Underground Station
Westcott Underground Station
Wotton Underground Station
Wood Siding Underground Station
Brill Underground Station
Waddesdon Road Underground Station
Waddesdon Underground Station
Quainton Road Underground Station
Granboro R.D Underground Station
Winslow Road Underground Station
Verney Junction Underground Station
Shepherd's Bush Underground Station
Shepherd's Bush Market Underground Station
Goldhawk R.D Underground Station
Uxbridge R.D Underground Station
Wood Lane Underground Station
White City Underground Station
Latimer R.D Underground Station
Ladbroke Grove (North Kensington) Underground Station
Westbourne P.K Underground Station
Bayswater (Queens Road) & Westbourne Grove Underground Station
Paddington (Praed St) Underground Station
Paddington (Bishops Rd) Underground Station
Edgware R.D Underground Station
Marylebone Underground Station
Edgware Underground Station
Brent Underground Station
Harrow Weald Underground Station
Kingsbury Underground Station
Queensbury Underground Station
Canons Park Underground Station
Stanmore Underground Station
Wembley Park Stadium
Wembley Park



First Tube Map: The diagrammatic map of the London Underground designed in 1933 by Henry C. Beck. [© TfL from the London Transport Museum collection]



Current map of the London Underground
[© Transport for London, Registered User No. 17/S/3250/P]



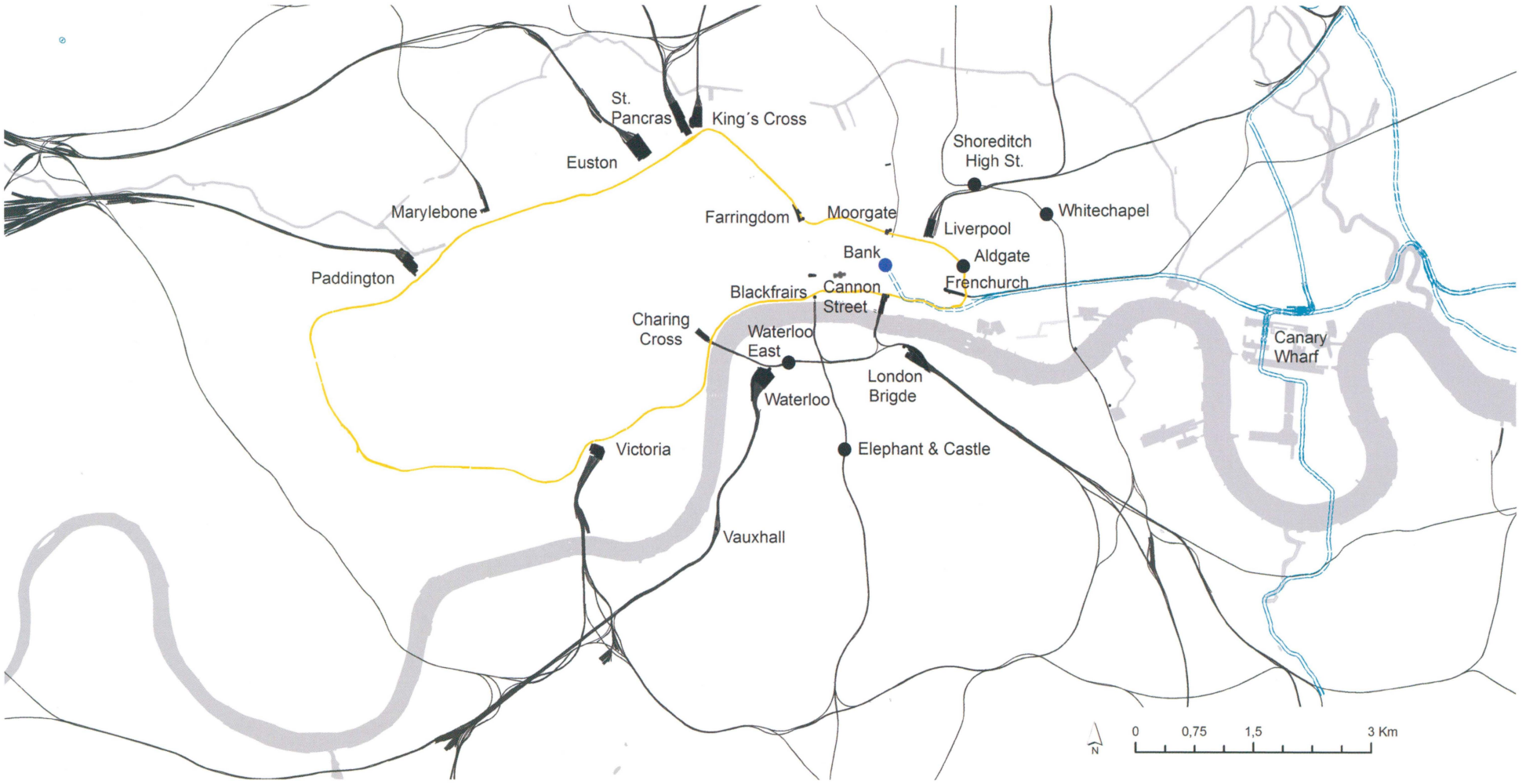
and the structure of the city.

extent or scale the similar role of Aldgate East and Earl's Court with respect to the Underground, since they are located next to the ring but without participating in the circular traffic.

The center is defined by that ring of stations, the railway lines are the links with the extensive outer territory, as Geddes affirmed, and the metro lines constitute the links with the interior. Next, the frequentation and connectivity of stations understood as graphs are analyzed quantitatively. The river is the origin of the city and constitutes another main component of its structure, with the functions of corridor, border and boulevard that are analyzed in chap. 3.

Some roads and streets, located inside and outside the central area, function as significant itineraries for the city, which are discussed in chap. 4. As you will see there, among the interior ones stands Regent Street, whose north-south layout is a 'social divide' of the city.

On the matrix of streets and buildings appear a few large green spots, which are the main parks and many smaller ones of great local value. And new spots also appear, which are the areas of opportunity defined by the city to increase its density, taking advantage of existing mobility. Both spots are discussed in chap. 5, along with certain points of concentrated activity, or 'Hot Spots' that offer essential functions for the city, such as airports, stadiums, amusement parks or specific sites of great concurrence.



Current stations and rail lines

The complementary mesh of the Underground

The remaining Underground lines form another **mesh** that is more complementary than secondary because of its greater volume of traffic, although less structuring due to its great transshipment capacity. In the center, this mesh has a more **reticular** character, although from the ring it is as radial as that of the railroad, and in that area are relevant the **diagonal** position of some stretches of the Bakerloo and Piccadilly Lines, and the east **centrality** of the well-called Central Line.

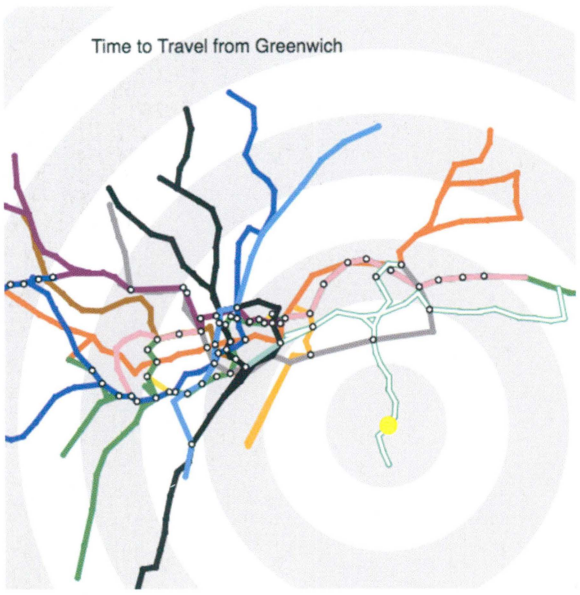
The role of the most modern lines, such as the Jubilee Line, is the result of a complex mix of objectives, very precisely established in terms of the **bottlenecks** of the central nucleus and the **deficiencies** of the exterior of the ring. The process of crystallization of this line through the tens of years required for planning and construction can be followed in the precise account of one of those responsible for it [112:118-135]. Also of interest are the formalization of the layout and selection of stations of the Crossrail and Thameslink lines under construction analyzed in 5.3.

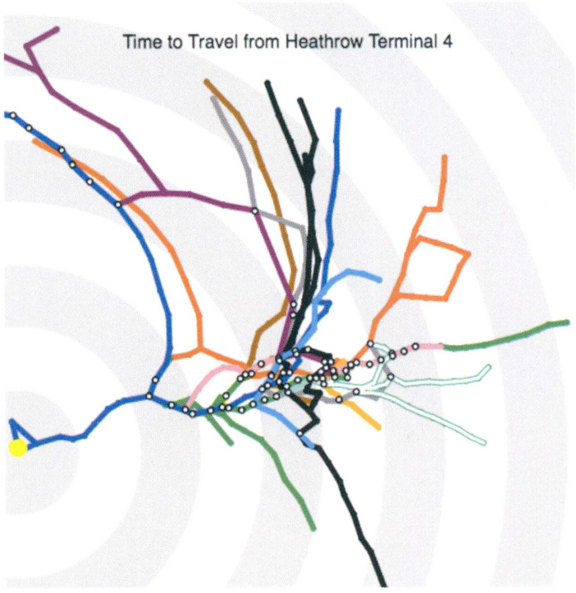
becomes important with transfers

Within the central zone, the railway stations where several Underground or rail lines cross, such as Baker Street where 5 lines cross, Bank and Embankment with 4 lines crossing and ten stations with more than 3 lines, become more important. In London, it is worth noting the use of the tracks by several lines, which allows a more efficient use of the stations and a few simple transfers, because it is enough to go out onto the platform and wait for the next train of the other line.

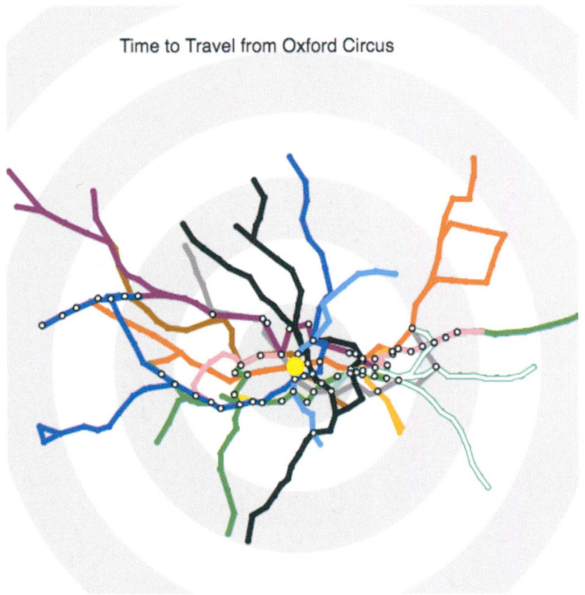


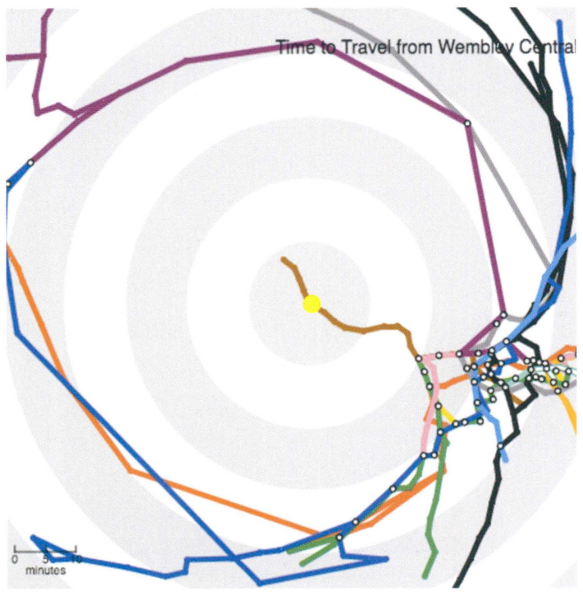
Spatial distortion plans of the Underground network due to travel times [Own elaboration from Travel Time Tube Map, http://www.tom-carden.co.uk/p5/tube_map_travel_times/applet/]

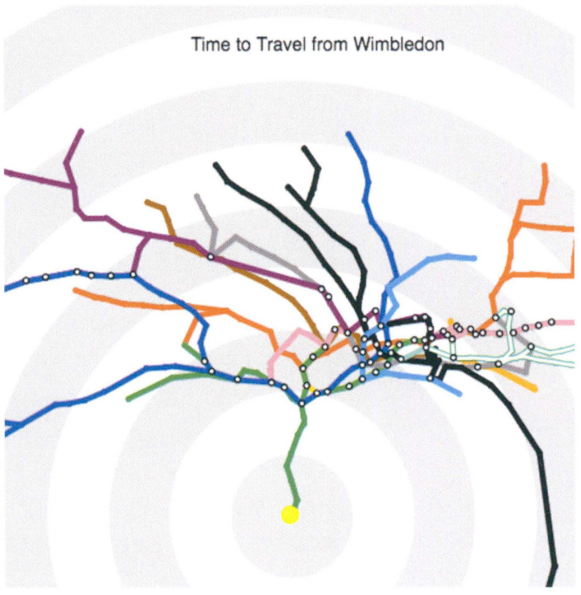








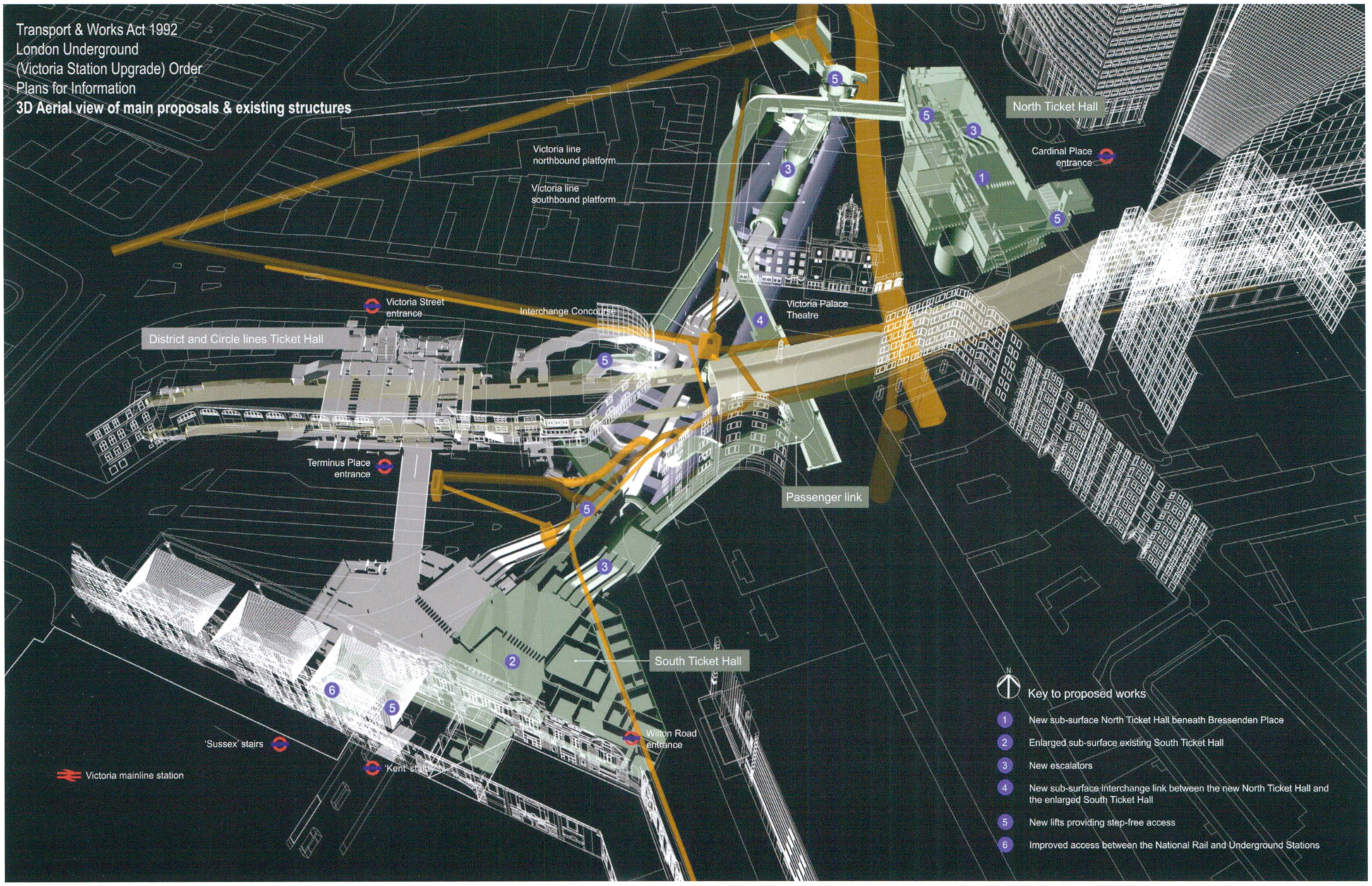




Time maps

The travel time maps on the Underground network show the distortion produced by the vertices or their lack in the perception of the network as a whole. The name of the station of origin, indicated at the top of each scheme, is highlighted in yellow and occupies the center of the circles of 10, 20, 30, 40 and 50 minutes of travel. The least distortion occurs at stations near the city center, such as Oxford Street or Charing Cross.

The most pronounced occur at marginal sites, such as Heathrow, Wembley, Wimbledon or Greenwich, corresponding to stations located at the end of a line, without close crossings with other lines. The case of Wembley is perhaps the most dramatic in pointing out the isolation of the west branch of the Bakerloo Line: to go from its stations to those of other geographically close lines, it is necessary to reach the Circle Line and return by the other; something like getting to the trunk of the tree to go from one branch to another [27].



Victoria Station plan [London Bridge Associates LTD, https://www.lba.london/project/victoria-station-upgrade/]

and get functionality and efficiency

All this has a direct and measurable effect on the functioning of the network, which requires quantification, graph theory and statistics on the use of lines and stations, in order to obtain quantitative scales of the importance of each node and, consequently, establish hierarchies within the network.

Quantitatively, the ring is about 20 km long and encloses an area of 1800 ha, whose shape narrows to the east, at the height of St Paul's, picking up the complexity of the old City and the layouts and stations of the first railroads, built precisely there. To the south, the ring sticks to the river, as much of its layout was built simultaneously with the wharves at Westminster and Embankment.

with its spatial distribution in the city.

In terms of density or concentration, the 27 interior stations are distributed unevenly: to the west of Regent Street there are only 7 stations, to the east there are 17 and the remaining three are on the Bakerloo Line, built under

that street and its extensions. However, the constructed surfaces are similar because, although the part to the west is 1100 ha, Hyde Park, Green Park and St James' Park occupy about 320 ha. That leaves about 780 ha built while the east side has 700 ha, but the eastern buildings are higher and generate more transport demand and more stations. All this is a faithful reflection of the lower density of the city to the west and reinforces the role of Regent Street as the N-S divide of the city, analyzed in detail in chap. 4.

Comparison with other countries.

The main magnitudes of the London Underground are indicated in the first five columns of the following table, while the last six show different connectivity and centrality indexes.[28] Other European Metros are included to have a comparison scale.

The reading of the table can cause much debate, although obtaining precise quantification for comparison would require having relative measures, capable of separating questions of size and avoiding the handling of dependent variables. In a summary review, the dominance of London seems clear, except in the number of stations, where Paris stands out, despite having a network of about half the length. But the kilometers of network do not indicate connections and may be due only to the spread of the city, as seems to be the case. The number of stations, on the other hand, offers more options to the citizen, where Paris seems to dominate. However, the stations of Madrid seem to allow more connections or better transshipments than those in Paris, having a connectivity almost as high as London.

Indicators of the European Metros

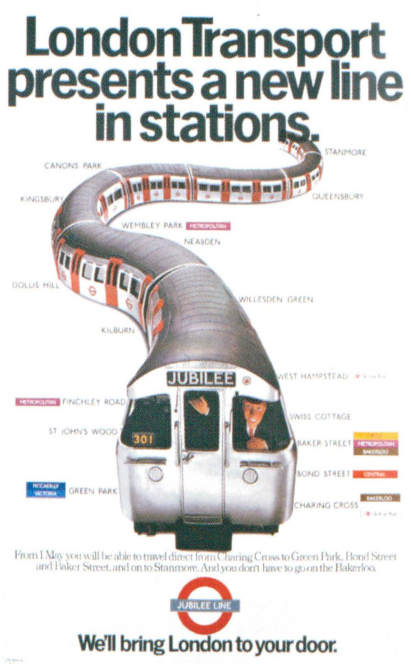
City	Long	Ln	V	L	R	γ	g	β	b	r	η
	km	lines	stations	edges	routes	L/3(V-2)	R/3(V-2)	L/V	R/V	im/V	Long/l
London	402	11	56	99	105	0.61	0.62	1.77	1.87	1.24	4.06
Moscow	309	12	40	63	63	0.55	0.55	1.56	1.56	0.10	4.95
Madrid	286	13	46	79	79	0.60	0.60	1.72	1.72	0.00	3.62
París	218	16	66	105	105	0.55	0.55	1.59	1.59	0.12	2.16
Paris	147	10	31	42	42	0.48	0.48	1.34	1.34	0.00	3.55
Stockholm	106	3	18	18	18	0.35	0.35	1.00	1.00	0.11	6.22

Source:http://transportproblems.polsl.pl/pl/Archiwum/2015/zeszyt2/2015t10z2_04.pdf
im=total number of edges with multiple directions

The most used stations.

To get an idea of the activity of the stations, it is necessary to take into account their marked seasonality, with morning and afternoon peaks, and daily over weekends. To do this, daily values are used and multiplied by the weight corresponding to the number of 253 working days, 52 Saturdays and 59 Sundays and holidays, to see the annual activity.

The differences between work days and weekends are important to understand the type of station. Those with few passengers over the weekend are the most dependent on commuters, while the most regular ones depend on tourist traffic or situations of proximity to places frequented every day. The differences between the number of passengers entering and departing are minimal, except daily in Waterloo, where eleven thousand people make a different outbound trip, perhaps because the train schedules are less convenient or for other reasons.



Panel Poster; London Transport presents a new line in stations, 1979 [© TfL from the London Transport Museum collection]

Underground stations most used in 2015

Station	Daily Enter	Saturday Enter	Sunday Enter	Daily Exit	Saturday Exit	Sunday Exit	Yearly Enter and exit
Count by station	thousands	thousands	thousands	thousands	thousands	thousands	millions
Loads	253	52	59	253	52	59	
Waterloo	147	103	61	158	101	62	95.1
King's Cross St. Pancras	138	120	99	139	112	90	93.4
Victoria	123	98	78	128	95	78	82.9
Liverpool Street	116	65	57	118	66	66	73.3
London Bridge	115	86	54	110	83	52	72.0
Stratford	91	100	68	82	92	61	61.4
Bank & Monument	107	30	14	102	28	13	57.5
Canary Wharf	94	32	24	96	34	25	54.4
Paddington	80	51	46	76	48	40	49.6
Euston	63	50	43	64	50	39	42.2
Charing Cross	35	32	18	29	22	11	20.7

Source: Transport Planning - Strategy & Service Development, with own elaboration

Underground stations most used in 2015

Station	Daily Enter	Saturday Enter	Sunday Enter	Daily Exit	Saturday Exit	Sunday Exit	Yearly Enter and exit
Count by station	thousands	thousands	thousands	thousands	thousands	thousands	millions
Loads	253	52	59	253	52	59	
Oxford Circus	134	119	75	145	132	77	92.4
Leicester Square	59	89	55	54	86	49	43.7
Piccadilly Circus	60	74	47	58	74	42	42.8
Holborn	63	40	25	68	45	26	40.5
Green Park	60	40	26	65	49	32	39.6
Bond Street	57	50	30	56	48	29	37.1
South Kensington	50	45	34	50	44	33	33.9
Brixton	48	39	28	45	37	27	30.8
Baker Street	47	32	25	45	30	23	29.4
Finsbury Park	45	42	25	43	33	23	28.8

Source: Transport Planning - Strategy & Service Development, with own elaboration

London is built by regulating private interest.

This reflection on the structure of centrality granted by a railway network, built by private interests and only regulated to harmonize interests and limit abuses, contrasts with the vision of the problem of location of the stations of a railroad financed, conceived and built by the state in the highly planned Paris.

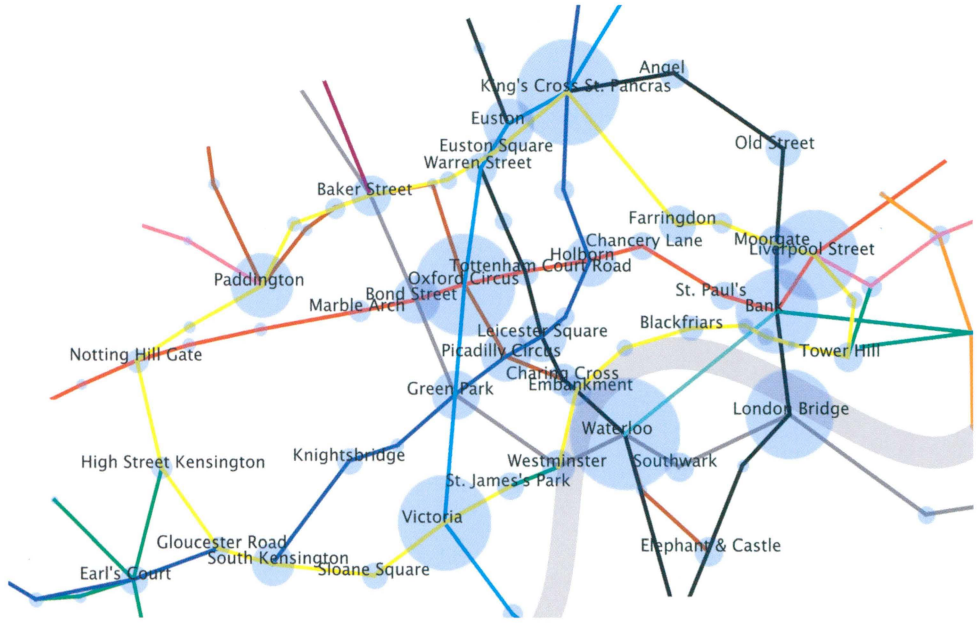
As Walter Benjamin cites (*Arcades* F4a, 3), *Haussmann was incapable of having what could be called a policy on railroad stations....Despite a directive from the emperor, who justly baptized* les gares *'the new gateways of Paris,' the continued development of the railroads surprised everyone, surpassing all expectations....The habit of a certain empiricism was not easily overcome* [17:280].

The station as an image of the industry

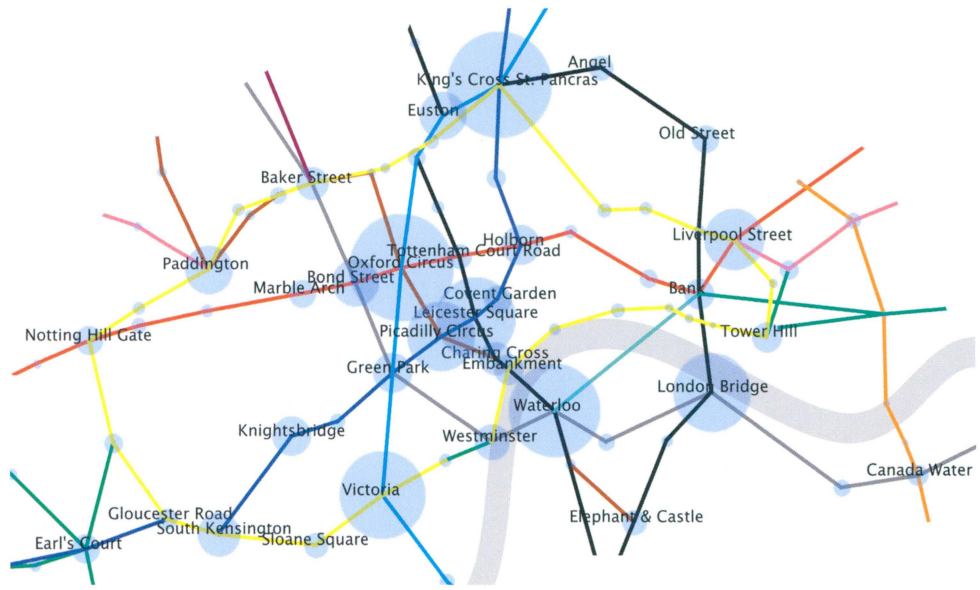
The railway station inaugurates a new type of building that exceeded the uncomfortable functional presence of the tracks and supposed the visible image of the railway in the city. Its façade communicated its presence, while its posi-



London Bridge Station track yard from The Shard



Passenger traffic in the central area of the Underground network on weekdays



Passenger traffic in the central area of the Underground network on Saturday

tion fixed the conditions of mobility with respect to the nearby streets and in relation to the other stations.

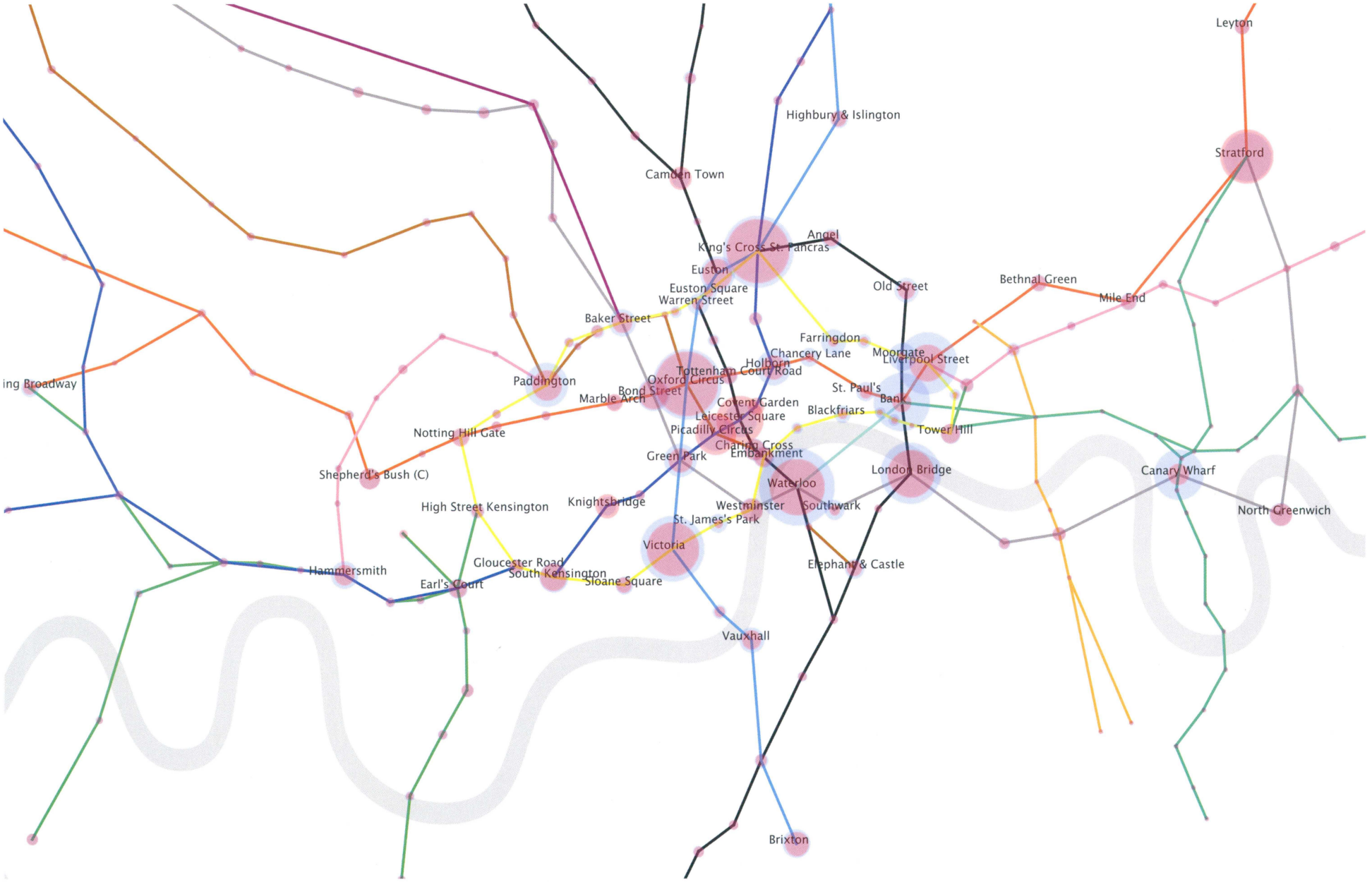
brings a not very modern aesthetic

The modernity of Crystal Palace did not endure in the city and the stations were presented with the attire required by the taste of the time.[29]

The critic William Curtis attributes *to the stations a decisive role in the semantic confusion that supposed the program of a utilitarian shed on one side and an urban façade with an uncertain program on the other* [137:34]. Long before and with a broader perspective, Walter Benjamin himself affirmed that the first stations did not understand the new material...

but it responds to a calculated pragmatism.

But that aesthetic result is not the result of a lack of criteria, since it responds to the objective of pleasing travelers on the part of the developers of the lines, in defense of their economic interests, whose conflicts with the city were regulated by the Parliament. It was about selling trips, something sufficiently



Comparison of passenger traffic between weekdays (blue) and Saturday (red)

new and difficult to justify the pragmatism of doing it to the client's taste, which is essentially the taste of the time, without entering into architectural or aesthetic debates that would still take some 80 years to settle.

In its 180 years of existence, the Victorian stations have suffered demolitions, modifications and extensions of all kinds, but they continue to play an important role in the functioning and imagination of the city. After the early mistake of demolishing Euston's first station - or, perhaps, thanks to it - the city understood the value of these stations and treated them with care. None more have been destroyed, nor converted into a greenhouse, while some built afterwards with only functional criteria have not achieved citizen appreciation.

For all this, the stations constitute a valuable built heritage, which is a good reflection of a decisive time for the city and is kept alive in its functions, in its reference value and in its contribution to the identity of London.

3. S. Magnes

2. Gray Church

5. Dunston in the East

Lyon kay

Billings gate

THE BRIDGE

3 | Capital of the Empire

The River. Docks and Bridges

I do not know much about gods; but I think that the river
Is a strong brown god - sullen, untamed and intractable,
Patient to some degree, at first recognised as a frontier;
Useful, untrustworthy, as a conveyor of commerce;
The only a problem confronting the builder of bridges.

T. S. Eliot -Four Quartets, 1943 [42:205]

The River as Origin, Border and Boulevard

Wealth came to London by river / and made it the center of the world. // London was founded by the river / that was fence and border, / granting identity to its shores, / as a corridor, barrier and threshold. // But its presence marked the character / of a city based on money and power, / with a history represented on their maps, / and collected in views and panoramas. // It was a barrier to fire and a place for the gaze/ when Wren built St Paul's dome/ and appreciated it from the other shore. // Although its interior disappointed Stendhal, / its presence extends through the city,/ without being altered by other cathedrals. // The Thames is the liquid history of London.

The River as Corridor

The river guarantees continuity / and connects edges and shores / to the rhythm of wind and tides, / overcoming blocked streets/ despite shallows, ice and storms. // Docks and bridges make the river urban, / where river navigation converges / through a system of locks, / efficient until the early 1800s. // Boats to the docks, stevedores/ in cranes to the edge and rear warehouses, / while the sailors at anchor/ go up stairs to taverns. // Trade demands constant level docks, / both on the north shore / as on the south shore, / commercial docks proliferate and / access to Regent's Canal is improved, / towards the British canal system, / surrounding the city and its stations, / but the railway absorbs its traffic. // Vessels of increasing size / require longer docks, / that are located further and further away / until departing from the city. // Labor disputes of the 1890s / force a new port authority / and a great and useless plan, because / the boats no longer fit in London.

Clean Water and Foul-Smelling Sewer

Upstream, other uses/ produced landscapes of clean water, / they took the supply out of the city / and they dispersed their management and location,/ concentrating water extraction / to distribute it to multiple destinations. // When they stop extracting, they harbor other uses. // But the water was contaminated/ and the sanitation had to be undertaken, / with a powerful plan, / which included the drainage of low areas, / both on the left bank / as on the right,/ with pumping to overcome the tides / and an extensive network of sewers. // To avoid works in the downtown streets / dikes were built in the channel,/ with functional and cost advantages. // The three dikes or embankments / built with new techniques, / facilitated communication channels, / they lowered the price of the Underground, created gardens,/ roads and avoided floods, / being the most celebrated of that plan.

From Border to Threshold

Attracting and containing make sense/ and urban projection to London Bridge / that starts another center with market and cathedral. // Linking South Bank with Charing Cross / with public buildings, bridges and footbridges/ for the Southbank cultural center. // Local development at Vauxhall Bridge.

Boulevard from Greenwich to Richmond

Its role as boulevard of the gaze begins / in Greenwich, as presence of power/ synthesized in Nelson, Navy, Nation, / that marks the gate of the empire / and hides the treasure of Queen's House, / but the kings moved to the high stretch. // Thames Path. // A story of the boulevard. // The gaze slides over the façades / and falls towards the river itself. // The works arouse their criticism, / but they let themselves be carried away by the landscape. // The river reveals itself as a boulevard / and takes them to the quiet countryside, / where the picturesque is reaffirmed.

The River as Origin, Border and Boulevard

Wealth came to London by river

and made it the center of the world.

London was founded by the river

that was fence and border,

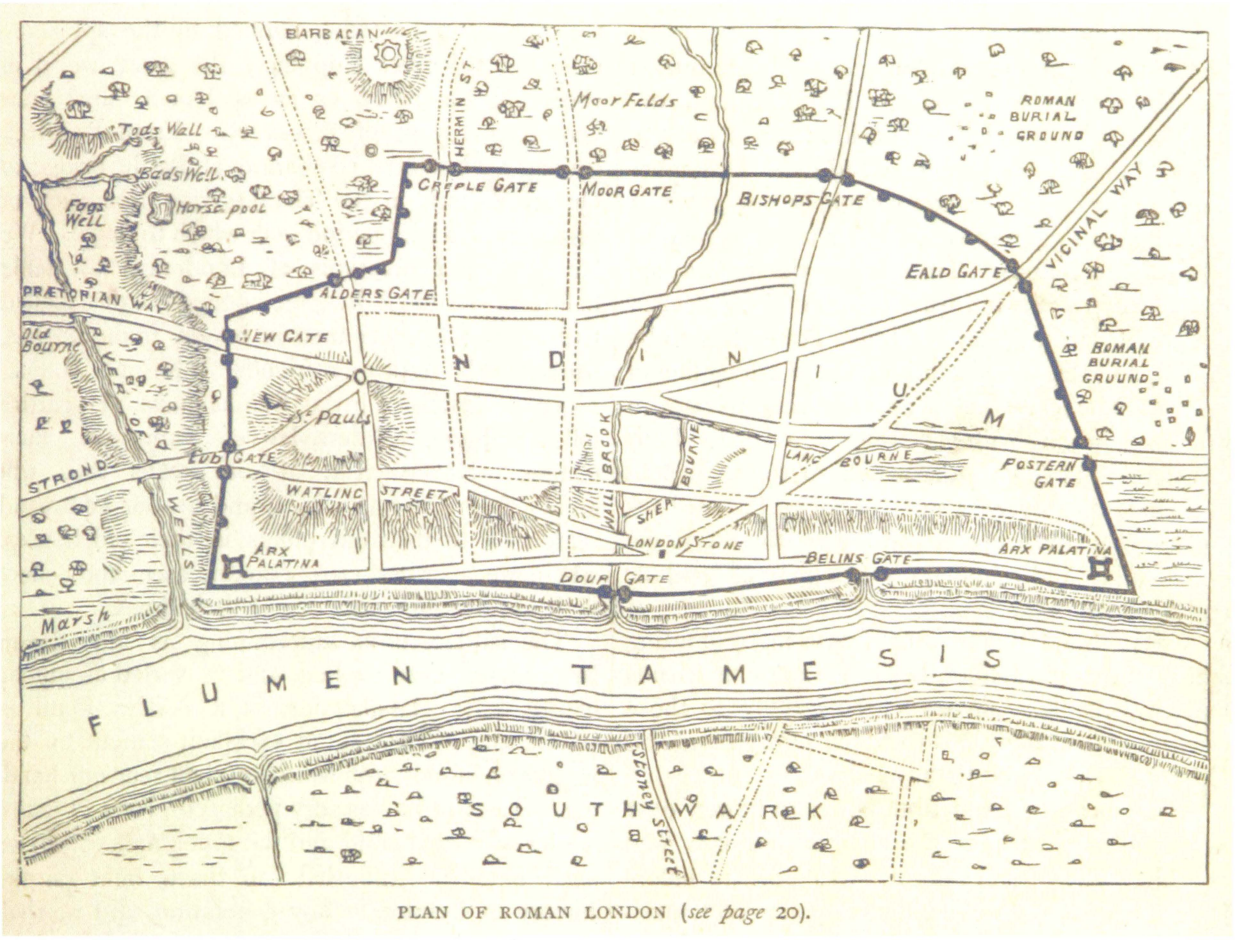
In his search for the 'soul' of London, Ford Madox Fox awarded the river the protagonism of its origin to find that everything *began with London's settling on the best-placed highway in Europe, and England is still very much tied to the Thames* and its *wealth has always come* by the river of London...

In later centuries, Ford continues, *the tendency has been for the Administration to settle near the centres of wealth, and the combined attractions have made the tract of marsh and flat ground in the lower basin of the river the centre of the Arts, of the Industries, of the Recreations and of the moral 'tone,' not for England alone, but for wider regions of the earth* [47:47].

London is not a product of urban plans, but it shows certain displacements or drifts of great spatial content. An axis of great significance, perhaps never understood as central, is the river. The Thames was the origin of the city, then an edge to lean on, later a threshold sometimes manipulated as a border, but it was always used as a corridor and lived as a boulevard.

When founding a city next to a river, part of the essential fence[1] is already set and the place is *strong by nature*, as the Romans well knew and the art of poliorketika gathered. But it requires a bridge, which was its first major construction, so that the fence contains the possibility of going out in search of freedom. Well, as Simmel says, *the human being is the connecting creature who must always separate and cannot connect without separating* [115:10].

Plan of the Roman city [Old and New London (1887) 1.015, vol.1, p.33. Illustrated, by Walter Thornbury. British Library]



PLAN OF ROMAN LONDON (*see page* 20).

But fences or borders not only delimit physical areas, they also serve to build identities[2] of different character according to their permeability. A rigid frontier generates a strong and unequivocal identity, while a flexible frontier offers points of encounter with otherness and generates open and shared identities, through actions of encounter and negotiation [129:20].

granting identity to its shores,

As a corridor, it was not only decisive in the choice of the site for the foundation of the city, but also as a fundamental communication artery between neighborhoods, when the multitude swarmed the roads. Ford Madox Ford claimed that *the Thames is the oldest as it is the most majestic of the roads into London* [47:65]. Navigating the river involved facilitating the passage longitudinally or transversally, but with such ease of control as to constitute a filter.

as a corridor, barrier and threshold.

As a barrier, the Thames was the first frontier, line, edge or delimitation of maximum significance for the city. But rivers are peculiar borders, because they generate paths along the edge and allow passage by boat, becoming the threshold. From the oars of the ferryman to the jetty of the ferry there is only a short wait, which only anticipates the appearance of the bridge.

As a threshold, it was soon smoothed with bridges, which are a guarantee of permanent passage and progressive generators of the city on the other side, according to the well-known strategy of 'bridgeheads,' as foci of penetration into otherness.

But its presence marked the character

But none of this canceled the permanent presence of the Thames, which was imposed on the city as an indelible mark of character. It always worked as a supporting edge for the construction, both of its masonry and its identity. That something happens or is located 'to the north' or 'to the south' of the river means much more than mere position, when reporting on questions of belonging to areas of very different character.

of a city based on money and power,

On the north bank the first Londinium settled, perhaps used as a military camp but soon turned into a supply center. Between 43 and 50 BC, Tacitus wrote that London was full of negotiatores and was a well-known place for its commercial prosperity. Ackroyd clarifies that it was not strictly merchants but negotiators, businessmen, as those who now occupy the main buildings of the City, who he considers direct or indirect descendants of those arrived in the first century: the City has always been established upon the imperatives of money and of trade [1:19].

From its origin, *London is based on power, therefore. It is a place of execution and oppression, where the poor have always outnumbered the rich. Many terrible judgments of fire and death have visited it*. It grew and flourished with the construction, at the end of its first century, of a large forum and a larger basilica than the later St Paul's cathedral, built in the 1700s by Christopher Wren on Ludgate Hill. In a few years a fort was added where there is now the Barbican, temples, shops, stables, an amphitheater where the current Guildhall is, all at the service of a population of about 30,000 people.

with a history represented on their maps,

Hundreds of years later, the history of London began to be represented in the history of its maps, which function as *symbolic tokens of the city and as attempts to picture its disorder in terms of fluent and harmonious design*. The first large map in copper plates, of which only three fragments have reached us, was made in the mid-sixteenth century, and *represents an attempt to mitigate the chaos, to know the unknowable* [1:20 and 94].



and collection in views and panoramas.

From the London prior to the fire we have received several 'panoramas,' in the style of the Italian *'vedute'* but obligedly more elongated by its low and extensive skyline, of which only the towers and spires of its churches stand out. The best known panorama is that of Wenceslaus Hollar, drawn in 1647 without distorting the perspectives as was usual, and titled *Long View of London from Bankside*. A few years later everything that is seen in it was destroyed by fire, making this engraving the best testimony of what the city was like.

Hollar stood on Bankside, the opposite bank, on the roof of St Mary Overie. From that height he saw the north bank, with its massive church-dotted construction, but also that of Southwark. But the visual center of the city in the panorama is the mass of the previous St Paul's, then without a needle, as will then be the new cathedral from that shore.

The river is the protagonist of the engraving, ordering the construction, pointing out the densities, with the port full of large sailboats to the right - downstream - and small boats of urban traffic upstream of the bridge. The whole city is present, with its three nuclei, and all its buildings are represented with great precision.

From Whitehall and Scotland Yard on the left to The Tower and the meander of the Isle of Dogs in the background on the right and on the south bank, from The Globe to S. Olaf, downstream of the bridge, all the buildings of the city appear in great detail. The drawing is completed with identifying signs of some 50 constructions, from palaces to pubs passing by the river stairs. It also documents the activity of the city and the river, from trade to the loading and unloading at the docks or the eel fishing boats in the river.[3]



Long View of London from Bankside - Wenceslaus Hollar, 1847.[37]

In 1666 The Great Fire completely destroyed those buildings and the entire City. The river was effective as a barrier to prevent its spread, but it had also been used as a filter to avoid the invasion of undesirable customs and characters in the City. London used its power both to impose certain uses on the south bank, and to avoid others in the north. Over time, the bridges multiply and function as essential passages or thresholds to implement these relationships, and the docks as routes from which to look at the city on the other shore.

It was a barrier to fire and a place for the gaze

After the fire, recalls Anton Capitel, *the royal architect, Christopher Wren, could not reform the city as he and the king had wanted, but in return he built the new cathedral, Saint Paul's, in the manner of a new Rome, a new Saint Peter and he also built an infinity of new parishes, creating the types of Anglican churches and originating a tradition that reached into the 19th century and that turned the network of parochial temples into a true urban structure. Despite the great heights and multiple transformations, this can still be glimpsed today, even if it is quite blurred.*[5]

when Wren built the dome of St Paul's

The most interesting and great thing about St Paul's (1710) is the dome: large on the outside and small on the inside. This puzzle is actually resolved with three domes, since there is a third between them, and responds to a pragmatic constructive sense. The intermediate dome is the only resistant one, it is made of brick with iron with a frustoconical shape and it directly transfers the loads of the lantern to the lower ring. It weighs little and is perfect to withstand the perimeter tractions, although given its shape it is unclear whether it really is a dome.



St Paul's from Bankside

and appreciated it
from the other shore.

On the outside, a wooden framework covered with a wooden skin and lead of large dimensions is suspended, with a decidedly Renaissance dome shape, clearly competition with that of Saint Peter in Rome. On the inside, another smaller dome without other charges than its own weight and covered with paintings receives the interior views from below, as if it were the batter of the exterior.

With this contraption, Wren obtains the external form that he needs to compete with Saint Peter and eliminates all the structural problems that cracked that one, whose solution of a perimeter band with iron chains arose from the famous report of the three mathematicians.[6] It gets a lighter and easier-to-build solution, which engineers tend to call cheating, because it hides or betrays a purported structural truth, but it's just a contraption.

From the outside, its 111 m height and the size of its dome give it a great presence and compete effectively with Saint Peter. It dominates the city and is related to everything built radiating a huge energy. The best place to check the power of St Paul's Cathedral is from Southwark on the other side of the river, because up close it is overwhelmed by what was built around it.



St Paul's from the summit of The Shard



One New Change with St Paul's Cathedral



St Paul's from Queens Head Passage



There Wren settled, to follow from the other shore the progress of his work and to observe how the city was being peppered with the new churches. He occupied a house in Cardinal Wharf, next to the Tate Modern, a building whose former identification with the number 49 Bankside is now questioned.[7] It is a narrow house of three floors and cream color that had illustrious residents. A plaque on the façade says: *Here lived Sir Christopher Wren during the building of St Paul's Cathedral. Here also, in 1502, Catalina Infanta de Castilla y Aragon, afterwards first queen of Henry VIII, took shelter on her first landing in London.*

On his trip to London, Stendhal dedicates his first visit to St Paul's, praises some of its sculptures and notes *that it is surrounded by a beautiful cast iron gate. It looks good, but the space is too small ... it is buried between the houses.* A few lines later he writes: *The interior of San Paul's is a sewer compared to Saint Peter; inferior even to the interior of the Milan dome* [130:16].

Stendhal does not give reasons, but it is true that the interior of St Paul's Cathedral is rather underwhelming, perhaps because one expects to be placed under the center of the dome and that one's sight ascends towards the heights seen from outside, but the shape and size of the internal dome lack greatness. The impression that the interior is not up to par, never better said, is perhaps a product of the high expectations derived from its ubiquitous exterior.

The dome is present throughout the city, it is visible from unexpected places. From any crack in the City, from any fissure of the built, the smothered St Paul's may appear showing a part of its unmistakable features. As Jerrold and Doré gather, when crossing the passage that unites Paternoster Row with St Paul's, *it is a slit, through which the Cathedral is seen more grandly than from any other point I can call to mind* [39:XI].

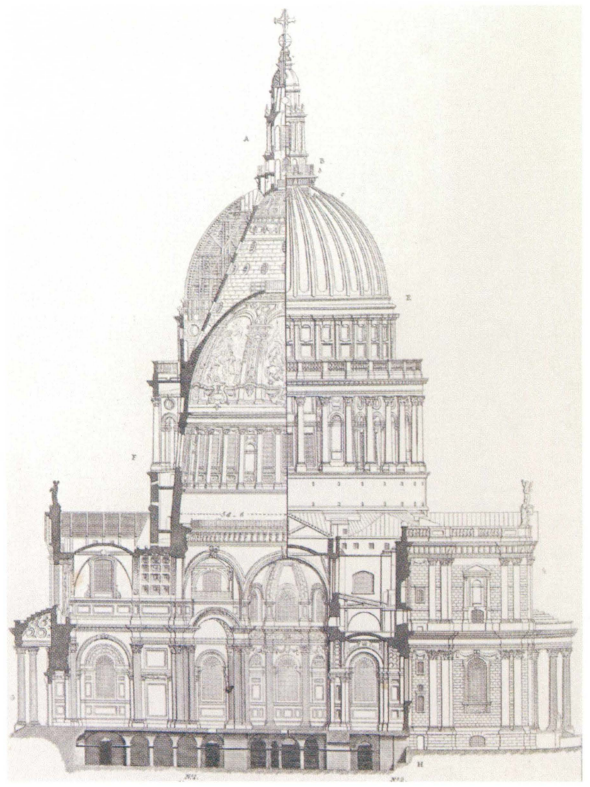
The recent One New Change shopping center, located next to the cathedral to the east, has turned and broken its façades, torn its patios and staggered its roof to 'own' St Paul's. One of its panoramic elevators focuses its window towards the cathedral and allows to 'travel' its façade vertically, at the bottom of the slit of a courtyard open to the street.

In London there are two other cathedrals corresponding to the other two foundational nuclei: Southwark and Westminster, Anglican and Catholic. Both are large buildings, but lacking the urban significance that St Paul's has. In both cases, their environment is of interest, although for various reasons (see 4.4).

All this manifests itself in different ways, according to the motives and needs of each era, even with variations of sign, supporting today what previously one attempted to prevent. And thus it enriches the consideration of the role of the river in the evolution of the city and forces us to study the different nuances introduced in each epoch in its different sections.

In 1929, when an American historian compared the River Thames unfavorably with the Mississippi, the parliamentarian John Burns, -protagonist of the *Town Planning Act* of 1910- responded: *The St Lawrence is water, the Mississippi is muddy water, but the Thames is liquid history.*[8] It always had a great role, which evolved to the rhythm of the city: *The Thames acted as an artery, a boundary, a larder and, at certain times, a sacred stream.*[9]

Although its interior disappointed Stendhal,



St Paul's - section [105:1, PL.VII, vol.I]

its presence extends through the city,

without being altered by other cathedrals.

The Thames is the liquid history of London.



Present London Bridge, 1972

London Bridge

As primordial element of its founding, London Bridge exercised the above-mentioned functions on the Thames, but also attracted various activities linked to the upper flow of people and lower flow of boats and water.

It became a point of control of the passage and threshold of uses and customs that, allowed on one side, were forbidden on the other so as not to alter the desired character of the City. At the same time, in the other direction it acted as the edge of the sea and the fluvial port. By establishing itself as a step and a threshold in both orthogonal directions, London Bridge was the true center of activity of the city from the start.

The first bridge over the Thames was built by the Romans in a site very close to the current bridge and we know very little about it, except that it must have been made of wood. At the end of the 12th century - it appears to be in 1176, without certainty - the construction of a 19-arch stone bridge began, attributed to a Peter of Colechurch, which was completed in 1209 and was known as the Old London Bridge in the 19th century.

For 600 years it was the only crossing point on the Thames. Originally it did not have any building on the road, except for a chapel, but by the 16th century it was full of them. Markets, exchange houses and shops built on the bridge alternated with grain mills and lifting wheels for water supply moved by the current and the tides. Many were stores with houses on the upper floors that became fashionable in London. All this changed frequently and the bridge proved to have a life of its own.

This was nothing new in the bridges of the big cities, but in London all those uses acquired a huge volume. The most famous building was Nonesuch House, erected on two arches with a prefabricated wooden structure brought from the Netherlands. Subsequently, several mills were built to supply water and several more to grind corn. The history of this bridge includes exciting stories of fires, tournaments, battles, fairs, royal processions, dramas, songs and dances.

In the early nineteenth century, the volume of traffic on the bridge was excessive and the bridge was permanently crowded. There is a survey of June 1811, which includes 90,000 pedestrians, 770 cars, 2924 wagons, 480 carriages and 764 horse riders in a single day. Meanwhile, its 19 piles with large foundations posed a remarkable obstruction for navigation by river.

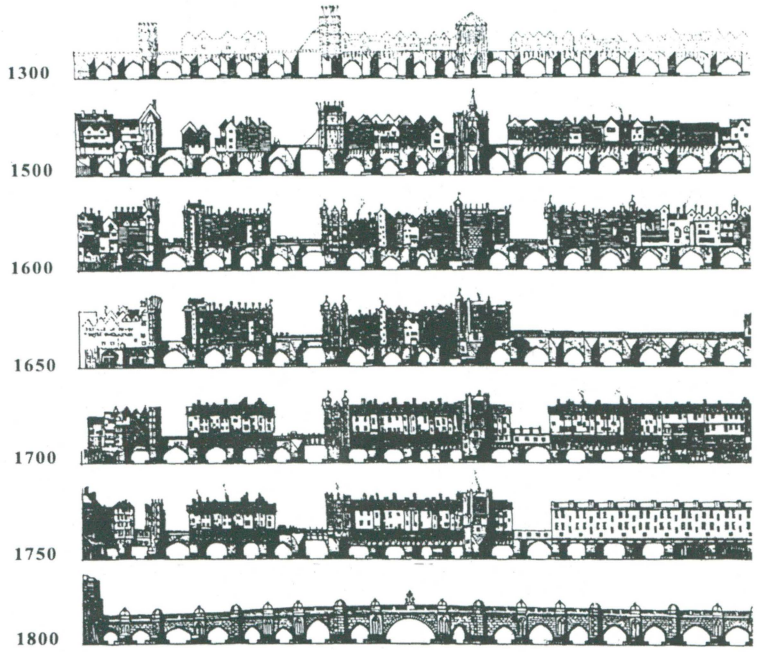
In 1800 a contest was called for a new bridge in that place, which did not prosper in a solution, but became famous for proposals to use iron for its construction. Thomas Wilson proposed a bridge of three spans of 67, 73 and 67 m, in the range of Sunderland spans, with its already proven scheme of an arc formed by iron voussoirs and tympanum of circular rings. Telford's second proposal, which burst in after the ruling with its well-known 200 m span, caused the postponement of Wilson's winning project, although it was submitted after the deadline. The tympanum of this great bay was solved with radial bars with intermediate adornments suggesting new arches, of somewhat confusing design.

The size of the project involved duplicating the arch span of the Sunderland Bridge, the largest iron bridge built until then, and Thomas Telford developed a questionnaire with twenty questions to consult numerous scientists, engineers and builders on the feasibility and potential problems it could it generate. The design is formed by a series of parallel arcs, which are joined to the board by means of a filigree in two levels joined by a new more stretched out upper arch, of still ambiguous functions. The dimensions of the arch and the consultation with the professionals gave a lot of diffusion to the project, but its construction was never seriously considered [6:217].

In 1820 a commission was appointed to study the state of the bridge, which decided to make it of stone, and in 1824 its demolition was pro-



Old London Bridge from Bankside - Wenceslaus Hollar, 1847[4]



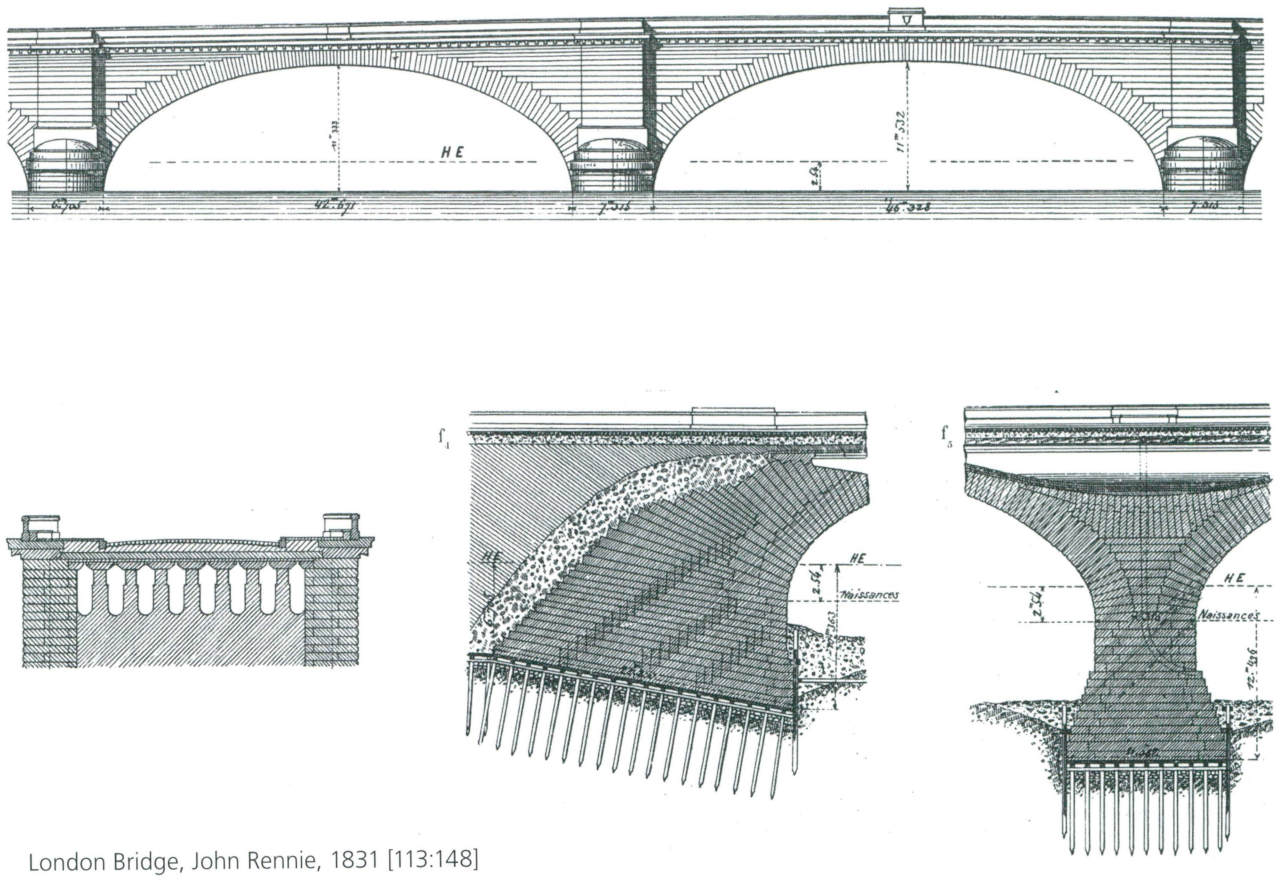
Evolution of the constructions on Old London Bridge

posed and its replacement by a new bridge, according to the design made by the engineer John Rennie (1761-1821) before his death. In 1824 his son John Rennie Jr. (1794-1874) was commissioned to build the bridge according to his father's design and in mid-March the cofferdams for the foundation were being built. The work progressed without major setbacks and was inaugurated in August 1831[127:24].

According to Juan Benet, *the demolition of the neighborhoods adjacent to the accesses of the London Bridge was the most ambitious work of those years, the most expensive also because of the expropriation* [15:44].

In the 1950s a new bridge was proposed in the same place, but it took 17 years to make the decision to commission it to Mott, Hay and Anderson in 1967. The bridge, finally opened in 1972, has three openings built by prefabricated concrete segments in Russian Docks, and joined by post-tensioned steel cables. Again the iron was not considered of sufficient nobility for a place of such significance.

The ashlars and voussoirs of the demolished Rennie Bridge were sold to a California real estate developer, sent there by boat and reused for a reconstruction of the bridge in Lake Havasu City, Arizona.



London Bridge, John Rennie, 1831 [113:148]

The River as Corridor

The river sweats
Oil and tar
The barges drift
With the turning tide
Red sails
Wide
To leeward, swing on the heavy spar.
The barges wash
Drifting logs
Down Greenwich reach
Past the Isle of Dogs[10].

T. S.Eliot [42:73]

The river guarantees continuity

The condition of the urban edge granted to the river does not eliminate its role as *corridor*, a term used in landscape ecology for spaces of predominant longitudinal dimension characterized by their continuity. This continuity is not only required by the river, it must also have its margins or banks, as richer spaces that house numerous processes. It is not so much a line, as a band of sufficient width to integrate the margins, with its own elements and transversal processes or gradients that enrich its role [49:158].

and connects edges and shores

Navigation through the center of the river is always possible, but tides prevent access to the banks before and after each low tide. In the same way, ships can not remain moored in the docks for loading and unloading, being forced to anchor near the center of the river and to transfer their merchandise to boats and barges. The flat bottom of these boats allows them to sail with scarce drafts and stay dry next to the shore without suffering damages.

to the rhythm of wind and tides,

The tidal currents are used to go up or down the river, going with the flow, with the sole auxiliary impulse of the oars and, on rare occasions, of some support sail to take advantage of the wind, in western-dominant London, that is, against the current. With this, the game of combinations of draft, wind and currents governed the river navigation.

As travelers Jerrold and Doré punctually gather, *and still the bustle thickens upon the tide. The boats come and go - and sidle and shift, and bewilder the sight and sense. The water is churned with paddles and oars, and the tiny skiffs dance and plunge in the swell of the steamers* [39:10]. Now, however, the current floating platforms, guided by vertical piles and connected to the ground by means of footbridges, allow navigation with any level of water in the river.

overcoming blocked streets

In principle, if the city had an effective system of streets and roads, the boats would be limited to the traffic between banks and at the service of the ships anchored in the river. But, with the crowded streets, it took less time to go down to the river and call a boat to go sailing, so that many of their trips connected urban destinations located on the same north shore.

For Ford Madox Ford: *The Thames was for sixteen centuries the great highway of intercommunication within London walls. London streets were mere footways or bridlepaths between house-walls* [47:48].

despite shallows, ice and storms.

The piles of the Old London Bridge narrowed the navigable zone and increased the current of the tide in the center, but they made the water on the banks stagnant.





Wapping Old Stairs

Prospect of Whitby

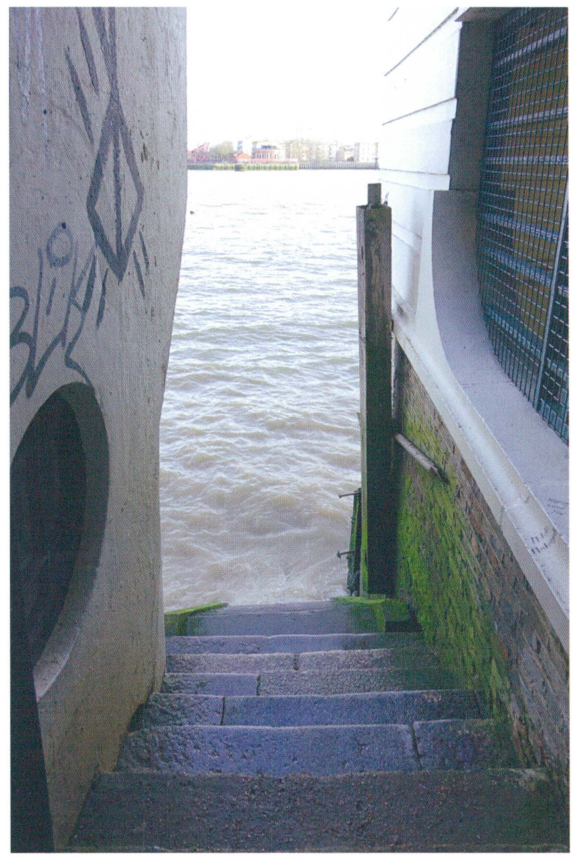
The original London Bridge - the medieval bridge that was encrusted with shops and houses - rested on no fewer than nineteen arches, which were built on foundation piers so wide that even small boats found it difficult to pass between them. The bridge acted, in effect, like a partial dam, holding back the waters of the river. One of the curious side-effects of this was that, in exceptionally severe winters, the Thames could actually freeze over above the bridge. This was further helped by the fact that in the un-embanked river the current at the edges was much weaker than it is now, permitting ice to form in the slack water and spread outwards [142:78].

When the river lends itself to navigation, the banks are transformed into piers to accommodate the longitudinal flows through the river. Somehow, the docks build the river and fit it into the city, forcing the streets to give them access and generating parallel land flows of people and goods that end up generating edge roads.

This transformation of the fence into path and of the obstacle into passage, by virtue of navigability, consecrates docks and bridges as key works in the mobility of the city, by concentrating longitudinal and transverse transport flows. The patterns of development of these urban schemes are profoundly conditioned by the ownership regime of the river plots. The public accelerates the transformation while the private delays it: even today, the edge roads of the Thames have no continuity throughout their journey.

Docks and bridges make the river urban,







New Crane Wharf

Pelican Stairs

King Henry Wharves, Wapping

where river navigation converges

In London maritime and fluvial traffic converged, the latter perhaps of a lesser scope but of vital character during many centuries for the inner country, which was reached by river and the enormous network of channels constructed throughout the country.

In the mid-18th century, the Thames had a long history as the most important commercial canal in England, navigable by barges of 150 t to Abingdon and 60 or 70 t to Oxford and Lechlade. More than 100,000 t left the London docks every year; 60,000 t passed through the Boulter lock in Maidenhead, about 20,000 t were still upstream of Reading, and similar tonnages were returning by the river. Despite this large amount of traffic, navigation was not easy. There were no locks downstream from Maidenhead. The navigation from there to Abingdon depended on a series of 18 locks, mostly flow locks, located in landfills of hydraulic mills.

Then came the three enclosure locks, built in the 1630s, and from Oxford to Lechlade the barges sailed through some twenty flow locks built specifically in the early years of the seventeenth century. Much of the traction had to be done by crews of workers, since there was only a towpath for horses along a few sections disconnected from the river. In steep slope sections it could be necessary to hold the boats with winches against the current to go up through the flow locks [123:153].

through a system of locks,

Beginning in the 1770s, there were several improvement plans for river navigation upstream of Richmond, already including dock locks to facilitate maneuvers, continuous towpaths in each section and dredging to maintain the draft. The city, for its part, joined the plan, so that by 1845 there was a fairly efficient river navigation system to the port of London.

The locks were operated to ensure that the upstream level did not fall below a specified low water mark in summer or exceed a high water mark in normal winter months: generally 30 to 45 cm above the low water mark. The resulting gradients in a typical longitudinal profile were about 20 cm / km in high water and 6 cm / km in low water, which, added to the 'steps' of the gates gave an average gradient of 30 cm / km. There is no doubt that during the floods the entire landfill would be submerged, but the system worked satisfactorily.

In the districts upstream of Staines the barges traveled downstream averaging about 40 to 55 km per day, and upstream 35 to 50 km per day. These rhythms could have been improved in the mid-nineteenth century, but four days from London to Oxford and three days for the return trip would probably be considered a good journey [123:153].

Until the early 1790s, the river navigation that arrived from the upper course of the river came together in London with the maritime traffic, coming from all the ports of the world. Both found sufficient accommodation with the anchorages in the center of the river and the boatyard for the movement of loads to the warehouses on the banks. Traffic subject to customs duties used the docks on the banks between the Tower and London Bridge, and the so-called Sufferance Quays on the opposite shore.

efficient until the early 1800s.

Until then the port operations on the river docks were done by hand, with the help of barges to reach the ships anchored in the river. The sacks were carried on shoulders or in carts to the warehouses distributed near the banks and were elevated with pulleys, still visible in their façades. There were no railways and the canals were the only way to take the goods to the interior of the country.

Boats to the docks, stevedores

On the docks of London there were stairs for crew and passenger ascent and descent, facing the water, with a watchtower on one side. There were also many cranes, formed by small booths placed on the edge of the pier on four pillars, with a davit -in principle, fixed- cantilevering perpendicular to the dock. Behind the docks were warehouses that stretched along both banks of the Thames, from London Bridge that marked the boundary upstream of the port to the river mouth.

in cranes to the edge and rear warehouses,

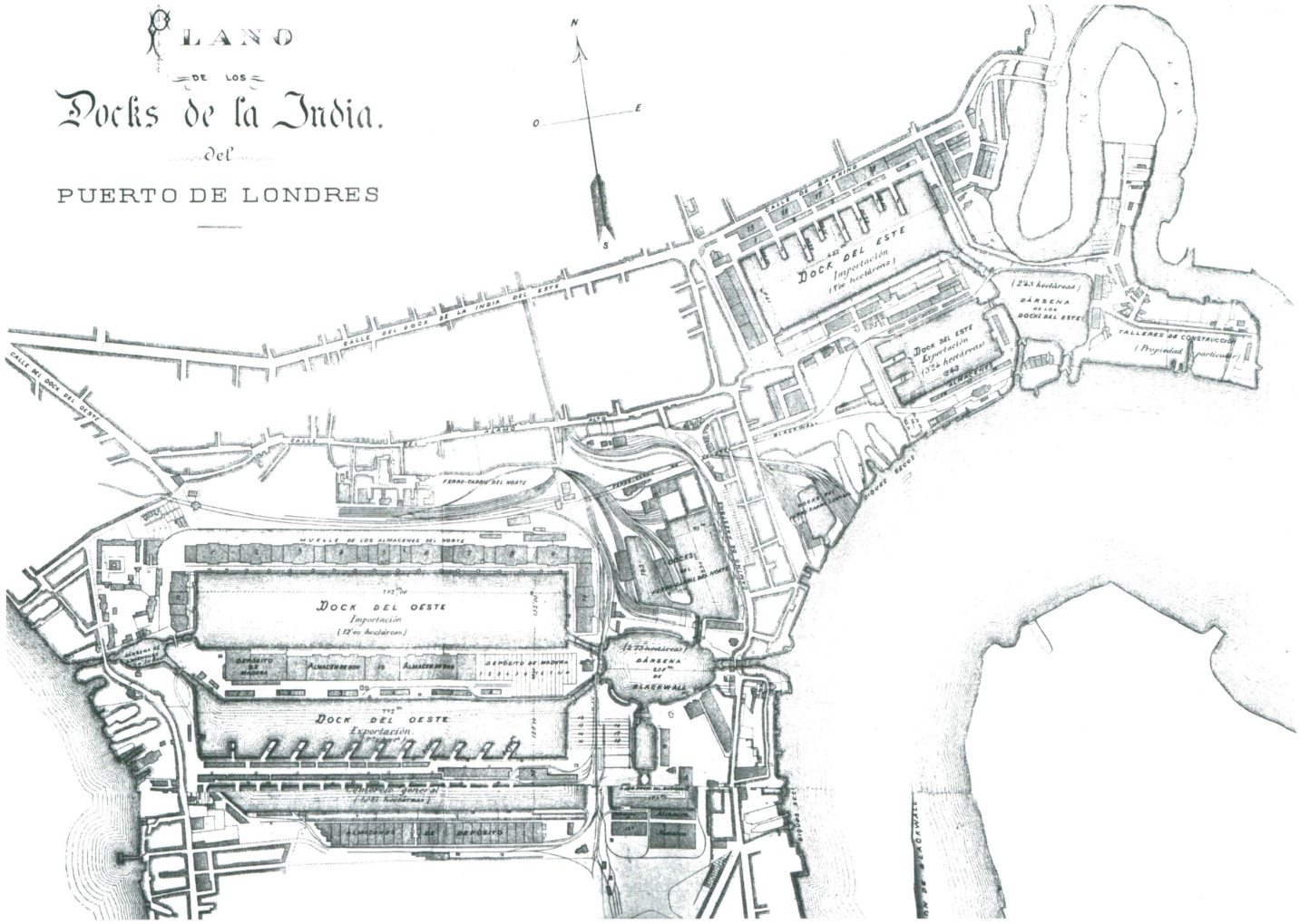
Clusters of canoes and boats gathered at the steps of the docks, which remained empty and tied to each other while the crews of the ships were on land. The ships spent weeks or months in port to unload their goods and load the return cargo before setting sail again, requiring thousands of people for these tasks. Sailors and stevedores crowded the streets causing a frenetic activity collected by chroniclers and portrayed by illustrators such as Gustave Doré:

while the sailors at anchor

The creak of cranes and rattle of pulleys; the pulses of the steamships under way; the flapping of idle sails; the hoarse shouts of sailor-throats; the church bells from many quarters; and through all, the musical liquid movement and splashing of the water, strike a cheery note in the brain of the traveller, who comes to us, by the Port, to London [39:8].

These sailors and stevedores also populated the pubs and taverns located on the banks of the Thames, close to the warehouses, with direct stairs -*Old Stairs*- from the water and narrow passages to the streets such as Wapping

go up stairs to taverns.



India Docks-William Jessop

High St or Wapping Wall St, really formed by a succession of warehouses with some pubs like Captain Kidd and The Prospect of Whitby, or The Anchor and the Mayflower on the south bank. Many of them have large rooms with windows to the river, where the sailors spent their days without losing sight of their boats and the bustle of the river.

Beside these pubs there used to be narrow corridors that led to the shore, where a narrow staircase, without landings or railings, entered the water so that the sailors could come and go directly from the boats to the taverns. Next to the Prospect of Whitby there is one of these passages that leads to the Pelican Stairs. Some of these ladders with boats clustered at their base can be seen in Hollar's Panorama of 1647. From them it was also possible to call for 'rowers' to go to other destinations in the City or cross the river.

On the river there was some dry dock and a few small docks for the armada at Deptford and, in some riverside shipyards, a dock for ship equipment where the **Greenland Docks** would then be built, with equipment and factories for trade derived from whales and another similar port in Blackwall, inaugurated in 1790. The system was quite efficient until the end of the century, when the traffic outgrew the docks, with 12 or 16 large ships covered in each position, excessive loading and unloading delays and impossible security control, with generalized looting.



Port of London Hermitage

The merchants protested, demanding better docks, with wharfs and warehouses on the edges, customs services and security for the merchandise. For their construction they proposed to take advantage of the natural conditions of the Isle of Dogs, Rotherhithe and St Katherine, although they finally opted for Wapping on the river bank, with a second entrance in Shadwell.

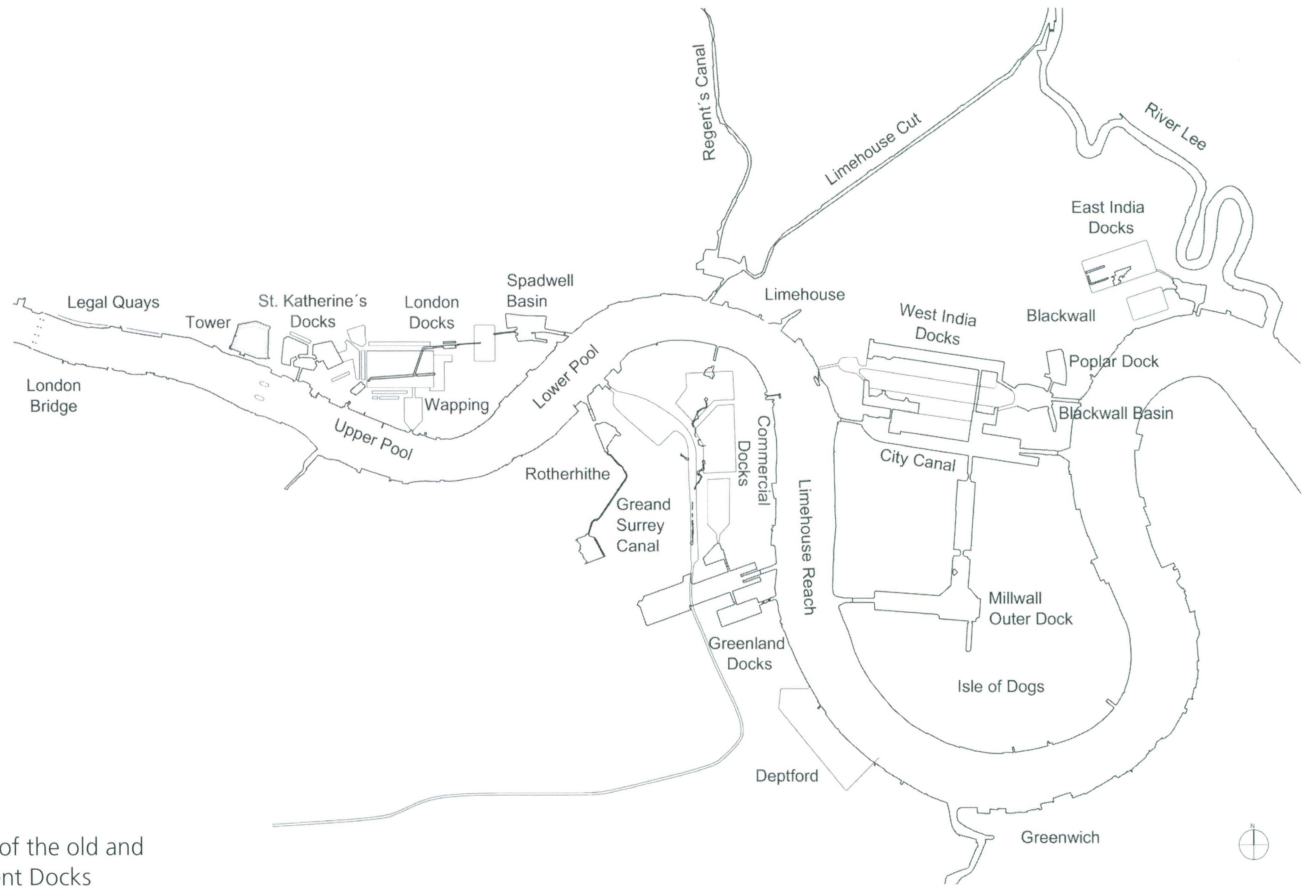
After a first 1794 plan, fostered in that place by Parliament, and later reviewed and budgeted by the engineers Daniel Alexander and John Rennie in 1796, the city -with competences on the port and greater vision of the future- proposed alternatives through engineers George Dance and William Jessop, based on a channel through the Isle of Dogs and a supplementary dock in Rotherhithe, in an attempt to withdraw port traffic from the river itself [121:88].

The idea of getting constant level docks to facilitate loading and unloading arose in 1799 and was applied in the construction project of William Jessop's **West India Docks** in 1802. It was solved with the creation of interior ponds excavated on the mainland, bordered by walls[11] and connected to the river by means of a double lock on each side of the meander, upstream in Limehouse and downstream in Blackwall. The one located more to the north was dedicated to import and in parallel, somewhat more to the south, the export one. Somewhat further south, also in parallel, the City Canal avoided going around the meander to go up or down the river.

Trade demands constant level docks,



West India Docks



Plan of the old and current Docks



West India Quay Bridge

Next to Blackwall lock, London & Blackwall Railway station, one of the first two railways in London, which linked it to Fenchurch in the City, will be built years later. Between the locks and the rectangular docks of 12 ha surrounded by warehouses, smaller maneuvering docks were arranged, with a stationary steam machine on the side. The West India Import Dock entered into service in 1802, and the Export Dock, started next, did so in 1806. The **City Canal**, built independently at City expense, was completed in 1805 and was used by ships in transit.

In 1800 **London Docks** began to be proposed, located upstream in Wapping, with a dock of about 8 ha, more square and with two dock and lock accesses, one called Hermitage Entrance and the other Wapping Entrance, on which Robert Mylne and John Rennie collaborated. It was completed in 1806 and always maintained a high occupancy, but the cost of acquiring the land accounted for more than half of the total budget and profitability did not exceed 4 or 5%, so the rest of the project, consisting of the Eastern Dock and the Shadwell Entrance, took a long time to finish. Now it has been filled in and a commercial and office block has been built there.

Downstream from Blackwall, near the mouth of the Lea River, it was proposed to expand the Brunswick Dock with an import basin of just over 7 ha and a new entrance, calling it **East India Docks**, entrusting the project to John Rennie and Ralph Walker. Its entrance lock, 62 m long and 14.5 m wide, was the largest in the world for about 40 years. It was also inaugurated in 1806.

both on the north shore



West India Quay Bridge



Greenland Docks



Surrey Docks -Old Salt Quay Bridge

Greenland Docks-Swing Bridge





Greenland Docks-Swing Bridge to Thames

Greenland Lock

In 1807, the **Grand Surrey Canal & Basin**, located on the south bank, near the aforementioned Greenland Docks, which is the last of this first stage of the construction of the Port of London, was completed [121:87-103].

as on the south shore,

Located further away on the south bank is **Greenland Dock**, whose origin are the Howland Great Wet Dock, built in 1690 on the grounds of the first Duke of Bedford and sold a century later to engage in trade with the North Atlantic, with the name of Greenland Dock. During the early 1800s, the pier was rebuilt and a small additional dock and two new ponds were added for wood to the north, forming a port system. In 1807 the Commercial Dock Company was formed to take over the business of whaling and boiling fat for oil.

In 1865, the company merged with the neighboring Surrey Docks, to form **Surrey Commercial Docks**, controlling 80% of the London timber trade, which came from Canada and the Baltic. The previous Greenland Dock was extended in the late nineteenth century with more than double the length and almost double the draft. The **Surrey Canal**, which previously exceeded the pier at its inner end, now connected to the middle of its north and south sides. The access lock to the Thames was also extended to 168m x 24m (550ft x 80ft), with the important draft of 11 m (35ft).

commercial docks proliferate and

Between wars, Greenland Dock was visited regularly by the ships of the Cunard line, propelled by large steam turbines, which carried passengers and merchandise between Rotherhithe and the St. Lawrence River in Canada. They were boats too big to climb upstream and had to be turned in the river to enter the lock. There were many neighbors of Rotherhithe and Bermondsey who emigrated to Canada in the first decades of the 20th century.

Along with these great ships were many boats and nacelles one tenth of their size that brought wood from Finland; they were survivors of sailboats with three or more masts, representatives of the timber trade from the Baltic. The



Limehouse Basin

Finland Quay, Swedish Quay, Norway Dock and Russia Dock were the result of that first wood trade of Rotherhithe. Greenland Dock was closed in 1970 and its piers were gradually rebuilt from 1982 onwards with the current result.

Access to Regent's Canal is improved,

Regent's Canal Dock was built to connect the channel begun in 1812 with the Thames in Limehouse, initially with a small dock designed only for the canal boats, although later the decision was made to build a boat dock and extend the entrance lock to accommodate them, which was completed in 1820 and has been renewed several times since then.

towards the British canal system,

The extensive and ramified British system of inland navigation is represented in London by **Regent's Canal** (1812-1820), a key piece in its structure and operation by connecting the network of channels with the factories and markets of the capital and, through its ports, with the whole world. The connection with the Grand Junction Canal takes place in Little Venice next to Paddington Station, from where it circles the entire city to Limehouse Basin.[12]

surrounding the city and its stations,

The layout intended by developer Thomas Homer and his associate engineer James Morgan ran parallel with New Road, the new bypass to the north, from Paddington to Islington. Homer learned that the architect John Nash was working on the design of Regent's Park and proposed him to take part in the project. Nash thought he could get water from the canal and that it would be fine for the ships to sail through the park. But then he realized that



Regent's Canal-Mile's End Lock



Regent's Canal-past Acton's Lock



Regent's Canal-Cricketers Bridge



Regent's Canal - Commercial Road Lock -DLR Bridge



Regent's Canal-Islington Tunnel - east

those ships and their merchandise did not match the intended character of the park and diverted the course to its northern edge, placing the towpath on the outside.

The passage through Islington Tunnel was the highlight of the journey[13]: *When I was a boy,* says Ford Madox Ford, *I persuaded a bargee to take me through the tunnel that goes under the Edgware Road and reappears near Regent's Park. The darkness, the plash of waters, the faint stars of light at either end, combined to make a deep impression on me. The bargee and his mate pushed themselves and the barge along by pressing their bare feet against the walls of the tunnel* [47:58].

From the 1840s the railroad threat began to come true. In 1845 there was an offer to convert the canal into a railway line but it failed. Little by little, the traffic of the canals was transferred to the railroad and Regent's Canal began the fight for its survival, passing through various organizations to abandon its industrial role, until it consolidated itself as a leisure and recreational resource in the open air.

but the railway absorbs its traffic.



London Port Authority, 1922

Vessels of increasing size

When the overseas trade grew, it was more efficient to increase the size of the ships than their number and, the larger their size, the more sense it made to build them in iron and propel them with steam engines. This created the need for large and numerous new docks in the most frequented ports, such as London and Liverpool, much more complex than the previous berths, generally equipped with locks to maintain the water level independently of the tides [35:20].

require longer docks,

From 1850, port activity grew significantly and it became necessary to expand the capacity of docks and quays, with new ports. Between 1850 and 1855 **Queen Victoria Docks** were built, with a rectangular dock 2 km long whose elongated shape generated more perimeter per unit of water surface area. The increasing length of the new ships required a greater dock length, which gave rise to large docks and made it necessary to look for locations far from the city. Thus began the progressive departure of the ports from the city and their total change of character. As distant enclosures, large and efficient functioning, they became alien to the city, with a scale incompatible with the urban milieu.

that are located further and further away

Even farther and larger, **Prince Albert Docks** were built between 1875-1880. Designed by Alexander Rendell, they had a length of 2.8 km and a depth of 8.3 m, were built in a short time thanks to the use of mechanical means and the use of gravel extracted from the excavation to make concrete. Their great

length would allow a hundred years later the construction of a long runway inside the dock for the City of London Airport.

The length of the boats grew so fast that the docks of the Albert Dock were soon outgrown and the decision was made to build Tilbury Docks, designed by Donald Baynes and built between 1882-1886 in a location already completely outside the city, closer to the mouth of the Thames.

until departing from the city.

Some extensions were also built, such as **Millwall Docks** of 1864, with 80 ha of dock on the Isle of Dogs and a dry dock of 126 m, designed by John Fowler; or the extension of Surrey Docks, undertaken by Wolfe Barry in 1893, already mentioned in Greenland Docks [110:247].

In 1889, after a long period of conflicts and several strikes, the stevedores formed an important national union, the Dock, Wharf, Riverside and General Laborers' Union. For the first time, the low-skilled workers, with temporary contracts and poorly paid, decided to form a common front and created a union, in contrast to the previous associations, that were more or less guilds and that had been protagonists of the social movements in the Victorian era.

Labor disputes of the 1890s

Its huge social impact prompted the government to create in 1908 a new port administration, the London Port Authority - LPA, with a mandate and characteristics then replicated in many other countries. Right away, the LPA drafted in 1911 a great plan of action and proposed the creation of a new port of 26 ha in North Woolwich, which was completed in 1912 and was named **King George V Docks**.

force a new port authority

Patrick Geddes doesn't stop harshly criticizing the new London Dock System of 1911, the most extensive port plan ever made in the world, for the extension of the largest port in history: *the 14,000,000 scheme...that is shown not only as the biggest and costliest up to date, nor even, as we venture to suspect, as probably presenting, alike in proportion to outlay and in principle, less of engineering design and of industrial economy than elsewhere heretofore*.

and a great and useless plan, because

For urbanism, the main problem of this formidable plan lies in *its naive and total ignoring of...the essential map of London* and *the main, basal, social, economic, and therefore also engineering fact* of requiring *a vast increase of dockers*, both fundamental requirements for efficient operation. And he does not stop highlighting that it involves *the total reorganization of East London*, with great repercussions for the city and Greater London [50:217].

Despite Geddes' diatribe, the plan seems to have been merely instrumental, and again the theory remained marginalized. The ports left the city because they did not fit in it, just as they did not accommodate the new ships, that is, for pure pragmatism, as they would do in other major cities of the world.

the boats no longer fit in London.

In London remained only the noble headquarters of the LPA, designed by Sir Edwin Cooper and built in 1922 in Trinity Square with a small and careful Memorial Hill in front. This beautiful building would later be transformed into a Four Seasons Hotel that, as its advertising says, is *in a landmark of power and prestige...a central City location...just steps from the Tower of London.*

Thames Barrier

In the winter of 1953, three hundred people lost their lives due to a huge flood in the south-east of Britain, caused by a combination of tides and a major storm in the North Sea. The City was not affected but the Thames estuary was destroyed by an unprecedented rise in sea level. Until the construction of the Embankments, there were records of previous floods in Westminster and in various low-lying areas of the city, such as the one referred to by Samuel Pepys, which flooded all of Whitehall in 1663.

These risks are aggravated by several factors; on the one hand, London is gradually sinking by the weight of the buildings; on the other, Great Britain tectonically tilts about 30 cm per century to the southeast; finally, the level of the ocean increases due to the melting of the polar ice cap. The result of all this is the growth of the tides of about 60 cm per century. To protect the city from these risks, the Thames Barrier was designed. Its effectiveness is limited until 2030, when the water level will rise to a point where it would no longer be able to subdue it [70:10].

The barrier began to be designed in 1975 by Rendell, Palmer and Triton and was completed in 1982. In that place the river is 520 m width, which is covered with ten spans of unequal size: there are three access spans from the left margin to a small booth, then six bays with five large booths, and then another small bay with another access bay on the right bank. The access spans are formed by the gangway and the sector gates while the remaining spans allow the ships to pass.

In total there are seven booths to house the machinery that moves the rotary gates, capable of hiding in the river bed to let the ships pass and turn 90 degrees to rise 20 m and form a continuous barrier. With a marked technological air, the booths have curved shapes in all the elevations, suggesting clearly directed flows of current and neutral oculi in laterals and upstream to stabilize the volume.

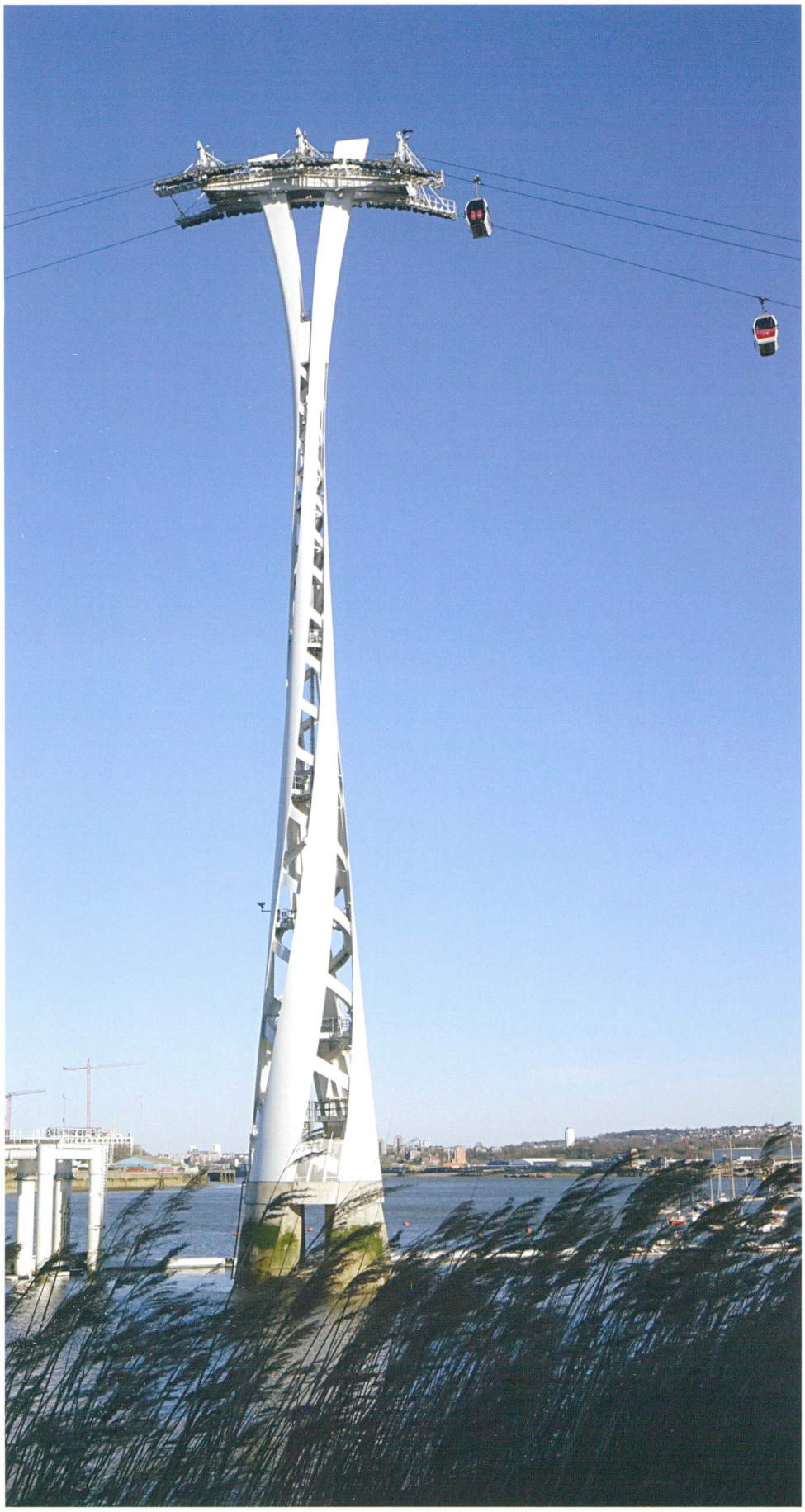
A few meters upstream of the left abutment there is a garden that bears its name, very well designed with geometric shapes and a very careful treatment of the hedges, forming a kind of channel that obliquely cuts the square plan of the garden. The channel constitutes a replica of the river that crosses the garden in the direction of the barrier, with waves simulated inside by hedges cut to suggest the current.

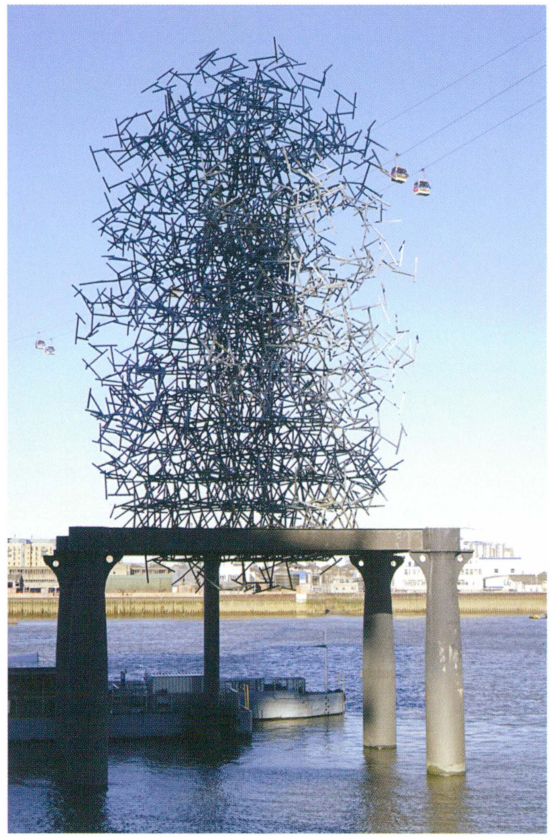
There is a lot of grass and few trees: pine trees of rather poor character along that oblique channel and some alignments of whitish poplars or black poplars, carefully placed forming transverse avenues. In the far part of the river, the garden ends against the modern made DLR station that closes the perspective on that side and allows a view in the background the old warehouses of the Royal Albert Dock.

From the Thames Barrier you can see the Millennium dome located about 2 km upstream, at the tip of the Greenwich Peninsula, along with the towers and cables of the Emirates Cable Car, a funicular that connects the dome to the western end of Queen Victoria Dock. At the foot of its southern pile there is a sculpture of 30 m high, *The Quantum Cloud*, built by Antony Gormley in 1999. It is formed by tetrahedra of steel profiles 1.5 m long, organized by means of a random algorithm from a figure based on the body of Gormley, residually visible in the center of the sculpture.









The Quantum Cloud,
Gormley, 1999



Millennium Dome

Emirates Cable Car South

St Katharine Docks, 1828

Approved by Parliament in June 1825, St Katharine Docks occupy land adjacent to the Tower of London and form the most harmonious port in London. The plans had been made the previous year by engineer Thomas Telford and architect Philip Hardick, who will have Peter Logan as a resident engineer and Richard Douthwaite as general manager of the work, all of them with proven previous experience in port design and construction.

What differentiates these docks from other London ports is the level of design required for all their components from the initial approach of the project. From the start there is the scale assigned to a few docks of scarce surface, in front of buildings of presumed presence and careful design. Telford sought an urban scale, a presence capable of living with The Tower, the oldest monument in the city, in a place linked to the port activity as the later was to the origin of the city.

The initial proposal of 1824 was not a simple official request, with a general layout sketch and a budget estimate, but a true blueprint, with determinations for the design and construction of all the port components, from the foundation details to the elevations of the stores. In fact, everything was built according to the initial project, with minor modifications introduced by Telford in the design of the entrance lock.

After that entrance equipped with three pairs of gates, there is a small dock of 0.7 ha and two docks attached, 1.6 and 1.8 ha, each equipped with another gate to maintain the level and surrounded by large warehouses. The general plan of the set designed by Telford shows a great number of subtleties in the provision of passage spaces and access to the docks and warehouses, which are enriched with patios, twists and setbacks. The corners of the docks are freed from warehouses to give direct passage to the docks, but they articulate the built in a very convincing way with the free spaces offering a truly exemplary plan.



Western dock drawbridge in 1976

In spite of the modifications introduced in successive renovations, the elevations towards the docks still maintain some of the varied dignity claimed by Telford in his original project, although the general increase in volume certainly penalizes the whole. There were buildings for specific functions, captaincy, customs, boatswain and a huge pub, which still keep alive and present the original port function, unlike the simple evocations intended by the presence here and there of some vintage ships, used as an excuse in many of the old ports recovered throughout the world.

For its part, the design of the most engineering components of the port was equally careful, as in all of Telford's works. Each of the three bridges located on the main gate and the docks is an exercise of simplicity and success.

The bascule bridge of the main entrance shows how it will open and how it will resist each of its members, board, brace, counterweight axis, making explicit the functional and the structural from the first look, no doubt attractive due to the successful bright red of its paint.

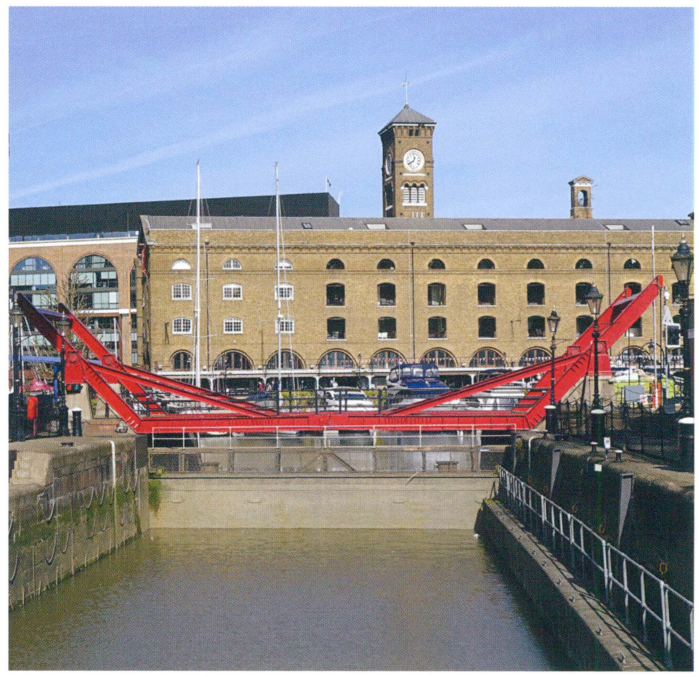
The drawbridge access to the western dock painted blue is a typological suggestion of traditional wooden bridges over old canals, widely used in the Netherlands and in the British channels themselves. Its historical character has been reinforced with a dubious classical temple, which the presence of the modern building in the background ends up destroying.

The retractable access bridge to the eastern dock is less frequent and, fortunately, remains untouched in its original appearance. The board is composed of two tubular semiarch brackets projected from the abutments, which extend into a counterweight and roll on rails on both sides.

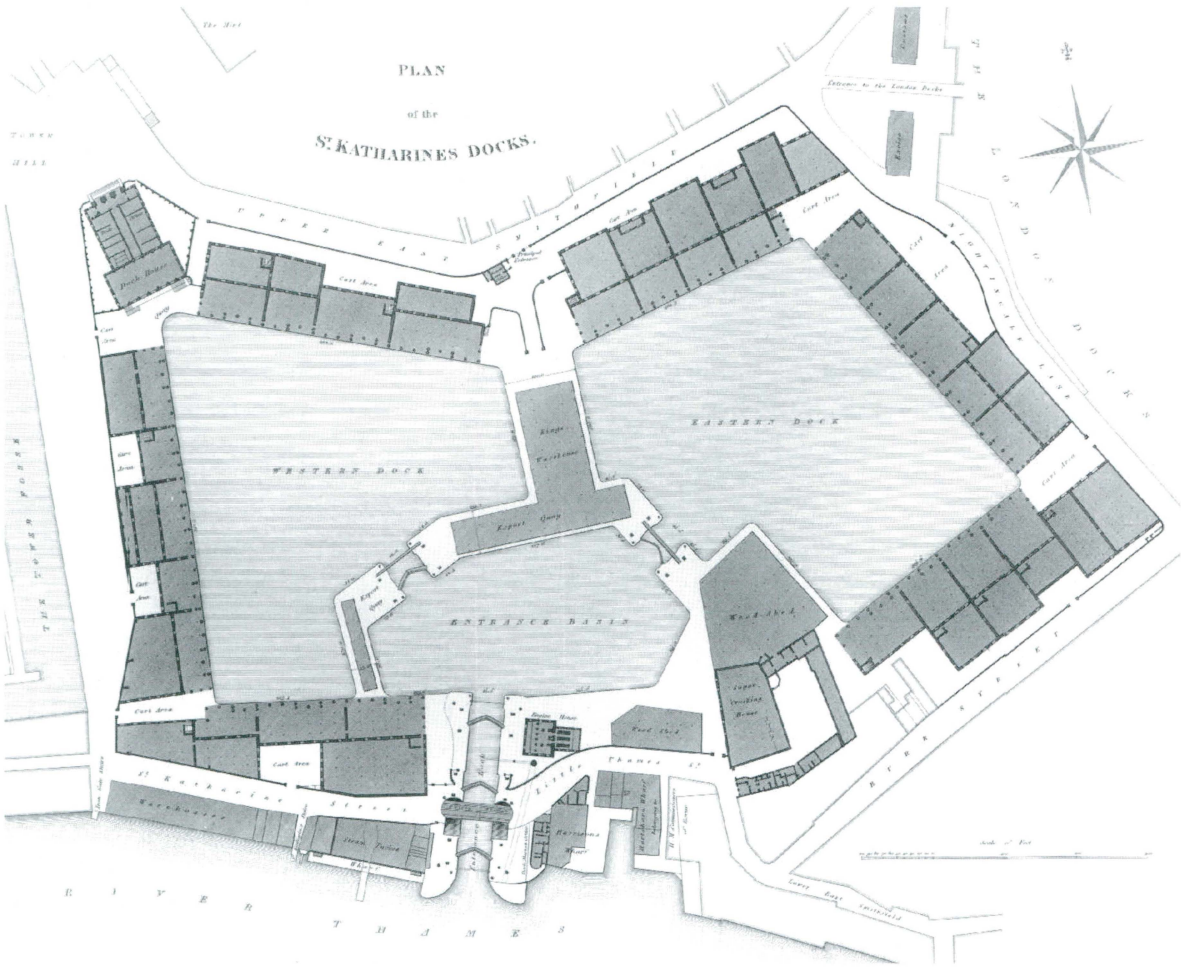
The work was awarded to George Burge and, after a certain initial delay due to difficulties in clearing and cleaning the land, he made reasonable progress despite the limited space available. A tide of exceptional height flooded the excavation in October 1827, but the damage could be repaired in a couple of weeks, thanks to the employment of a considerable number of workers. St Katharine Docks were finally opened in October 1828 [122:82].



Western dock drawbridge in 2017



Bascule bridge at the entrance of St Katharine Docks 2017



St Katharine Docks-Thomas Telford [Atlas to the Life of Thomas Telford, 1838, plate 40



Eastern dock retractable bridge



Putney Bridge. Exit of the 2017 women's regatta. Cambridge on the left starts very well, Oxford on the right gets unbalanced, the second row on the port side enters badly into the water, the boat twists and loses five boat lengths that it will not be able to recover



Chiswick Bridge, downstream, The Ship



Chiswick Bridge-Men's regatta, from The Ship. Oxford reaches the goal post

One Day and Three Bridges for a Regatta

In the upper section of the river it is common to find rowing boats training, with one, two, four or eight rowers paddling their paddles, under the motionless gaze of a helmsman in the stern of the boat. When the month of June approaches, the number of boats increases and the activity increases in the rowing clubs located on the banks. At the passage of the passenger ships the concentrated rowers do not look up while the passengers take the opportunity to see their rhythmic effort up close.

But that placid cadence is transformed into emotion and competitiveness of crowds with the imminence of the Oxford-Cambridge regatta, the oldest competition in the country celebrated with continuity. In a chapter entitled *All London at A Boat Race*, Doré and Jerrold describe an expectant crowd, focused on the preparations and incidents of what is happening, *utterly possessed with the keen spirit of the day… the shout of laughter, or extra thrill of excitement went travelling up and down the river,* as if *there was an current electric over all the course*.

They think that that brightness in the eyes and the excited comments are due to the *combativeness which lies deep in the English nature,* that *throughout the centuries, has expressed itself in brutal and in noble forms. The keenness of the life-struggle is expressed in the astounding masses of frantic people who are here, upon every boat and… every inch of vantage ground-covering every slate and tile of every roof… Men and women of all estates, as we have remarked, feel alike, the blood dancing in the veins-at the idea of the fierce contention after long and anxious preparation, that is about to happen*...[39:56].

The classic regatta leaves Putney Bridge and travels 6.8 km upstream of the river, passing first through Hammersmith Bridge and then through Barnes Railway Bridge, to reach the finish line just before Chiswick Bridge. It is celebrated when the tide is rising, with the current in favor upwards. In front of the bridge two boats are placed anchored in the river, with an immobile crew facing the five stone arches of the bridge. A few minutes before the regatta, mooring ropes will be tended to the patrons that are placed behind them, in the opposite direction, which they should not release until after the shot. They are very stretched out arches, clearly inspired by Perronet, which give the bridge a usually quiet character, but everything becomes expectant and feverish when its board and its surroundings are occupied by thousands of people.[14]

On the left bank there is a large park with a cottage, but on the right the city appears more built, with a church downstream and a large set of brick houses upstream, with a very well-kept



Hammersmith Bridge



Putney Bridge



Chiswick Bridge



Barnes Railway Bridge

façade. On the shore there are two famous taverns, Star & Garter River Bar and Duke's Head, where the members of the rowing clubs located a little further upstream are concentrated. Of the three bridges involved this is the one that concentrates the most activity, because of the preparations prior to the regatta when the crews walk their boats to be cheered by their supporters, but there is absolute respect to the opposition too.

The second bridge of the route, the Hammersmith Bridge, is located 2.7 km upstream and was the first bridge in that stretch of the river. It lays the foundation for the history of the place and was built and rebuilt by well-known engineers. First there was a masonry pylon bridge very similar to the one in Budapest on the Danube, designed by the engineer Joseph Bazalgette, author of the London sanitation plan, and built by the same engineer of the Hungarian bridge, W. Tierney Clark. The current bridge was already built with steel piles, but the chains continued to be made of flat bars and not cables, so it remains in good condition, although somewhat weakened. It is very decorated with a perhaps too monumental air, but it is still a beautiful bridge. Located in the center of the regatta, it is traditionally the place where most fans are concentrated, both because it has a fairly close Underground station that facilitates access, and because it dominates the first section of the race and you can bet on the crew that seems stronger.

The third bridge, Chiswick Bridge has three openings of reinforced concrete lined with stone and its design is a direct legacy of the bridge of the Veurdre, by Eugène Freyssinet.[15] It is mainly known for being the finish line and it is spoken of in relation to the regatta. Any other technical consideration about its construction or functionality is worth nothing: it has been reduced to being the finish line of the regatta and all mentions about the bridge refer exclusively to this.

The arrival pole is located on the left bank just downstream of the bridge; the cameras and the referees are located on the right bank just in front of the pub called The Ship. The place is narrower than the abutments of Hammersmith Bridge and it does not fit as many people, but the final stretch of such close races is always exciting.

A mile before the finish there is a fourth bridge, Barnes Bridge, of lesser significance for the race because it is a railroad bridge, although it is attached to an old bridge that used to function as a footbridge, and now it is not open to the public. When the race presents a tight finish, it is the place where the skippers begin to measure strengths and to weigh the convenience of forcing the rhythm.

Clean Water and Foul-Smelling Sewer

Upstream, other uses

In those stretches of river where the regattas are celebrated, the landscape is very different. There are still houses and buildings but more dispersed and surrounded by trees and meadows. The river is cleaner and hints at its possible role as a source for the supply of the city. But there are no intakes or dams in sight, only some lagoons or pools more or less grouped with a building in their vicinity that seems to be more than a residence, but does not reveal its industrial nature.

In general, the river water enters the water supply system after filtering into the ground and penetrating the water table, from where it is extracted by means of wells and pumping, stored for short periods of time in these shallow ponds and then driven by pipes to the city. Earlier sometimes and now regularly, these flows are previously filtered and treated to guarantee their purity before reaching the taps.

they produced landscapes of clean water,

These deposits, reservoirs, pumps and treatments are not very perceptible, except when you know and seek their presence. But there are some signs that never fail, such as the presence of sailboats on the horizon or old buildings with tall chimneys that do not smoke: they are crossed signs of the presence of water, earlier or still used to supply the city.

they took the supply out of the city

Between the first census of 1801 and 1851, the population of England, Wales and Scotland went from 10.5 to 20.8 million inhabitants, that is, it doubled in 50 years, and to 38 million in 1901, almost double, again. This increase in population caused serious water shortages, which the cities were solving as best they could.

From the middle of the eighteenth century, London developed a peculiar supply system, with independent water supply companies, which obtained water from different sources, wells or direct takes. By the middle of the century there were nine companies that divided neighborhoods and suburbs to serve about 270,000 houses, according to the following table.[16]

London Supply to 1848

Company	Thou. houses	Hm^3/day
New River	83,2	70,5
East London	56,7	40,9
Southwark-Vauxhall	34,9	27,3
West Middlesex	24,5	15,0
Lambeth	23,4	14,1
Chelsea	21,0	17,7
Grand Junction	14,1	15,9
Kent	9,6	5,0
Hampstead	4,5	1,8
Total	271,8	208,2

The first of these, the New River Company, had its origin in a water elevation system built in 1767 by the great John Smeaton at Old London Bridge. It was a large hydraulic machine that obtained the driving force of the Thames current by means of a hydraulic wheel system. The machine was dismantled when the old bridge was demolished to build the new London bridge, designed by John Rennie. The rights of the old concession for the water supply - with a term of 500 years that expires in 2082 - were transferred to a new company, the New River Company, which already considered the bringing of waters 'rolled' from the outskirts of London [96:198].

and they dispersed their management and location,

The development of the Watt steam engine prompted the construction of pumping stations along the Thames and the consequent proliferation of companies supplying small areas of the city. Its greater power allowed, in addition, to supply water at greater pressure with which construction of cisterns in the roofs of the houses and the use of the 'water closet,' known from the Tudor period and perfected during the 19th century, was generalized.

As the wells and lower reaches of the rivers became polluted as a result of poor sanitation, the companies found themselves obliged to stock upstream

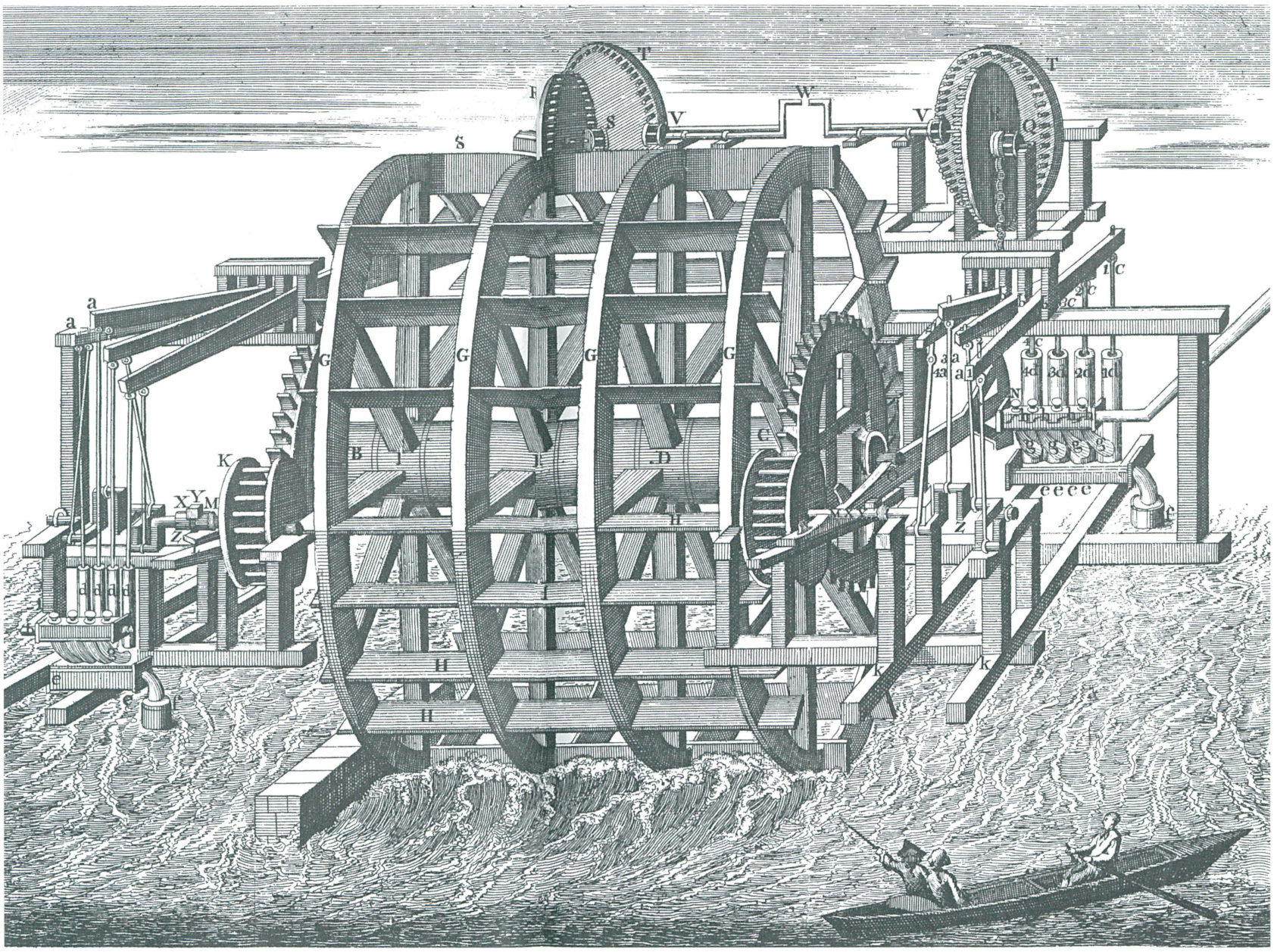
of the city, looking for cleaner waters. This caused a very dispersed system, with varied facilities of capture and impulsion.

The important supply station called **Kew Bridge Waterworks**, was equipped with large pumps of the Cornish Pumping Engine type, mainly used to extract water from the mines, driven by steam and with a large rocker beam in the upper part to actuate the two piston rods at the same time. They were high artifacts, with complex buildings around them to access all their elements.

In Kew, the axis of the large rocker beams rests on four high fluted columns of cast iron, joined at the top with a large prismatic head, vaulted at the bottom to mark the supports. From the heights of the head fall slender pairs of bars that drive the pistons, surrounded by fine lubrication pipes with keys and pressure gauges.

concentrating water extraction

Old London Bridge Wheel, 1767 [96:200]





Stoke Newington Pumping Station, 1852

to distribute it to multiple destinations.

The pumping station, located upstream of the left abutment of the Kew Bridge, supplied water to the nuclei of Brentford, Chiswick, Isleworth, Hounslow, Ealing Acton, Bayswater, Hyde Park, Notting Hill, Marylebone, Pimlico, Paddington and Kensington. It was built in 1909, with five buildings grouped around the balance chimney and its elevated deposit, with a cluster of seven storage ponds located on its west side.

When they stop extracting, they harbor other uses.

Those impressive machines powered by steam stopped being efficient and the pumping stations have been converted to other uses. The Kew Bridge Works was transformed into the London Museum of Water. Another good example of this is the **Stoke Newington Pumping Station**, owned by the New River Company and with the appearance of a Scottish castle. It was built in 1852 by the Scottish engineer William Chadwell Mylne and the architect Robert William Billings, expert in Scottish castles. Its castle-like appearance is underlined by its location on top of a hill, in fact an artificial mount to reinforce that appearance.

The pump stopped operating in 1942 and was saved from the demolition by the clamorous protest of the neighbors, entering the list of grade II protected buildings in 1974. Its interior is currently used as a climbing center, Castle Climbing Center, some of the nearby supply ponds are used by a nautical center, while a water pump building of the 1930s located on its edge has been transformed into a place of celebrations.

But the water was contaminated

At first, the dirty waters were discharged into septic tanks, connecting them to the sewage system being prohibited, but the innumerable overflows with their consequent episodes of contamination and epidemics generalized the connection. As the sewers and collectors did not have the necessary slope to absorb these discharges, the sanitation system became a serious sanitary problem.[17]

and the sanitation had to be undertaken,

After the cholera epidemics of 1849 and 1854 in London, which caused more than 20,000 deaths, the municipal authorities decided to create the Metropolitan Board of Works in 1855 to solve sanitation. Sir John Bazalgette was appointed responsible engineer and designed large collectors parallel to the Thames to intercept the existing drains that emptied directly into the river.

As he himself affirmed in 1864: *Although great differences of opinion existed, and continue to exist, as to the causes of the disease, yet an inspection of the houses in which deaths occurred was sufficient to show that, however occult might be the connection between death and defective drainage, the places formerly most favourable to the spread of disease became quite free from it, when afterwards properly drained* [61:124].

with a powerful plan,

Joseph Bazalgette proposed a network of main sewers, running parallel to the river, which would intercept both surface water and waste, conducting them to the outfalls at Barking on the northern side of the Thames and Crossness, near Plumstead, on the southern side, beyond the city limit. The plan envisaged serving 3.5 million inhabitants, 25% more of the existing population, of which two thirds were located north of the river and one third to the south.

A particular difficulty arose from the fact that much of London, especially the area around Lambeth and Pimlico, lies below the high water mark, thus mak-





Stoke Newington West Reservoir Centre, 1930s

Stoke Newington Pumping Station, 1852

Stoke Newington West Reservoir Centre

Stoke Newington Pumping Station - Castle Climbing Centre







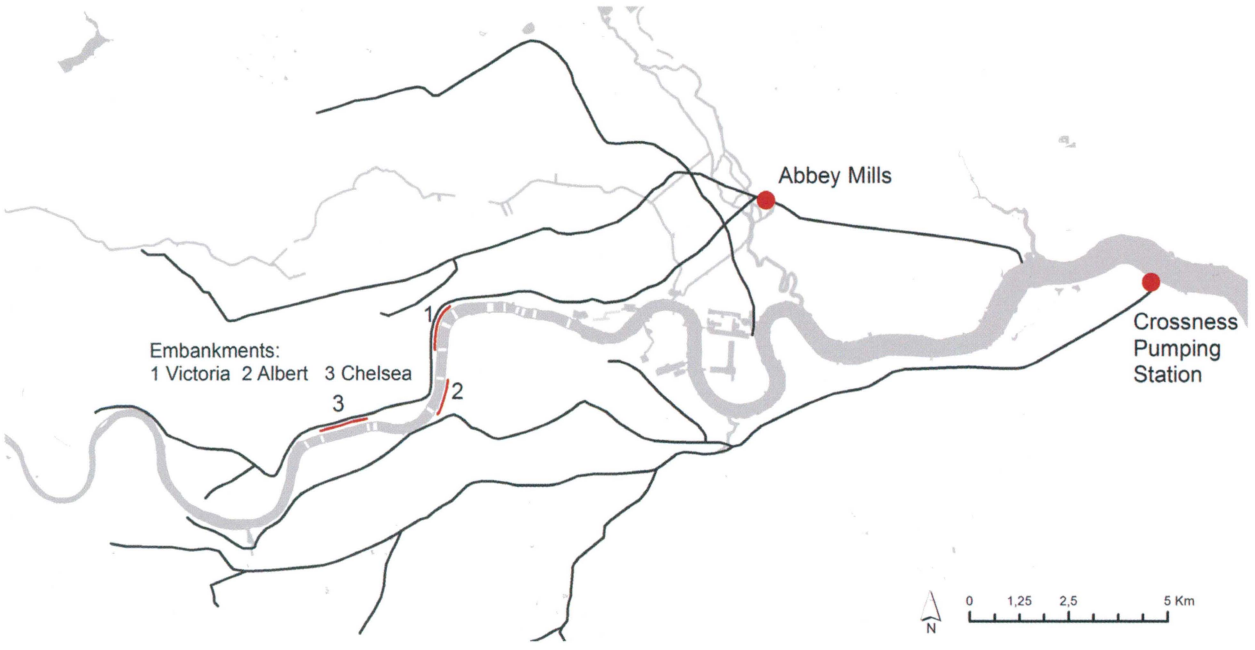
Kew Water Works – water reserves [Own elab. from a London 1896 plan]







Kew Water Works



Sanitation of the Thames in London (1875)
[Elab. belongs to [61:80-81]]

ing it necessary to lift the sewage from these areas to a level at which it could flow by gravity into the rest of the system.

The northern low level Sewer was a much more complex enterprise since it lay for much of its length along the northern (Victoria) Embankment which, besides the intercepting sewers themselves, was also to house a subway, the Metropolitan underground railway, gas pipes and other services.[18]

which included the drainage of low areas,

At Abbey Mills a pumping station of exotic oriental design was constructed, with eight beam engines, which lifted the low level sewage 36 feet into the outfall sewer. There it joined the contents of the high and middle level sewers and flowed, with them, a distance of 5 miles to the outfall reservoirs at Barking and thence into the Thames [61:81]

The northern outfall sewer required the construction of massive embankments to carry the outfalls across low-lying marshy land and it also had to negotiate a dense network of roads, rivers and railway lines.19

both on the left bank

The southern drainage was similar in conception to the northern though the area covered was smaller and the population little more than a third of the numbers living north of the river. The southern high level sewer ran from Clapham High Street 9,5 miles to Deptford Creek where it was linked to Dulwich via the old Effra sewer. It flowed into the northern outfall at Deptford.[20]

as on the right,

At Deptford the Board built a pumping station which opened in 1864 with four beam engines lifting the sewage 20 feet to the southern outfall sewer which ran from Deptford to Crossness. Of the 7,5 miles, almost a mile of the outfall sewer was built in a tunnel beneath Woolwich.

with pumping to overcome the tides

At the Crossness Pumping Station, at high tide the sewage was discharged directly into the river but at other times it was lifted 21 feet into a reservoir to await high tide, this being accomplished by four huge beam engines, built by James Watt and Co. and named Victoria, Prince Consort, Albert Edward and Alexandra. These were the largest ever built and they remained in use until

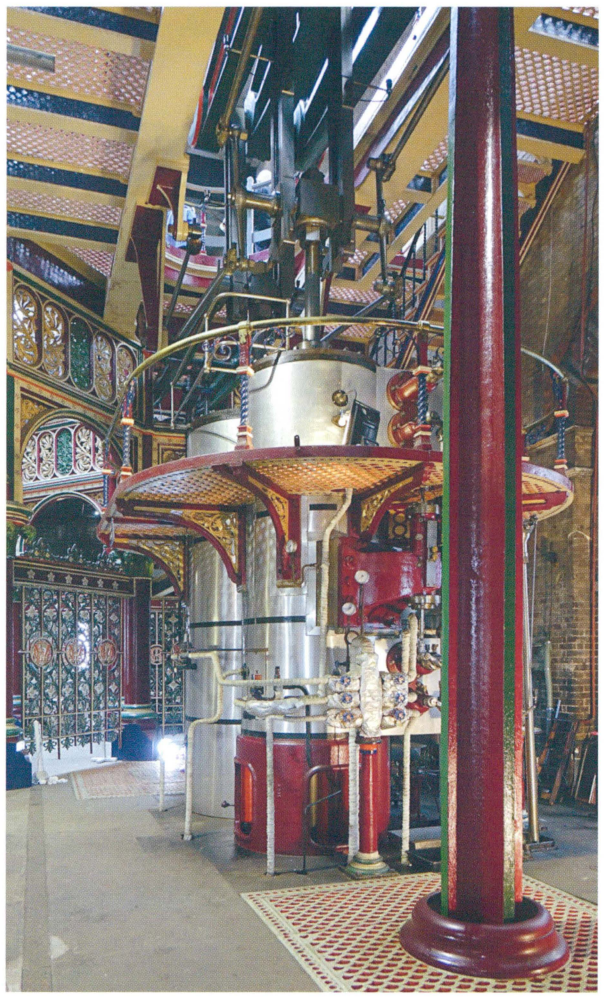


Crossness Pumping Station











Crossness Pumping Station

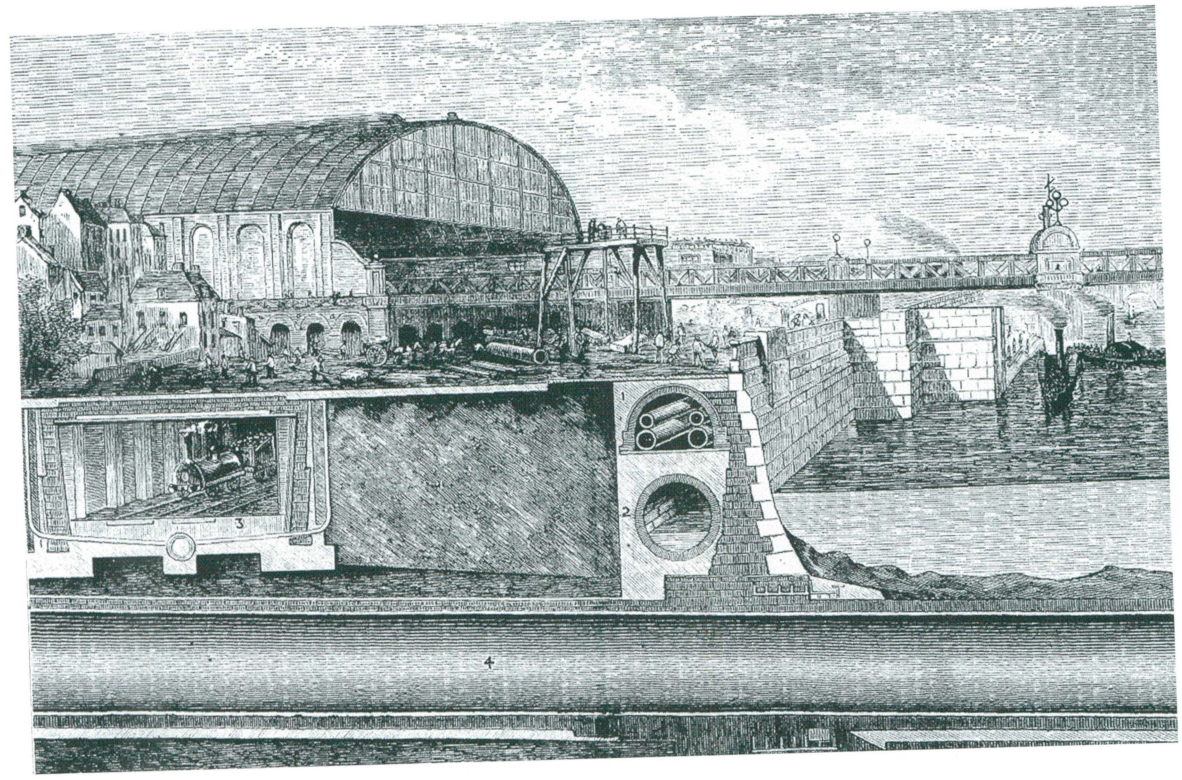
1953, surviving the attentions of scrap merchants because they were deemed too large to be removed. They are now being restored by the Crossness Engines Trust.

Besides building the intercepting sewers the Board was also responsible for maintaining the network of main sewers previously constructed by the Commissioners of Sewers and their predecessors. Thus in its annual report for the year 1863/4 the Board reported that, with most of the contracts for the main drainage under way, it had been turning its attention to repairing and enlarging the older sewers, on which it had spent £800,000 during that year. The Board eventually reconstructed 165 miles of old main sewers[21] [61:99].

and an extensive network of sewers.

To carry out the plan, Joseph Bazalgette devised new dikes with three functions: containing a large collector located at depth, hosting a service gallery placed above, and providing new banks to the river to replace the unusable edges of mud with a wide and well paved road. Because of its great impact on the functioning of the city, these dikes, the Victoria, Chelsea and Albert Embankments, were the most striking and significant works of the entire plan, and avoided the serious problems that the works would have caused, interrupting for months the main roads from the city. They also altered the character of the river and made it urban.

To avoid works in the downtown streets



Victoria Embankment, section, 1867[61:159]

dikes were built in the channel,

By 1850 *the Strand was the main thoroughfare between the centre of commerce, the City, and the seat of government at Westminster. It was choked with vehicles throughout every weekday and the effect upon traffic of digging it up to lay the largest of all the sewers would have been catastrophic*. To avoid inconveniences and delays, probably catastrophic, Bazalgette proposed building the collector with land reclaimed from the river by means of a dike-dock, which would constitute what is now known as the Victoria Embankment. In addition to avoiding the ditch, *upon completion* the filling *provided an alternative route between the two centres, thus relieving the congested Strand*.

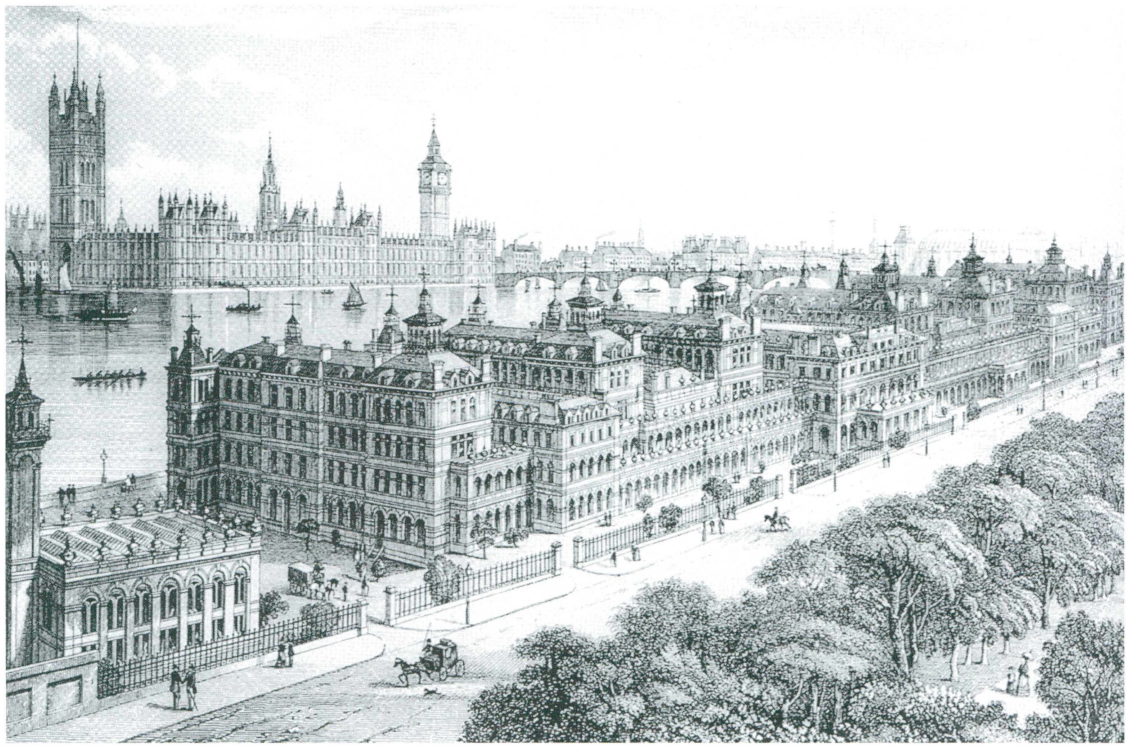
with functional and cost advantages.

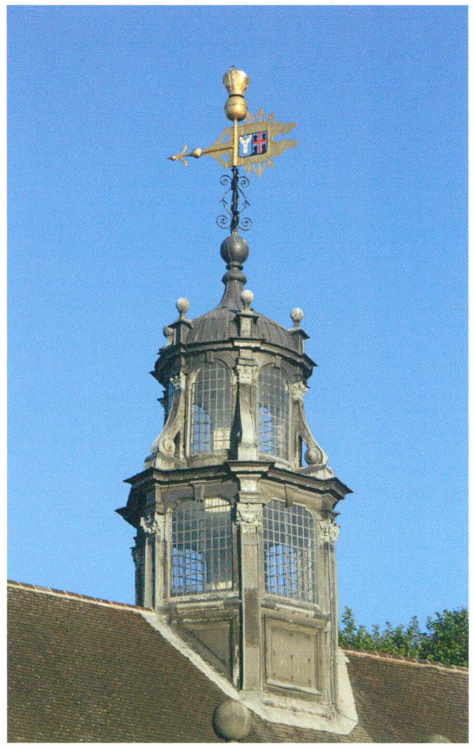
The proposal to build the interceptor collector on the left bank - north of the river - by means of a channeling dam had great advantages, in addition to avoiding the great trench of the Strand. One of the main ones was to allow the construction of the District Line in parallel to the collector, although later this proved to be a source of delays for the general progress of the sanitation, since the tunnel works were very slow due to the financing difficulties of the railroad company.

Another advantage of these channeling dams was the improvement of the drainage of the river itself, by increasing the current and the drag of materials contained in the water, although this also produced a greater undermining of the foundation of bridges and piers.

The three dikes or embankments

The plan of Bazalgette included three **Embankments**, three large dams with their corresponding fillings to contain the river, gain space and put collectors, the Victoria Embankment and the Chelsea Embankment on the north bank and the Albert Embankment on the south side. Together, they entailed the creation of 21 ha of land gained from the river for parks, roads and railways, bringing great advantages to the city, but adding significant costs to the project.[22]





St Thomas' Hospital on Albert Embankment [61:156, Guildhall Library, Corporation of London]

St Thomas' Hospital - detail

In its construction innovative materials and techniques were used, such as Portland cement, patented by the brick manufacturer Joseph Aspdin in 1825, of great strength and able to harden in water, and so called because of its resemblance to Portland stone. It had never been used in works of this magnitude, but Bazalgette specified it for the mortar of his factory works, both the brick of the collectors and the stone walls of the dikes, for its good coexistence with water.

built with new techniques,

The foundation of the dikes was made with the help of cofferdams, built with two rows of wooden piles driven into the bottom one next to another and refilling its interior with clay that allowed to keep dry the pit by means of bilge pumps.

The first to be completed was the **Albert Embankment**, on the south bank between the bridges of Vauxhall and Westminster, whose construction began in July 1866 and ended in November 1869. With its construction, the flooding of the lower areas of Lambeth Bridge was avoided, and there was room for a new road that avoided the congestion of the area.

facilitated communication channels,

Part of its cost was financed by selling land to St. Thomas' Hospital, evicted from Southwark to make way for a bundle of railroad tracks and built again between the bridges of Westminster and Lambeth, in front of the Houses of Parliament, where it still remains.

The **Victoria Embankment** was inaugurated in July 1870, making available to the city 15 ha gardens, a concave river wall which was decorated at intervals with bronze mooring rings in the form of lions' heads and illuminated by cast iron lamps, in the form of dolphinat intervals of 70 feet. A broad, tree-lined thoroughfare from the City to Westminster had been created, over a mile in length, and the Embankment Gardens, after some dispute provided some pleasant green spaces in a congested part of London.

they lowered the price of the Underground, created gardens,

Besides the low-level intercepting sewer the Victoria Embankment carried service pipes for gas, water and eventually electricity. It was the first place in London with electric light installation, thanks to a generator installed where the Embankment Underground station is now, whose District Line was the first underground railway in the capital. *It also housed the capital's first underground railway as well as providing five landing stages for the Thames steamers at intervals along its banks. No other civil engineering project in the capital has solved so many problems simultaneously* [61:160].

roads and avoided floods,

In July 1871 Bazalgette began work on the **Chelsea Embankment** which carries the low level intercepting sewer from Battersea Bridge to Chelsea Hospital and, like the other embankments, provided a much-needed thoroughfare 3/4 mile long as well as protecting from flooding the low-lying areas around Cheyne Walk. The Chelsea Embankment was opened on 9 July 1874 [61:162].

being the most celebrated of that plan.

The Embankments were Bazalgette's most spectacular and famous works, although he put it in context when commenting that I get most credit for Thames Embankment, but it wasn't anything like such a job as the drainage.

The full credit for the drainage came after his death with the elimination of cholera, but meanwhile the Embankments received the warmest praise in the columns of the Times: For the principle engineer, of course, it will be a monument of enduring fame, ahead of all the great achievements that have marked the Victorian age [61:163].

Victoria Embankment and Cleopatra's Needle



Victoria Embankment- Channeling wall



From Border to Threshold

Along the Thames there are certain agglomerations of uses, caused both by the proliferation of bridges and their lack, defining areas of propagation of a similar urban fabric on the south bank, or undesired activities in the north that are located there. In the process of approaching or attracting the other shore, as well as repelling or ignoring it, the role of bridges is substantial.

The case of Vauxhall Bridge is a good example of a desired spread of the city to the south through the 'bridgehead' effect, while the appearance of the old theaters such as The Globe or the Old Vic in Southwark, or modern waste transfer power plants next to the Battersea thermal power plant or upstream of the Wandsworth Bridge on the right bank of the river - to the south - make sense as a rejection of their location in the north.

The clearest historical example is that of the first London Bridge, which generated the population nucleus that over time transformed into the city of Southwark, but it is of great interest to point out here what subsequent developments in the area have meant. First was the market, then the neighborhood, then the cathedral, later the railroad and now the remodeling of the station, still not completed but already with remarkable repercussions.

Each of these steps has had an effect on how the area is used, on the type of buildings being built and on the new character driven by the changes. Little by little, the city projects itself on the other shore and infects it with its needs, in a slow and prolonged process until a few years ago, but now quite accelerated.

Attracting and containing make sense and urban projection to London Bridge

Borough Market

Borough Market-Latticework over Borough High Street



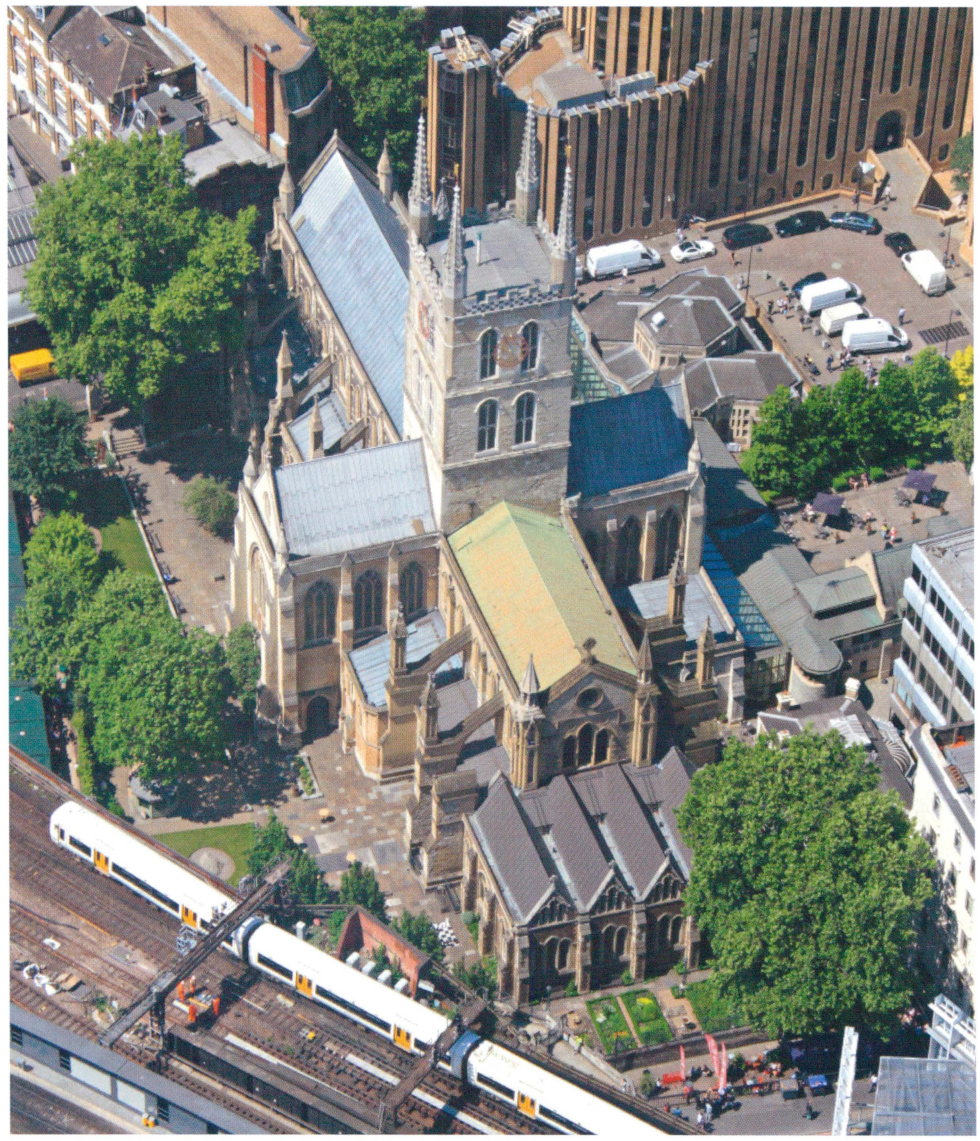




Southwark Cathedral



Southwark Cathedral - interior



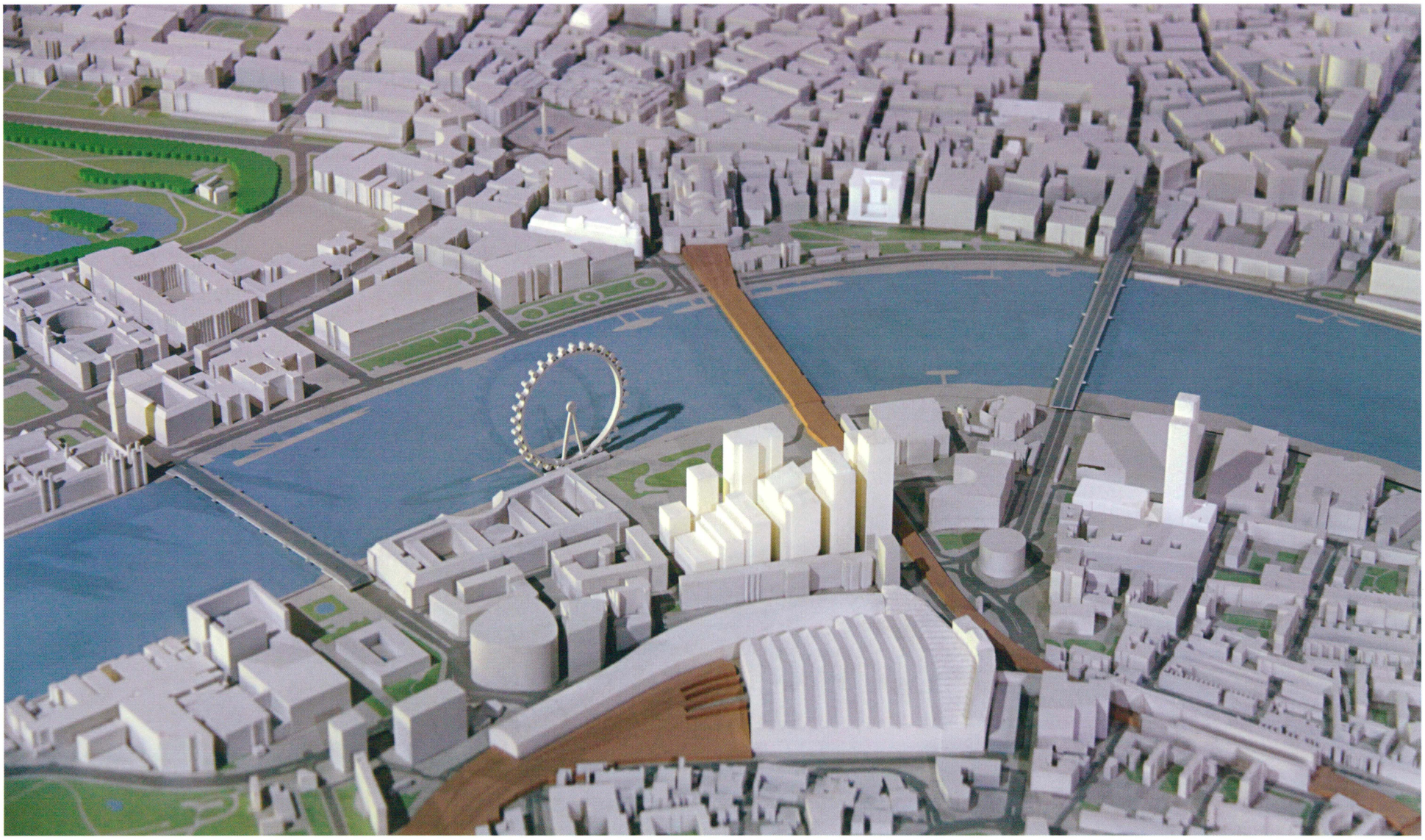
Southwark Cathedral from The Shard

that starts another center with market and cathedral.

Southwark Cathedral is very close to the south abutment of London Bridge, on the access road to the bridge on the opposite side of London Bridge Station. Bridge, station and cathedral occupy the vertices of a triangle of about 100 m on each side, as close as possible to the City and practically next to an elevated beam of roads that makes an S to save the cathedral and enter Southwark Railway Bridge.

Under that beam and next to the cathedral is Borough Market, the old market of the urban nucleus, now converted to a tourist market of restaurants and fast food stalls, which has become one of the must-see places for tourists.

The cathedral is quite overwhelmed by the surrounding buildings, but behind it there are some points from which it is possible to appreciate the entire north elevation. It occupies a central place of ancient religiosity with numerous associated legends; the most popular one recounts that the first of the three buildings that have occupied the place was the legacy of a boatman who got rich from traffic between both banks, before the construction of the Old London Bridge. About 100 m west of the cathedral are the ruins of Winchester Palace, the bishop's palace and one of the most important buildings in medieval London.



Model with Waterloo, Hungerford and Westminster bridges

Linking South Bank with Charing Cross

Built between 1220 and 1420, on an old collegiate church later converted into an Augustinian monastery, Southwark Cathedral is the oldest Gothic church in London and only in 1905 was it converted into a cathedral. The interior maintains its original purity and remains one of the best gothic examples in London [85:51].

South Bank is a section of the right bank of the Thames, more or less delimited by Waterloo and Westminster bridges, with Hungerford Railway Bridge and its two footbridges stuck to both sides, between them. In that area the river enters oriented towards the north and it leaves oriented towards the east, after describing a somewhat closed curve that, in its day, gave rise to a fan of paths directed from Elephant Castle and St George's Circus towards each one of the bridges and towards the center of London.

The strip closest to the shore is covered with public buildings, precisely generated by London's will to be present on the other shore. The first bridge in the area is Westminster Bridge, of 1750, later replaced by the metal bridge of 1862, which is still in service and led to the establishment of St. Thomas' Hospital (1871) upstream and County Hall (Ralph Knott, 1909-1922) downstream.

Waterloo Bridge



Hungerford Bridge







Royal Festival Hall

Embankment Place (Terry Farrell, 1990)



Westminster Bridge

with public buildings, bridges and walkways

Formerly the seat of the London County Council and now a place of business and attractions, County Hall attracts many visitors with its aquarium, the great London-Eye Ferris wheel, the dungeons and a Marriott Hotel. Down with the river are the Jubilee Gardens, built in 1977, surrounded by a series of residential towers under construction or just finished that extend back to Waterloo Station and down the river to the railroad tracks.

Hungerford Suspension Bridge, built by Brunel in 1845, crossed the river at a point of maximum centrality making way for pedestrians from Southbank to the Strand and Trafalgar Square, by a board four meters wide. It had a central span of 206 m and two sides of 101 m, supported by iron chains[23] anchored in two grand stone porticos with a large Roman style archway.

Years after its entry into service a proposal was made to allow the passage of vehicles, but it was not carried out and, finally, the superstructure was removed in 1863 to make way for Charing Cross Railway bridge, which took advantage of the lower part of the piles[24] and maintained the pedestrian crossing by two narrow lateral cantilevers [25:59]. In 2002 the overhangs were replaced by the Golden Jubilee Bridges, whose boards are suspended from a series of inclined pylons by means of braces.



National Theatre

for the Southbank cultural center.

The bridge is the central element of South Bank because of its position and because of the places and buildings it links up, which arose on the occasion of the South Bank Exhibition - Festival of Britain, held in 1951. The main one is the Royal Festival Hall, designed by Robert Matthew and Leslie Martin, a concert auditorium that is home to two orchestras, the London Philharmonic and the Philharmonia, built on the industrial grounds of an old brewery. Later, the smaller Queen Elizabeth Hall was built, with the Purcell Room for chamber hall, now under renovation, and the Hayward Gallery behind and the National Theater, on the other side of the Waterloo Bridge, to form the great artistic Southbank Centre.

The Waterloo Bridge of 1945 is already of modern conception, with a continuous beam of reinforced concrete plated in stone of five bays, three 71 m central and two semi-openings as accesses, designed by the architect Sir Giles Gilbert Scott (author of St Pancras) and the firm Rendell Palmer & Tritton, in the 1930s. Previously there was another bridge, designed by John Rennie in 1815, with nine beautiful stone arches of 36 m, supported by piles topped by a pair of Doric columns. First it was a private toll bridge, known as Strand Bridge, and then rescued as public bridge by Bazalgette. From 1951 only the Royal Festival Hall remained, but the image of the exhibition was monopolized by the Skylon, a tensigrity structure with a rigid element of tapered shape held by cables as if floating in the air.







London Eye

Thames Path - right up Waterloo Bridge

County Hall



Waterloo Bridge / Waterloo Station Area

1. Waterloo Station
2. Waterloo Bridge
3. Hungerford Bridge and Golden Jubilee Bridges
4. Westminster Bridge
5. London Television Center
6. IBM
7. National Theatre
8. National Film Theatre
9. Waterloo Hospital for Children and Women
10. Queen Elizabeth Hall
11. Hayward Gallery
12. Waterloo Hospital
13. Royal Festival Hall
14. The Imax
15. Belvedere Rd and Jubilee Gardens
16. London Eye
17. Country Hall
18. St Thomas Hospital
19. Isambard Kingdom Brunel Statue
20. Somerset House
21. The Institution of Engeneering and Technology
22. Savoy Hotel
23. Shell Mex House
24. The Adelphi
25. Victoria Embankemant Gardens
26. North Bank Gateway (1862)
27. Savoy Pier
28. Cleopatra Needle
29. Bazalguette Monument
30. Victoria Embankement Pier
31. Charing Cross Station
32. Embankement Gardens
33. Royal Houseguard Hotel
34. Governments Offices
35. Banqueting House
36. New Scotland Yard
37. Big Ben
38. Houses of Parliament

Waterloo Bridge - right



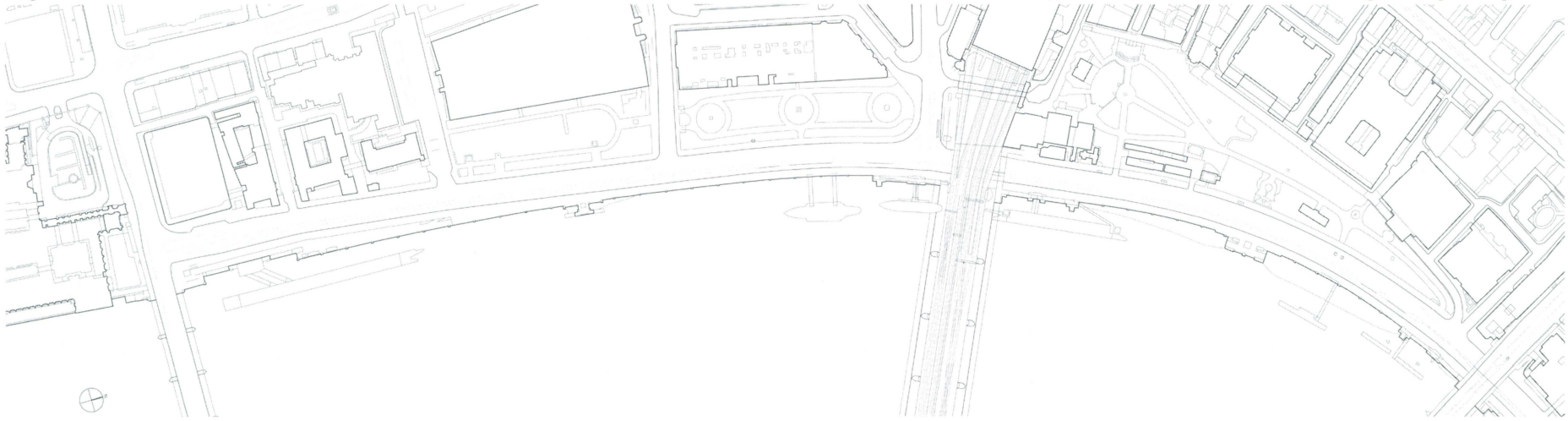
Waterloo Bridge | Queen Elizabeth Hall | Royal FestivalHall | Hungerford Bridge | Jubilee Gardens | London Eye | Country Hall | Westminster Bridge

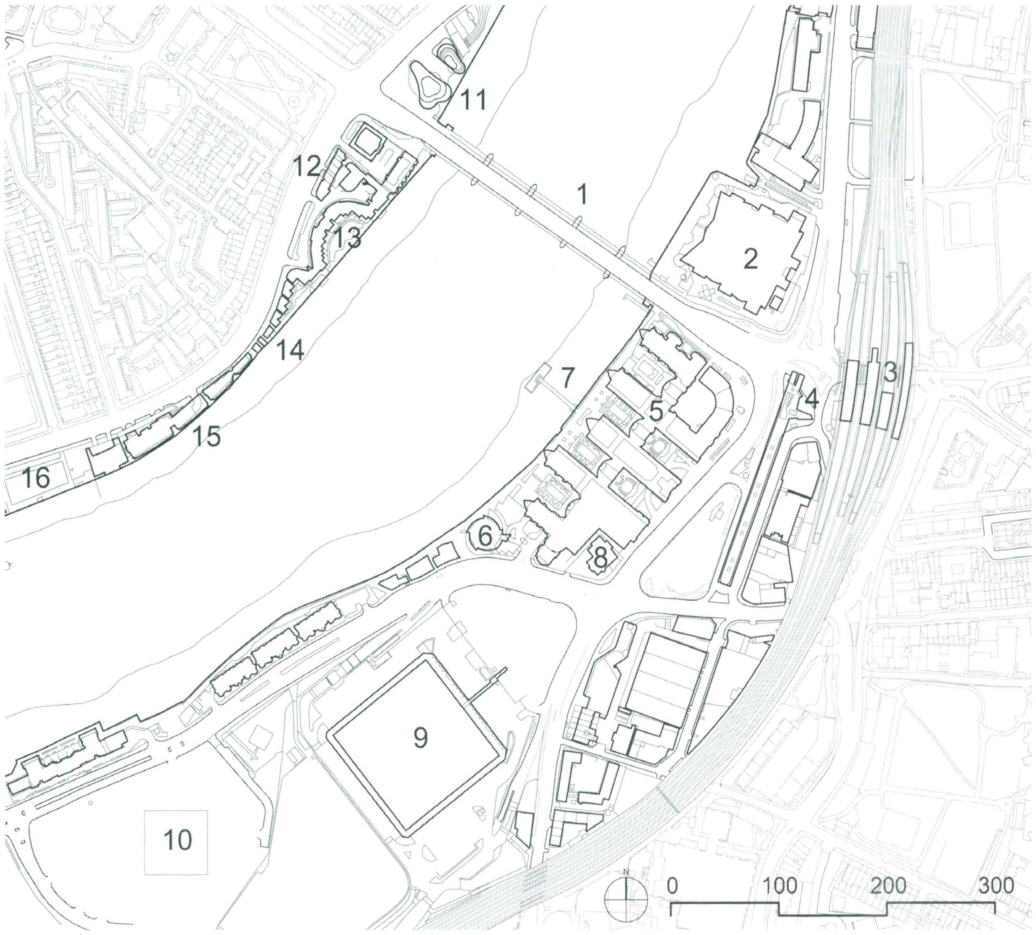


Waterloo Bridge - left



Westminster Bridge | New Scotland Yard | Government Offices | Royal Horseguard Hotel | Charing Cross St | North Bank Gateway | The Adelphi | Shell Mex House | Sayoy Hotel | Institution Engineering | Waterloo Bridge





Vauxhall Bridge

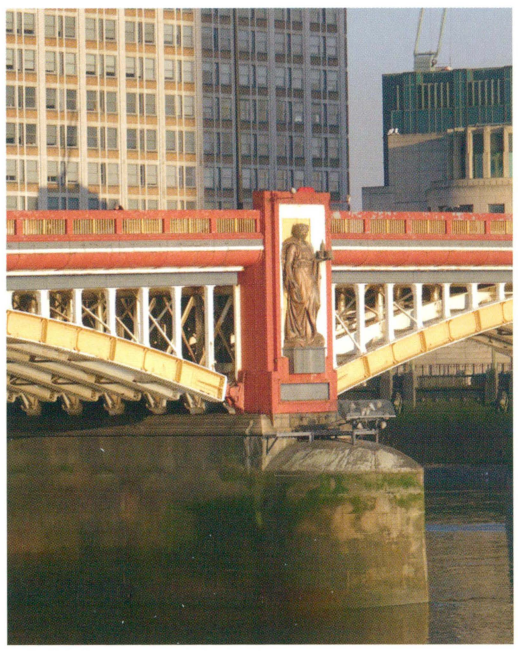
1. Vauxhall Bridge
2. MI6 Secret Intelligence Service
3. Vauxhall Train Station
4. Vauxhall Bus Station
5. St. George Wharf Building
6. St. George Wharf Tower
7. St. George Wharf Pier
8. Brunswick House
9. New Covent Garden
10. Ambassador Building
11. Riverwalk Tower
12. Engineers Kirk & Randall Building
13. Crown Reach Building
14. Tyburn House
15. Eagles Wharf
16. Pimlico Gardens



Vauxhall Bus Station



Crown Reach Building





Vauxhall Bridge



St George's Wharf

Vauxhall Bridge is another point of concentration of buildings around its abutments but, unlike Southbank, the developments on the right bank are very limited in depth by the railway line. After a first line of tall buildings, the rear one is a kind of transport interchange in Vauxhall Cross; first there is Vauxhall Bus Station (Arup, 2005), an outdoor station, sheltered under a long marquee with ribbed profile on inclined piles, whose northern end rises from the ground as in a takeoff; and further back, Vauxhall Station, which looks almost rural but has a lot of traffic towards the nearby Waterloo Station.

Local development at Vauxhall Bridge.

Upstream of the right abutment is the St George Wharf Tower, a huge complex formed by five parallel blocks of about 100 m long that offer an aggressive staggered and pointed profile towards the river, topped by whimsical towers, joined at their center by another even larger block, about 250 m parallel to the river and about 15 floors that increase to 20 in the towers. It has won the competition for the ugliest building in London several times. At its southern end there is a 52-story cylindrical tower, which brings some seriousness to the whole.

Downstream of the bridge there is a multilayered cake-shaped building with central symmetry, which is the headquarters of the MI-6, the British foreign intelligence service, with a staggered layout full of protruding cylinders and prisms, which looks like something more serious than its neighbor, but difficult to assess. Perhaps its biggest attraction is the blasting and systematic destruction to which it is subjected in *Skyfall*, the James Bond film directed by San Mendes in 2012. Further downstream blocks devoid of interest multiply.

On the left bank, the edge road also limits the construction zone in height, so that the bridge appears as the only link between the blocks and towers on either side. But the scale, materials and forms are totally different. Upstream of the bridge is the Crown Reach Building, an organic set of twinned apartments, arranged in a semicircle around a courtyard, with a very attractive appearance that invites you to stay there. On the back, the building has no elevation because the sloping roof originates from the first floor.

On the other side of the bridge, the terrain is narrower and accommodates an undulating tower with a sculptural garden on the riverside promenade, of greater volume but much more careful than its neighbors opposite, which contain some government offices.



Albert Bridge

Upstream is **Albert Bridge**, an unattractive bridge painted pink and pale blue on a pale green background, with excessive pillars and ornaments of all kinds. It is a bridge that does not respond to the attempted technological figure of cable-stayed bridge, which is the chosen structural type.

In the central span, the upper brace that is anchored in the center of the span hesitates between the hanging and the cable-stayed form. The weight of the chains gives it a certain curvature but instead of covering a complete catenary it forms an angle right in the middle, where the two tie rods meet. The bridge must probably be lacking in strength because it has been lowered in the middle of the central span with an additional stack that makes the stiffening beam work practically like a resistant lintel.

Despite all this, perhaps the most important for the demerit of its design is the excessive and ornate decoration around the piles, which contributes little and confuses a lot.

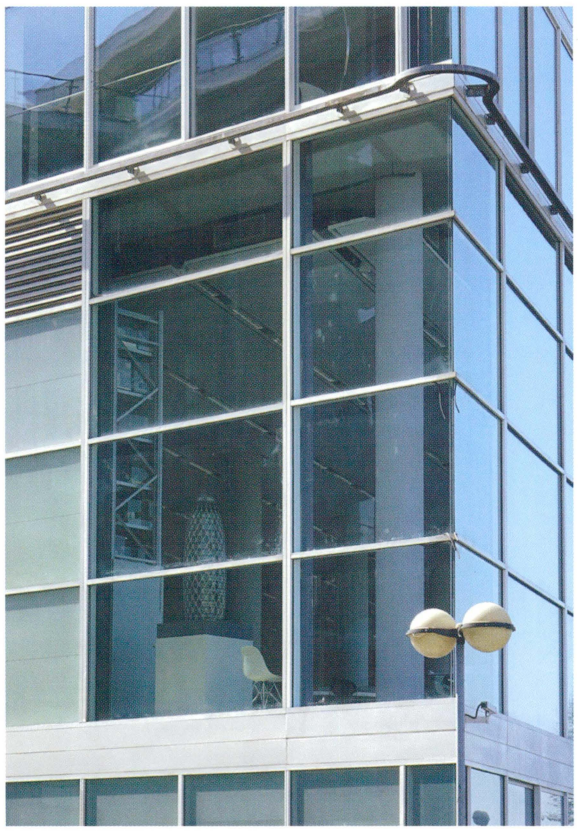
Upstream of the right abutment is the studio of Foster & Partners, a prismatic glazed volume with a sharp edge towards the river, with very careful details. To its side there is another huge cake or better, half donut, of curved plan and elevations on piles in a V, that must be an annoyingly looking neighbor.

Downstream is Battersea Park and on the left bank is Chelsea, with low buildings and with no density or height agglomeration, so the Albert Bridge is a 'neutral' or 'inert' bridge from an urban perspective.



Foster & Partners

Albion Riverside Building





Bridges over the Thames



1894
Tower Bridge
3, tilting, steel
Tower Hamlets / Southwark



1973 (1831, 1209, 50)
London Bridge
3, continuous beam, concrete
City: Monument / Southwark



1866
Cannon Street Railway Bridge
5, beam, iron
City: Cannon St / Southwark



1921 (1819)
Southwark Bridge
5, arch, steel
City: Queen Street / Bankside



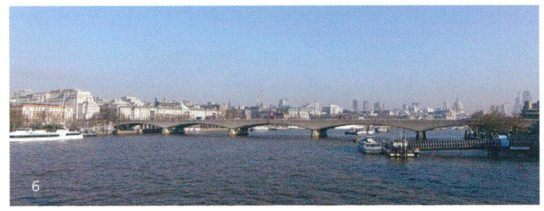
2002
Millennium Bridge
3, pendant, steel
City: Queenhithe / Bankside



1886 (1864)
Blackfriars Railway Bridge
5, arch, iron
City: Blackfriars / Southwark



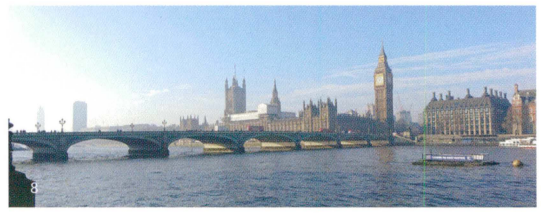
1869
Blackfriars Bridge
5, arch, iron
City: Blackfriars / Southwark



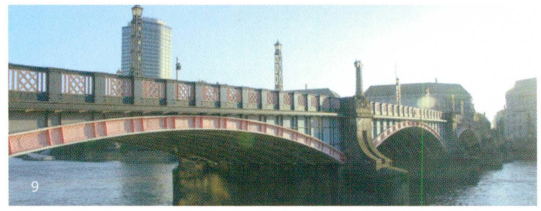
1945 (1817)
Waterloo Bridge
5, continuous beam, concrete
Westminster / South Bank



2002-1864 (1845)
Hungerford & Golden Jubilee Br
7, cable-stayed, steel
Westminster / South Bank



1862 (1750)
Westminster Bridge
5, arch, iron
Westminster / South Bank



1932 (1862)
Lambeth Bridge
5, arch, steel
Westminster / Lambeth



1905
Vauxhall Bridge
5, arch, steel
Pimlico / Vauxhall



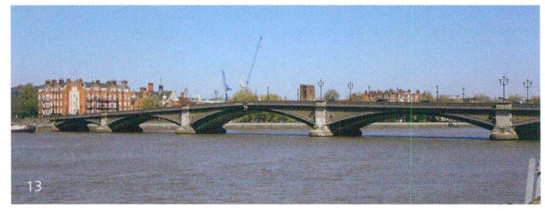
1967 (1859)
Grosvenor Railway Bridge
5, arch, iron
Westminster / Wandsworth



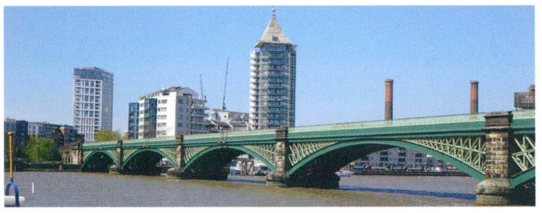
1937
Chelsea Bridge
3, pendant, steel
Chelsea / Battersea



1873
Albert Bridge
3, cable-stayed, iron
Chelsea / Battersea



1890
Battersea Bridge
5, arch, steel
Chelsea / Battersea



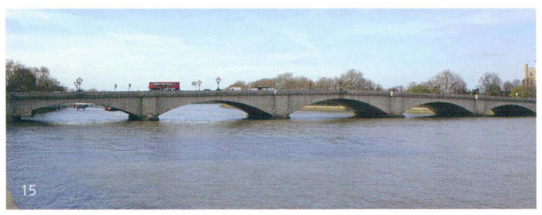
1863
Battersea Railway Bridge
5, arch, iron
Imperial Wharf / Clapham Junct



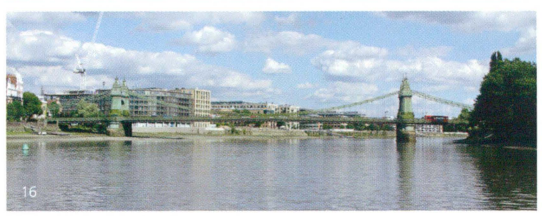
1938
Wandsworth Bridge
3, continuous beam, steel
Fulham / Wandsworth



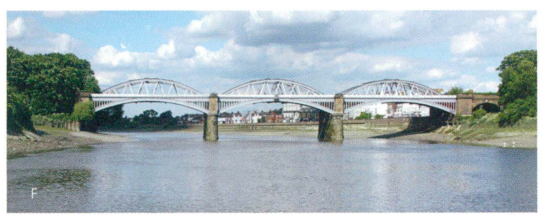
1889 (1729)
Fulham Rw Br & Footbridge
7, lattice beam, iron
Putney Bridge / East Putney



1886
Putney Bridge
5, arch, stone
Fulham / Putney



1887 (1827)
Hammersmith Bridge
3, pendant, iron
Hammersmith / Castelnau



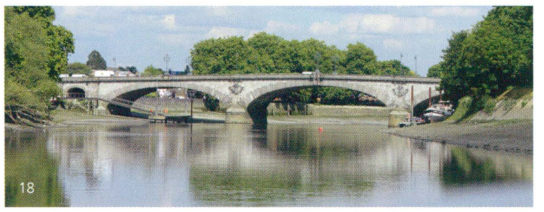
1895 & 1849
Barnes Rw Bridge & Footbridg
3, bowstring, iron
Chiswick / Barnes



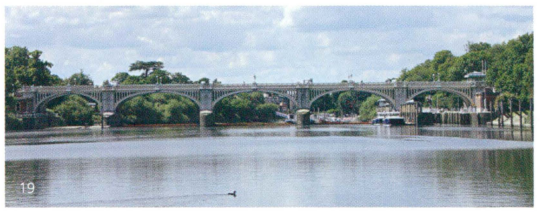
1933
Chiswick Bridge
3, arch, stone
Chiswick / Mortlake



1869
Kew Railway Bridge
5, lattice beam, iron
Gunnersbury / Kew Gardens



1903
Kew Bridge
3, arch, stone
Brentford / Kew



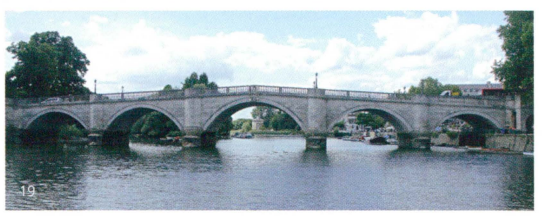
1894
Richmond Lock Br & Footbridge
5, arch, steel
St Margaret / Richmond



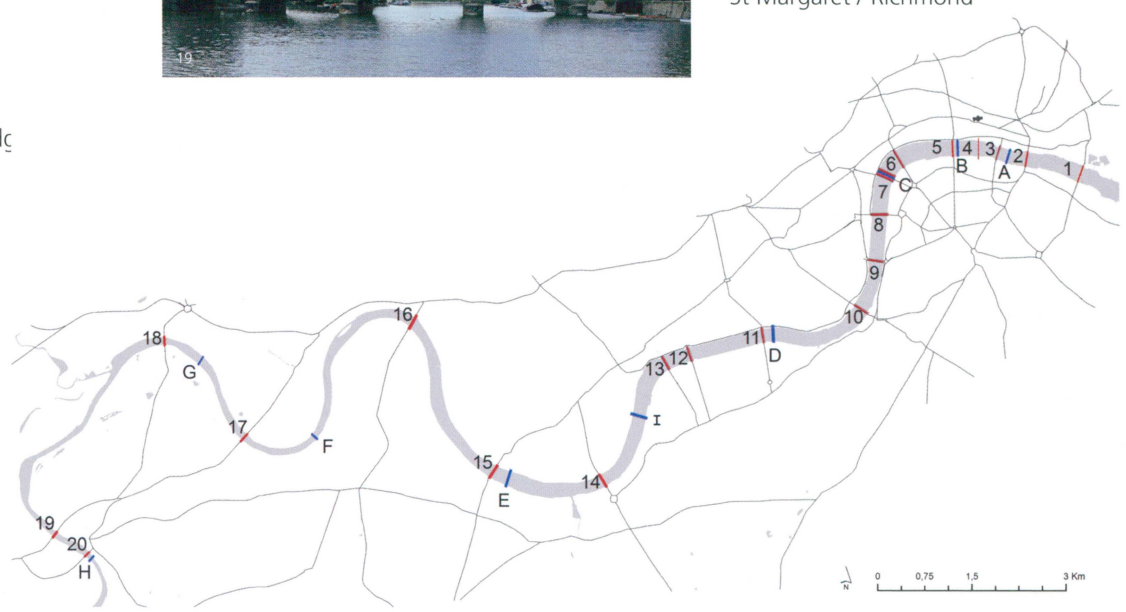
1933
Twickenham Bridge
3, arch, concrete
St Margaret / Richmond



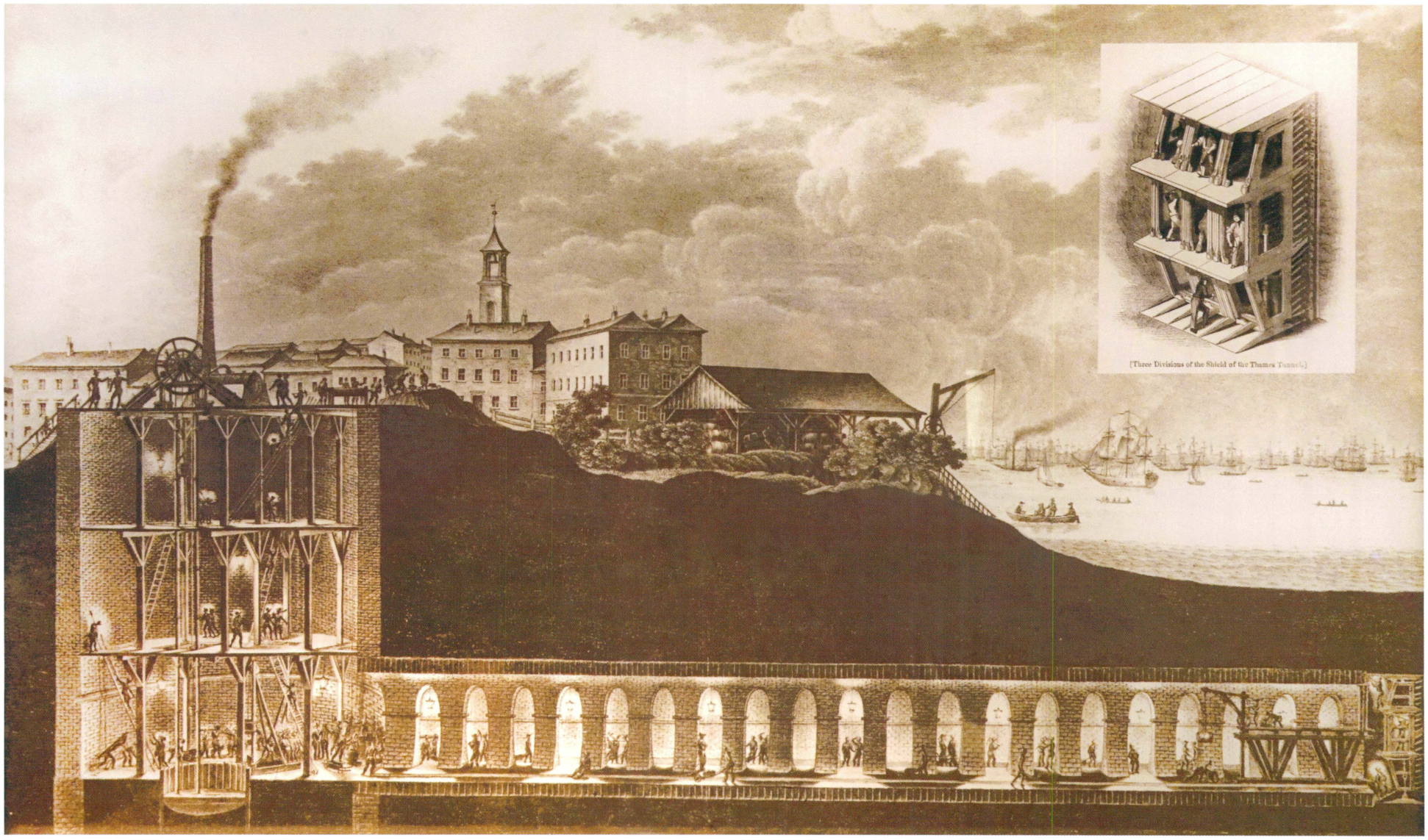
1848
Richmond Railway Bridge
4, arch, iron
St Margaret / Richmond



1777
Richmond Bridge
5, arch, stone
St Margaret / Richmond



Source: Own photos and data from https://structurae.net; https://en.wikipedia.org/wiki/List_of_bridges_in_London



Coat of arms of Marc Brunel for the Thames Tunnel [Own elab. from Transport Museum]

Thames Tunnel - Legacy of Brunel

In 1824 the company to build the Thames Tunnel between Rotherhithe and Wapping was formed, and the following year work began on the well of Rotherhithe, already with Isambard K. Brunel as assistant engineer, although he was only 18 years old, and a year later as resident engineer.

The well of Rotherhithe was 15 m in diameter and its excavation began in 1825 with the driving method. The structure was a brick wall and Roman cement 90 cm thick on a circular iron ring. The well was driven by its own weight, by digging manually under the cutting edge of the iron ring. The water that entered the interior of the well was extracted with steam-driven pumps, helped by handpumps.

After the well, a cover was built on it to support the steam engine that had to move the pumps and the endless belt to extract the excavated lands. In October the shield began to be mounted inside the well with the castings. The first shield was 10.5 m wide and 6.15 m high, but it was later enlarged.[25]

The advance rates were about two meters per week, working two shifts with about 36 men working on the shield. The tunnel was invaded by water on numerous occasions.[26] Each time this happened, the divers submerged themselves in the river to locate the gap and determine its importance. The Brunels, father and son, then descended on the crack with a bell of compressed air, to decide where the filling would begin. The gap was closed by throwing sacks of clay on it. Then the gap was covered with 25 by 25 m tarpaulins that were unfolded and placed on the cavity, with the help of thick chains on their edges.

The work was stopped from 1828 to 1835, and was completed seven years later, in 1842. At first, users descended through the wells by stairs or elevators to cross the river, but later it was used for the London Underground. Regardless of the remarkable shield, the Thames Tunnel was also important, not only because of its 353 m longitude below the river, but for its huge 19 m long by 7 high section, which was built directly



Blackwall Tunnel under the Thames in London (1887)



Greenwich Footway Tunnel, LCC, 1902

by full section, that is, without advance gallery, manually pulling each piece of clay.

Between 1884 and 1890 two more tunnels were built for two railway lines in London, whose works were directed by James Greathead (1844-1896), who had been in charge of the second tunnel with Peter W. Barlow.

In the second Thames tunnel passengers descended in wells and embarked in groups of twelve in small cylindrical cars that were moved on rails, by cables driven by steam engines. The scheme could not pay the costs and the operation had to be abandoned, so the tunnel was crossed on foot and the elevators were replaced by spiral stairs. The tunnel was finally closed to traffic in 1898. Currently, the tunnel is used for hydraulic pipes and its northern entrance is preserved next to the Tower of London.

With a short stretch under the Thames the Waterloo & City Railway built the first Underground line since 1890 to join both banks with a tunnel opened in 1898 [110:245]. In 1892, Blackwall Tunnel under the Thames, 8 m in diameter, was built in a very difficult soil, laden with water, but the work was completed in time.



Brunel Museum

Boulevard from Greenwich to Richmond

Its role as boulevard of the gaze begins

In addition to this double mobility fostered by docks and bridges, the river gives a new breadth to the gaze, which gives rise to a new axis of significance. In parallel with these new directions and possibilities of displacement, visual flows of infrequent scope and incidence arise in the urban fabric. That always attracts looks that, in turn, bring buildings to see and be seen.

The width of the channel allows a frontal view of everything that is built on the banks, giving rise to a new urban façade, with impossible visual qualities in the narrow streets, which turn the river into a boulevard. But the alignments and meanders of its natural course enrich the rhythms and visual routes, to propitiate a lively and fluid landscape where the river guarantees permanent changes of light, rumors and reflections, along its route. That capacity of the river is a good example of its boulevard function in the city

in Greenwich, as presence of power

When entering from the sea, Greenwich warns of the arrival at the capital of the empire. The overwhelming presence of the grandiose ensemble built by Wren forever ensured Greenwich's place in the Royal Navy. Domes, pediments, columns and symmetries insist on the enormous British power achieved and sustained with its ships for an empire that came from before and reached its zenith in 1919, when Britain acquired the colonies of East and West Africa and Samoa from Germany in the Treaty of Versailles, which marked the end of the First World War.

Old Royal Naval College



Without having to enter the National Maritime Museum, the bombardment of phrases and images of its posters supports the same idea: *Discover epic stories of exploration and endeavour that have shaped our world today. See for yourself the very coat worn by Nelson at the Battle of Trafalgar. Take the helm at the Cutty Sark's wheel. Explore how the Royal Navy shaped everyday lives as it became a central part of society and turned sea-faring heroes into national celebrities.*

Images of the Cutty Sark, ships and boats, life at sea, pirates, shipwrecks or the Titanic, lead to 'global markets and maritime trade' in an inevitable itinerary that ends in the power of the empire. A museum gallery called *Nelson, Navy, Nation* is its most synthetic formulation, but the set of buildings constructed is articulated to support this synthesis: Old Royal Naval College, Greenwich Maritime Institute, National Maritime Museum, Naval College Gardens, Seaman Hospital, Royal Observatory (to fix the longitude coordinate) or The Barge House have the same naval pride in each of their stones.

synthesized in Nelson, Navy, Nation,

Definitely, Greenwich is the gate of the empire, brought by the sailors to the city that always offered its best places to honor them. It is not especially relevant to know what each building is or which are its contents, because their plan, elevations and sections are interchangeable and indifferent to their content. Even churches are inserted in the same conformation and you can only appreciate that they are churches from within. Of that uniformity, perhaps pretentious but enormously effective, only a small building located behind the rest is freed.

that marks the gate of the empire

Royal Observatory





Queen's House

and hides the treasure of Queen's House,

It is Queen's House, a beautiful Palladian-style house built by Inigo Jones between 1616 and 1635, a royal residence and the only remains of the previous palatial complex located there, which is the most attractive part of Greenwich. With two arched wings and the central house elevated on a podium in the front, the 'villa' reveals its affiliation, but its interior is more radical and innovative. The square floor, with a cubic lobby of 12 m on one side, a second bay with two patios and the third with a rear loggia on the upper floor is very unique and has no antecedents. It eliminates the expected central symmetry in a square building and generates the richest space in the lobby.[27] The pavements, stairs and details of the whole building are also of great interest.

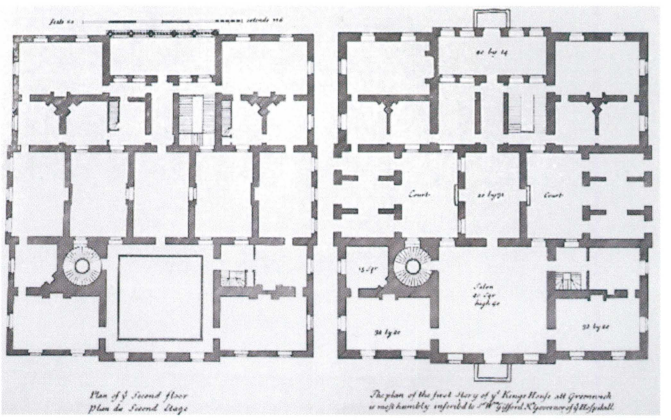
but the kings moved to the high stretch.

But the kings preferred the character of the upper course of the river: for the *Original Picture of London* of 1826, the beauty and variety of everything that appears on both banks delights the traveler's gaze. The tour exhibits a continuous series of towns, magnificent sites, splendid villas, beautiful landscapes and carefully cultivated gardens.

Queen's House Lodge



Queen's House - plan



And the air is healthier. *When William and Mary came to the throne,* says Hornak, *they preferred Hampton Court to Greenwich. Greenwich's position to the east of London was subject to the smoke and pollution carried from the city by the prevailing westerly winds: this aggravated the William's asthma* [70:16].

Nobles, princesses, princes, kings and lovers settled in large mansions on the north bank of that high stretch of the river, from Hammersmith or Chiswick to Richmond. Upstream of Richmond are the parks and lagoons of the Hamptons, where the palace and gardens of the royal residence of Hampton Court are located. The landscape becomes more rural, although there are still frequent trains to London and it is only 10 km from Heathrow Airport.



Queen's House Stairs

National Gallery

Sailors in the Center of the Empire

Nelson in Trafalgar, turning his back on the art of the National Gallery, with the South Africa High Commission on one side and the Canadian High Commission on the other, to dominate from above the power of Whitehall, the Old Admiralty Building, a few meters from the 10 Downing Street, home of the Prime Minister, the Admiralty Arch as entrance to Pall Mall with Buckingham Palace in the background, surrounded by statues of illustrious sailors such as Captain James Cook, discoverer of Australia, are a good example of how much the sailors mean for London.



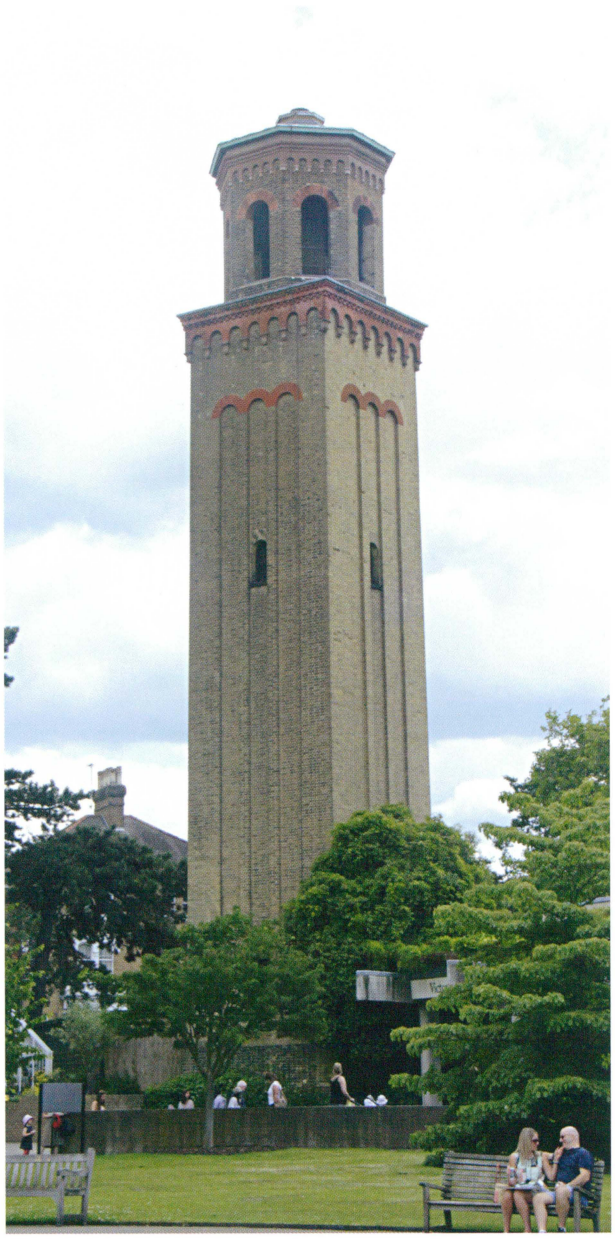
Admiralty Arch





Captain James Cook

Nelson in Trafalgar



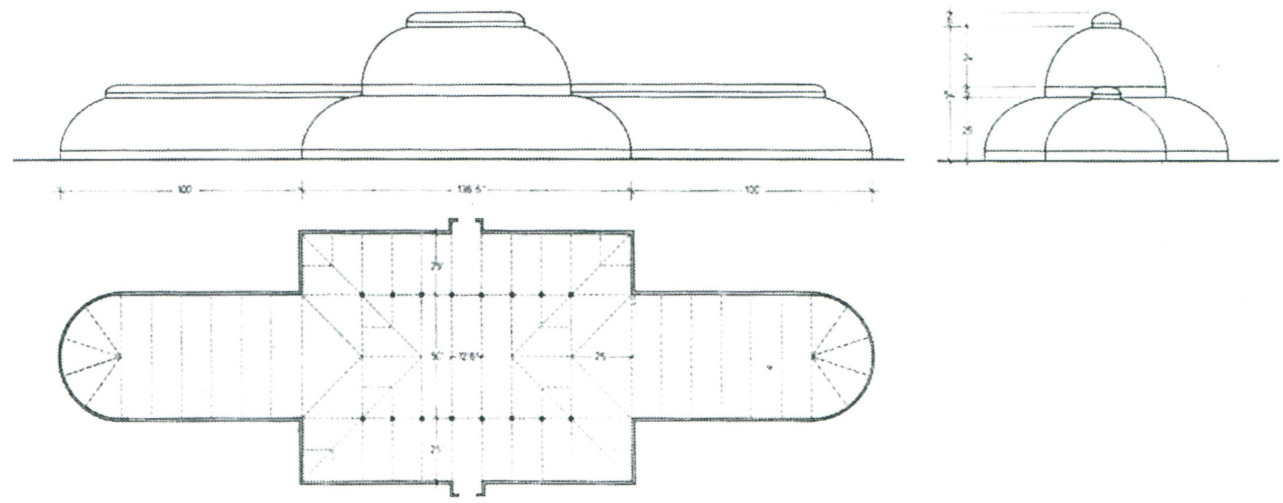
Kew Gardens

Around Kew Gardens' Palm House there are reasons for interest for very different disciplines, from landscaping, gardens and botany, to thermodynamics, the manufacture of tinted glass or structural engineering. Many of the most significant issues of the building have been misinterpreted or misunderstood, preventing the greenhouse from being given the place of honor it deserves due to the numerous innovations it brought along. But although historiography marches slowly, the facts end up coming to light.[28]

Until a few years ago, its design had been attributed to Decimus Burton, with the collaboration of Richard Turner for certain constructive details, but the examination of Turner's correspondence with Sir William J. Hooker, director of the Royal Botanic Gardens in Kew, proves that both were coauthors of the general design and that Turner made the detailed project of the structure and the ventilation-heating system. In addition and significantly, Turner's structural details changed the shape of the structure so that it was constructible with the materials then available.

Turner's main idea was to suppress the system of perimeter supports and central lintels by a single arch supported on a plinth 1.3 m high. For the arches, he first used forged iron instead of the wood and foundry used at Chatsworth by Burton, and stiffened it with tensioned braces. With this, the structure of three Gothic-looking naves, gabled roofs in the central span and with semi-vaults on the sides, became a single arch supported on the floor in the wings and a similar arch resting on pillars in the central section. Burton applauded the modification, declaring that it greatly improved the project and facilitated its construction.

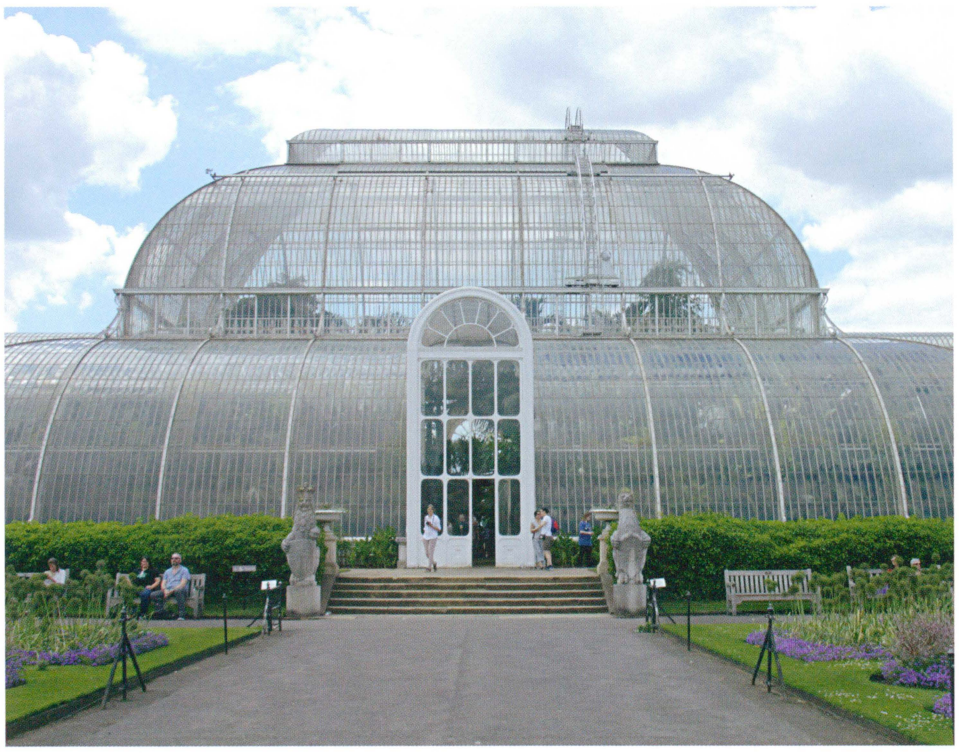
In fact, Turner's proposal eliminated the façades and gave way to the large decks of railway stations, made starting in 1848. It is in Kew that Paxton was inspired and learned for Crystal Palace and where the embryo of the progress of the iron and crystal structures is found. Paxton simplified the structure of Hyde Park and proposed to make it lintelled to reduce costs and deadlines, keeping the vault for the main transept. The engineers of the stations, on the other hand, needed more light and they bet on lattice arches, but everything comes from the talent shown by Turner in the Kew Palm House.



Plan and section, Palm House, Kew Gardens (Richard Turner, 1844)[29]









Wapping High Street-Oliver's Wharf



Wapping - Aberdeen Wharf





Wapping - Aberdeen Wharf



Wapping High Street-Oliver's Wharf



Richmond Lock & Footbridge

Thames Path.

Thames Path is a 340 km pedestrian path, from its source to the Thames Barrier, which runs through some of the most iconic sites in Britain. The complete road obtained the official status of National Trail in 1989 and its London section of 97 km is considered by the transport authority, Transport for London, as one of the most important pedestrian routes of the capital. The Lonely Planet guide pointed it out in 2013 as one of the best urban walks in the world.

In some of the urban stretches it is possible to walk without interruptions along the banks of the Thames along a path with green areas, comfortable benches and vibrant cultural institutions. But in other areas, the road looks more like a high security prison corridor than a site with a public right of way: doors, barbed wire and televised control notices remain vigilant on fragmented plots on the river bank, abruptly beginning and ending, and whose access rights are wrapped in a veil of bureaucratic darkness. In a long and documented article,[30] Jack Shenker highlights the difficulties of using public spaces on the banks of the river, which are often only partially public or totally private.

In this canyonised universe of visible and not-so-visible boundaries, some campaigners see a microcosm of the contemporary city as a whole: one of soaring inequality, in which the line between public and private is becoming dangerously blurred. The continuity of the road and the conspicuous presence of the river make evident a sensation that is present in many areas of the city, as in some squares or sections of street between buildings pointed out throughout the book.

Since its founding, the identity of London has been linked to the Thames, but the key questions of decision-making power over the river and how it is used have always remained in a diffuse area. And they are still a relevant issue in the areas located downstream from Tower Bridge, where the recent renovation processes provide precedents for the privatization of spaces that should be clearly public.



Wapping Wall-and stairs



Wapping High Street Buildings



Wapping - Aberdeen Wharf

In Canary Wharf, the Thatcher administration gave the London Docklands Development Corporation (LDDC) the power to override local planning decisions in exchange for the commitment to integrate the surrounding neighborhoods and river banks into local life. But the result in areas like Wapping and Limehouse has not been the sought-after inclusion but rather the opposite: along Narrow Street and Wapping Wall, the road skirts *a series of high brick walls screening off self-enclosed bubbles of private housing; London's elite now look out upon the river, and turn their backs to the rest of the city instead*.

Indeed, the piers of that section have been transformed in recent decades into some of the most exclusive apartment blocks in the city, but the fact is that in many of them, the walk along the river is interrupted. It is not at all a unique case, but Wapping is a good example of the problems of the Thames Path. Sometimes, it is not so much the appropriation of public space, but physical difficulties of passing behind old buildings that impose complicated solutions, with or without detours, and sometimes with new construction footbridges to restore the passage.

Thames Path National Trail

Distances between bridges (km)	North Bank Shore	South Shore
Hampton Court Bridge		
Kingston Bridge	4,57	
Teddington Footbridge	3,03	
Richmond Bridge	5,29	4,51
Richmond Lock Bridge	0,95	0,90
Kew Bridge	5,63	3,90
Chiswick Bridge	2,67	2,04
Barnes Footbridge	1,69	1,36
Hammersmith Bridge	3,17	2,82
Putney Bridge	3,30	2,81
Wandsworth Bridge	2,48	2,60
Battersea Bridge	2,80	2,89
Albert Bridge	0,46	0,40
Chelsea Bridge	1,23	1,09
Vauxhall Bridge	1,66	3,11
Lambeth Bridge	0,91	0,93
Westminster Bridge	0,89	0,72
Hungerford Rail Footbridge	0,55	0,57
Waterloo Bridge	0,57	0,25
Blackfriars Bridge	0,94	0,81
Millennium Footbridge	0,39	0,37
Southwark Bridge	0,56	0,32
London Bridge	0,43	0,67
Tower Bridge	1,04	0,84
Greenwich Foot Tunnel (south bank)	8,21	9,56
Thames Barrier		6,87

www.nationaltrail.co.uk/sites/default/files/distances_between_bridges_in_london-1.pdf

A story of the boulevard.

In the stories of travelers, the bridges serve as milestones to differentiate sections of homogeneous landscape along the Thames and are used as viewpoints from where to describe its riches by the illustrator Gustave Doré and the writer Blanchard Jerrold around 1870, on an upstream river trip. The protagonism of the activity of the port, characteristic of the city, gives way to the magnificence of what was built on its banks, to later become a peaceful river in the middle of the countryside:

But to the West as to the East of London Bridge, the surging life and vehement movement are swift and stern. There is no room for a holiday thought. The mills are grinding the corn, by steam; the barges are unloading hastily, the passenger boats are bound on pressing errands-the train shoots over the river towards the Continent, and crosses another with the mail from India. The loiterer will inevitably be crushed or drowned.

The gaze slides over the façades

Downstream from London Bridge, there is still activity but the façades gain prominence, changing character and marking differences between the north and south shores: *the first view above Bridge, with Fishmongers' Hall on the immediate right, is the most striking in the way of movement, and the proportions of the commercial buildings on the two banks... Between Southwark and Blackfriars, the scene changes. The shore buildings have another, and a less pretentious character. They are older, and of busier outward aspect... and on the Surrey side, the only breaks in the low level of the wharf, are the tall factory chimneys, with distant spires of Southwark churches behind.*

and falls towards the river itself.

Between new Blackfriars Bridge and the railway bridge that is thrown alongside it, composing a curious scene of river railway and roadway traffic, crossing and passing in every direction; the river broadens and bends away on a bold southerly dip past the Houses of Parliament, to Vauxhall. The scene is less busy. The greenery of the Temple; the handsome proportions of the Library; the noble lines of Somerset House, are a relief to the eye [39:39].

The works arouse their criticism,

With the Victoria Embankment in motion, the works modulate the tone of discovery of the trip. Jerrold and Doré talk about *the unsightly work of the Embankment*, although the buildings behind the esplanade refocus their interest and their eyes slide down the bank upstream:

The embankment changes the whole aspect of the scene-as we pass under Waterloo Bridge, which M. Dupin described as "a colossal monument worthy of Sesostris and the Caesars." The great buildings are now piled on all sides. On the Surrey Bank the Shot Tower and the Lion Brewery give a new dignity to the shore which is not yet embanked. The Adelphi buildings; the pointed roofs of the Charing Cross Hotel; the vastness of the brick railway station, the fine threads of the line carried across the river reach [cables of the Hungerford Bridge].

but they let themselves be carried away by the landscape.

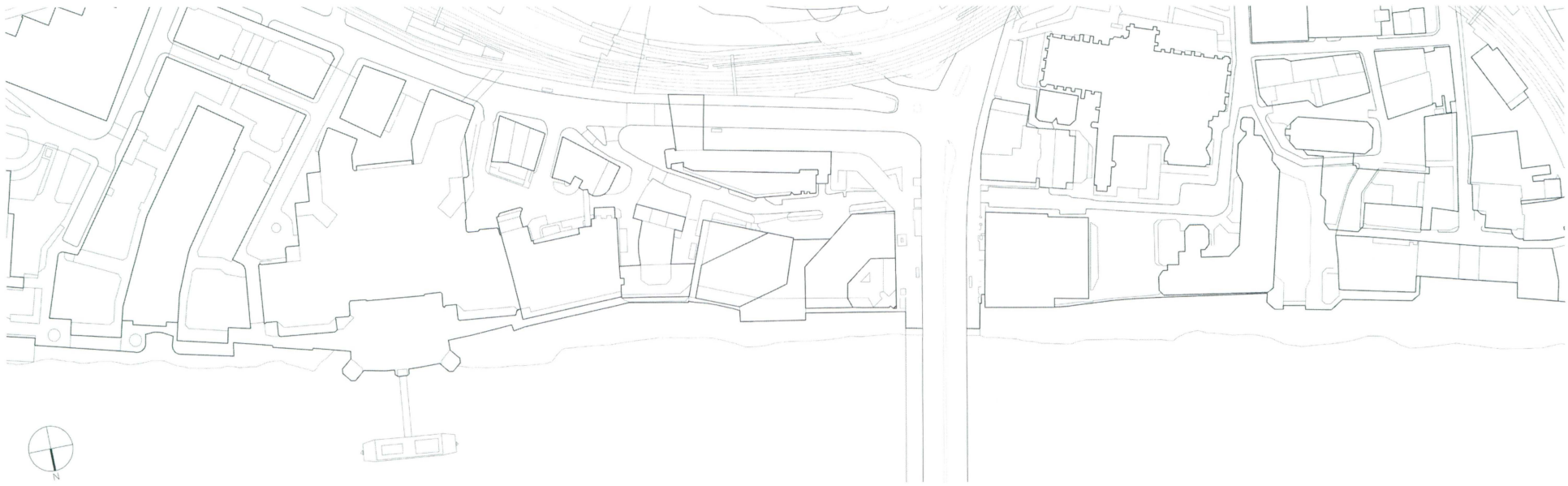
The view slides to the bottom and everything becomes a landscape: *the glimpses of the new Westminster Bridge beyond; the Houses balanced by the new Hospital;-combine into a picture...* that takes them back to the preconceived image of the city to see its most classic symbols: *...that gives a gracious and lively idea of London on the Thames. The gardens of Whitehall... and the palatial town dwelling... lead the eye pleasantly to the Westminster clock tower-and so on to the Halls of Parliament.*

South shore, upstream of Chiswick Bridge





Hays Gallery | Cottons Centre | London Bridge Hospital - The Shard | London Bridge 1 | London Bridge | Glaziers House | Southwalk Cathedral | Winchworth Sherwood | Pickfords Wharf | Winchester Wharves



London Bridge right

The river reveals itself as a boulevard

The Thames is in full splendor *from the low parapets of the new bridge at Westminster*. There it reveals its condition as a boulevard, a place to go where the new and the old are visible, the restlessness of modernity in competition with the tranquility of the old*: from there we can appreciate it at its best, its brightest; at its newest and its oldest... But from the western parapet of the bridge, the Old and the New are brilliantly suggested. The dark walls of Lambeth Palace, face the ornate lines and terraces of the modern Houses of Parliament.*

The inevitable industrial zone, always located on the edges of the city, is of little appeal, aggravated by the presence of ominous elements and meaningless voids that are not yet part of the countryside: *from Westminster to Vauxhall, past the gloomy Millbank Prison on the Middlesex shore-and the coarse Lambeth potteries on the Surrey side, we may hasten.* Here the waters are calmer, *the river shows fewer boats and barges* [39:41].

and takes them to the quiet countryside,

Little by little the travelers move *away from London houses, London smoke, and London commerce. We are almost quit of the black barges. There are bits of greenery. The air is clearer...* At the height of Battersea Park, the Thames

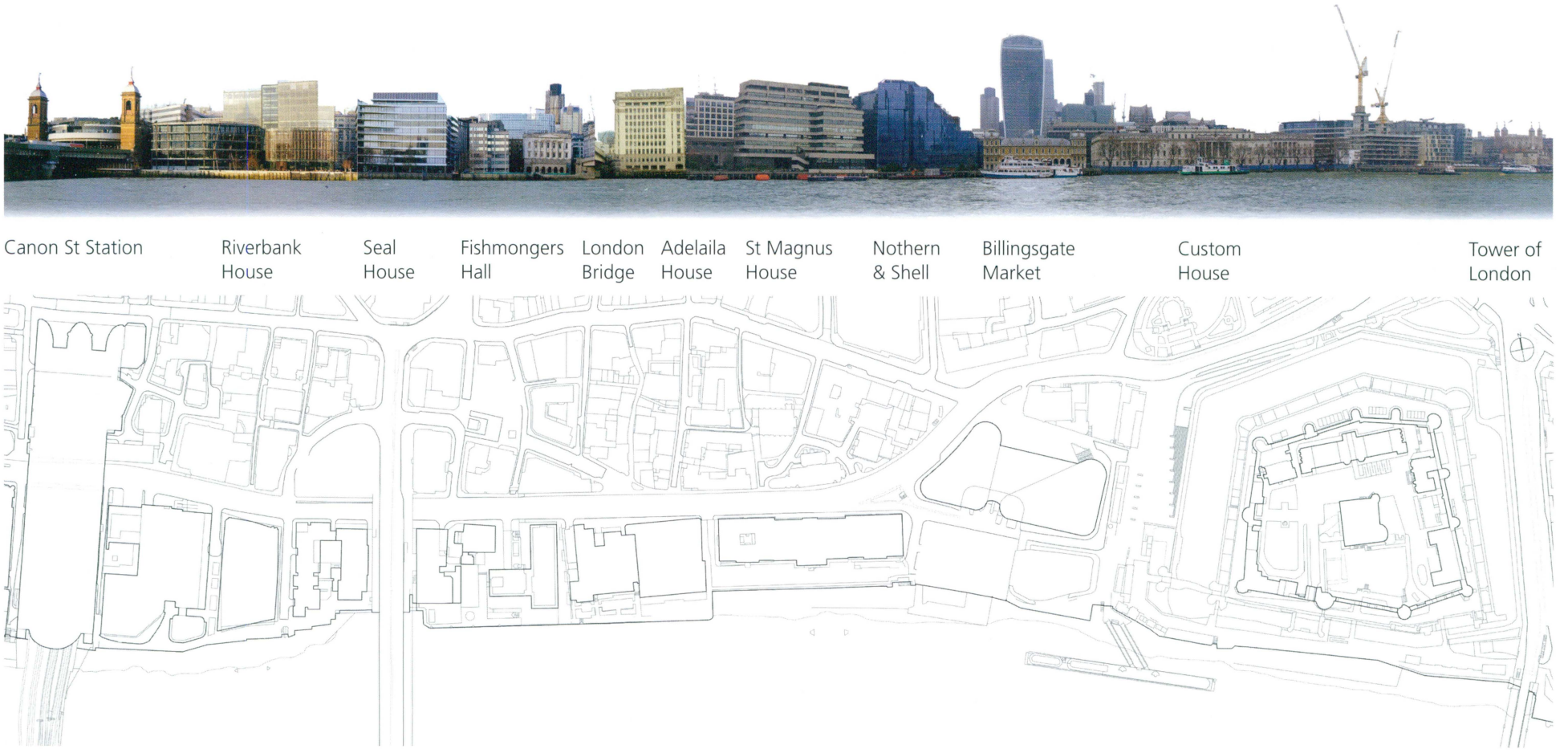
begins to be a normal river, without the characteristic hustle and bustle of the port area that so impressed travelers, but with buildings of closer and more reassuring functions: *the aspect of the river between the new park and the old hospital and its grounds, is a relief after the turmoil of the port through which we have passed.*

Then the attributes of the open field are present; the river continues with another way of life, but the signs appear that the city ends, *the grassy banks, the meadows and the uplands, the villas and the parks, the anglers and the-punts, the locks, the picturesque barges, and the towing paths* [39:44].

where the picturesque is reaffirmed.

Doré and Jerrold anticipate by more than one hundred years Baudelaire's reflections on the new perception of the city from the boulevard. But in their vision of the river of 1711 there are already new elements. They speak of counterpoints, of competitions, of diversity, of colossal monuments next to fine threads, of hustle and bustle or tranquility. There is also a change in the way of describing one or the other contrasts, using short and sharp sentences for the new, long and corny when perceiving the old, which seems to bore them. There is a modern, precursory gaze, that will be absent from the streets for many years, like a flash that will end up dissolving into a comfortable romanticism.

London Bridge left





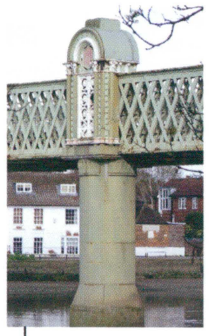
Brentford Ait



Pavilion in Syon Park



Kew Br.



Kew Railway Br.



Terrace Houses, Chiswick Quay



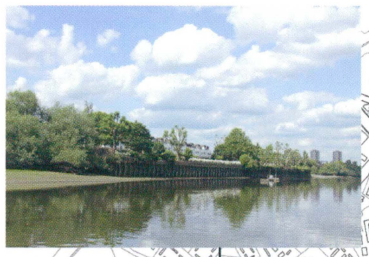
Enmanuel School of Boating



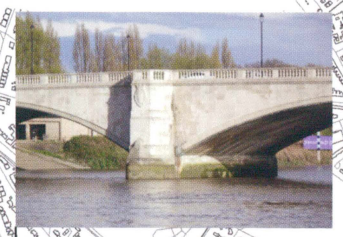
Mortlake Anglian & Alpha Boat Club



Terrace Houses, Hartington Rd.



Isleworth Eyot



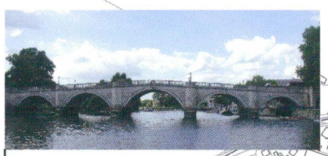
Chiswick Br.



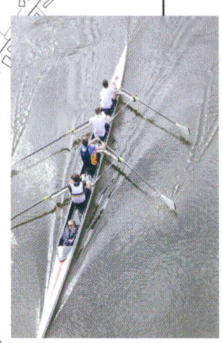
Kew Gardens



Kew Pier



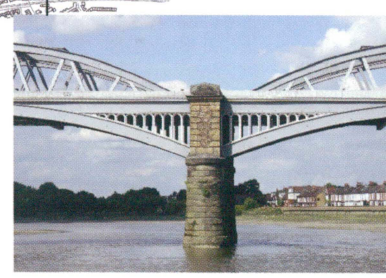
Richmond Lock Br.



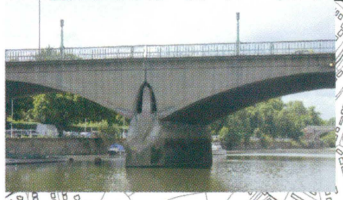
Kew Marine



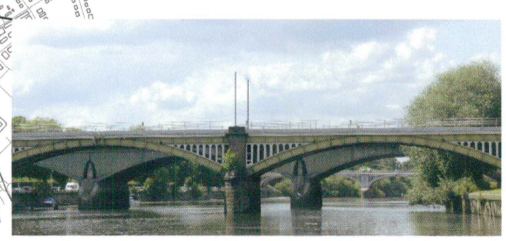
The Ship



Barnes Br.



Twickenham Br.



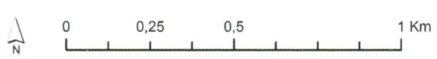
Richmond - Twickenham Railway Br.



Putney Town Rowing Club



The White Hart



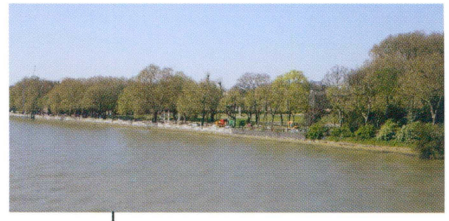


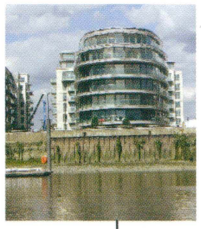
Blue Anchor Pub


Fulham Football Club


Imperial Wharf Marina

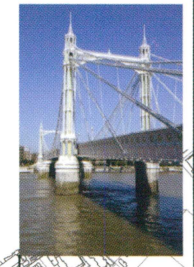

Battersea Railway Br.

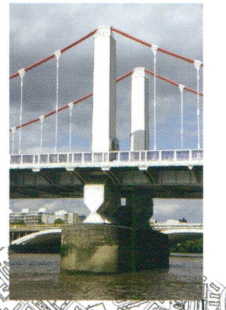

Ranelagh Gardens


Goldhurst House

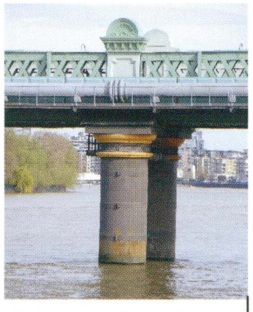

Rivermead Court


Chelsea Harbour

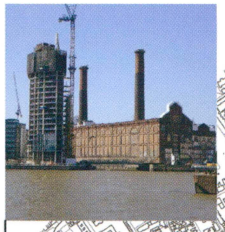

Albert Br.

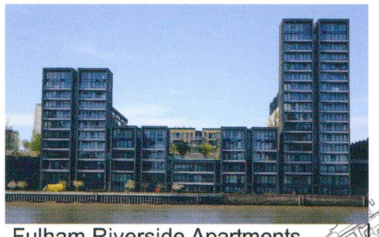

Chelsea Br.


Price Industries


Fulham Railway Br.

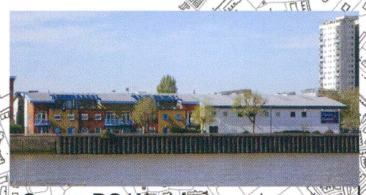

Watermans Quay


Chelsea Power Station


Fulham Riverside Apartments

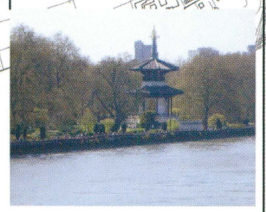

All Saints Church

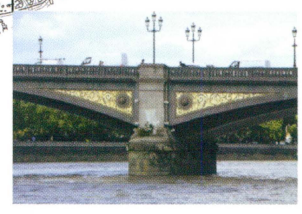

Wandsworth Br.


Currys PC World


mmersmith Br.

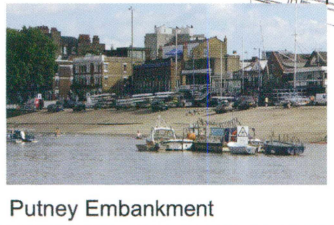

Foster & Partners

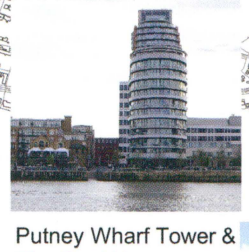

Peace Pagoda in Battersea Park

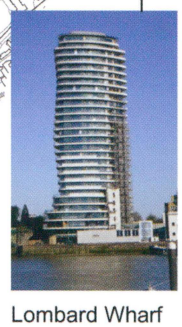

Battersea Br.

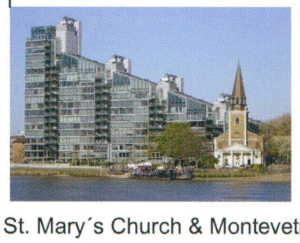

Battersea Railway Br.

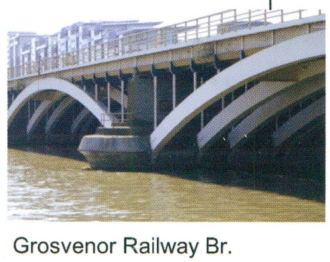

Star & Garter River Bar

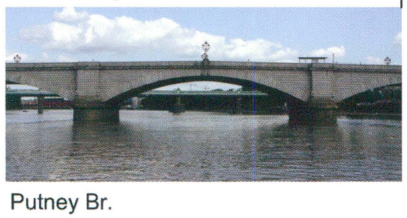

Putney Embankment

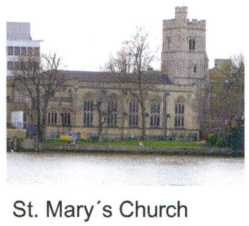

Putney Wharf Tower & The Boat House

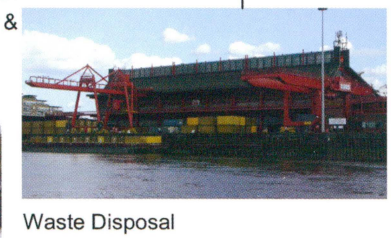

Lombard Wharf


St. Mary´s Church & Montevetro Bldg.


Grosvenor Railway Br.

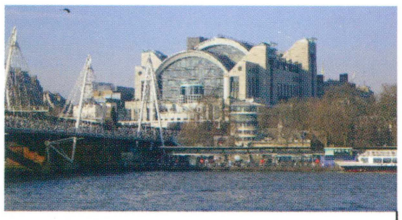

Putney Br.


St. Mary´s Church


Waste Disposal


Ascensis Tower & Comodore House


Battersea Power Station



PCW Enbankment Bldg. &
Golden Jubilee Br.



Hungerford Br.



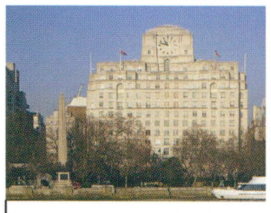
Vinters Hall



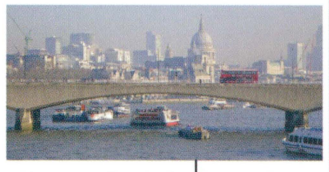
Cannon St. Station &
Southwark Railway Br.



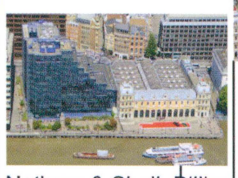
Police Station



Cleopatra´s Needle & Shell Mex House



Waterloo Br. & St. Paul´s Cathedral



Nothern & Shell, Billinsgate Market



Customs House



Royal Horseguards Hotel &
Enbankment Gardens



Somerset House



Adelaida House



Tower of London



St. Katherine Docks Lock



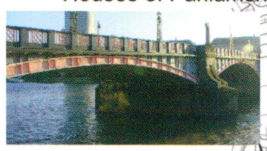
Wapping High St.Bdgs.



Wapping Wall 37



Westminster Br. &
Houses of Parliament



Lambeth Br.



Millbank Tower



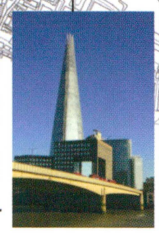
London TV Centre



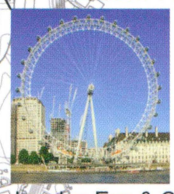
Blackfriars
Railway Br.



Southwark Br.



London Br. &
The Shard



London Eye & County Hall



Blackfriars Br.



Thames Tunnel Mills



Crown Reach Bldg.



Cottons Centre



Eagles Wharf



Merano Residence



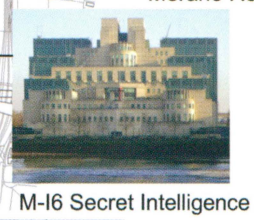
Shakespeare´s Globe



Tower Br.



The Mayflowe



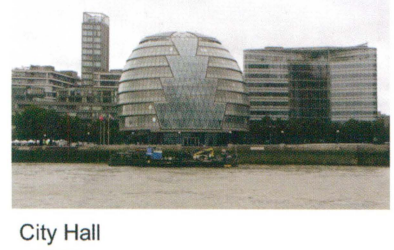
M-I6 Secret Intelligence



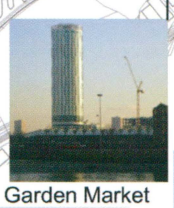
Sea Containers Bldg.



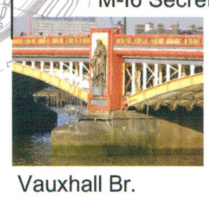
New Tate Modern & Millenium Br.



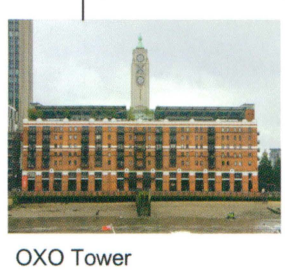
City Hall



New Covent Garden Market



Vauxhall Br.



OXO Tower

Hays Gallery

HMS Belfast

River Light Quay 1 to 5

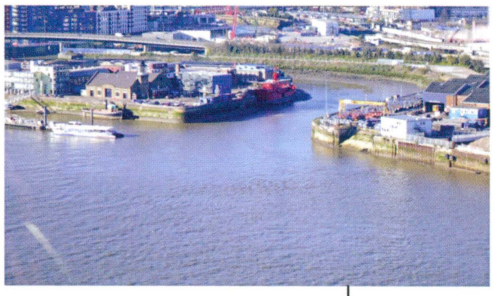
St. George Wharf Bdg. &
The Tower London



dwell Bassin Lock



Canary Wharf Pier



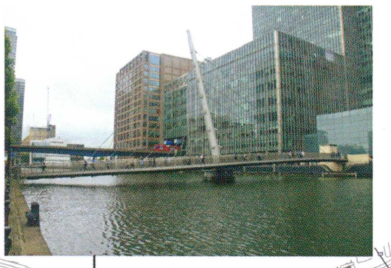
Bow Creek



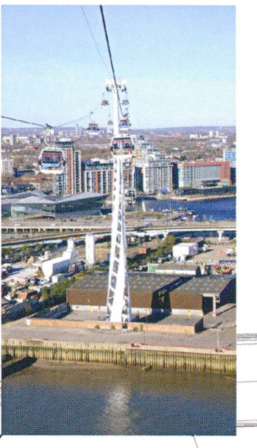
Thames Barrier



Desembocadura Lime House



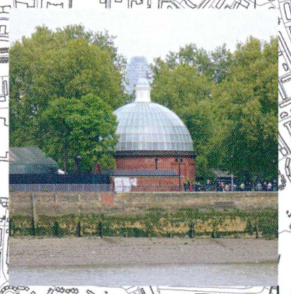
South Quay



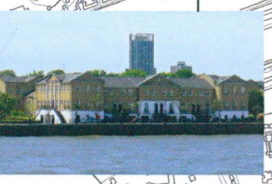
Emirates Cable Car



Salt Quay Br.



Greenwich Footway Tunnel



rrace Houses, Rotherhithe St



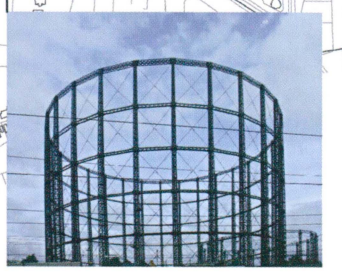
mbia Wharf



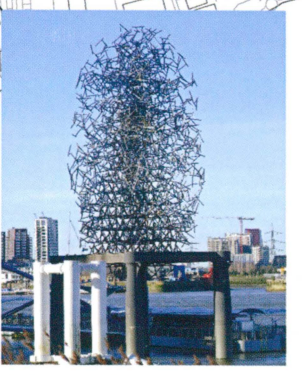
Greenland Lock



Old Royal Naval College



Kensal Green Gasometer



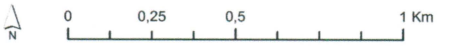
Millenium Pier



Millenium Dome



Engineers Mills




Except buses, taxis & cycles

4 | Modern City

The Planning. The Street

We have no City, nor Streets, nor Houses, but
a Chaos of Dirty Rotten Sheds, always tumbling or
taking fire, with winding Crooked passages (scarse
practicable) Lakes of Mud & Rills of Stinking Mire
running through them

Nicholas Hawksmoor, 1711 [116:14]

Roads, Streets and Plans

The crucial issue is on the roads / that mark the city with their character, / although the iron ones are also obstacles. // The streets always jammed / produced noise and confusion, / avoided with beltways and urban viaducts for crossings. // From 1851 the city is unblocked / and a series of itineraries is consolidated, / but a plan to improve the streets is missing / and conflicts of interest arise. // Works paid with construction rights / increase density and do not reduce dispersion.

Variety and Character

Variety and differences south of the river. // In Elephant and Castle there is / diversity of uses, / diversity of building types, / and cultural diversity,/ provided by 227 shops in a mile, / with owners of different origin, / striking signs and merchandise, / in an amalgam of languages. // There is also variety in the similar / and even surprises,/ like a historic courtyard,/ with access to London's last private street. // The housing units, in contrast, / can be monotonous and oppressive / even with walls / and towers, not of defense but of offense, / regardless of their quality and endowments. // There are nearby performances of similar filiation / and even harder, / or brutalist, now aesthetically rehabilitated, / but many others of greater interest, / made by well-known architects.

Coexistence of the Unequal

From similarities and differences arises character / and shows itself as the style of power / with different costumes in time and place / that make up a language of symbols / imported with foreign art and culture. // The Poverty Maps marked two frontiers,/ one in a north-south direction on the river / and another east-west on Regent Street, / although the port blurred them. // In the ambiguous West End, multicultural Soho was secured/ by the design of John Nash/ that turned Regent Street into a social divide, / with 'border shops' on both sides / of a shopping mall of fashion stores, / where the London of the rich began, / that followed by the north shore of the river. // The development of leased land / was more difficult with the Church, / that preferred the 'three lives' system, / more negative for development. // The well-to-do classes were concentrated, / although the richest alternated countryside and city.

Figures in the Plan

Destruction encourages reflection, / as Wren did during the fire, / when he proposed a set of axes and squares, / that was unfeasible and was rejected. // The city then recovered its layout,/ and continued to be disorganized,/ to become an ugly monster / or a chaos of unclean sheds. // The churches of Hawksmoor/ wanted to revitalize the city, / as references of spirituality / and of power, to order chaos. // The pragmatic order of the railroad / generated coordination problems, / that demanded analytical reflection, / but its absence consecrated the practice / of compositional figures, such as squares, / that could include gardens / open or closed to the public, / to dose the privacy of residents, / or the terraces to maximize the yields / and crescents to manage visibility. // Neighbors or adjacent.

Plans, Accesses and Rings

The pulse between road and rail / over the accesses to the city / began in the 1920s with the highways, / called motorways in Britain, / supported by motor groups/ and reaped the first failure of the roads. // London's Green Belt / and the urban planning of the 1940s / they faced concentration and growth, / with territorial, industry and employment plans. // The attempt to build motorways in the 1960s / stumbled on the Camden Town knot / with strong citizen opposition, / that rejects them inside and applauds them outside. // After that, a report is requested from Buchanan, / while the motorways are growing / with government radials and GLC rings, / that produce some environmental disasters / and worsen air pollution. // Mrs. Thatcher's revolution / produced successes that ignored the plan / and pushed pragmatism / to build highway fragments / and the road plan was abandoned.

Roads, Streets and Plans

The crucial issue is on the roads

In his penetrating, previously mentioned, essay on the city Ford Madox Ford concentrated the difficulty of moving through London in the narrowness and congestion of its streets, stating that *the roads into London have always been the crucial matter.* Because of them, the city has grown and operated in a peculiar way, with no other possibility than to increase its density.

The roads *remain both the 'question' and the cause of that question. This question is not merely topical of the twentieth century; it has been the sempiternal question, it will remain unsolved until London and the country begin to fall into decay. It is, in fact, the 'old' question and just as today the alternative to rapid transit is the erecting of tall buildings, so it was in the old day for ever. The story has been the same down to the minute details* [47:47].

that mark the city with their character,

In another of his books entitled *The Heart of the Land*, a study dedicated to the territory instead of the city, Ford Madox Ford again stresses the importance of the roads with a resolute desire to treat them as something more than just the constructive type that earlier received the noble name of Public Works, now degraded as infrastructures.

Each road has its own particular individuality, nay more, each has its own moral character, its ethics as it were, since what are ethics and morals but the effects of one's attitude upon the beings who come in contact with us? Roads will soothe us, tire us, exhilarate us, fill us with thoughts or excite our minds with pictures of the whole hosts of history that have passed along them [48:35].

although the iron ones are also obstacles.

The iron roads immediately fulfilled the task of efficiently transporting people from their residence in the suburbs to their work in the city. But the articulating power of the railways is concentrated in the stations, while they do not contribute with similar efficiency to the 'construction' of the territory. As a link between isolated points to ensure the daily mobility of large populations the railway is unrivaled, but it does not lay out those bands of public space that make the whole of the land accessible, making it a country. The outlines of the railroad actually produce real obstacles to the transversal movement on the country and they do not manage to adjust access to the city, marking and modulating its limits like dirt roads do.

And for the traveler, the experience of the trip is also different and it contributes to remove him from the environment. As Ford Madox Ford points out *there are deep cuttings, coming into London where brick walls, fifty feet high, are black, sombre, and austere. You are in a kind of underworld, savagely impressive enough. The square fronts of houses peep down on you as you run beneath; constant footbridges overhead give to the thin light of day a constant shudder and quiver. We, who are not made for strong impressions, are ourselves inclined to shudder* [47:58].

The streets always jammed

Since Roman times, passage through the interior of the City was very slow and motivated a constant creation of alternatives. The road later known as Oxford Street led to Silchester, the Roman city near Reading and Watling Street lead to St. Albans, Holyhead and St David's in Wales. Now, the end of Watling Street is called Edgware Road.



Ludgate Hill - A traffic jam on the street [39:169]. View of St. Paul's from Fleet Street with London, Chatham & Dover line train on the Ludgate viaduct, traveling towards Holborn Viaduct Station

For its part, Watling Street was built to avoid London Bridge, always very congested, as a precursor bypass route. Instead of crossing over the bridge, travelers went down Watling Street and crossed the Thames on an old ford near Houses of Parliament. In Roman times the sea had a lower level than today and the ford would probably have been more superficial then.

Around 1740 Piccadilly suffered a permanent traffic jam. Not only were there pedestrians, horsemen, horse-drawn carriages and carriages of all kinds, but the road was full of cattle. London needed meat and herds of cows and sheep were taken to London to be slaughtered in Smithfield. They were taken to London and kept for a day or two in Hyde Park and the fields of Maida Vale. From there they were driven along Piccadilly, interrupting the traffic and caus-

produced noise and confusion,





ing the cattle to enter the Chinese fashion stores. The noise and confusion became unbearable.

In Dickens' *Oliver Twist* there is a description of that atmosphere. Oliver and the bandit Sikes leave at dawn for the city, pass through Bethnal Green, head towards Shoreditch, leave behind Crown Place and Sun Street, go through Finsbury Square, enter Barbican on Chiswell Street and take Long Lane to Smithfield, which was the source of the *tumult of discordant sounds that filled Oliver Twist with amazement.*

It was market-morning ... Countrymen, butchers, drovers, hawkers, boys, thieves, idlers, and vagabonds of every low grade, were mingled together in a mass; the whistling of drovers, the barking dogs, the bellowing and plunging of the oxen, the bleating of sheep, the grunting and squeaking of pigs, the cries of hawkers, the shouts, oaths, and quarrelling on all sides; the ringing of bells and roar of voices, that issued from every public-house; the crowding, pushing, driving, beating, whooping and yelling; the hideous and discordant dim that resounded from every corner of the market; and the unwashed, unshaven, squalid, and dirty figures constantly running to and fro, and bursting in and out of the throng; rendered it a stunning and bewildering scene, which quite confounded the senses.[1]

To avoid this, it was decided to build the New Road as a roundabout or bypass from Edgware Road to Smithfield, north of the existing construction in Lon-

don. The affected area was not suitable for agriculture, being used as pasture, and the new road could be finished quickly. Incidentally, the work would open the possibility of building houses in these areas, but that was not the original reason for building the road, whose different stretches are now called Marylebone Road, Euston Road, Pentonville and City Road.[2]

From the port of London, Roman roads ran from the north to Colchester and from the east to join the road to Silchester and Watling Street to Wales. Fleet Street was very swampy so this part of the street was built on wooden piles. From 1732 the Fleet River was turned into a vaulted culvert, that arrived in 1769 to the Thames, next to Robert Mylne's Blackfriars Bridge that opened in that year.

In 1863, the Corporation of the City of London obtained the London coal and wine rights law to finance improvements in the Holborn Valley and a law for a new Blackfriars bridge. The Holborn Valley Plan included the construction of a viaduct to replace the old Holborn Bridge. The project was carried out by William Haywood, municipal engineer, in 1864. The work began in 1867 and the **Holborn Viaduct** was inaugurated in 1869 [127:139].

The 425 m masonry viaduct traverses the Farringdon road with an oblique bridge over granite pillars that support the arched beams and the cast iron board,[3] which looks genuinely Victorian. The casting painted in deep red with its golden filigree interior is repeated in the powerful handrail of the bridge and in the recesses of the four buildings at its corners, where the access stairs to the board are located. It is worth visiting and observing closely the ornaments and the four sculptures dedicated to Science, Fine Arts, Agriculture and Commerce.

From the urban point of view of operation and construction of the city, the set of the bridge with its four access buildings in the abutments-corners has a lot of interest. It is an early example of planning dealing with a conflictive part of the city, in fact one of the few geographical irregularities of the great London plain, where two perpendicular flows of carts and pedestrians had great difficulties crossing, similar to those that years later will have the railway viaduct of Ludgate Hill located about 350 m from there, drawn by Doré. The adopted solution shows great attention to pedestrian connectivity, with those stairwells (now there is an elevator in the northeast) that anticipate the current design trends discussed in the next chapter.

As we have already seen, from the Universal Exhibition of 1851 on the perception of the city changes substantially and its persistent gridlocks are unblocked. In 1855 the Metropolitan Board of Works was created by law, which began work in January 1856 with the appointment of Joseph Bazalgette as Chief Engineer. Its first and main task is the elaboration of the general sanitation plan, but as municipal engineer it is also responsible for all the other problems of the city, with jurisdiction over roads, streets, traffic, gas, energy and, in general, all the municipal works.

From 1951 the city is unblocked

However, over time a series of itineraries for passage or crossing the city had been consolidated, which relieved the long routes. The first crosses the city near the river from west to east on one of the oldest routes of the city, which linked the two nuclei of the City and Westminster, and ran through Victoria St, Victoria, Whitehall, Strand, Fleet, Ludgate Hill, Cannon and London

and a series of itineraries is consolidated,



Holborn Viaduct



Consolidated itineraries

1. Victoria St, Whitehall, Strand, Fleet St, Ludgate Hill, Cannon St & London Bridge
2. Notting Hill, Oxford St, New Oxford St, High Holborn, Holborn, Newgate, King Williams & London Bridge
3. Vauxhall Bridge Road, Victoria St, Grosvenor Pl, Park Lane & Edgware Rd
4. London Bridge, Gracechurch, Bishop Gate, Shoreditch High & Kingsland Rd
5. Waterloo Bridge, Kingsway, Southampton Row, Woburn Pl, Eversholt St, Camden High St.

Bridge. The second has the same direction but in the upper part of the city, farther from the river, and is one of the first roundabouts of the city, running through the streets of Notting Hill, Oxford, New Oxford, High Holborn, Holborn, Newgate, King William and London Bridge.

The third is orthogonal to the previous ones and starts from Vauxhall Bridge Road to continue north on Victoria St, Grosvenor Pl, Park Lane, Edgware Road and arrives at the M1 motorway to the north. The fourth also goes south, but further to the east, and runs through London Bridge, Gracechurch, Bishop Gate, Shoreditch High and Kingsland Road. And the fifth is somewhat more central in the same sense, from Waterloo Bridge by Kingsway, Woburn Pl, Euston and St Eversholt, to Camden High. This series of routes is not wide enough to constitute a system of express roads, but they lack nooks and crannies and the different sections maintain the alignments, so they are useful routes to cross the city.

but a plan to improve the streets is missing

In 1858, Bazalgette presented an extensive list of works to be executed but the capacity of the Board to fulfill its tasks is clearly limited, by virtue of its constitution and work procedures. Every proposal of general interest for London was questioned by a coalition of vestry councils, each of which could oppose it, and required careful negotiation. In addition, the City Corporation -defender of the City's particular interests- had its own agenda and favored any proposal that would involve more traffic and, consequently, more business for the city, while opposing any work that sought to diminish them.

In particular, the opposition of City engineers to any work that did not bring flows to the heart of London clearly harmed any improvement in other parts of the city.

On December 1, 1866, *The Builder* criticized the lack of *such a comprehensive plan, or design, as has been the basis for all the great works that have*

been achieved in Paris during the last few years, while praising Baron Haussmann for his work on the surface and the subsoil of Paris, similar to the one carried out by Bazalgette.

However, the problem was not so much in the lack of a plan, but in what today we would call the governance, or London municipal government system, forced to attract very diverse citizen interests and completely alien to the authoritarianism of Napoleon III. In that sense, as would emphasize years later *The Times* editorial of January 26, 1872, guaranteed *was the selfish opposition which is sure to be offered by every separate division of London to any large scheme designed to benefit the whole capital* [61:166].

The Board had two major problems, the regulatory and the financial. On the one hand, it lacked the power of expropriation to carry out urban improvements. Any plan or scheme of action had to be approved by the Home Secretary (Secretary of State of the Ministry of the Interior) and then negotiated with the affected owners, a process often in need of arbitration. In 1860, for an extension of 130 m from Garrick Street in Covent Garden, the Board had to negotiate with 28 interested parties, including owners, tenants and merchants, facing compensation of about 100,000 pounds. In 1875 everything became even more complicated when the Home Secretary forbade the Board to demolish the homes of more than fifteen workers before relocating them.

The Board obtained sufficient pressure to finance the sanitation plan given the environmental and health situation, but the same did not happen with urban improvements, less urgent for ministers and parliamentarians. After purchasing the properties involved, the Board could recover some of the investment by renting or selling commercial spaces on the new street, which sometimes required a high volume of construction to justify the price demanded.

That happened at the southern end of Regent Street, which runs from Trafalgar Square to the river on Northumberland Avenue, with a much higher building density than the rest of its layout, due to the high price Joseph Bazalgette, then in charge of the Metropolitan Board of Works, had to pay to acquire the Duke of Northumberland estate: the enormous amount of half a million pounds. Still today, the height of the buildings built on both sides of the avenue is excessive and overshadows the end of the great street [61:167]

However, the accumulation of density solved the most serious problems, but could not stop the expansion of single-family homes in the suburbs. In 1905, Ford recognized: *Ten years ago tall flats for the comfortable and tall dwellings for workmen seemed to have solved the question. The latter are already discredited, the former have always been disliked, and London is once more sending out bee swarms of small houses. We may consider that the thousands and thousands of small brick, slate-roofed cottages on the flats and low hills of south Essex are the contribution of 'workmen's fares.' These, though still growing, are old-fashioned already, so quickly do we move* [47:50].

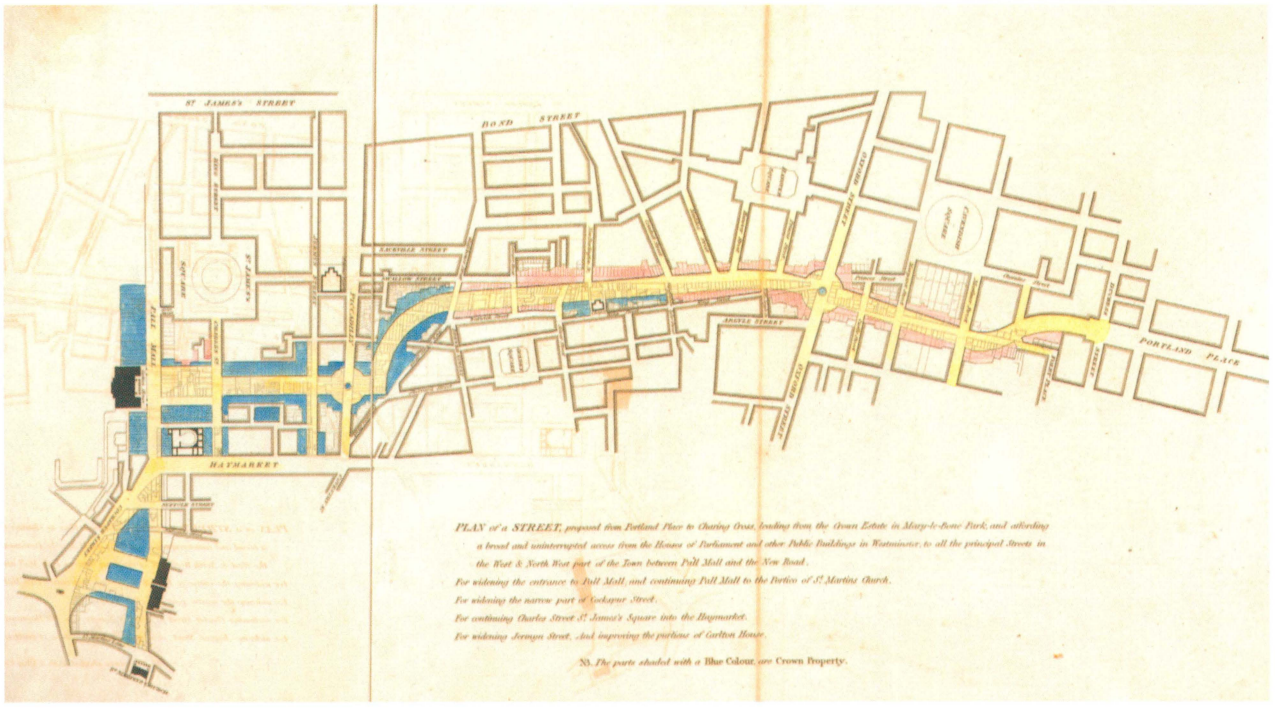


Tower Bridge Road

Works paid with construction rights

increase density and do not reduce dispersion.

Proposal for Regent Street, published in 1813 [British Library, Grace Collection of Maps of London]





BBC- Broadcasting House, 1932

Regent Street as Axis

In the panorama of narrow streets and the chaotic city usually portrayed by chroniclers and illustrators, the great accomplishment of Regent Street stands out, which, from its conception, was much more than a street. It is really the great set that starts in Regent's Park, and continues with Park Crescent, Portland Place, Regent Street, Piccadilly Circus and Waterloo Place, later extended to the river next to Charing Cross. It crosses the center of London from north to south and, at the same time, divides the city into two halves, east and west, which give it a certain functional ambiguity and a powerful urban significance.

This set is considered by Antón Capitel *a sophisticated and complex urban system* that articulated the modern central area of North Westminster, *originating one of the most valuable parts of the city*. And he also considers that *this was the most important urban reform of classical London*. It was designed by the architect John Nash (1752-1837) by order of the Prince Regent, with a first design in 1813, then remodeled in 1824 by Nash and later rebuilt in the 1920s [28:117].

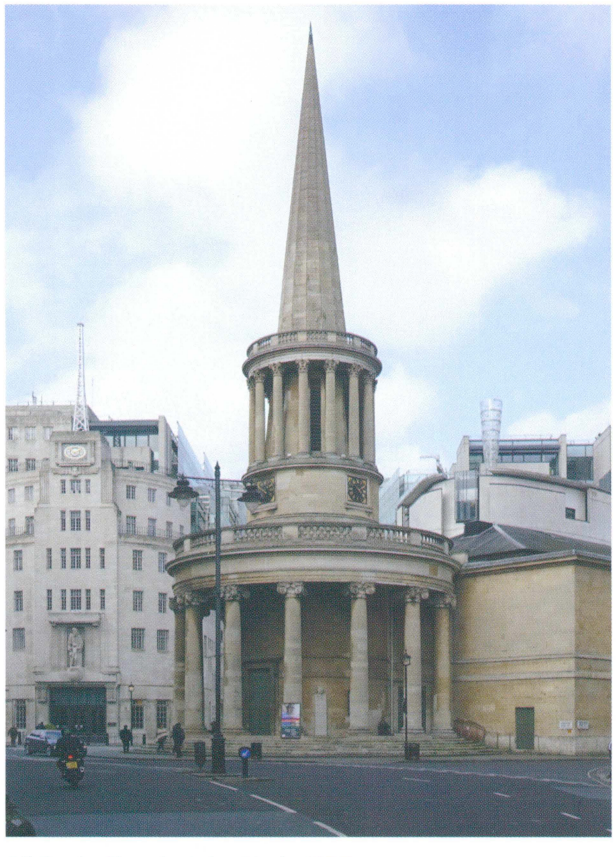
Nash started designing the Regent Street system in 1811, when he was finishing the final layout of Regent's Park. To give a dignified start to the street, he extended one of the main tree-lined avenues of the park to the south, to the northern ring road of the city, there called Marylebone Street, as an extension of New Road and Euston Street. There he organized Regent's Park Crescent, from whose center starts the Avenue of Portland Place, with a central wooded promenade and sidewalks.

At about 600 m from its start, the layout makes a small eastward turn at Langhan Place and then regains the main north-south direction, crosses Oxford Street creating Oxford Circus and, after another alignment of 600 m, makes a similar break and arrives at a quadrant located just north of Piccadilly Circus, where the last lineup of similar length starts from Piccadilly to frontally take on Pall Mall's Carlton House, residence of the author of the commission.

These two twists, perhaps introduced for reasons of land ownership described below, plus the creation of Oxford Circus and the quadrant of Piccadilly Circus were skillfully treated by Nash and grant a differential quality to the layout. Thanks to them and the similar developments of the successive alignments, Regent Street acquires an appropriate rhythm and scale for a city like London, where the forceful layout of the great avenues of Paris and other European cities would be unfit for reasons of size and character.

To that urban differential quality must be added the possibilities of architectural design present in those significant points of the layout, where the points of view are multiplied and front perspectives are created. The first of the twists is adorned with All Souls Church of 1823, designed by Nash himself as a 'tholos' or circular Greek temple surrounded by columns, whose classic spirit is betrayed by a high spire, which is supposed to be seen from afar.

Of greater interest is the Broadcasting House of the BBC, located in the same Langhan Place behind the church and built a century later in Art Deco style, as a backdrop, but of undoubted prominence for its height and for the commu-



All Souls Church, John Nash 1823

nications tower located above. The bas-reliefs incorporated in the flat lateral façade manage to brighten it up, despite their large dimensions.

The buildings of the second curved section were planned in 1920 by the prolific architect Reginal Blomfield (1856-1942), author among many other works of interest of Lambeth Bridge (1929), located between Westminster Bridge and Vauxhall Bridge. By extension, that curved section is often referred to as The Quadrant.

For its part, The Quadrant - the quadrant of connection with Piccadilly Circus, was disfigured by the large number of links required there. The circus ceased to be so to become an elongated and shapeless square, although the conclusion of Regent Street is the most interesting of this complex place. It was resolved with a narrow block on each side, of identical façades but placed orthogonally. While the façade of the north side maintains alignment and ends the curve behind a small speed bump, the one on the west side is placed at right angles to the street at the height of the speed bump, to generate the façade of the square on that side.





Regent Street

Regent Street junction with Piccadilly (The Quadrant)

Variety and Character

Variety and differences south of the river.

The primitive north-south border of the river had as effect an urban zone to the south, around Southwark, much less structured than the one located to the north and with a quite unequal distribution of uses, that produces great variety. It is not a case here of different levels of wealth, but rather a mixture of uses, cultures and ways of living, which have demonstrated a remarkable ability to coexist over centuries.

In the zone situated on the south bank of the river, the uses are very mixed and the adjacent inequality becomes conspicuous. Ford Madox Ford picks a good example: *right in to the very bottom of the Waterloo road, and nearly up to Westminster Bridge, old villas, new houses and new shops lie side by side, or stare at one another. They are all mixed together, it is not possible to get any zones to 'synchronise,' it is not possible to say 'early Georgian London had reached here, middle Victorian here, the railways produced this district, the short stages this'* [47:54].

In Elephant and Castle there is

In that area, the variety is not limited to the era of the construction of the houses. Somewhat further south is the old nucleus of Elephant and Castle, true gateway to London from the roads coming from the south that meet in a square or plaza from where the roads were unfurled to enter the city by the different bridges. The uses of the buildings constructed are indeed very varied: the square is surrounded by tall buildings, mainly residences but also by some recent offices, and its center is occupied by a substation enclosed in a building-monument to Faraday.

diversity of uses,

To the south is the railway station and behind it there was a huge pentagon of five high blocks of low quality housing that have been demolished to make way for a new development. To the east is the new campus of the London Southbank University, with some buildings of interest, while to the west is the Strata Tower, a skyscraper of 43 floors and 147 m high visible from almost all of London, characterized by the presence of three large wind generators 9 m in diameter at its top and which has generated a few other tall towers around.

diversity of building types,

As you can see, high-quality and low-quality residences coexist in this high-diversity area, a university, office skyscrapers, a popular plaza with a multi-ethnic supermarket and some public services such as a library or the Metropolitan Tabernacle.

and cultural diversity,

To that diversity of types of buildings and uses is added another area of high diversity arising from multiculturalism because, in addition to all that, at the entrance gate of Elephant and Castle comes Walworth Road in the south, whose final section offers a great concentration of stores of diverse origin. Although they are located relatively close to the center, they have a different and sufficient cultural significance to generate a certain awareness of locality, above their variety.

provided by 227 stores in a mile,

An investigation by Suzanne Hall, published in 2010, detected 227 small shops, located along 1600 m of that street [60:55 *et seq*]. While these units are retail stores, there are also some public buildings and services, such as the Newington Public Library, the Cummings Museum, and the Walworth Clinic.





Elephant and Castle developments on Walworth Road

Links from Walworth Road, near Elephant and Castle (Suzanne Hall, 2006) [60:54]

Most of the façades have a width of 4.5 m for simple stores and 9 m for double stores, indicating a comparatively small scale and density of retail in general. More than 60% of the retail units were independent stores that do not belong to a chain or a franchise and, in most cases, the owner was directly involved in the store.

Of the 130 independent stores, there were more than twenty different countries of origin among the owners, without predominance of a single place of origin. An image of the survey juxtaposes the map of Walworth Road with the map of the world, and draws the links between the two, relating each store of that street section with the birthplace of its owner. The image also evidences, although partially, a correlate of the map of the empire, reflected in the large proportion of the countries of origin of the owners which are former colonies of Great Britain.

with owners of different origin,

The visual examination of the signs of the different establishments is also clear indication of their variety. In many other cases, the identity of the store responds to a combination of explicit cultural and personal characteristics. In a Halal butcher shop and a convenience store, for example, the space was divided into two areas: the first, closest to the street, included a variety of food products and the meat counter; while the second space, farthest from the street, stored food products more oriented to customers of North African and Muslim reference.

striking signs and merchandise,

This owner, who had just arrived from Sudan, promoted his street façade, with signs in Arabic and English, using a series of words intended to include a broad customer base, 'Absar Food Store. Halal butchers and grocery store. Afro Caribbean and Mediterranean, fresh fruit and vegetables.' Other Walworth Road store signs also represent a similar desire to reach a diversified customer base, sometimes humorously expressed, such as 'Mixed Blessings Bakery' - West Indian and English Bread.' The cultural amalgam was not the only mode of hybridization represented by these signs, and signs such as

in an amalgam of languages.



Shops in Walworth Road

'Roze and Lawanson Nigerian Market. Money transfer. Wedding. Garments' and 'Afroworld Food Store. Cosmetics, wigs and fruit and veg' allude to the various combinations of goods and services offered by these independent stores.

There is also variety in the similar

With all that, there could be a sense of variety, even though all these stores sell the same type of product, as long as the façades offer sufficient differences in signs, lighting and formal arrangement, and the showcases display different specialties of that product. At the end of the day the prospective buyer sees a sufficiently varied offer to be able to discriminate qualities, compare prices and buy - some, others and a combination of them - across different stores.

A good example of this are the jewelers of Greville Street in the Farringdon area, a few meters west of Smithfield Market. Again it is a multitude of small shops, concentrated in a not very long block of houses, with small extensions from their ends. But now all sell jewelry, although in one shop window there are only watches, in the following wedding rings and in the one beyond diamonds. Some of them are luxurious stores, with good-quality shop windows, sober design and few carefully placed items, while the one next door shows a hodgepodge of objects in rows, and the one on the other side uses overlapping velvet boxes that group jewels of similar condition.


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and even surprises,

The signs are also varied, and next to 'antique and second-hand silver,' appears 'Diamond Palace' or 'specialists in custom-made engagement rings.' On the other hand, the colors, the lighting, the sales notices and the usual movement of the public and employees generate a market atmosphere. Around the corner of the only restaurant in that block, there is a short alley that ends in a courtyard, 'Bleeding Heart Yard.'

like a historic courtyard,

As often happens with sites of a certain character, this small cobbled courtyard of old houses with a workshop look appears in a famous novel, in this case Charles Dickens's *Little Dorrit* -which highlights its character- and it is associated with some type of crime, in this case a murder. The courtyard now houses a restaurant, but at its other end there is a small, hidden doorway at the end of Ely Place, the last private street left in London.

with access to London's last private street.

Ely Place is a short and wide street, closed to traffic and with a gate at the entrance, with good buildings on both sides and, among them, St Ethelreda's Church, in honor of the founder of the Abbey of Ely in 673. Previously, the church was the private chapel of Ely House, the 'townhouse' (city residence) of the Bishop of Ely in London, a large ensemble with halls, courtyards, gardens and a string of buildings around.

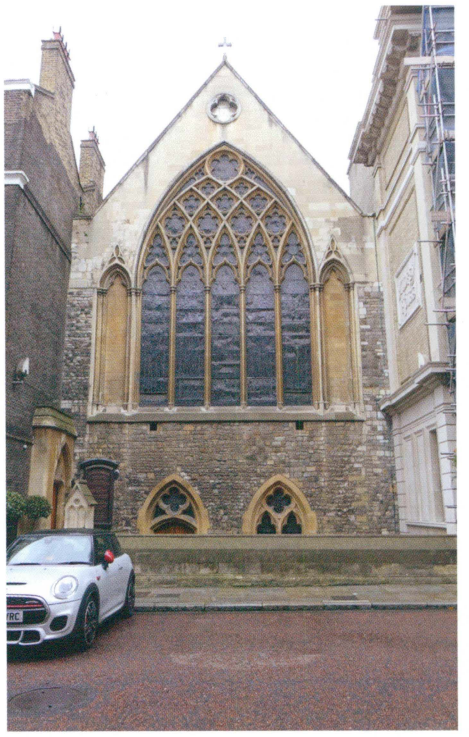
The housing units, in contrast,

Planned actions, on the other hand, can manifest very different character traits and, sometimes, of excessive uniformity. It seems inevitable because it is typical of the developments of social housing undertaken by the administration, as well as the most exclusive private developments.

The desire not to mix with the surroundings, to consider them of inferior quality or to maintain a security enclosure is present in both types of developments. Some are protected with fences and bolts and others with uniformed guards and security cameras, but they indicate a similar attitude.



Bleeding Heart Yard



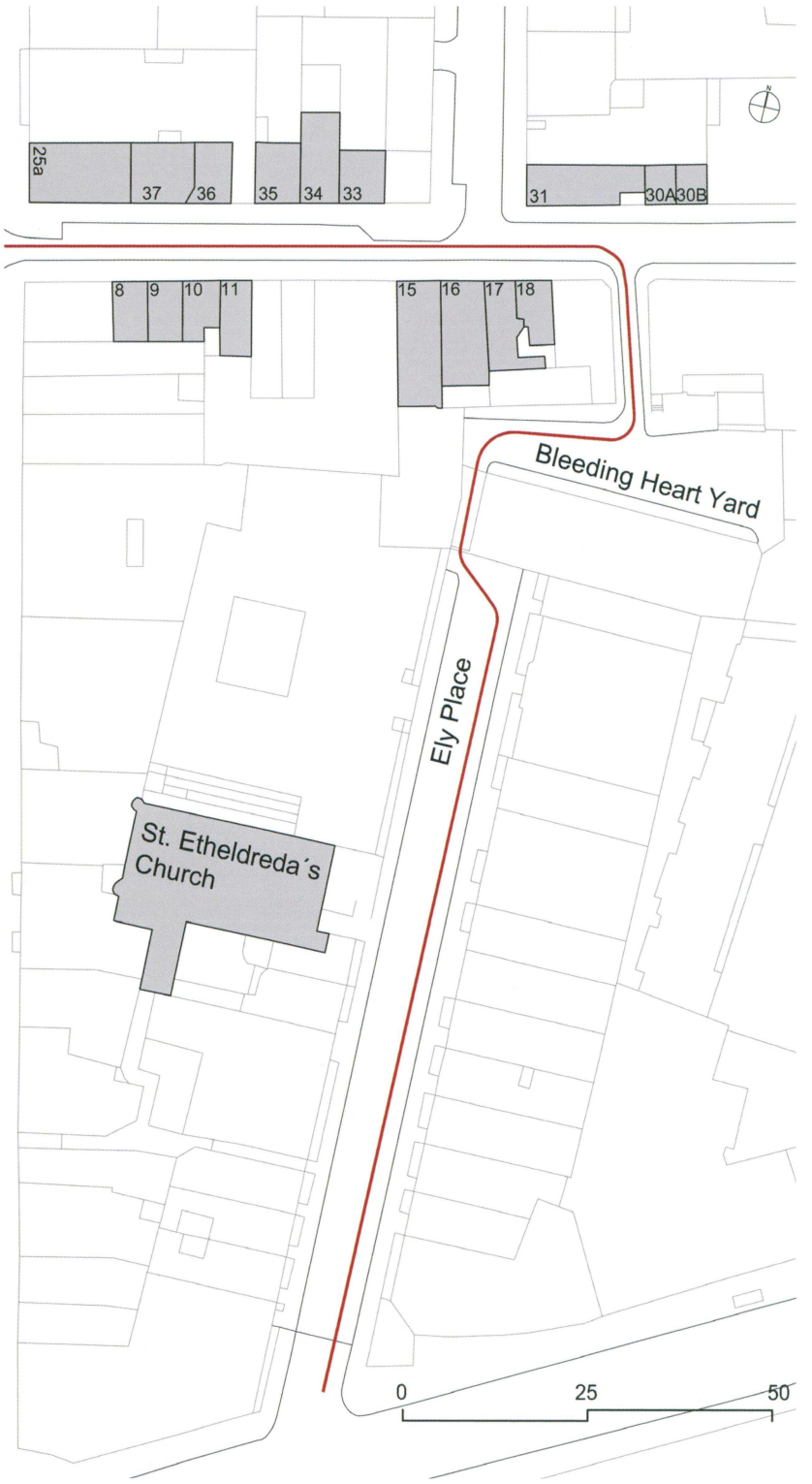
Saint Etheldreda´s Roman Catholic Church



Ely Place

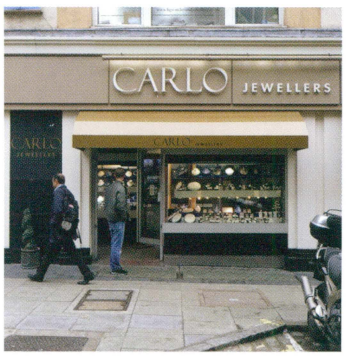






Greville Street

8. Jade
8-9. Riviere
8-9. Elegance Jewellers
10. Finecraft
11. Danesh International
15. Durrants
16. DC Jewellery
17. The Goldsmiths´Company
18. Vault
30A. Queensmith
30B. Hearts of London
31. Platform
32B. Farringdons Jewellery
34. Pacha of London
35. Blue Angels Jewellers
36. Diamond Palace
37. A.R. Ullman Ltd
25a. Carlo Jewellers













Barbican - Golden Lane. 3D simulation from the southwest. In the foreground, the curved building of Goswell Road and the red and greenish of Golden Lane on its left. In the background, the three tall towers of the Barbican with the whole set around them.

London Museum & Barbican Tower









Barbican Centre

Barbican courts

The case of the Barbican Estate (1959-1971) is a good -already classic- example of a large residential project located in the urban center. Its architects Chamberlin, Powell & Bon had designed the Golden Lane complex in 1952 and the long curved building on Goswell Road, located west of the site, which were completed around 1962. During the construction of Golden Lane the architects were asked to develop a design for the adjacent Barbican Estate, which they presented a second scheme for revised in 1959, with many more houses, two schools, a museum, an art center and a concert hall. The Barbican was built in five phases between 1963 and 1976 and the Arts Center was not completed until 1981, so the firm worked there almost 30 years.[4]

The Barbican built complex is effectively in the center, next to the old city wall, but totally isolated from the city. In fact, it is almost a fortress, having reflected in its physical reality the character suggestions contained in its name: barbican means a special configuration of the fortresses used in their entrance doors, usually formed by a monumental gate, with a drawbridge and a couple of towers.

can be monotonous and oppressive

Golden Lane Estate



The most precise significance of Barbican is in that character of mediation between the city and the fortress, because it should be as 'strong' as the rest, but at the same time show the friendly face of an access or entrance. In short, a contradiction in functions resolved with the ductility of the draw-bridge, which, as Simmel pointed out in the aforementioned article, is more door than bridge when opened and closed at will.

even with walls

Of course, the Barbican in addition to the fortress-entrance and towers, has its own walls, being built on a kind of podium about six meters high above the city. In principle, the intention was to separate circulations, cars below and citizens above, but the visible result is a powerful wall that nullifies any possibility of a dignified life at its feet.



Guildhall Buildings

In fact, the Barbican is a stopper or obstacle that interrupts the vital flows of the city and seriously harms its continuity. And it does it in a worse way for pedestrians than for vehicles, whose traffic is facilitated with covered paths, while the pedestrians must climb to the upper platform if they want to stay outdoors or endure a long tunnel full of smoke and noise.

But it also has towers, whose architecture -by some called Brutalist- makes an ostentation of forms, materials and hard finishes of a character closer to offense than to coexistence, responsible for a more serious deterioration of the urban skyline than the current iconic skyscrapers.

and towers, not of defense but of offense,

From an exclusively aesthetic point of view, the exhibition of its residential function in an aggressive way in each and every one of its floors, is more brutal and less careful towards the city than the Gherkin or mobile phone images of two nearby skyscrapers recently covered with glass, now strongly criticized but ultimately naive or, at best, banal.

The wide internal spaces, where one can enjoy a city without noise, are somewhat over-designed, but also oppressed by the volume built around them. Something similar happens in this huge and well endowed cultural center that includes a large auditorium where the London Symphony Orchestra is based.

regardless of their quality and endowments.

This cultural center joins the nearby Museum of London and Guildhall Buildings to become the great cultural center of the City. There is a clear desire for physical articulation on the porch and stairs of City Place House, but its connection with the labyrinth of access corridors to the Barbican requires too many signs and indications to be effective.

Middlesex Street

Trellick Tower- Golborne Road





There are nearby performances of similar filiation

and even harder,

or brutalist, now aesthetically rehabilitated,

The Middlesex Street Estate council house block occupies a block a little more to the east of the Barbican, and presents similar problems of insertion into the neighborhood. Built by the Department of Architecture of the Corporation of London in 1965 - 1970, it is composed of a tower of twenty-three floors surrounded by apartments and family homes arranged around a landscaped courtyard.

Sometimes it has been called *'a poor man's Barbican Estate,'* says Pevsner, who describes it *very hard and very urban, even by the standards of the time.* It is formed by a square of *aggressive six-storey outer ranges of partially stepped section in black engineering brick, their dominant motif fiddly slotted concrete balconies*.[5]

This block of houses stars in an episode of the English series *River*, the name of a policeman who chases the probable murderer of his companion to that building. Climbing up the stairs to a high floor, he runs down an outside gallery and knocks down the door of the apartment where the pursued has entered. Upon hearing the policeman enter, he throws himself through a window and plunges into the void at the back of the building, which looks even worse than the main façade.

In Golborne Road, already outside the city, next to the central trunk of Paddington Station tracks, is Trellick Tower, built by Ernö Goldfinger, in 1972, a clear example of Brutalism. This thirty-one-story apartment block, commissioned by the Greater London Council, was well received by its first inhabitants, but like many other contemporary public housing projects, it quickly collapsed due to funding cuts for its maintenance and security and it entered into marginality.





Keeling House in Bethnal Green, Denys Lasdun, 1955

Neoconservative critics blamed architecture, but sociological studies have challenged the idea that residential towers generate social unrest. After its privatization by Margaret Thatcher in the 1980s, the owners of the Trellick Tower, increased protection against intruders, made long delayed repairs and now it is a highly desirable property rightly appreciated for its design quality [46:26].

Other council housing complexes have deserved mention in the manuals of modern architecture, such as Denys Lasdun's cluster blocks in Bethnal Green. According to William Curtis, they were *an attempt at forming a new image of community, appropriate to the problems of post-war urban reconstruction, an undertaking in which it became increasingly clear that the new and the old must have a more complex symbiotic relationship that that proposed by 'diagrammatic' slab planning* [36:445].

but many others of greater interest,

The Bethnal Green project maintains the ideal of well-lit and ventilated floors, open to views and the sun, but rejects the monolithic prism model by grouping circulations and facilities in a central core, from where bridges arise to duplex houses located in four separate and rotated prisms.

made by well-known architects.

The two height houses were based on the type of house suitable to the place, while the parapets and proportions reaffirmed the scale and rhythms of the neighboring nineteenth century façades. In this way, modern sanitary and sculptural qualities were employed, incorporating the social and physical context of the place with a plan of biological forms, opposed to the prismatic ones habitually used in these dwellings.

Coexistence of the Unequal

From similarities and differences arises character

The variety of situations and uses is present in many manifestations of the city, reflecting times, styles, tastes or, in short, the clothes that the city dresses in as it is being built. And, again, London shows that the coexistence of different styles or attire, even of opposite aesthetics, is a certain fact and decisively contributes to modulating its character.

As already seen, the financial prosperity of the 1840s produced an accumulation of capital whose surpluses were invested mostly in the railroad, but part of them went abroad in search of other opportunities. Thus, British money arrives in Europe, using Belgium as a beachhead, and initiates the path of London as the financial capital of the western world, as seat of overseas market and as an exporter of new technologies. [15:56].

and shows itself as the style of power

As a step back from that skyrocketing, the city had to change its skin to show the world where it invested its own power and solidity. As we saw in 3.1, the city is based on power and capital, which are the most responsible for its configuration. But also, they are patrons of the styles, the fashions, the new constructions and even of the new professional trades and archetypes arisen to the spell of their servitude. Its seal combined modesty, solidity, moderation, attachment to tradition and a horror of ostentation, leaving in the hands of the state, the crown or the aristocracy all sumptuary excess.

This 'banking' style had to satisfy its own grandiloquence and the desire for solidity of the shareholders, letting the money be seen through the noblest materials and conjuring up the passage of time with the classic language of the colonnades of the ancient temples [15:57]. The streets of the city and, above all, the banks of the river are filled with buildings configured and 'dressed' to show those qualities.

with different costumes in time and place

In his book about London, so often quoted, Anton Capitel uses the term 'disfraces' (disguises) to refer to that will and uses it in his title, *Londres ciudad disfrazada* (*London Disguised City*) [28]. The city uses those garments, successively in time - classic, romantic and modern - or simultaneously, according to the types of buildings or areas of the city with different intensities. Sometimes it would seem that it does it without much conviction, but also sometimes the bet is consistent and systematic until it shapes the character of streets, zones or entire neighborhoods.

The historian Hobsbawm holds Vienna as an example of adapting each style to an end. *Thus of the new buildings along the Viennese Ringstrasse the church was naturally gothic, the parliament Grecian, the city hall a combination of renaissance and gothic, the stock exchange (like most others of its kind during this period) a modestly opulent classicism, the museums and university high renaissance, the Burgtheater and Opera what can be best described as Second Empire operatic, in which eclectic elements of the renaissance predominate. The requirement of pomp and splendor normally found the high renaissance and the late gothic most suitable as an idiom* [66:288].

that make up a language of symbols

That happens in London and in many other opulent cities, but the important thing is that the buildings are not the expression of a truth or assumption inherent to art or architecture, but of the self-confidence of the society that built them. The faith of the bourgeoisie in its destiny is what makes its



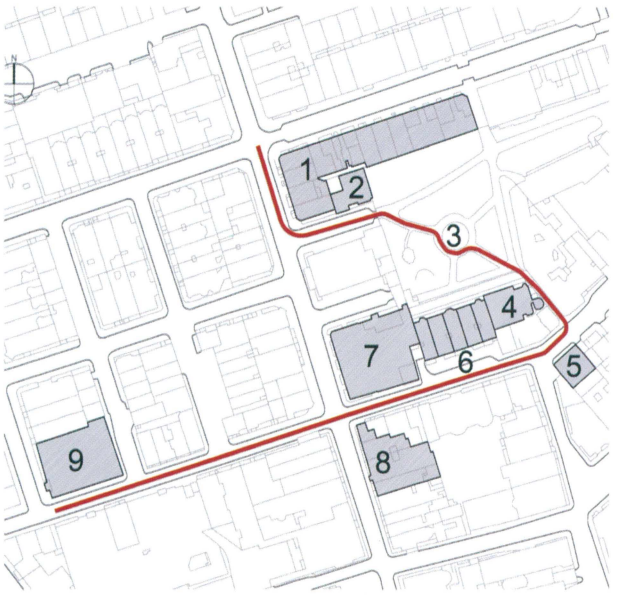


Bank of England

Bank of England Tivoli Corner

best examples impressive, if only because of their size, because it is a language of social symbols. *Hence the deliberate concealment of what was really novel and interesting in it, the magnificent technology and engineering which showed their face in public only in the rare occasions when what was to be symbolized was to be technical progress itself: in the Crystal Palace of 1851, the Rotunda of the Vienna exhibition of 1873, later the Eiffel Tower (1889).*

That's why the railway stations were hidden behind the hotels, disfiguring their functionality with renaissance attire such as Paddington or Neo-Gothic such as St Pancras, or they included vaults and domes in functionally necessary iron and glass museum covers, or they disguised mobile bridges with medieval towers and Gothic pendants, as in Tower Bridge. As Hobsbawm concludes, *otherwise, no age has hidden its merits so persistently* [66:289].



1. 92 Mount Street
2. Mayfair Public Library
3. Mount Street Gardens
4. Saint George School-South St.
5. 58 South Street
6. 39 South Street
7. T Good & Co. 35 South Street
8. South St – South Audley St.
9. 9 South Street

Mayfair, Costumes and Nooks

In South Street, some of the disguises so abundant in Mayfair appear one after another and in comfortable adjacency. It is a small and surprising street, which contrasts with the repetitive alignments of the terraces arranged throughout West London. Entire neighborhoods where not just one type of house, but exactly the same house is repeated again and again. But these are not neighborhoods in the suburbs populated by council houses, but the most expensive neighborhoods in London, where each of these houses is an impossible dream for a large majority of Londoners, 'the house you wish you had.'

Mayfair is close enough to the center to have lived different times and circumstances and was not developed at one time, as a unique urban development. The large farms leased in block for a hundred years, to build houses, produced developments of the same appearance, only because it was simpler and more profitable to build them identical, something that has been and will continue to be done when the size of the developments is large enough.

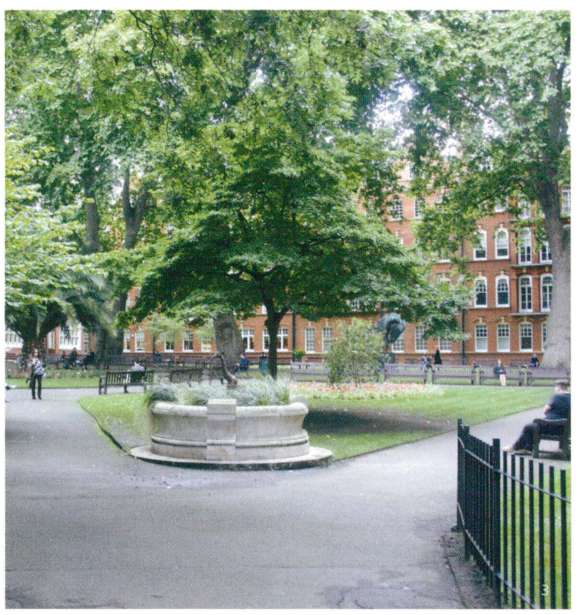
But the organic construction of the city, to the rhythm of the times, accuses the ways and the aesthetics of its era. It shows vitality, by replacing a previous style with another that is fashionable and brings fresh air to the streets. It will always be more attractive to contemplate the result of different intentions and constructive moments, than to live the repeated product of someone who only intends to do business.








Library











imported with foreign art and culture.

These clothes arrived in the city by the hand of a few architects and artists, such as John Soane, whose Lincoln's Inn Fields house-museum is an impressive hodgepodge of works of art of all kinds, quality and condition brought from Italy, truly difficult to digest. Soane was not just an outstanding architect; he was also an arbitrator of taste, a man who knew how to open the eyes of his compatriots to continental works of art. He was one of the inventors of the Grand Tour to France, the Riviera, Switzerland and Italy, which, in a few years, would become an obligatory test of the English upper classes, a sign of its distinction and superior quality.

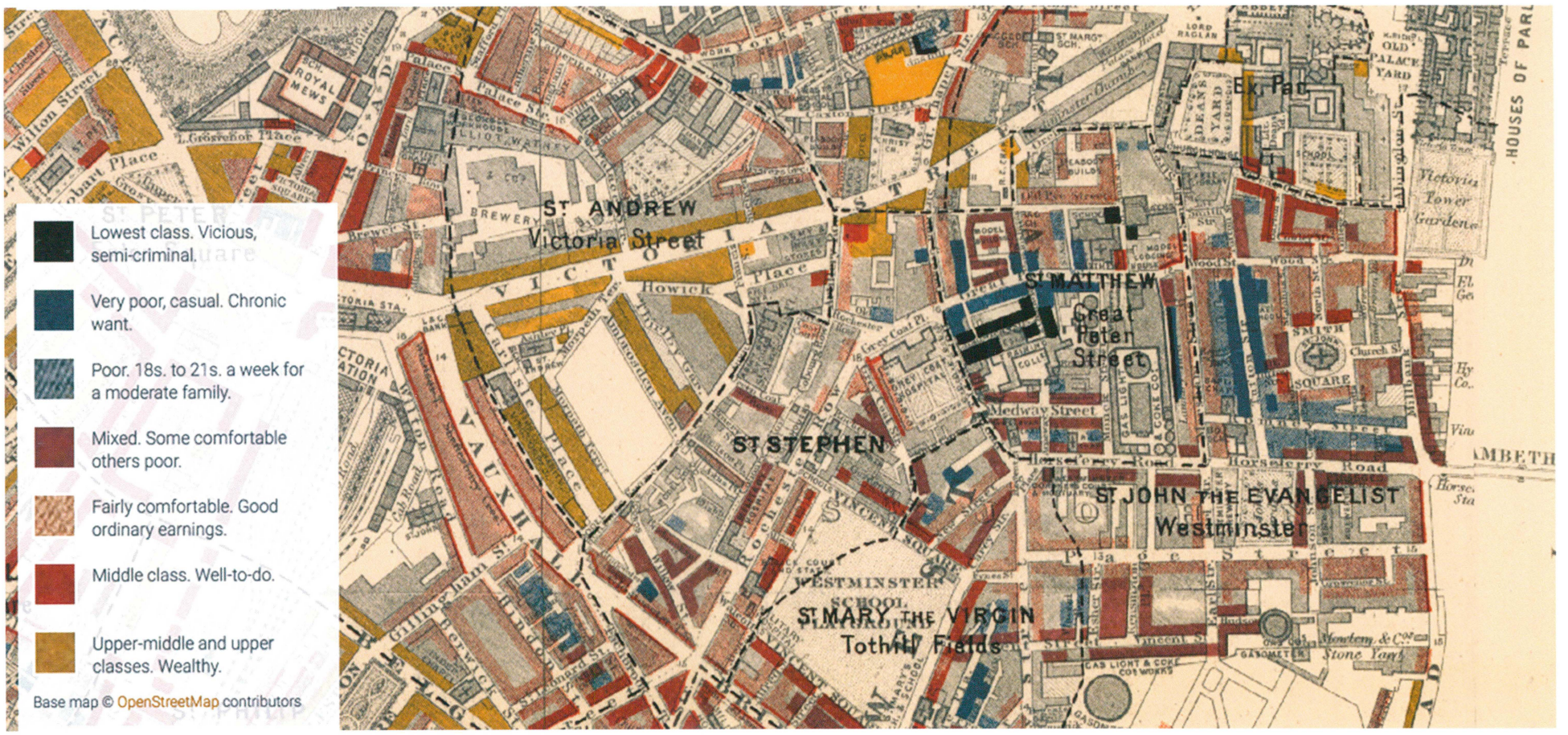
The Grand Tour introduced the British to southern art and attracted to London, through generous contributions, continental masters such as Händel or Canaletto. And thanks to the flourishing economy, Egyptian, Greek and Roman antiquities began to arrive in England, an art traffic that culminated in the pillaging of the Panathenaic frieze that Lord Elgin transported from the Acropolis to the British Museum, and the erection of the Cleopatra Needle by the river, an ephemeris full of all kinds of vicissitudes [15:59].

The Poverty Maps marked two frontiers,

In the true face of inequality, the well-known London Poverty Maps of 1903, drawn by Charles Booth (1840-1916),[6] are so detailed and perfect that they explain themselves, although it should be noted here how they reflect the two borders that have been dealt with throughout this book.

one in a north-south direction on the river

The main one is the Thames, especially in the most central stretch, corresponding to the southern edge of the City and Westminster, where the darker colors clearly predominate, the dark blue color - which Booth reserves for the 'very poor' - and the color black - the lower, vicious and semi-criminal classes.



As will be seen below, the other border is Regent Street, which marks the eastern boundary of the upper and upper-middle classes, for which Booth reserves the yellow-gold color. To the east, there is only the exception of Bloomsbury, to the north and east of the British Museum, around Belford, Russell, Woburn, Tavistock and Gordon squares, bordering on the north with Euston Street.

and another east-west on Regent Street,

However, these boundaries do not define homogeneous zones, they only mark the different general tendencies of the two sides. But within each one of them there can be a great variety of situations where difference establishes neighborhood relations or simple adjacency between adjoining ones. This can happen at all levels, for buildings, groups of them, blocks of houses or entire neighborhoods.

In the port section of the river the north-south border is blurred, because the most conflictive neighborhoods are located between the river and the Docks, both on the left bank, between the disappeared London Docks and the river, in Wapping, as on the right, between Surrey Commercial Docks and the river, in Rotherhithe. According to this, the entire east side of the city would have a similar consideration, while on the west side, the border of the river maintains the delimitation, although it also fades as it ascends along its course.

although the port blurred them.

At the end of the 19th century, when Booth made his *Inquiry into Life and Labor in London* (1886-1903), which was captured in 41 notebooks, the port area was a hotbed of maritime activities, with boats anchored on the banks and inner docks, served by a large floating population of sailors and stevedores.



Poverty Maps, 1898-1899 [London School of Economics Library]





Regent Street

Vilebrequin-Regent Street

In the ambiguous West End,

The urban scene of the area was monopolized by warehouses and by the incessant traffic of carts and wheelbarrows with barrels, bales, sacks and all kinds of merchandise, which came and went from the ships and barges to the upper floors of the warehouses, where they were lifted up by the typical rotating davits, which have been consecrated as icons of that maritime world.

All the rehabilitations of the warehouses of the docks maintain one or several davits in their façade, as a safeguard of their industrious character. The character and activity of this area was included in the drawings and stories of the illustrator Gustave Doré and the writer Blanchard Jerrold as the maximum exponent of the picturesque character of the city [39:1 *et seq*].

The West End, together with Whitehall and Westminster, is currently the tourist heart of London, where the most visited sites and neighborhoods are located, and stores, restaurants, theaters and hotels are concentrated, well connected by all modes of public transport. The large buildings and monuments offer an image directly representative of the national society, in a rather explicit space, but a closer observation immediately picks up the presence of certain areas crossed by the ambiguous and the different.

At the same time, the West End reveals the industrial traces of the nineteenth and half of the twentieth centuries, where the middle class joined residence and work near the center of the city. These workshops were part of the Victorian factory belt, located to the north and east of central London, consisting of small industrial enterprises, vertically linked and generally dependent on nearby specialized facilities, which had been located near their immediate metropolitan markets: retail trade of the West End and of wholesalers of the





Burberry, Regent Street

Regent Street

City-East End. The classic example of these companies is the clothing trade, established around Saville Row tailoring workshops and extended, through the social divide of Regent Street, to Soho, where less skilled and paid work was carried out [41:50].

This Victorian West End, now represented by Soho, was developed during the 17th and 18th centuries by the local aristocracy, but later attracted workers in search of temporary employment and remained a place where the rich and poor lived close and were economically linked by services. Its association with the entertainment industry was firmly established in World War I. The aristocratic clubs of Pall Mall were joined by the less reputable nightclubs and theaters built at the turn of the century east of the Royal Opera House and the Theatre Royal on Drury Lane. Many of them were built on the recently completed Shaftesbury Avenue and Charing Cross Road, providing respectable entertainment for an expanding middle class, now sustained by theaters and restaurants.

multicultural Soho was secured

The area also acquired a certain reputation for newly arrived foreigners, first Greek and then French Protestants (Huguenots) with their trades as silk weavers, watchmakers, engravers, silversmiths, jewelers and upholsterers, in sufficient proportion to constitute a community maintained throughout the eighteenth century. From the beginning of the nineteenth century, other French, German and Italian refugees arrived, later joined by Polish and Russian Jews. In the 1860s and 1870s many Germans and Swiss arrived, as well as Italian chefs and waiters, consolidating the multi-ethnic character of the neighborhood.







Carnaby Street

by the design of John Nash

These processes of settlement and long-range segregation were undoubtedly supported, channeled or propitiated by the decision of the Prince of Wales to improve the royal estates located north of Oxford Street. The idea was to link them with his Carlton House residence in Pall Mall, by means of an 'elegant' connection, which would also revalue the passage areas. He commissioned the design of this street to John Nash (1752-1835), who in addition to being an architect was a smart businessman. Nash devised a long and majestic street from south to north, with the aforementioned layout from Carlton House to the Piccadilly Circus quadrant and then down Regent Street to Portland Place.

According to Roy Porter, *this route was determined by ownership of the land: it was cheaper to plant the road on Crown property than to go as the crow flies. But Nash's path was not just cheap: it had another advantage. Between Piccadilly and Oxford Street it followed Swallow Street. It thus created a frontier between crowded, confused Soho on the east and elegant Hanover*



Selfridges, 400 Oxford Street

Square and Cavendish Square on the west. By restricting eastern access to Regent Street, Nash's route succeeded, in Sir John Summerson's phrase, in 'damning up Soho,'[7] and London's grandest thoroughfare thereby became its social barrier, with Portland Place and Regent Street screening the fashionable West End from déclassé quarters [102:127].

In parallel, the aristocracy moved westward and Regent Street functioned more and more as a social divide between the trendy West End and the multi-ethnic and less affluent population of small entrepreneurs, craftsmen and garment workers and the unemployed of Soho. By the turn of the century, many of the main characteristics associated with Soho in the 1920s and 1930s were clearly established: a foreigners' neighborhood, where the different groups initially maintained their socio-cultural differences. Later settlers from the English colonies of the Caribbean and Africa were added, and a large group of Vietnamese and Chinese, consolidating the cosmopolitan and multiracial nature of an area progressively extended along its main arteries. [41:52]

that turned Regent Street into a social divide,

French and Italian influences complemented by different Asian cuisines are still maintained in the restaurants located on its streets and radiated beyond its northern border of Oxford Street and southeast across Covent Garden. After World War II an incipient sex industry was installed, whose regulation in the mid-1980s made the neighborhood attractive to a wider audience. The real estate developers learned to live with the Soho Society, which represents this variety of residents and businesses, with projects that can be assimilated by the peculiar atmosphere of the neighborhood, which is much more interesting than its architecture or its streets.

with 'border shops' on both sides

The street designed by Nash acts as a social divide between East and West as well as functioning as a north-south corridor. Therefore, the clothing stores located in the parallel streets closest to Regent Street have the character of border shops. These are stores that concentrate their own activities on one side to serve markets resident on the other.

In those located to the west, such as Saville Row, there are still tailors originating from the specialized craftsmen located there since the mid-nineteenth century close to their natural market. On the other side and a century later, Carnaby Street concentrates the product of modern fashion designers that emerged from the west closer to the crowded downtown market, especially nurtured by the populous east.

of a shopping mall of fashion stores,

Regent Street was built between 1817 and 1823, and lands were rented to developers to build luxury stores with exclusive residences on the upper floors. Nash reserved the development of the quadrant located next to Piccadilly and the stretch of the street up Oxford Street rivaled Bond Street as the most fashionable street in London. The most everyday or utilitarian stores, such as butcher shops or bakeries, were not allowed, and fashion stores were asked for large windows and luxurious materials for their decoration.

where the London of the rich began,

West of Regent Street begins the London of the rich, where everything is different. It is true that there are some very high-level neighborhoods located east of this great street, especially in the north, between Oxford Street and the New Road, such as Bloomsbury with its large squares, elegant alignments and several crescents, mentioned above. But it is also true that west of Regent Street there are few or very rare areas of low-level houses or streets.

Ford Madox Ford does not fail to point out *the stolid London of squares and clean streets, to the westward,* and characterizes it in its streets and houses: it *still retains something of its Sunday morning hush: the pavements are empty, and as it whitened, and where there are the large detached houses, with bits of garden, and large old trees, the town still has its air of being a vast cemetery of large mausoleums, that no one ever visits. Then indeed that third state, the deep leisure, settles upon the middle London of the professional and merchant classes. There is a stillness, a hush* [47:135].

that followed by the north shore of the river.

The rich appreciated the high reaches of the river and their comfortable social life, which at certain levels could be excessive. Peter Thorold, tells of the summer 'water parties'; or the so-called 'breakfast parties' organized by the Duke of Devonshire at Chiswick House, which began at three in the afternoon and ended at midnight; or dining at Ham House and being rowed back 'in style' to London. Steam-boat trips were more routine, beginning to be commercialized



Syon House Pavilion, Syon Park

in the late 1820s, whose biggest attractions were the good houses on the banks [134:232].

Many mansions have disappeared or have been transformed, but on that northern bank there are still three large buildings. One is Fulham Palace, the summer residence of the Bishop of London, the last moated palace in the London area; another great residence is Syon House, at the height of Kew Gardens, rebuilt by Robert Adam; the third is Chiswick House, built by the Earl of Burlington and inherited by the Duke of Devonshire, a mansion designed not as a family residence but to exhibit paintings and sculptures in large halls. Also noteworthy are the large houses of Strawberry Hill, Horace Walpole, and Marble Hill, built by King George II for his mistress [134:234].

The development of leased land

The process of transformation from rustic to urban land has a special component in London, derived from its condition of land rented for long periods of time. The large landowners did not usually sell the property of the land, but the right to build on it in exchange for receiving one rent for the land and other rents from the occupation of the houses built on it.

The usual procedure was to lease the land to a developer, who invested capital in the development of residences or offices, entrusted its construction to other companies and recovered his investment with rental income from those spaces. Generally, the lease of the land was long-term -99 years was a usual term- and, of the rent received from the tenant, a part was allocated to the owner of the lot, thus increasing the rent of the land.

it was more difficult with the Church,

Paddington and its surroundings were lands of the diocese of the Bishop of London, one of the largest landowners in the city, with very scattered farms. While the other owners leased their lands with enough time to interest the builders, the Church had been content to comply with the limitations established by Parliament.

that preferred the 'three lives' system,

Often, their leases were only 40 years long, or, as in Paddington, according to the 'three lives' system, even more discouraging for developers. Under a lifetime lease contract, the tenant named three people, normally but not necessarily himself, his son and his grandson. When everyone died, the lease ended; and meanwhile, each new 'life' that agreed to the contract had to pay a penalty or transfer to the owner.

more negative for development.

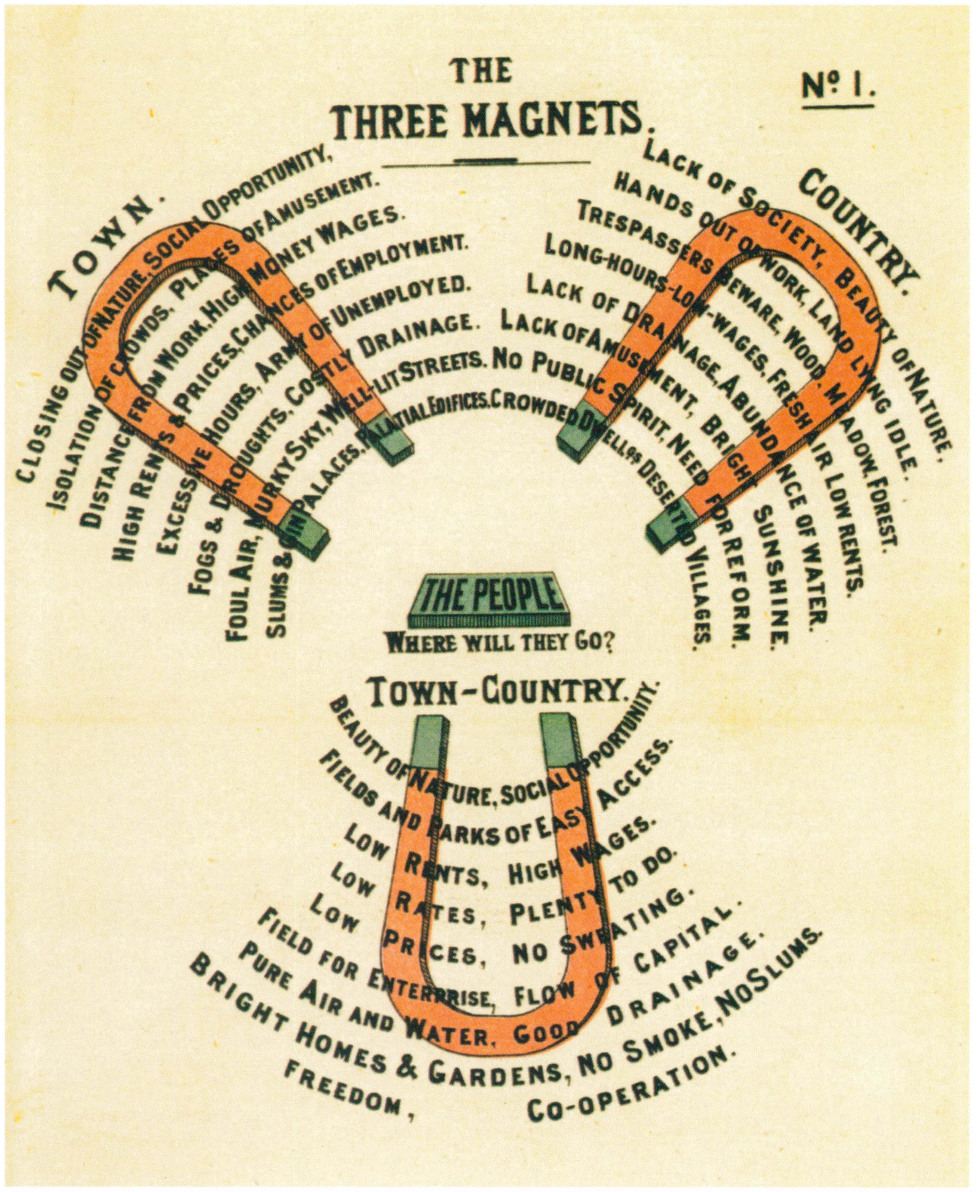
In the short term, the system was attractive to landowners, since they added transfers to rents, while long-term leases only guaranteed rents that were often just of the ground for generations. Although the Church used to renew concessions automatically, the risk of not doing so was enough to discourage tenants from investing significant amounts in construction. Since, in addition, they expired at different times, these leases for lives effectively ruled out integral development [134:257].

The well-to-do classes were concentrated,

Well-to-do London was fairly concentrated at the beginning of the 20th century. As Ford points out, *If the idea of the "working classes" seems to call up a picture of the black plains of the East End, the picture when the "leisured classes" are in consideration is that of a circumscribed parallelogram of rows of tall buildings. It is a square block like a fortress that we all, more or less, are besieging -the little plot of ground bounded on the south by Piccadilly, on the west by the railings of Hyde Park, on the north by Oxford Street and on the east by Bond Street* [Practically the neighborhood of Mayfair].

That territory *stands fairly well for where we should all live if we were "really rich," it represents, as far as London is concerned, our castles in the air whether we should be contented with a small, bright house in one of the angles of Mayfair, with a suite of rooms in the P___ that overlooks the Green Park, or whether we should be contented with nothing less than one of the palaces in Park Lane.*

And they showed a way of life, continues Ford, also different: *these streets are quiet, for London, and bright and well swept and almost joyous* [47:111]. Those who could not afford to live there sought housing farther from the city, where they kept coming and going to work and could enjoy for leisure in the clubs, the most affordable located north of Hyde Park, and the oldest and most exclusive on Pall Mall or Whitehall.[8]





The truly rich could afford to live at the same time in the city and in the countryside, keeping open two residences that they used according to the season and their social agenda of commitments and parties. Literature, film and television series have been more effective than essays in translating an image of how people lived in mansions surrounded by gardens and parks.

Perhaps only worth highlighting here is the ease of movement of their inhabitants, sometimes mystified by the appearance of the luxury motor vehicles of the early twentieth century, whose attractive image ends up canceling the other possibilities. Before the automobile, many trips between the city and the country mansions located in the outskirts were solved with the railroad and carriages to and from the stations. Although a same day round trip was not frequent, it is clear that these trips were commonly made, usually taking the opportunity to spend a few days in the city, to visit friends and attend a show, spending the night in their own town houses, in hotels or in clubs in the case of men.

although the richest alternated countryside and city.

Howard's 'Three Magnets' diagram, 1898. The positives and negatives of Town and Country living are unified in the Town-Country model

Propaganda image of Howard garden city [16:414]



Third project for the reconstruction of London by John Evelyn (above) and London's reconstruction plan by Sir Christopher Wren, 1666 (below) [106:87]

Figures in the Plan

The war always led to processes of deep reflection on the city, with the consequent emergence of theories and plans once peace was signed. That concentration in the task of thinking may be due to the paralysis of action, prevented from dealing with the next future by the emergence of urgent temporarities. It does not make much sense to debate an urban reform or implement what is planned for the city, when bombs are falling and destruction takes over the mind.

Destruction encourages reflection,

The emergence of plans after destructive events is expected and necessary, perhaps obvious. But it is convenient to deeply consider when and how the reflection they are based on takes place. In this sense, the degree of elaboration of urban theories and proposals arising after destructive conflicts, as well as the rapidity of their appearance on the scene when everything calms down, proclaim the existence of solid ideas, not only long meditated but partially or completely drawn. And they do not seem aimed at correcting the real damages, nor are they confined to the destroyed territories, but arose as the intellectual fruit of a previous reflection on the city, which gains force with the opportunity offered by catastrophe.

The Great Fire of London, punctually and neatly related by Samuel Pepys (1633-1703) in his diary, and published separately in his famous *The Great Fire of London* [99], is paradigmatic. It began at dusk on Saturday, September 1, 1666 and devoured the city until Thursday, September 6, although its embers were rekindled several times during the following months. But on Monday, September 10, the king received Christopher Wren, who presented him with a plan to rebuild the city. On September 13 John Evelyn presented his own plan, on September 20 Captain Valentine Knight presented another and on the 21st, Professor Robert Hooke presented his. In 15 days, four people who were all *'amateurs'* presented plans to rebuild a completely devastated London [106:102].

The London reconstruction plan, developed by Wren when the fire was still sweeping the city, is the best known. Although its author was 34 years old, and only four of them dedicated to architecture, he had won a Chair of Astronomy at 25 and was recognized as a great talent for mathematics. Rasmussen explains that *his scientific knowledge proved advantageous to him in all constructive, economic and acoustic matters, and his synthetical faculty, trained through his knowledge of mathematics, made him at the same time a solid planner.*

as Wren did during the fire,

His interest in architecture arose from the reading of many books and a trip to Paris, escaping the plague that struck London the year before the fire. He had occupied a position as supervisor of the works of the Crown and in 1666 he had drafted a restoration project for St Paul's Cathedral, which was in poor condition. With that baggage, he presented a plan that was the abstract product of a great ingenuity. *It is clearly* - Rasmussen concludes - *the mathematician who, starting from definite postulates, has solved an interesting geometrical problem* [106:104].

when he proposed a set of axes and squares,

Wren held quite clear the objectives of his plan, based on providing what the city lacked to reach the level of the great European cities. He gave great importance to the accesses, to the gates and to the bridge, he recognized that the buildings had to be square and placed the cathedral and the stock market in dominant position. *The problem*, says Rasmussen, *was the plexus of the streets. This he solved by means of common form ideals of those days* [106:105].

that was unfeasible and was rejected.

Regardless of its formal appeal, to which he devotes many pages of his book, and of the other alternatives, Rasmussen admits that *Wren's plan was absolutely impossible to carry out. Not one street nor one building was kept in its old place*, which involved a direct attack on private property. *It is therefore not surprising,* he concludes, *that the plan was rejected*.

For Rasmussen, *the rejection of Wren's plan is not a fault but rather a new triumph of what might be called the idea of London*. It is based on the *apparently incidental growth* of London, behind which lies a *latent power, a desire to make the town healthy*, based on being *self-governing and independent from the Crown. This local government was the vital nerve of the town - more important than any plans. It may sound like a paradox to say that there is more true town-planning in the unrestricted growth of London than in contemporary Continental towns that developed according to plans* [106:113].

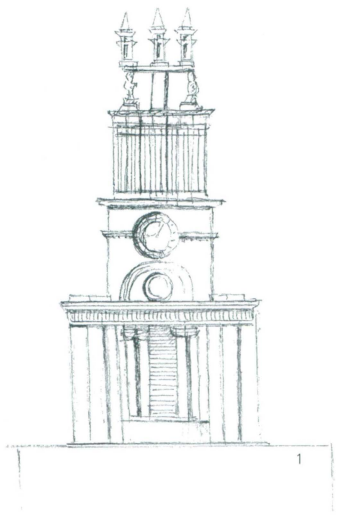
Capitel, in his presentation of the translation of Rasmussen into Spanish in January 2011, laments that *the mythification of urban spontaneity -that is, the lack of layout- lets the author say that it was good that the City did not reform its plan after the terrible fire of 1666*. Although it is not difficult to agree with Capitel that *it would have been great to trace the city proposed by Wren, by Evelyn or by Hooke, if the latter had been preferred*, that does not go beyond being a pious desire and in a certain way deviates from the fundamental issue.

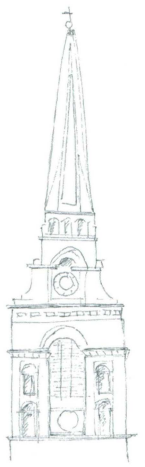
The city then recovered its layout,

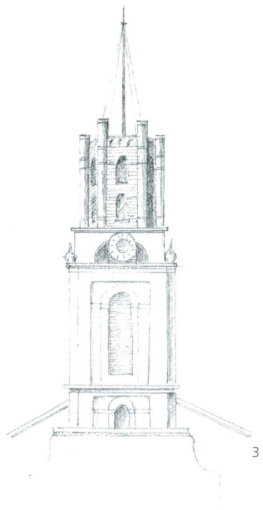
The city was reconstructed little by little according to its formal pre-existences, as three centuries later Berlin will do after the Allied bombings of World War II. What is surprising in both cases, is not so much that projects of 'full rationality' are presented, which is the only thing that humans can turn to after disaster, but the subsequent professional celebration of their formal concretions. Praise for these projects is, at least, naive and points out the probable dissatisfaction of professionals like Rasmussen, put down before and now because they still believe that real problems can be solved with borrowed forms, drawn in a few days in the solitude of a cabinet.

Over the years, the examination of these reconstruction projects reveals that this would-be rationality is the result of the ways then established of drawing the cities and not of the direct examination of the reality of that which has been destroyed. Perhaps one could speak of a rationality mediated by the styles and professional habits of the time, but urban historiography further defocuses the possible critical assessment of these proposals, striving to find formal similarities and common features between completely different plans for cities.

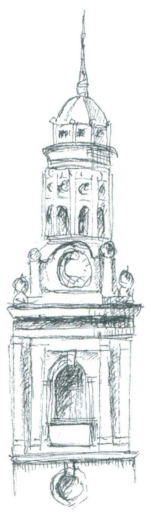
It is not surprising that all this is of interest only to urban planners.

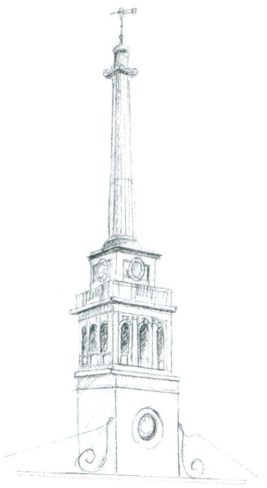

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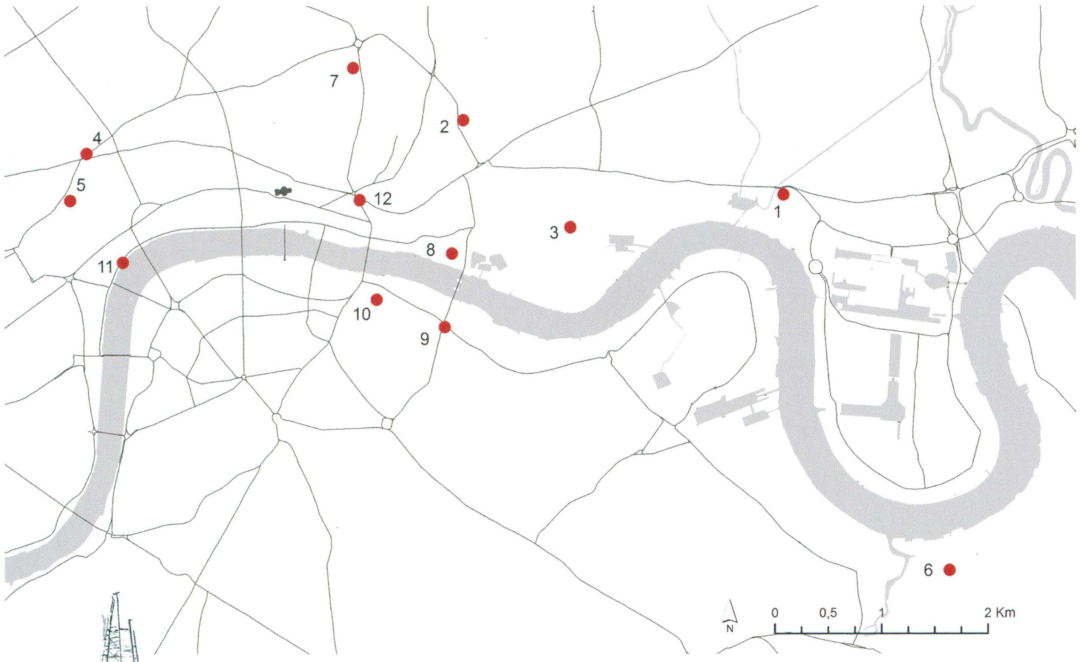

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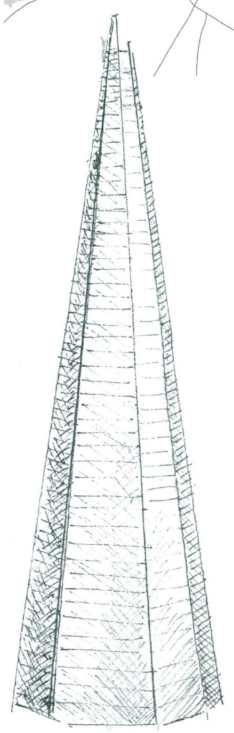

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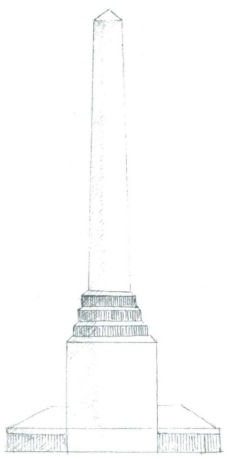
Plan, own elaboration from reading Sinclair's book [119]. PHL 2017

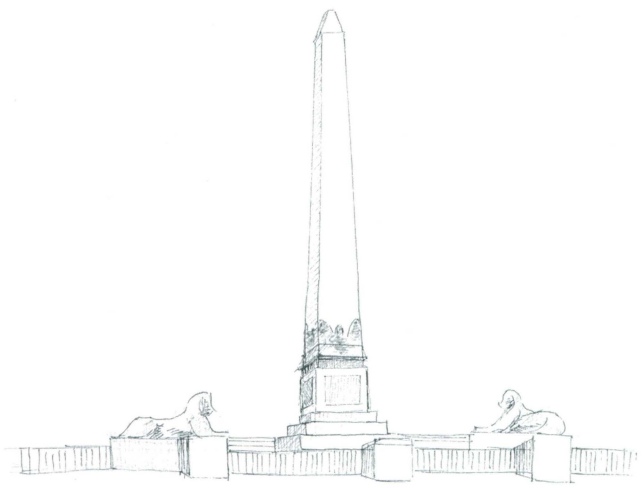

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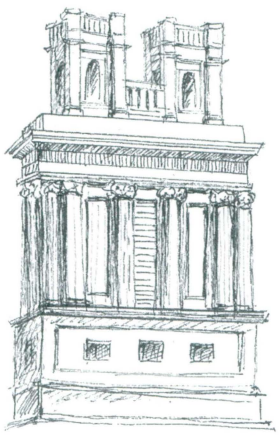
1. St. Anne's Church, Limehouse
2. Christ Church Spitalfields
3. Saint George-in-the-East
4. St George's, Bloomsbury
5. Seven Dials
6. St Alfege Church
7. Obelisk Bunhill Fields
8. Tower of London
9. St. John Horselydown
10. The Shard
11. Cleopatra's Needle
12. St. Mary Woolnoth


10


5


7


11


12

and continued to be disorganized,

As John Gwynn noted years later, *unfortunately for the city and suburbs of London, right lines have hardly been considered*. There were no itineraries to cross the city from side to side except, perhaps, The Strand as the initial link of the City with Westminster, or wide streets with perpendicular crossings to guide its unitary regeneration.

Despite its energy and vivacity, towards the 1700s the city *had little that was truly capital, and its public face remained largely disorganized*. Unlike other European cities, says Roy Porter, its *public buildings were unimpressive, the royal palaces made a poor show and London Bridge, with its tottering skyline was a medieval survival* [102:124].

to become an ugly monster

In *The City of Disappearances* [119], Iain Sinclair points out that the city had become *an ugly monster, inconvenient and unmanageable, that destroys itself*. In 1711, Sinclair continues, Parliament approved the Church Building Act and commissioned Nicholas Hawskmoor with its implementation. It was a case of building churches spread throughout the city, to rebalance the presence of the Anglican Church in relation to other beliefs, Presbyterians, Quakers, Congregationalists and Baptists, generally recognized as dissenters.

or a chaos of unclean sheds.

Hawskmoor knew well the city where, instead of houses and streets, there was *a Chaos of Dirty Rotten Sheds .., with winding Crooked passages (scares practicable) Lakes of Mud & Rills of Stinking Mire Running through them* [116:14]. And he considered the commission from the double perspective of the buildings themselves and from the possibility of using his position as a way to improve the city.[9]

The task of Parliament's law was to build 50 churches - including the acquisition of plots, grounds for burial and parochial houses - and also to take responsibility for the obelisks of St Luke's Church (now a musical center, operated by the London Symphony Orchestra), Old Street and St John Horsleydown (now demolished, with the London Mission building on its perimeter plinth).

The churches of Hawksmoor

Among all of them, and on account of their unitary character, the seven churches made directly by Nicholas Hawksmoor are especially noteworthy: St Alphege (Greenwich, 1712-1714), St Anne's (Limehouse, 1714-1724), St George-in-the-East (1714-1734), Christ Church (Spitalfields, 1714-1729), St George's Bloomsbury (1716-1727), St Mary Woolnoth (City, 1716-1727) and St Luke's (Old St, together with John James, 1727-1733) .

The first to be built was St Alphege, located in the center of Greenwich, a short distance from the hospital and the facilities of the English Navy. Following the model of his master Christopher Wren, with a symmetrical plan with a head tower, he elaborates the interior by eliminating the columns of the almost square-shaped nave, to offer a unitary roof, but recreates the intimacy of the worship space with two raised side stands, in wood. It thus obtains an innovative disposition, that combines the succession of door, tower, nave and altar with the centrality provided by the floor and the lateral tribunes [28:67].





Christ Church (Hawskmoor, 1729)

Christ Church, urban axis

Christ Church







Saint Alphege (Hawskmoor, 1714)

From this solution arises a meeting space, where people can observe themselves while praying and singing, capable of promoting coexistence and reinforcing the community identity in the face of the incessant entry of foreigners. The model suggested by Wren was repeated and perfected in other later churches, both by Hawksmoor and by other architects.

St George in the East, located in Smithfield, and St Anne's Church, respect the model with slight variations, although the central nave of St George was destroyed in the war and only its elevations were reconstructed. Both churches stand out for the visibility of their forms, being surrounded by green areas without the burden of the built around them.

they wanted to revitalize the city,

Not coincidentally these churches are located in port areas, where the cultural mix was more conspicuous and where the dissenters proliferated: St George just north of the port area of St Katherine and Shadwell, and St Anne's on the Limehouse Basin side, where the Limehouse Cut canal starts, which connects that dock with that of Bromley-by-Bow, upstream of the Lea River. In fact, although it now has a more urban character, St Alphege was also next to Deptford Creek, a slit located on the other side of the river opposite Isle of Dogs, with a large port population.

In Spitafields, another of the most impoverished and deteriorated areas of London, is Christ Church, the most important of the series although distinct in a certain way and much more complete. Independently of the numerous and remarkable architectural contributions, *both in its bright interior and in its accomplished, attractive and original exterior*, picked up extensively by Antón Capitel [28:72 a 80], it is interesting to mention here its dominant presence





Saint George in the East
(Hawskmoor, 1734)

in the city, marked by its vertical proportions, reinforced by the slenderness of its notorious spire.

It is interesting to think that the geometrician Hawskmoor realized the possible role of the tall spires of the churches as referential landmarks, capable of suggesting anchors of spirituality in a then chaotic city. And to give the buildings a powerful character, capable of radiating a magnetism that went beyond the immediate surroundings of the churches.

as references of spirituality

In fact, it was the architect himself who chose the lots to build the churches and distributed them throughout the city with a non-casual and very elaborate scheme. Sinclair connects that attractive possibility with the knowledge of Hawskmoor, *a very skilful Mathematician, Geographer and Geometrician ... perfectly skill'd in the History of Architecture, as his obituary tells us*.

In a display of esoteric scholarship, Sinclair recognizes an exciting geometry of occult forces of opposition in the Hawskmoor scheme: the five mentioned churches *make up the major pentacle-star ... These churches guard or mark, rest upon, two major sources of occult power: the British Museum and Greenwich Observatory*, which he then links to the *sub-system of fire obelisks*, which comprises the three already mentioned *that form an equilateral triangle*, next to the *London's true obelisk – 'Cleopatra's Needle*,' which relates to its original position in front of the Temple of the Sun of Thutmose III, in Egypt [116:15].

and of power, to order chaos.

All his churches *are centres of power for those territories ... an enclosure of force, a trap, a sight-block, a raised place with an unacknowledged influence over events created within the shadow-lines of their towers and ... are only one system of energies, or unit of connection, within the city*[10] [116:17].

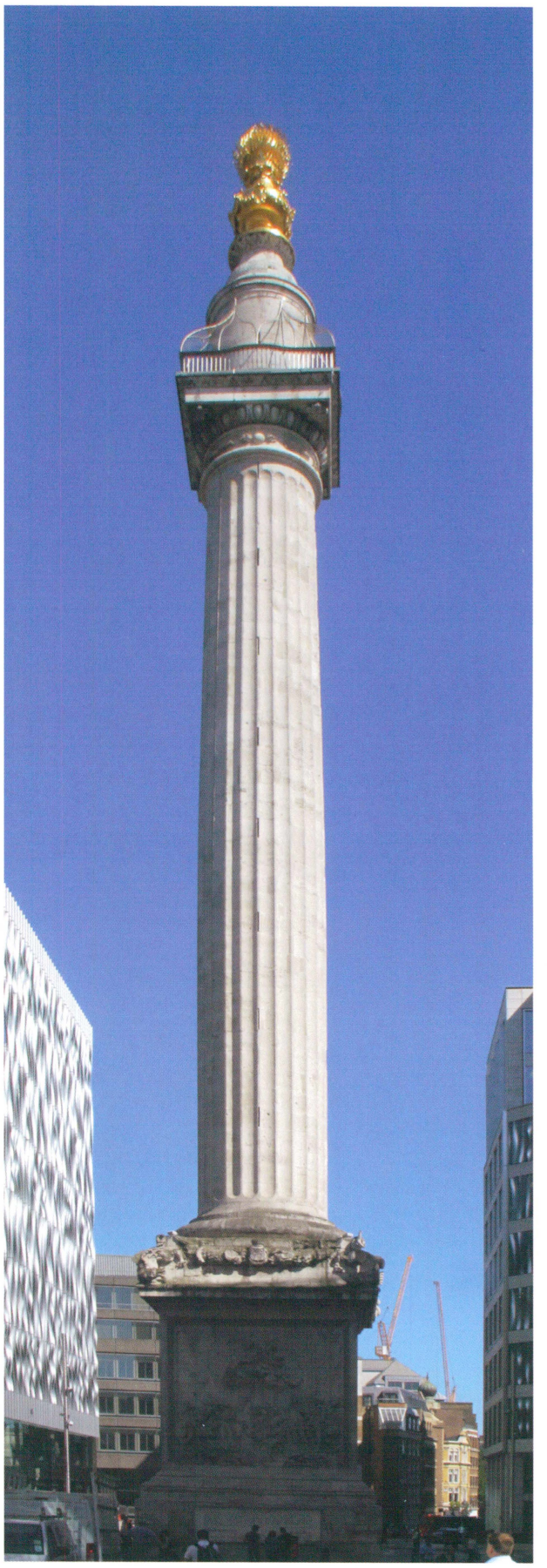
Milestones and Obelisks

This Monument designed by Sir Christopher Wren was built to commemorate the great fire of London 1666, which burned for three days consuming more than 13,000 houses and devastating 436 acres of the City. The Monument is 202 ft. in height, being equal to the distance westward from the bake house in Pudding Lane where the fire broke out. It took six years to construct 1671 - 1677. The balcony is reached by a spiral stairway of 311 steps and affords panoramic views of the Metropolis. A superstructure rises from the balcony and supports a copper vase of flames.

The allegorical sculpture on the pedestal above was executed by Caius Gabriel Cibber.



Paternoster Square Monument



The Monument



Christ Church Spitafields Obelisk



The Seven Dials

Cleopatra's Needle

The pragmatic order of the railroad

With the technological revolution introduced by the railway and its growth induced during the nineteenth century, the city grew while assuming a certain functional structure, with a center defined by the crown of stations and a more or less radial system of lines that related it with the periphery.

The scant planning developed in that fundamentally pragmatic world was clearly aimed at concrete problems. In the words of Geddes, *in our present phase, town-planning schemes are apt to be one-sided, at any rate too few-sided. One is all for communications, another for industrial developments. Others are more healthily domestic in character, with provision for parks and gardens; even, by rare hap, for playgrounds, that prime necessity of civic survival.*

generated coordination problems,

The mere coordination of actions involved a great effort, such as that made by the member of Parliament John Burns to put in agreement the countless number of local authorities and that of the London County Council, involved in the enormous and complex labyrinth of Greater London, when trying to adjust the different local urban schemes, as well as the necessary radial and ring roads for the Town Planning Act of 1910.

A practical guide of the time for the preparation of urban plans, which contains all the details for the application of that law, demonstrates the legislative tangle that any planning initiative had to face. In fact, much of the content of the law is simply the detailed exposition of all the particular cases that must take into account any attempt to improve, reform, correct or create a road[11] [18:18].

that demanded analytical reflection,

And the few plans destined for the city were of a rather formal nature, and of archaic design: *too many reiterate that pompous imperial art, which has changed so little from the taste of the decadent Caesars of the past to that of their representatives in the present*, says Geddes in 1915.

Simultaneously, Geddes demands a greater depth of analysis and a more scientific approach to the plan: *for each and every city we need a systematic survey, of its development and origins, its history and its present … Here is a vast field of social inquiry, inviting the co-operation of specialists of all kinds*, starting with scientists and universities, but, as *but as soon as may be it should be undertaken by the citizens themselves, aided by their municipal representatives and officials* [50:256].

but its absence consecrated the practice

While the required reflection arrived, the construction of the city continued governed by pragmatism. The London plan showed the lack of guidelines and the success of certain figures or formal practices that allowed to better sell the residences developed on the large farms that were being parceled out.

In a few decades there was no longer room for large axes or configurations, because the land was subject to leases, and the city became a sample-book of figures in newly built areas and disguises of old styles in the areas that they were consolidating. The figures are the product of urban planning that aims to modulate the space according to landscape criteria to achieve certain relationship conditions between housing and the city.

of compositional figures, such as squares,

With the figure of the **squares** one tries to control the presence of the city for the benefit of tranquility. The views are controlled, the traffic is controlled, the

people who can use the interior green space are controlled. The square shape is by nature fixed, does not facilitate movement but, when it is introduced, it is necessary to treat it with restrictions so that it does not alter the primitive function of that figure. If, on the other hand, traffic is given priority as in Sloane Square, the figure becomes denaturalized and the flow of cars and buses introduces a dynamic that breaks the balance and destroys the intended objective.

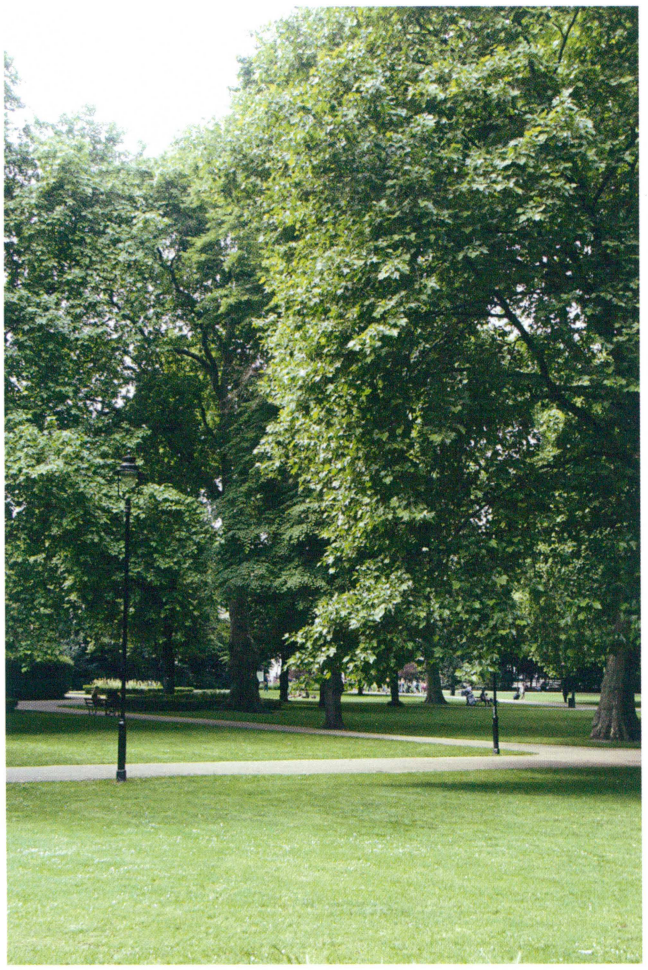
In the neighboring space ennobled by the palace of the **Duke of York's Headquarters** (now occupied by the Saatchi Gallery) the central area is enclosed by gates in a peculiar way. For there the lawn is conserved, but it is dedicated to the sports of the children of the neighboring school, with a running track around that does not disturb the tranquility of the space. Children make noise and move but, unlike cars, they are not considered disturbing but domestic, one can live with them nearby.

At the same time that Covent Garden was built, Lord Southampton asked the king for permission to develop his valuable **Bloomsbury** domains, but he did not obtain the license until 1850. In his project, the plaza was the center of a residential unit with a market or shopping area and a series of smaller and less expensive streets, which should be able to sustain themselves. These first projects of Covent Garden and Bloomsbury included houses for both the rich, surrounding the square, and for the less well off in the adjacent streets, but both projects had many differences.

that could include gardens



Bloomsbury Square





Russell Square

Bedford Place

While Covent Garden began as a small town of exquisite taste, and ended up being a large vegetable market for all of London, Bloomsbury also developed around a square, but instead of classic buildings with arcades, it had a series of individual houses of the same height. Instead of a classical church in front of a square paved in the Mediterranean way, there was a stately mansion facing a green space of grass and walks, with a more British character. Bloomsbury had its market and its own church, but outside the central part, and had small streets of narrow houses, located behind the largest, that were not seen from the mansion [106:256 *et seq.*].

From that initiative arose the area of Bloomsbury, with a series of squares from the old estate of the Duke of Bedford. **Bloomsbury Square** (1867), with a cross layout whose north-south axis was aligned with the main entrance of Bedford House, maintaining the views towards the hills of Hampstead and Highgate to the north, and with an oval meadow surrounded by trees and bushes designed by Humphry Repton.

Russell Square (1800), also designed by Repton, acts as a perspective background of Bloomsbury Square. While the latter is a space of transit and visibility for the buildings that surround it, Russell Square, which is reached through the luxurious **Bedford Place**, is a space to hang out, full of benches, footpaths and people, much more human and less pretentious.







In the center of Mayfair, reigns **Grosvenor Square** (1695), although somewhat subjugated by the imposing and threatening presence of Eero Saarinen's American embassy, with its ostentatious security measures. If one manages to abstract from the presence of characters such as Franklin D. Roosevelt, Ronald Regan and General Eisenhower, on their respective pedestals, Grosvenor Square is presented as a prototypical park with some of the most beautiful trees in the city, along with a lawn with areas of shade and sun, crossed by paths that just lead from one place to another without any other further pretensions. On the other side of the embassy, there is a classical flower-filled pavilion with another embassy behind it, which gives an even more serious look to a beautiful square, where the trees contrast with the rigorous brick and stone façades of the buildings that border it.

Grosvenor Square

open or closed to the public,



St James's Square

to dose the privacy of residents,



A smaller but nicely made square is **St James Square**, with a square plan, its two axes and an equestrian statue of William III in the center, surrounded by beautiful buildings. In St James you get a perfect balance between the buildings and the open space, 'a haven of peace in the hustle and bustle of the city' which is one of the effects of the square [83:116].

At the other end of the scale is the imposing **Fitzroy Square**, for many the most beautiful in the city, of monumental character with a serious Georgian air designed by Robert Adams. Surrounded by Grade I listed buildings, it has been the home of well-known figures such as Bernard Shaw, Duncan Grant, Virginia Woolf, Ford Madox Ford, and many others.









Fitzroy Square



Finsbury Circus

The squares are not only used for series of townhouses but also for large buildings, such as Finsbury Circus, with its six floors and an elevation full of attached columns and pediments, when its developer prefers a curved façade.

The **terraces** form alignments of similar, if not identical houses, forming straight streets with homogeneous façades in height, materials and ornamentation - which are often complemented by service back alleys or mews. They constitute the simplest formation - and most used by the developers - to fit in the city, forming streets or neighborhoods simply repeating the model. The noblest form large housing units in contact with nature, usually ornamented with classical motifs.

or the terraces to maximize the yields

Among the different constructions of monumental character that surround Regent's Park on both sides, Conwell Terrace (1823), Sussex Palace (1822), Chester Terrace (1825), Cumberland Terrace (1827) and Kent Terrace (1827) stand out, all in the immediate vicinity of the park. At the southern end of the Regent Street system is Carlton House Terrace (1832), two large buildings of 140 m long on large commercial podiums that shape the image of The Mall, facing St James's Park [28:121].

In the **crescent**, the component of the visual landscape gains weight over other landscape possibilities, by multiplying points of view as origin of varied perspectives. The set is well delimited and complete in itself and lends itself well to that specifically English characteristic of the squares, which Rasmussen defines as *a place where many people of the same class had their houses and it was therefore perfectly in keeping that it should be like the courtyard of a convent* [106:146].

and crescents to manage visibility.

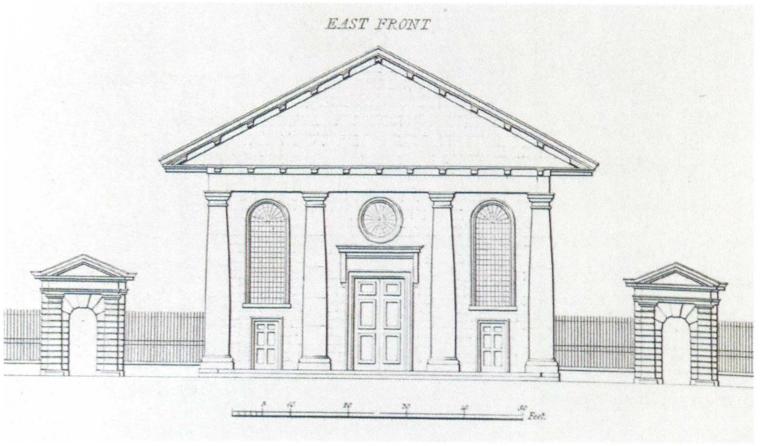
The London commercial arcades, in a way similar to the Parisian passages, were a novelty of the early 1810s in the public sphere. In the rich area of the West End, the Royal Opera Arcade of 1816 or the Burlington Arcade of 1818, were originally culturally linked to the private art.





The Arcade-Metropolitan Railways

Royal Opera Arcade



St Paul's Church, Covent Garden – plan and east elevation [105:115, vol.I]





Covent Garden



Covent Garden, the Great Square of London

The most important of all those space-figures is, without a doubt, **Covent Garden**, an Italian-style square designed by Inigo Jones. His project included all the buildings that define the square, presided over by the church of St Paul's (1631) which situates the main east-west axis. The high arcades of the edges enrich the central space, initially empty, then occupied by an informal market and, since 1830, by a neoclassical structure of little formal interest projected by Charles Fowler.

Its plan, on the other hand, is more attractive, with three strips formed by narrow side bays destined for the shops and wider central corridors, where later some courtyards recessed in the center were added. The deck, initially made of wood, was later replaced by another one of iron and glass, of banal design, built by William Cubitt. The set of spaces of the porticos, plus the open area of the square and the glazed roof corridors, generate an area of great variety, full of life thanks to the stalls, restaurants, cafes and the crowd that congregates around there. The infinity of clowns, musicians, puppeteers, singers, storytellers and other artists who follow one another from morning to night, inside and outside the building.

The stores of the arcades of the square, on the other hand, seem quite pretentious after their recent transformation in search of potential clients of greater purchasing power. In their attempt to improve incomes, they have introduced into a popular and entertaining place a luxurious fashion component, loaded with seeds of gentrification that, if successful, will end up destroying the atmosphere of the square.

Inigo Jones' St Paul's Church is the oldest element in Covent Garden, but it keeps its interest intact, arisen without a doubt from the - if you like - modern proportions of the columns with respect to the roof and the plaza. The overhang of its traditional gabled roof lacks any pretense of wealth, being instead quite unique in its rotundity. Unique is also the layout of the church, which turns its back on the square and offers its entrance on the opposite side from an interior garden which is accessed on both sides.

Antón Capitel explains that the portico responds to an interpretation of Tuscan order according to Vitruvius, sought by Inigo Jones to distance St Paul's - which was the first Anglican church in London - from the 'corrupted transformations' of the Roman Church, going directly to the Classical sources of ancient Rome. But that pretension of original classic purity is betrayed in the lateral arches of the porch, whose Palladian air impregnates the whole. Again, Capitel clarifies that Inigo saw in Palladio an architecture more faithful to antiquity than the fully Renaissance one, already 'contaminated' by the Catholic Church [28:22].

In any case, his search for the primitive breathes an undoubted modernity, given its radical and novel character, which appears in his way of doing things in other buildings. In a city where the classic is reinterpreted once and a thousand times routinely in dozens of large and pretentious institutional buildings, this not at all 'ancient' architecture of Inigo Jones is a breath of fresh air.

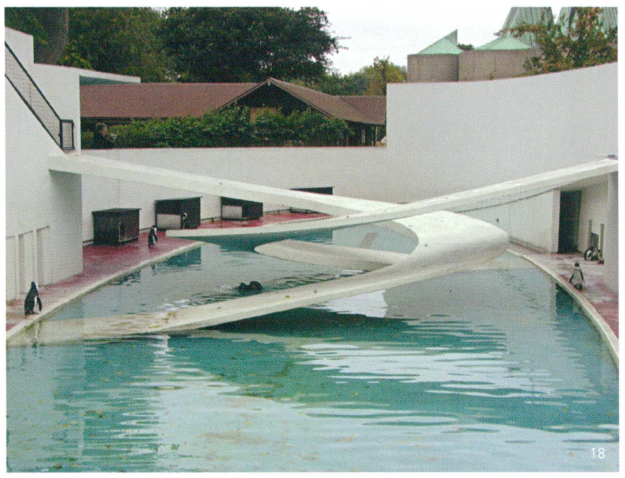


Regent's Park

1. Inner Circle
2. Outer Circle
3. Terrace Houses recortada
4. Park Crescent
5. Old Diorama Building
6. Cumberland Terraces
7. Queen Mary´s Gardens
8. Japanese Garden Island
9. Queen Mary´s Rose Gardens
10. Open Air Theatre
11. Boating Lake
12. North Bridge
13. South Bridge
14. Bandstand R.P.
15. English Gardens
16. The Hub
17. London Zoo
18. Penguin Pool
19. Snowdon Aviary
20. Quinlan Terry´s Villas
21. London Central Mosque
22. Regent´s Canal
23. Park Road Bridge
24. Charlbert Bridge
25. Macclesfield Bridge
26. Primrose Hill Bridge
27. Inner Zoo Footbridge 2
28. Inner Zoo Footbridge 1
29. Outer Zoo Bridge
30. Cumberland Basin
31. Primrose Hill Park





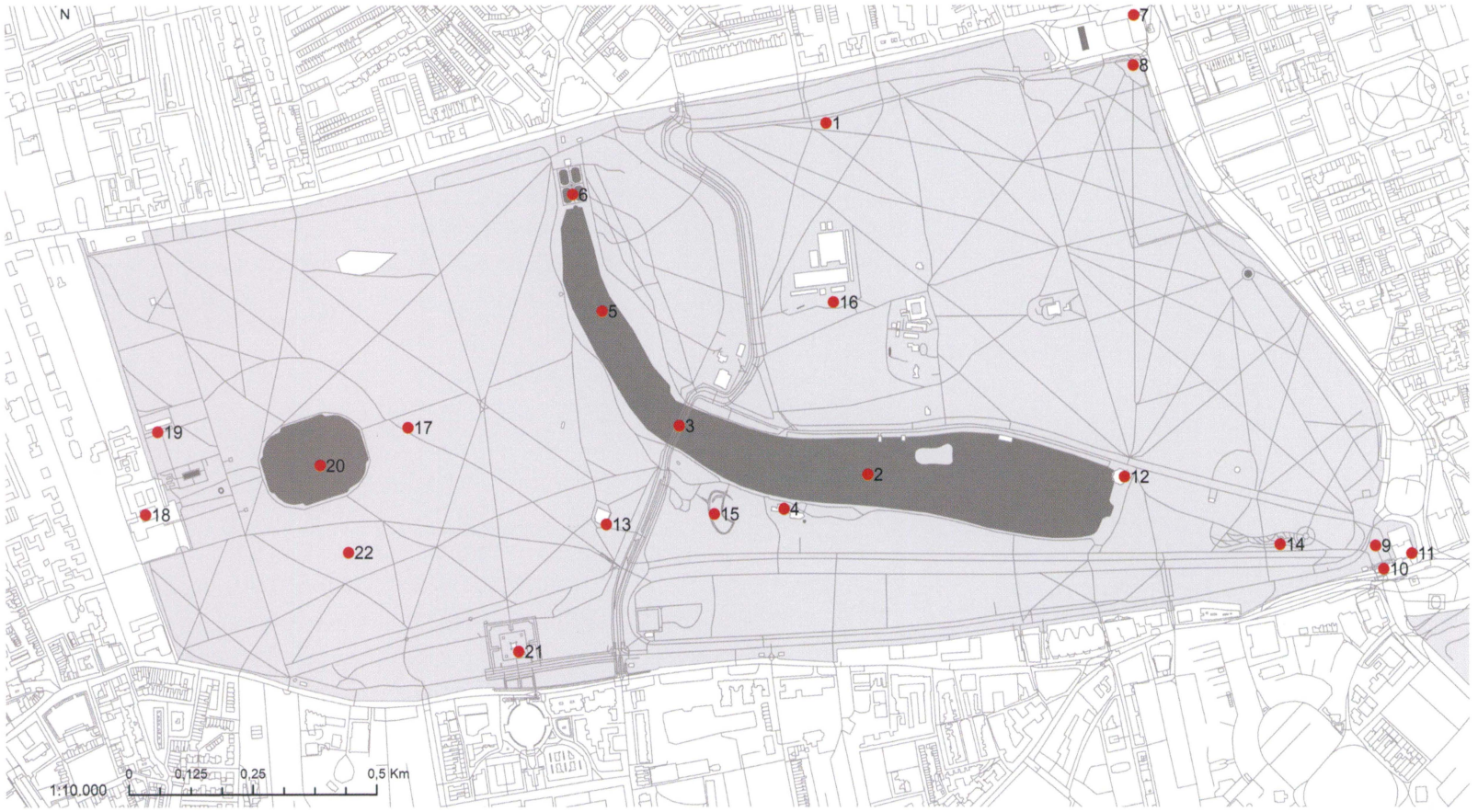


Two Large Parks with Figures

Before being a royal preserve and before the abolition of the monasteries, **Hyde Park** was part of the properties of Westminster Abbey and was opened to the public by James I in 1635. With 248 ha it was the largest park in the city until Kensington Gardens were segregated, and it is organized with a circular path and an artificial lake in its center, the Serpentine Lake, created in 1730 from the Westbourne River reservoir, with a spa on its southern shore. The upper part of the lake, Long Water, narrows until reaching four symmetrical fountains with spouts that make up the Italian Water Gardens (1861), in front of the summer house designed by Wren that closes the perspective. On the east side there are two arches, Marble Arch (John Nash, 1827) to the north and the Constitution Arch (1828) to the south, next to the Hyde Park Corner dedicated to Wellington.

In the eighteenth century the park was divided into two, taking in its western part the name of **Kensington Gardens**, an independent entity although in perfect continuity, only separated by West Carriage Drive and Serpentine Bridge (1826) at the junction with the lake. At the westernmost point is Kensington Palace (1605), acquired by William III in 1689 as a royal residence for 50 years. Christopher Wren was commissioned to reform the palace and design the gardens in 1689 with clear French influence from Le Nôtre; they were transformed with landscaping and opened to the public in 1841.

The Prince Regent, future George IV, commissioned from John Nash a large real estate project in a royal hunting ground located on the edge of the city. The original design for **Regent's Park** (1811), made in conjunction with George Repton, included a large green space with undulating meadows, tree groups and an irregular three-armed lake. It was bounded by a tree belt with a walkway surrounded by a row of 26 villas of varied styles, of which only eight were built, including the Regent's recreation palace. It linked through Regent Street with the official residence of Carlton House in St. James's and extended into the park's interior on the great tree-lined boulevard of Broad Walk.



Hyde Park

1. The Ring
2. Serpentine Lake
3. Serpentine Bridge
4. Lido Café
5. Long Water
6. Italian Water Gardens
7. Marble Arch
8. Speakers' Corner
9. Hyde Park Corner
10. Constitution Arch or Wellington Arch
11. Apsley House
12. Serpentine Café
13. Serpentine Gallery
14. Rose Garden
15. Princess Diana Memorial Fountain
16. The Hudson Memorial Bird Sanctuary
17. Kensington Gardens
18. Kensington Palace
19. Orangery
20. Round Pound
21. Albert Memorial
22. Bandstand

The large real estate development included terraces or rows of townhouses on the east, south and west sides of the park; a double ring row of collective buildings forming a circus with a perimeter walkway; and some crescents, arranged symmetrically to the north. Of the latter are preserved the Nash houses arranged in a horseshoe of Park Crescent (1806-1821) and Park Square (1823-1825) on the exterior of the Outer Circle. These residences were complemented by a periphery of churches, barracks, entertainment venues and markets that were supplied by the Cumberland Basin, at the end of Regent's Canal.

Of Nash's real estate project, only some perimeter blocks and a few houses were built, of which three remain at the end of the Inner Circle, and a part of the urban garden of 200 ha, bounded on the north by Regent's Canal, which was completed and opened to the public in 1838. To the northeast of the park, **London Zoo** (1826) contains two pieces of interest, the aviary (Snowdon, 1964), with its meshed tetrahedron framed in aluminum, and the penguin pool (Lubetkin &







Tecton, 1934), with two clean intertwined helical ramps of white concrete galleries as the germ of future paying museums. An example is the Adelaide Gallery, between Charing Cross and the Strand, open to the public in 1832 as a Gallery of Practical Science to develop scientific inventions related to electricity.[12]

With these figures, the 'city of the rich,' the widening of the city to the west of Regent's Street, acquires an unmistakable physiognomy and achieves urban living conditions that satisfy the British citizen. Both the one and the other are considered 'genuinely British' and are radically different from those that are consolidated in the eastern part of the city.

As Rasmussen insists, *these quarters are London's contribution to town-planning in the eighteenth century* and the same patterns were maintained in the new neighborhoods in the nineteenth century: *blocks of houses intermingled with squares with fine gardens and still preserving a distinct urban character*. And he does not hesitate to associate them with a sought-after English character: a standard house model *which would suit every family with a certain income*. The houses were as uniform as the customs and, both their sobriety and their similarity, correspond to the pronounced reserve of the way of being English [106:147].

Neighbors or adjacent.

In London, the ability to coexist with neighbors is greater than in any other large western city. But that does not mean that there is good vicinity, only that it is instrumented by varied or sophisticated ruses. The domain of the thresholds is absolute, next to luxury there can be misery but, even if they touch, they never get to mix. Just a signal, a barrier, a slight indication, a guard in a suit, warns the intruder.

It is not necessary that signs appear with words such as prohibited, restricted or guarded, a slight mention that the place is 'private' is enough. Although in thatpatio, garden or square there might be five restaurants with dozens of tables, there will invariably be a warning that this space is 'private.' It is a magic word, a kind of spell that indicates an insurmountable barrier. There are no threats or warnings, such as in the United States, where the 'do not pass' sign carries the risk -certain and imminent- of being shot. The guard does not carry weapons, or badge, or uniform: it is enough for him to be well dressed and to pronounce the magic phrase 'this is a private place' and immediately you know you can not pass, or take pictures, although one is always allowed to consume. The intruder may eat or have a drink, but will not pass if he only intends to take a look.

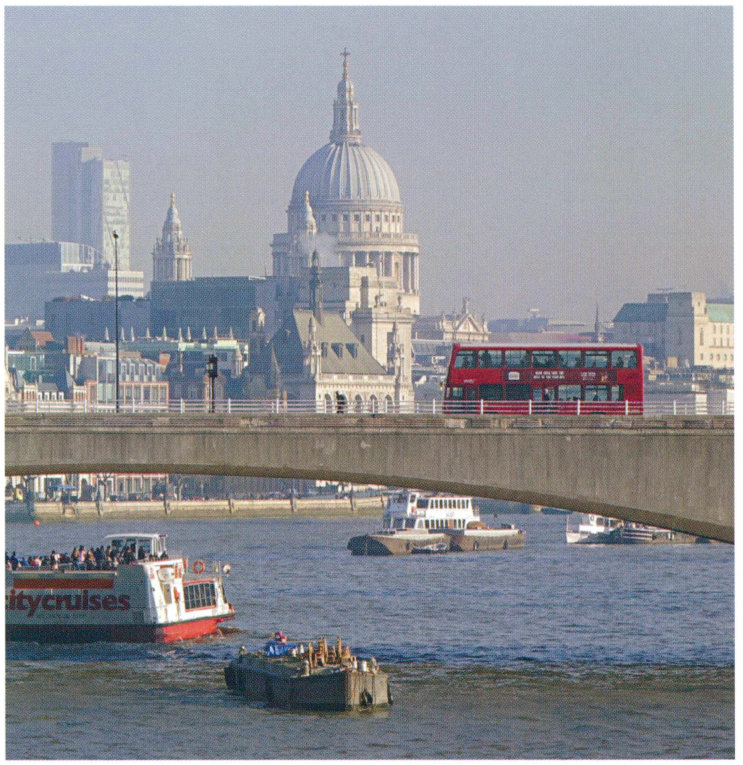
Luxury spaces lack signs; those who do not know what they are, do not deserve to enter. The prior knowledge of the place and its rules is a more effective filter than any prohibition sign and if, in spite of everything, someone passes or asks, will immediately and politely be asked: what can I do for you?

They are not interested in your intentions, you are not asked about what you need or what you want, it is the caretaker who has the initiative to make or grant. But if the intruder goes ahead and explains that he wants to take a look or take a picture, nobody will tell him that it is forbidden or that he can not. You will only hear: *this is a private place*.



Tower Place
(Foster, 2002)

London for tourists





ICONS





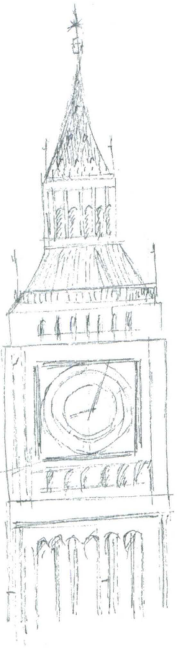




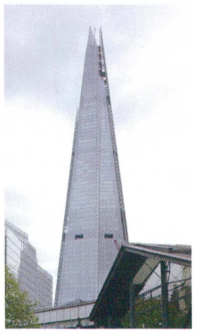




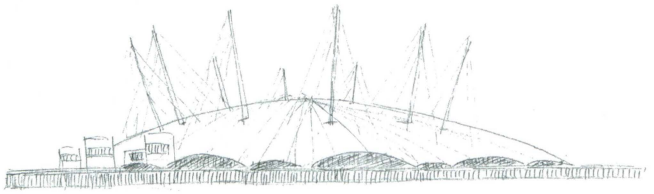
TOURISM

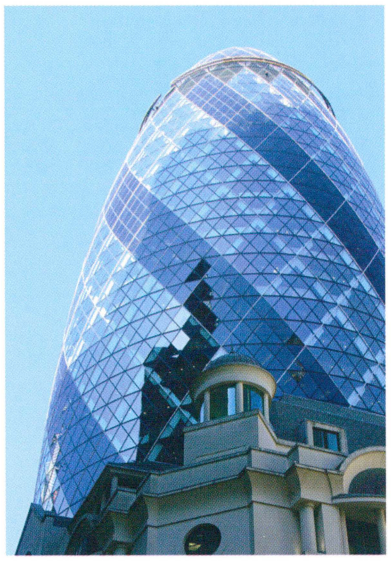




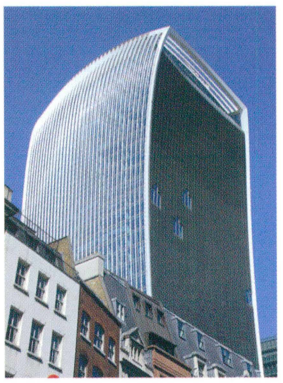








ARCHITECTURE











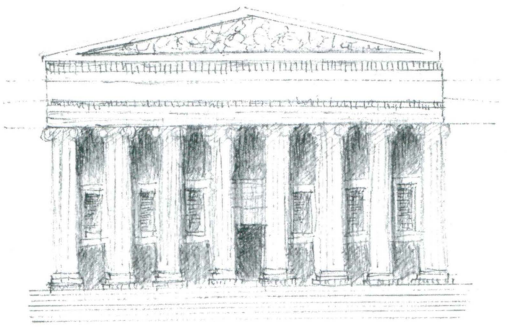


SHOPPING





MUSEUMS





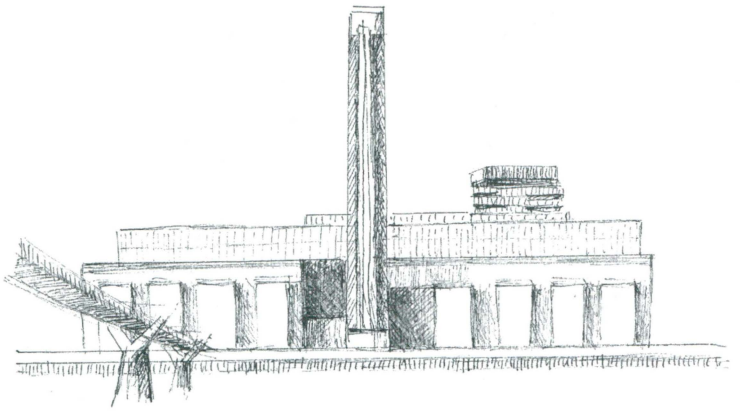






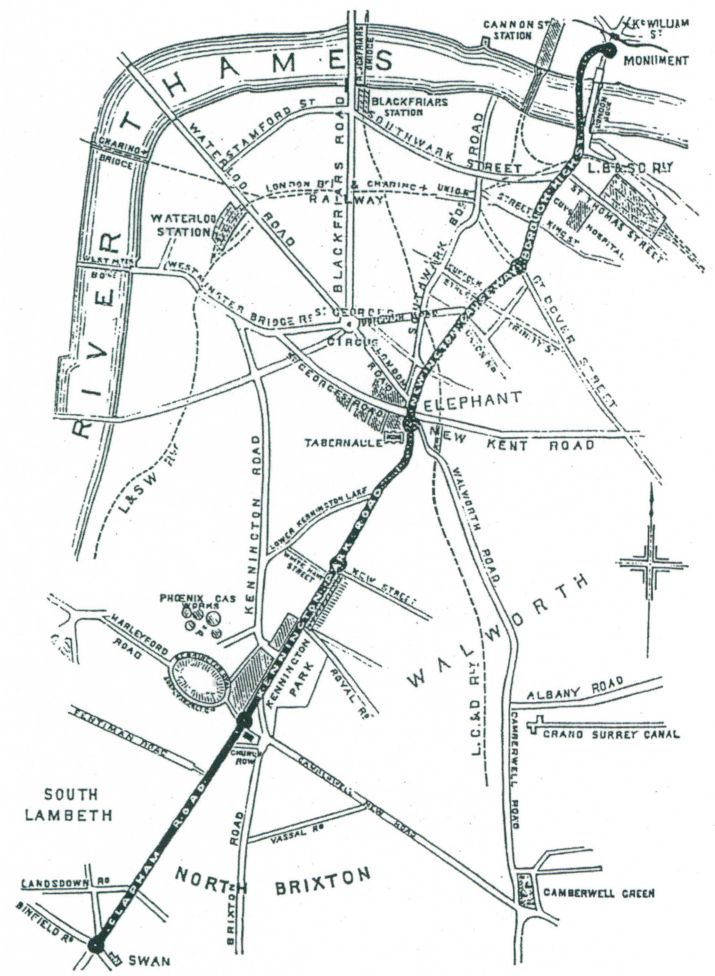






ENTERTAINMENT





City & South London Railway-Barrier and cut of the accesses to London from Southwark

The pulse between road and rail

over the accesses to the city

Plans, Accesses and Rings

In Great Britain, the roads destined to motor vehicles were positively considered by the planners, who understood them as a possibility of improving the city. But they were always conceived of as elements external to the city proper and, in a certain way, as the acceptance of a center that requires different solutions than the periphery.

Patrick Geddes himself applauds the recent trend to build *radial and circumferential* road systems, such as those advocated by Burns before the London City Council for the *Housing and Town Planning Act of 1910*, so *long-delayed*. And he also welcomes the fact that *the railway system is no longer above the community, even in houses of parliament so largely dominated by railway interests as have been ours* [50:232].

The underlying problem was that the adoption of the system of radial accesses and rings introduced to the city many more vehicles than it could absorb. That took time to be understood in London, where railroad interests muddied the issue. But when there was the desire to confront it, the failure of the system was already evident in other great cities of the world, by its economic and environmental inefficiency.

The concentration of journeys in the morning and afternoon requires a capacity of the roads, whose insertion in very built territories increases costs and generates environmental conflicts. In addition, it was found that additional investments in roads generate new traffic and, instead of solving the problem, complicate it. When this became evident in London, the railroads - already nationalized and with a unanimous voice - gained new momentum and regained prominence.

Among the old access roads to the city, the range of roads that cross the river from Southwark deserves special attention, for its contribution to the structure of that part of London and also for what some of its milestones meant as entry or arrival to the city. Some entry accounts show how the presence of the city is understood, regardless of the signs that indicate its administrative limits. For Ford Madox Ford, the notice of entry into the urban is the overcoming of the gloom of the countryside, when everything is flooded with light:

The other year I came in by way of the Kennington Road; along Newington Butts, past the Elephant, up London Road our eyes had grown accustomed to a gloom in the upper air. The Obelisk milestone in St. George's Circus appeared, pallid under its lamps, pale and grimy, Georgian, grim and surprising; the tall wedge of the Eye Hospital was a deep black among liquid shadows deeper still. All the mysterious and gloomy London of ancient names and ancient lives seemed converging out of those shadows into that dark space. And suddenly, at a swinging round of the tram, there was a long trail of quivering lamps, pink, red, and white, low down on the ground, vanishing in the distance of Waterloo Road [47:55].

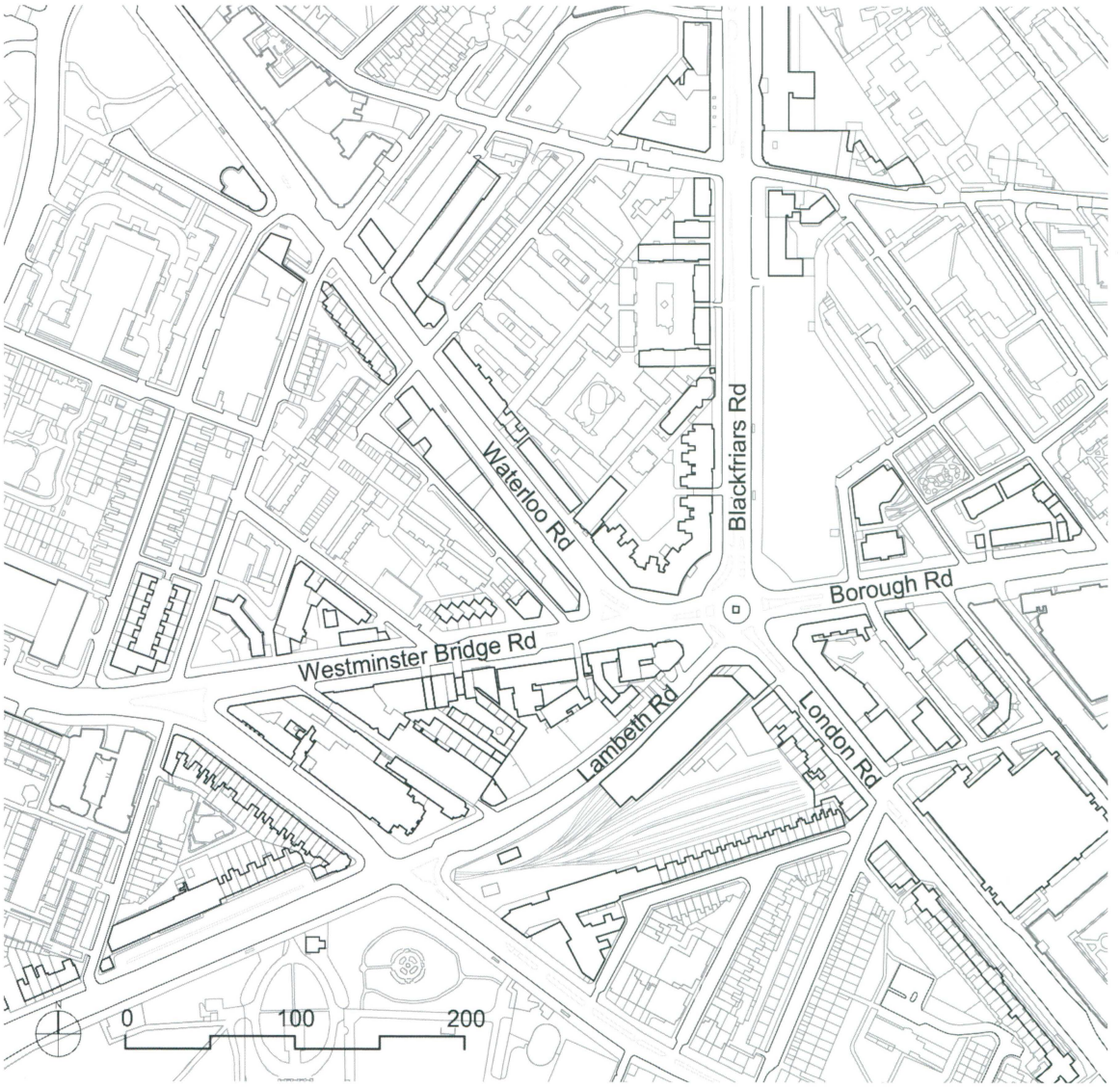
The City & South London Railway cuts obliquely and contemptuously the fine network of roads that link the prominent meander of Southbank with each of the bridges that were built in the city and allowed to select the best route to reach the destination neighborhood.











Plan of the roads of St George's Circus

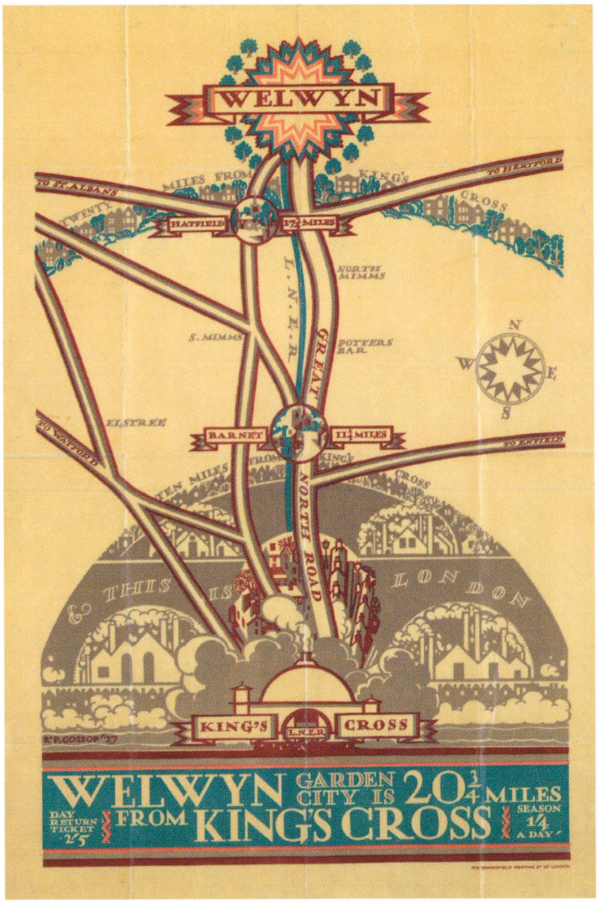
It is a proper distributor that you access by London Road from Elephant and Castle and that forks on four roads, respectively called Blackfriars Bridge Road, Waterloo Bridge Road -which formerly returned to bifurcate to Waterloo and Hungerford bridges- Westminster Bridge Road and Lambeth Bridge Road.

Access to Southwark Bridge and London Bridge is more direct from Elephant and Castle, although there is another exit called Borough Road from the obelisk that shortens the path to both bridges. If that last road is taken into account, the obelisk would order the roads to the seven bridges that access the center of London. And, as usual, the fan immediately generated a ring called The Cut, to access the radial roads from one another without going through the Circus.

began in the 1920s with the highways,

In the 1920s, the first roads destined exclusively for motor vehicles began to be built. The first was in Long Island around 1914, followed by an experimental road in Berlin in 1921 and then generalized throughout Europe with different denominations around the term auto, such as *Autobahn* in Germany, *autostrada* in Italy, *autoroute* in France.

Each country treated its roads and highways in a peculiar way, so it is not easy to generalize about their raison d'etre or way of being, very different from one country to another. There were also very different receptions by the public, so although they are built of similar measures, with the same materials and similar techniques, their implementation does not necessarily have to be similar in terms of motivations, significance and public assessment.[13]



Railway poster for the attractions of Welwyn Garden City, with a graphic that hints at a green belt, 1927. Image courtesy of TCPA-Town and Country Planning Association

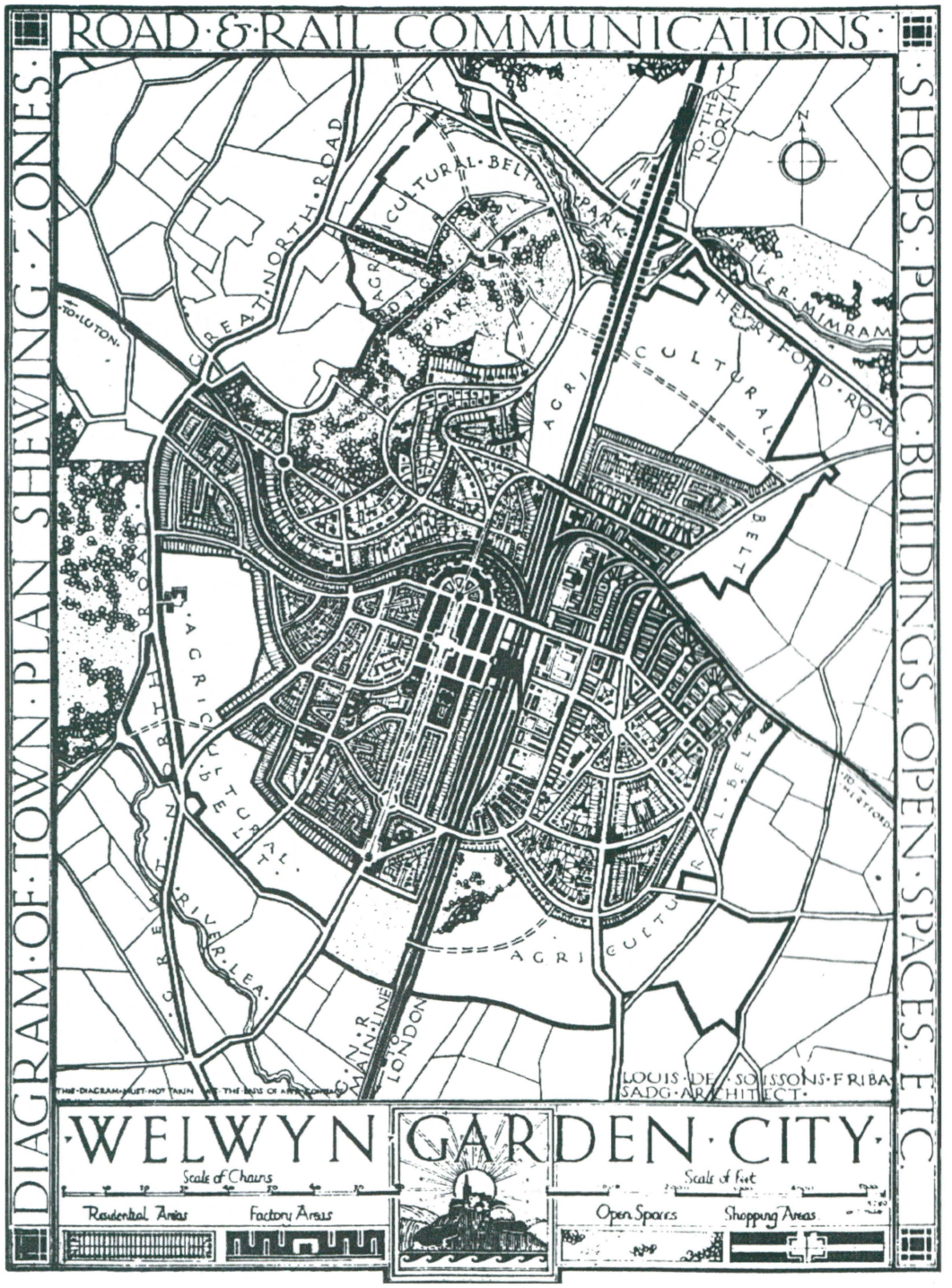
called motorways in Britain,

These new automobile roads, called motorways in Britain, were effectively forced to compete with a dense and extensive railway network, in the hands of a number of private companies willing to defend their interests. Their implementation was a common cause of controversy between Labour and Conservatives, with contradictory opinions even within both parties. The successive governments commissioned studies and plans but serious steps were not taken until the 1960s. There was a Road Act in 1920, creator of a Road Fund, whose unused funds were recovered by the Exchequer, thanks to a Finance Act of purely tax collection purposes.

In 1919 the Ministry of Transport was created and new legislation on traffic was approved in 1924, 1930 and 1934, but all the effort was focused on tending to traditional roads. In 1931 the Royal Commission on Transport issued a report arguing that the road system as a whole was not congested and that new roads were only needed at the entrances to the cities. It also felt that, in view of the stretches of newly made roads dispersed throughout the country, no road plan should be supported that would involve significant amounts of money [29:8].

supported by motor groups

In 1936 the pressure of the industry intensified through various institutions, such as the County Surveyors' Society, the Institution of Municipal and County Engineers, part of the ministry staff, the Institution of Highway Engineers, the Commercial Motor User's Association, the Automobile Association - AA, the Royal Automobile Club -RAC and the Royal Scottish Automobile Club -RSAC, which managed to approve several schemes and even a Trunk Road Act.



Welwyn Garden City by L. de Soison, 1919 [16:400]

In 1937 the German government invited a varied British delegation of 224 people - nourished by members of these institutions - to visit the German *Reichsbahn*. The following year, the British Minister for Transport repeated the visit and, upon his return, approved the construction of an experimental highway for motor vehicles *-motorway-* that could not be built due to lack of funds. In an official report, the Roads Director declared his stance against this type of road, arguing that they could not serve the different types of traffic and vehicles supported by English roads. With this he pointed to the need to build and maintain differentiated networks, and to their enormous cost, difficult to assume.

and reaped the first failure of the roads.

In 1938, of the 7,200 km of trunk roads in Great Britain, only 43 were dual carriageways. Then came the war and still in 1949 it was acknowledged in forceful terms that, in its 30 years of existence, the Ministry of Transport had failed in the provision of an adequate and safe road system.

In addition to pointing out the opposition of the railroad companies, it was argued that the road plans were governed by macroeconomic considerations of growth and employment. And also that, both the expenses of the ministry, as well as the funds raised through taxes on vehicles and gasoline, were subject to dictates of the Chancellor of the Exchequer, British equivalent of the position of Minister of Finance [29:29].

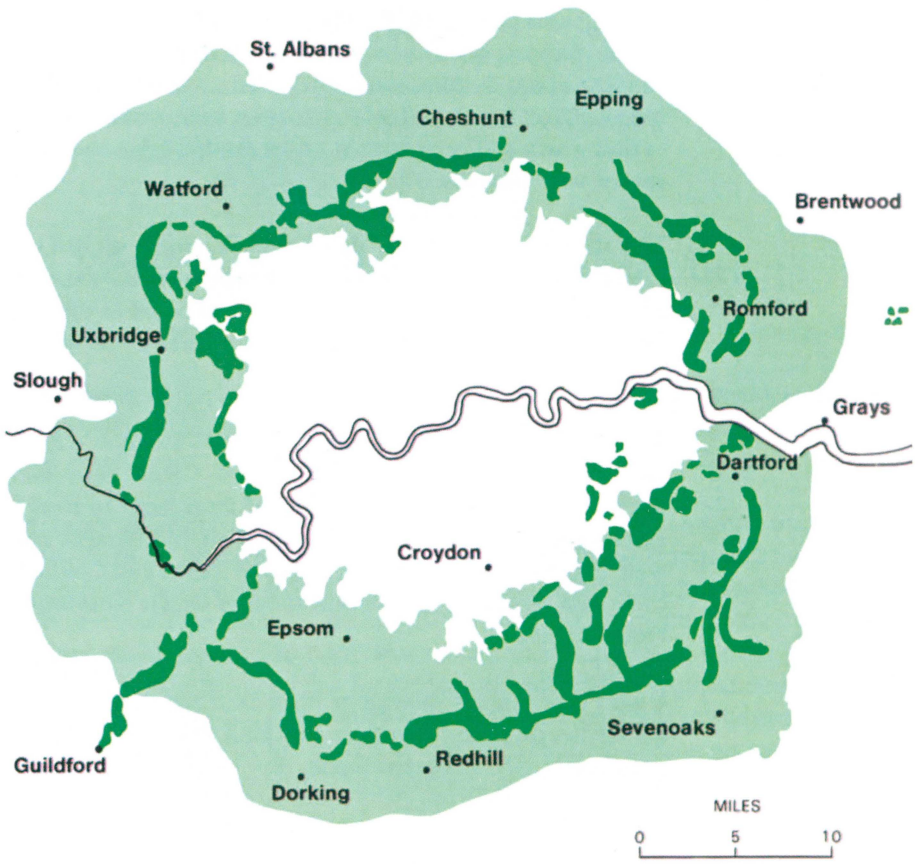
London's Green Belt

Shortly before World War II, Parliament approved the Green Belt Act in 1938, effectively prohibiting further expansion into the countryside, creating a large green area. Indirectly, as an initially unintended effect of that area without urban fabric, the railroad was much favored because, with few stops and long distances, it is much more efficient than the road. Perhaps for this reason, the railway industry did not oppose the enactment of the law.

and the urban planning of the 1940s

The Green Belt was supported by practically all the urban development documents produced in the following twenty years, as well as the ideas originated to harness growth -theoretically prevented by the belt- with the aim of building eight satellite New Towns, of about 80,000 inhabitants each. From the 1960s onwards, it was criticized for its ineffectiveness in holding back the growth of London, which continued outside the belt, forcing longer journeys. Some of its collateral effects were also highlighted, such as the increased cost of apartments in the interior of the city or that the green areas of the belt itself do not offer outdoor leisure opportunities or high environmental quality, as originally intended.

Comparison of Unwin's 'green girdle' with Abercrombie's Green Belt Ring, 1980s. [Cartographic Services Department of the Environment]



Then, the war led to a period of reflection that resulted in a series of important planning documents, mentioned later and used as a model in many countries. The election of Clement Attlee as prime minister in the last days of the war, reflected a popular expectation that planners could create a more efficient and prosperous world in times of peace. City planning was an integral part of this vision. The State took the lead in housing construction, and also took over the transportation system.

As Fernando de Terán points out, in 1945 there was a monumental milestone in the history of urbanism: the Plan for Urban Reconstruction in London, written up by Sir Patrick Abercrombie, which guided the development of that city for many years and served as a reference to other urban planning plans throughout Europe.

The famous Barlow Report of 1940 was a decisive influence on the drafting of the Abercrombie document, on the distribution of the industrial population, considered as a fundamental referent for the development of regional planning due to its economic content. Together with the Reconstruction Plan, it served as the conceptual basis of the policy of housing and urbanism that led to the creation of the New Towns from 1946.

For the first time, the process of concentration in the city is analyzed, with its evident advantages of economic efficiency and cohesion, while generating unemployment in depressed areas. These consequences began to be understood as two sides of the same coin and inspired policies to contain the explosive growth of large cities.

they faced concentration and growth,

As a direct consequence, says Terán, *in 1943 the Ministry of Regional Urban Planning was created, which worked from the beginning on the development of the ideas of the Barlow report, preparing decentralization procedures through city plans and territorial county plans. And the Town and Country Planning Act of 1947 would establish the typology and characteristics of the territorial urban plans of the British institutional system*.

These approaches remained valid for a long time, serving as support for a new series of plans *that granted England a prominent and referential range in universal urban culture and policy in the mid-twentieth century, inserting aspects of economic planning and proposing induced industrial development areas*.

A planning process originates that is then supported and maintained decisively and continuously *for enough time to configure a vast territory as it is now, that is, in a globally structured way that could never have been achieved without continued political action to maintain it*, such as the Strategy of Development of the Southeast of England of 1967, when extension of London's planning to the whole regional area became necessary.

with territorial, industry and employment plans.

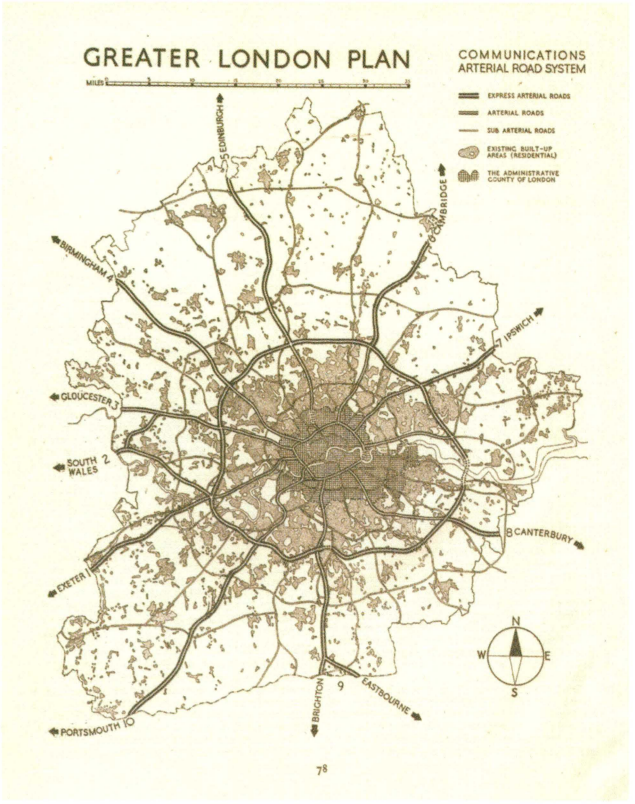
In England, growing concern about unemployment in depressed areas led to the approval of the Special Area Development and Improvement Act of 1954, *the first official attempt to solve the employment problem by creating jobs and first attempt to influence from politics the spatial distribution of economic activity*. And from 1957 the creation or transfer of industries began to be stimulated, and the problem was again related to the perception of the growth of London and other large cities as excessive [133:28-33].

During the decade of the 1960s, Great Britain undertook great projects of construction of motorways, in principle foreign to the territorial planning in spite of their evident relation. The road plans had enormous urban effects, but it will take decades to address them together. Birmingham, for example, was crossed by Spaghetti Junction and other cities had road plans with similar effects. That ended up generating important public protests. But it was the emergence of the motorways that connected both issues.

The attempt to build motorways in the 1960s

At that time, Robert Moses tried to pass a highway through downtown New York in Soho, causing an angry reaction from the neighbors that Jane Jacobs ended up leading. The result of that struggle was her 1961 book *Death and Life of American Cities*, which already includes as subtitle *The Failure of Town Planning* [74].

In London, the trigger for the biggest protests was the A25 bypass project. The planners had published the design of a ring road around London with



Greater London Plan; Communications. Arterial road system. Greater London Plan 1944; by Patrick Abercrombie; Published by His Majesty's Stationary Office, London.



London Bridge from The Shard

a huge ellipse, above the houses, but at that time the first public demonstrations against it began to emerge. As the highway approached London from White City, cutting the ends of the old terraces of the streets and separating the adjacent sites, and while drivers used the new highway as a race track, public meetings of opposition began to be held throughout London.

The main conflict originated with the design of the knot planned for Camden Town, with a large roundabout and crossings at three levels to organize the accesses to both directions of the Westway bypass and the crossing under it, which completely destroyed the enclave and also affected Hampstead with one of its branches. Road planners did not think they were provoking a revolt, but people opposed the plan, forcing the government to stop the construction of motorways. As a result, the Westway carriageway ends abruptly at Edgware Road.[14]

stumbled on the Camden Town knot

The neighbors were aware of what happened a century earlier in the City, with the construction of the great trench of the Metropolitan Line, from Paddington to Liverpool Street Station, passing through Euston, Fenchurch and Moorgate. Some people were then expelled from their homes, while others were so uncomfortable from the noise and dirt that they fled to the outskirts. The City of London lost 90% of its population between 1860 and 1880, which moved into the new neighborhoods of the west and began to generate a huge demand for single-family homes attached to areas further away from the center.

with strong citizen opposition,

However, the railroad was not the first occasion to provoke opposition among Londoners, who had rejected attempts to domesticate and direct their growth on many occasions: they ignored the attempts of the Tudor monarchs to prevent the growth of the suburbs outside their walls; and they refused to accept Christopher Wren's master plan for reconstruction after the Great Fire of 1666.

If there was a fierce opposition inside, outside the city, however, the highways received more aid without generating much opposition. In principle, the construction of roads or highways was presented simply as the natural march of 'progress.' The Chiswick overpass and the first section of the M4 motorway, the main route between West London and Heathrow Airport, opened in 1959. The connecting Hammersmith overpass opened to traffic in various stages from 1961 to 1965. According to Schabas, there seems to have been little analysis of whether these new roads were worthwhile: *the benefits seemed obvious, and at least initially the costs to the government were affordable.*

that rejects them inside and applauds them outside.

There was, however, no real overall plan, and no clear understanding of whether or how London would be transformed from a "railway" city to a "motorised" city. In 1963 the government published a study by civil engineer Colin Buchanan, Traffic in Towns. *It became a bestseller, at least for a transport book, with 18000 hardback copies purchased and a shortened paperback version by popular publishers Penguin Books. Buchanan had been asked to consider how British towns and cities could be rebuilt to accommodate the automobile.*



Tower Bridge Road



North Circular Road

After that, a report is requested from Buchanan,

Buchanan suggested that motorways were only part of the solution; wholesale rebuilding of central London would be required if it was to accommodate unconstrained motorisation. While Buchanan occasionally demonstrated sensitivity to historic communities, he did seem to believe that the plans should be implemented, stating, "It is clear that any attempt to implement these ideas would result in a gigantic programme of urban reconstruction. We see no reason to be frightened of this." But others found his vision of London rebuilt for the car, with pedestrians segregated onto bridges and decks, less than compelling (…). Enough of London had been rebuilt in this form by 1970 that the seductive power of architect's drawings was tempered by the realisation that this might not actually, be a nice city to live in. Certainly it would not be the London most people know and love [112:11].

In parallel to these discussions about their effects on the city, external motorways continued to grow. The M1 London-Leeds extended to the south, from Watford to the North Circular Road in several phases, from 1966 to 1977; the last section that was built was carried out in conjunction with the realignment and electrification of the Midland Main Line railway. During the 1960s, the elevated Chiswick path was extended in stages to Bristol forming the M4, a six-lane motorway.

while the motorways are growing

For its part, the construction of the M 11 London-Cambridge motorway was delayed due to a debate on whether to follow the valleys of the Lea River or pass through the Roding. This last route was selected and the motorway was inaugurated in 1977. Work was also done on other radial motorways, including the M2, M23 and M3, while other roads such as the A3 and the A13 were improved as dual carriageways, built with slightly lower standards and incorporating sections of existing roads. These motorways made it easier to drive into the interior of London, but both routes were still shallow arteries, with traffic lights, during the last kilometers in central London. And they were built primarily through open space, with limited impacts on residential property.

Although the radial motorways were central government projects, the rings were the responsibility of the Greater London Council (GLC), a regional government created by the Parliament Act of 1963. Its predecessor, the London County Council, only included 'inner' London and, sometimes to the chagrin of the conservative central government, it had come to be controlled by Labour. The new GLC limits were extended to include almost all of London within the green belt, including several prosperous and conservative outer districts.

with government radials and GLC rings,

The GLC had taxing powers and 'strategic planning' responsibility, especially for transport. Since 1970, the GLC also had control of London Transport (LT) and, therefore, local public transport, including the Underground and buses [112:11].

However, everything changed in 1970, when the A40 (M) Westway routes and A41 (M) West Cross connections were opened. These urban extensions of the M40 London-Oxford motorway were understood as environmental disasters, which ruined the communities through which they passed. The first stages of the ring-ways were practically the last ones. Despite the rapid rise of car owners and the technical arguments that, without the new roads, London's traffic would always be stuck, the scale of transformation required produced great dissatisfaction. At a time when many people still lived in crowded, damp and unheated houses, the revelation that these rings would displace more than 7,000 houses, in reality a small fraction of the total housing stock, was mostly understood as serious as its financial cost.

that produce some environmental disasters

The GLC planners tried to justify the scheme in terms of cost-benefit, but with a weak argument that could only be mounted with optimistic estimates of costs, ignoring the corresponding secondary improvements that would surely be necessary in road connections to deal with the millions of cars leaving the ring-roads.

and worsen air pollution.

There was also a new appreciation of the effects on health of air pollution from motor vehicles and a growth in the environmental movement. Since the 1950s, natural gas had replaced coal as the main heating fuel and London had become a 'smokeless' city for the first time in 300 years. Whereas in 1970 California already demanded that automobiles be equipped with catalytic converters, in Britain there was little control of automobile emissions and leaded gasoline would continue to be used until the 1990s. By the end of the 1960s, automobile emissions were replacing coal as the main source of air pollution in British cities. All these factors led many to question the wisdom of building urban highways.[15]

The London Ring Road Program was formally and finally abandoned by the GLC in 1973. But the construction of motorways outside of Greater London was maintained and the M25 bypass was opened in stages until 1986. With a route through the green belt with widely spaced knots, it is probably the only urban ring road in the world now not surrounded by commercial centers, warehouses and industrial parks.[16]

Mrs. Thatcher's revolution

In 1979, the Conservatives returned to power with Margaret Thatcher. Her government was a radical challenge to the post-war consensus on municipal policy, transportation and local development, areas that would be led by the private sector. The funds for the construction of public housing were exhausted while the aid programs for the purchase of housing were extended. The new policy guideline gave developers more reasons to appeal against the refusal to plan applied by local governments. Although the green belt remained untouched, it was easier for developers to obtain permits to build in 'Brownfield Sites,' that is, in abandoned or unused industrial sites due to soil contamination or containing hazardous waste.

Beyond the green belt, there was an explosion in the development of commercial areas with supermarkets and large parking lots. In the metropolitan area of London, large stores were built on land vacated by industry. The planners opposed this practice, because it weakened the existing urban centers and further reduced the use of the bus for shopping trips. But retail became more competitive and new stores were more convenient and efficient than the narrow premises of urban stores, both for retailers and consumers [112:24].

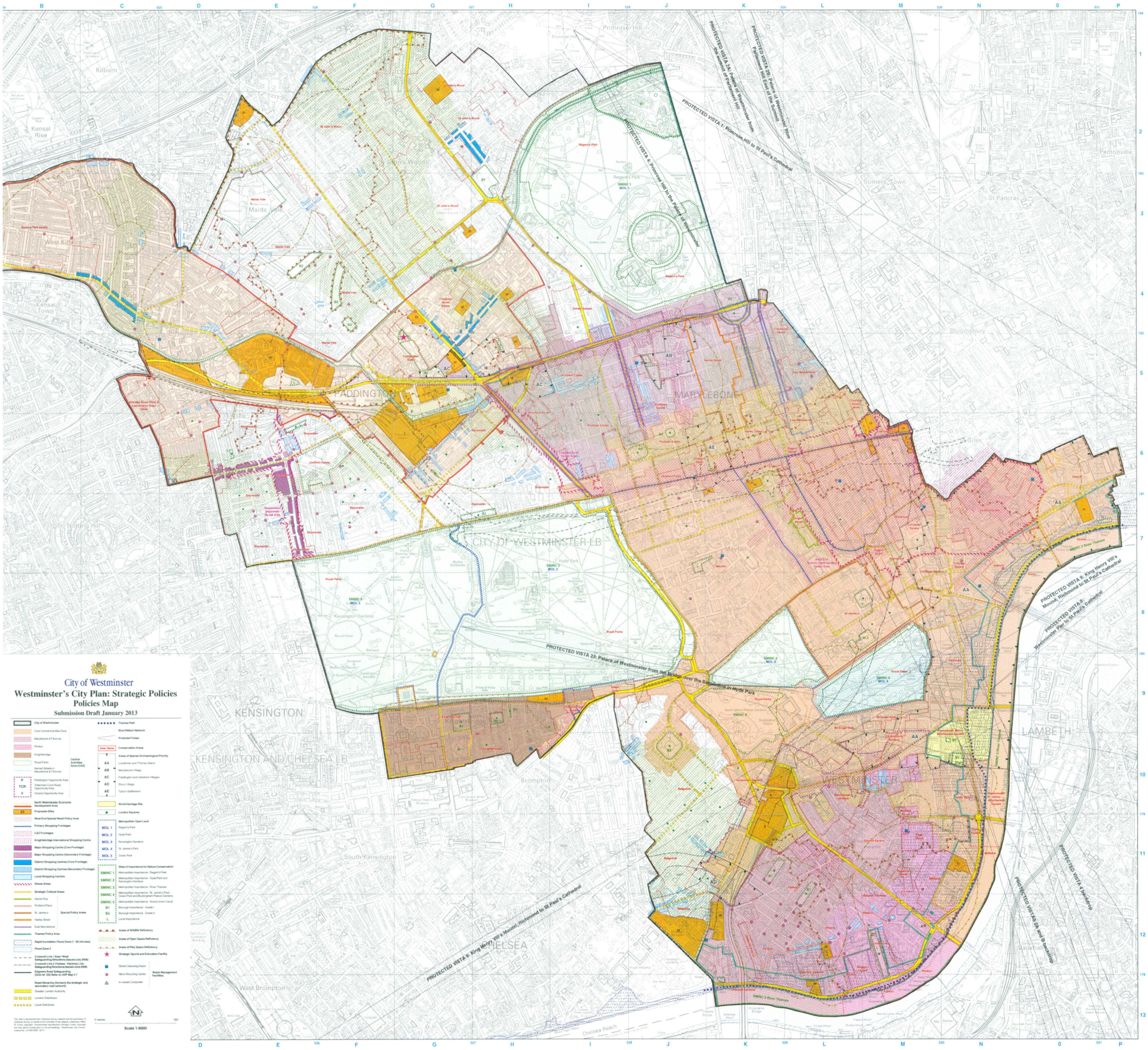
produced successes that ignored the plan

On the other hand, some of the greatest urban transformations occurred by chance. Londoners only massively supported plans to extend to the west when the military - aside from any planning - decided to build a bomber airfield at Heathrow, which later became the largest airport in Europe; and the development of Canary Wharf in the east was also alien to the city's plans, as it relied on the abusive use of fiscal stimuli for purposes other than the intended support for small businesses.

There are those who believe that London is a mildly anarchic city that has always grown haphazardly between outbursts and starts, and that quality is what is behind its robust long-term health.[17] Although many urban initiatives have proven successful, it would seem that the more prescriptive the plan, the greater the probability that it will be irrelevant, poorly received and even counterproductive.

Borough High St from The Shard





Westminster City Plan. Strategic policies (January 2013) [Protected views of monuments or places, in fine black lines]



Model of London in The Building Centre

In fact, it does not seem easy to defend that some initiatives, usually mentioned as possible successes, derive from the strict fulfillment of a plan: the 'heroic' Nash plan to rebuild the city after the great fire was ignored, although some of its grandiose proposals were made and applauded. The London Underground is an example for the world, but it seems to be due more to a pragmatic conciliation of private interests and less to the fulfillment of a previously drawn plan.

and pushed pragmatism

On the other hand, the meticulously designed plan carried out in successive stages by the City of London of the whole of the Barbican Estate, London Wall, London Museum and the Guildhall has produced one of the least attractive areas of London. And the radial highways and circuits plan, in principle exemplary and applauded by all European local governments, proved unattainable.

Perhaps even worse, as in his famous 1981 *Great Planning Disasters*, Peter Hall devotes the third chapter to London's Motorways, with a devastating beginning: *The most important point about it is that it does not exist. Or, strictly, only small fragments of it exist - some forty miles, out of 350 once planned. These fragments terminate arbitrarily at junctions that lead nowhere. The rest is abandoned, and for the most part, even the lines of the motorways are no longer safeguarded by the planners* [58:56].

to build highway fragments

The existence of the plan itself was really ephemeral, it only lasted thirteen years, from the decision to conduct a large survey on traffic in London and the corresponding plan in 1961, to the abandonment of the Motorways' Plan by the newly elected Labour Party to administer the Greater London Council in 1973 [29:74 *et seq*].

and the road plan was abandoned.

His Spectre driv'n by the Starry Wheels of Albions sons, black and
Opake divided from his back: he labours and he mourns.'

For as his Emanation divided, his Spectre also divided
In terror at these starry wheels: and the Spectre stood over Los
Howling in pain: a blackning Shadow, blackning dark & opake
Cursing the terrible Los: bitterly cursing him for his friendship
To Albion, suggesting murderous thoughts against Albion.

Los raged and stampd the earth in his might & terrible wrath!
He stood and stampd the earth! then he threw down his hammer in rage &
In fury; then he sat down and wept, terrified! Then arose
And chaunted his song, labouring with the tongs and hammer:
But still the Spectre divided, and still his pain increasd!

In pain the Spectre divided: in pain of hunger and thirst:
To devour Los's Human Perfection, but when he saw that Los



5 | Global City

Densification. The Tower

The banks of the Thames are clouded! the ancient porches of Albion are Darkened! they are drawn thro' unbounded space, scattered upon The Void in incoherent despair! Cambridge & Oxford & London, Are driven among the starry Wheels, rent away and dissipated, In Chasms & Abysses of sorrow, enlarged without dimensions.

William Blake, 1808[1]

A Denser City

Increase population without extending the city, / before with crushing masses of brick / and now with shiny glass surfaces,/ but with greater demands of mobility. // Substitution of the obsolete and recovery of the old. // The old channels run along new banks, / and give color to the glass of the offices. // Persistences. // Charterhouse. // Rehabilitate or build. // Recovery of the recent- Isokon Flats (1934).

Areas of Opportunity

Office landscapes. // Living with the monumental. // Planning the walking routes. // Public-private spaces. // Opportunity Areas. // Battersea Power Station Area. // From the Docks to Canary Wharf. // Docks, walks and homes in other areas. // Local development in the stations.

Moving Better in London

After a consolidation of companies in 1923 / came nationalization in 1948, / with cuts and reduction of lines in 1960 / that ended up being privatized in 1994, / and nationalized again in 2002. // Transport for London coordinates the modes / to improve their joint use / and start two big projects / with new financing means, / a car reduction policy / and densification of the city. // With the current construction of tunnels / new lines are undertaken in the 1980s / and now Crossrail from east to west, / which intersects with Thameslink in Farringdon, / located and designed for transfers / and financed with overbuilding rights, / while Thameslink goes from north to south / with pending and old stations. // Navigating the river,/ with the help of marinas and piers.

Further with Airports

Plans for the third London airport. // Access by road and rail.

Spaces of Concurrence

London and cinema. // The football stadiums-Wembley / was reformed for the Olympic Games, / and wants to be a world reference. // Arsenal stadium is the largest, / although there are other football stadiums. // The Olympic Games, as an excuse / for the local development of Stratford, / supported by transport terminals / and ennobled with parks and sculptures. // Recovery of theaters// The rogue Bankside neighborhood / recovers the classic theater in 1997 / and welcomes modern art in 2000,/ while bypassing the river towards St Paul's/ and it expands again in 2016 / while other museums are modernized.

A Denser City

Increase population without extending the city,

The policy chosen to increase the population without extending the city takes advantage of all fronts and opportunities for action, which are presented here grouped into four lines of action: the recovery of the old, the provision of jobs through the creation of offices, the construction of security and the height increase of the buildings.

These actions are concentrated in certain areas of opportunity, so called because they are places of maximum accessibility, such as obsolete spaces of railway stations or areas of good accessibility that allow the use of overbuilding rights on public land. Often, these areas use up the possibilities of transformation of public spaces into private-public spaces, generating a particular problematic and a peculiar debate about use versus property.

before with crushing masses of brick

The brilliant Ford Madox Ford, invoked in previous chapters, died in 1939, but his reflections from 1905 have not lost validity: *Tall blocks of office buildings are crushing out the associations of the Westminster courts, alleys and squares. We see terra-cotta ornamental excrescences, meaning nothing to us… they have no associations. The Memoirists have not yet written them up. But to our great grandchildren these excrescences will have meanings and associations, these heavinesses will be suggestive, because we, their ancestors, lived amongst these things our pathetic, petty, and futile lives* [47: 171].

The global city shows how pertinent his comment is. For his great-grandchildren, the terracotta generates associations by its own presence. That heaviness that crushed memories, today suggests them showing that it is still alive and housing the work. Although not as many as in Berlin, there are many warehouses, factories and buildings - old and huge - recovered for offices.

There are good examples, such as the **Waterhouse Square** complex in Holborn, between Brooke St and Leather Lane, a block occupied by a single building with three large patios of red pottery and Gothic feel, ignored in the guides but able to impress even the most staunch defenders of the modern movement. Neatly restored, it houses a score of companies in luxury offices, whose presence radiates into the neighborhood, sowing the sidewalks with cafes, restaurants and terraces.

and now with shiny glass surfaces,

Since the 1990s, the universal vocation of the city has found new ways to multiply its presence in the world. The offer of specialized financial services was the new engine of that old impulse, and brought with it the need for large office areas. In principle, the new computing and telecommunication possibilities seemed to allow these activities to be developed in any place, as they did not require specialized facilities.

However, when computing became completely mobile, it became essential to increase physical proximity with the rest of the industry. The speed of electronic transactions required the support of stronger relationships, which required more personal contact. For the city, that means more offices together with easier and more frequent trips, both inside the city and to distant destinations.

All this has fed back the tendency of London to continue growing, and makes it increasingly dense and more functionally extended. The old controls and

limits to development have shaped its growth into a compact form, where the continuous built area of the city remains within the boundaries of Greater London. However, contemporary London is geared to a functional region of more than 17 million people that extends beyond these boundaries, leaping over the green belt in all directions and spilling more and more all over the South East of England.

Multiple regional interdependence is increasingly evident, from the shared communication channels to the extended 'commuter networks' and the superposition of labor and housing markets. There is more and more long-term decentralization of employment, higher peripheral growth than in the center and new economic clusters and development corridors outside of Greater London.

However, despite these tendencies to the contrary, daily commuters to the city constitute significant quotas of the workforce in most of the region. The daily work trip to London is dominant and its average duration is about 43 minutes for the whole of London and 56 for the center, more than 85% of travelers using public transport.[2]

but with greater demands of mobility.

Waterhouse Square











Spitalfields Market

After flooding the south of the country, London uses its commercial experience and its imperial past to overcome the narrowness of its roads, the territorial proximity of the train and the dominion of the seas, and to spread through the air to the whole world. Three of the five international airports frequently used by Londoners are located outside Greater London, more than 55 km or one hour away from central London in the case of Luton and Stansted.

Areas of opportunity arise for a wide variety of reasons that encourage action, although the most powerful of them is usually the need to renew. A building or facility may be disused or half-demolished, and the opportunity will arise to fix it and build something else on top or alongside. It may be an action to replace something miserable with new constructions of higher quality, which will probably bring some kind of gentrification, inevitably.

Substitution of the obsolete and recovery of the old.

Other times they are industrial buildings, such as power plants or obsolete transport facilities, mainly railways in the vicinity of unused stations and docks, near the old ports. These types of places are the most demanded by the developers, since they usually have a lot of space and good accessibility, preserved from their old function, and have the support of the administration.

The river, as the only free space, has the appeal of width, although it is increasingly used on its shores. In larger sites, the invasion occurs by neighborhood, growing by successive adjacencies that generate a nucleus in which it is worthwhile for merchants to set up shop. In general, the process is directed by the different Councils of each neighborhood or area, which usually prefer large actions by solvent developers, able to face the fluctuations of the market, rather than the retail market of scarcely governable actions, in which the provision of endowments is more complex.

But there are infinite particular cases that take advantage of any loophole to propose a performance absolutely attached to concrete reality. Any crack in the urban fabric provides grounds for improvement and an opportunity to make the city. The rehabilitation of an old market, for example, generates a revitalization of the stores located in its interior that, by extension, invades its surroundings and motivates the recovery of business buildings and residences in a whole neighborhood, as happens in Spitalfields.

The old channels run along new banks,

In few places do the old and the new coexist in sight as they do in the canals. Old and long ships of ancient nomadic life with a roof full of odds and ends, wheelbarrows, bicycles, hoses, pots with flowers, coiled ropes, life preservers, wood piles, fenders or garbage bags, remain moored next to nickeled terraces with furniture of more modern design and very cool people, beautiful and indolent, imbibing concoctions of Caribbean resonances.

From its narrow cabins the interior is barely visible: you can see books, kitchen utensils, colored curtains, different traces of lives alien to anything that happens less than two meters away. From time to time a solitary crew member emerges with work clothes and many tools fixing a motor or chair.



Regent's Canal between Whitemore and Rosemary Bridges



Regent's Canal-City Road Lock



Regent's Canal - Branch Place



Regent's Canal - Kingsland Basin

In the middle of the afternoon, the inhabitants of the canal go out to sunbathe in the narrow bow and stern spaces, as it is rare for them to leave the boat to sit on the shore. There the stainless steel of the buildings remains cold and indifferent alongside of the painted plates of the hulls and the plywood of the superstructure. Behind the large windows of the new offices, bored employees of the ubiquitous real estate agencies let their eyes roam the channel without even recognizing themselves not even badly in those who work in those boats.

From time to time strange devices appear that permit maintaining life in the canal. A bubbling line from side to side involves an injection of oxygen to prevent the putrefaction of the water and allow the boats to circulate, without it filling with vegetation. Chains of buoys also appear barring the way to useless branches or draftless zones.

It is also a paradise of footbridges and overpasses: old, modern, steel, stone, brick, concrete. Any material is good, but modern designers often prefer a fleet rather than right angle passage, to give more dynamism to the crossing.

and give color to the glass of the offices.



St Botolph's, in Aldgate

All Hallows by the Tower



The old neighborhood of Aldgate is now the border between the conspicuous development of the eastern part of the City and the still undisturbed zone of East London. The new offices are advancing there and surround some scarce remains worthy of conservation, producing citadels of coexistence of the old and the new. The church of St Botolph's, surrounded by brand-new colored buildings, defends itself from harassment by showing its slender spire among the banality of offices.

There are similar examples of churches surrounded by offices or residential buildings throughout London, to the point of having become a habitual urban aesthetic of its own, perhaps less shocking the older the surrounding buildings are, yet in the same style. Basically, it should not be forgotten that many of them were born with the desire to 'mark' the physical presence of the Church in the urban fabric, in addition to offering their religious functions to the neighboring communities.

Charterhouse.

150 m northwest of the great towers of the Barbican Estate, one of the few medieval sites preserved in London has recently been recovered, with a long history of monks, deaths and occupations. It is an old monastery of Carthusian origin, later known as the Carthusian House of Salutation, a house of health formed through private acts of philanthropy [142:27], after an amortization dictated by Henry VIII. In 1538, the king ordered to hang, draw and quarter 18 monks of the monastery, because they refused to recognize him as head of the Church,[3] while the prior's arm was nailed to the door and other monks ended up starving in Newgate prison.







Charterhouse



Shadwell Basin Bridge

He then relinquished ownership of the place to several wealthy nobles, who rearranged and expanded the buildings to create a large Tudor-style mansion, large enough to receive Queen Elisabeth before her coronation, and later James I. At the beginning of In the 17th century, the property was acquired by a Thomas Sutton, considered 'the richest commoner in England,' who established it as a school for 44 poor children, together with a hospital for 80 gentlemen without resources. The school, still known as Charterhouse, eventually moved to Surrey (in 1872), but the pensioners remained in London, although much of the site, which was seriously bombed in 1941, was ceded to Bart's Hospital Medical School [85:84].

Since 1348 there are records of Black Death burials in its courtyards, some of which have recently been discovered by the Crossrail excavations. After a long restoration work, at a cost of 4.2 million pounds financed by the Heritage Lottery, the monastery can be visited, for the first time in more than 400 years, since the end of January 2017.

A part of it remains a residence for 40 poor, single, 'brothers' over 60, formerly reserved for *'decrepit or old captaynes either at sea or at land, maimed or disabled soldiers, merchants fallen on hard times … by shipwreck or other calamity,'* and now populated by *retired actors, musicians, teachers and clergymen … in need of the support of a community for the rest of their lives*.[4] The complex of patios and lounges forms a medieval citadel installed in the heart of London, adjacent to luxurious private residences maintained in its old gardens, a genome research center and several courtyards for university use, all within a few meters of the gigantic Smithfield market, located on the same street.

Until the late 1990s, the rehabilitation of significant buildings by their function, size or position in the city was, if not the norm, at least one of the options to be considered. When any process of revitalization of an area of the city began, the option of preserving its urban landscape was pondered while updating the functionality of what was built to the existing market demand.

This policy, which had developed from the timid resurrection of the role of conservation and emerged after the relentless development initiated in the 1970s, stumbled upon the new cultural environment born with the millennium's expectations of change. Perhaps naive or childish, the change of some digits, the nine by the zeros, seemed to bring new ways of living. This was supported by an expansive economic period, which had just successfully overcome the recession that emerged in mid-1992 and lasted until 1998.

The initial success of the recovery of St Katharine Docks, began to show the deterioration of time and voices arose asking for an update of the result of that careful process. The developers asked for new opportunities, arguing that the technological changes under way required different working conditions in the offices. Those buildings did not facilitate large open spaces, their facilities could not adapt to new energy requirements and connections, and they proved too rigid for architects eager to do new things.

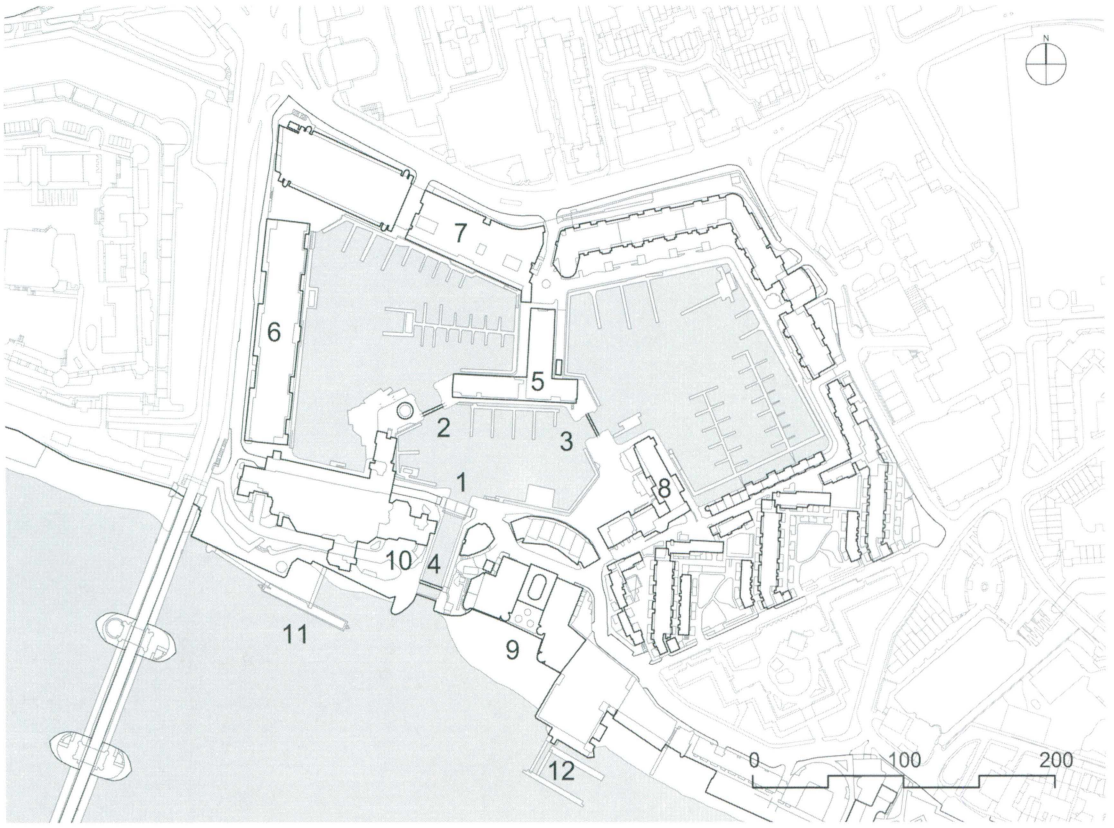


London Dock E1

Nor was the urban landscape easily adapted to the new demands of restaurants and public spaces expected or required by the increase in visitor flows. The previous industrial character, carefully preserved in the rehabilitation, seemed somewhat dismal, needed more light, more exterior life than that offered by the docks.

The St Katharine complex was updated and is still a successful place, despite some unfortunate breakthrough, but new developments began to demand more freedom of action. The developers achieved greater permissiveness regarding the conservation: it was enough to suggest the presence of the old with remnants of sufficient significance and the bulk of the built could be demolished to be replaced with new constructions.

Some docks of other port sets have been blocked off and used as sites to build business and commercial centers, without any trace of the previous usage, except for the name. London Docks, which used to have a double entrance through Hermitage and Shadwell and is now an office complex surrounded by streets and squares, is a good example.



St. Katherine Docks

1. Lift Bridge 1
2. Lift Bridge 2
3. Lift Bridge 3
4. Lock
5. Ivory House
6. International House
7. Commodity Quay
8. Dickens Inn
9. Devon House
10. Sundial in Tower Hotel
11. St. Katherine's Pier
12. Royal Navy Pier







12





18



6



9





Isokon Flats





Isokon Flats

But also the new is subject to restoration when its value is recognized. The modern Isokon apartments are located on a secluded street in Hampstead, north of London, with a lush park in the background that stands out from the triviality of the brick houses that surround it. Opened in 1934 and originally known as Lawn Road Flats, the building by Canadian architect Wells Coates for Jack Pritchard (a furniture designer whose company Isokon gave its name to the building) is one of the most important buildings of the modern movement in the United Kingdom.[5]

Recovery of the recent-Isokon Flats (1934).

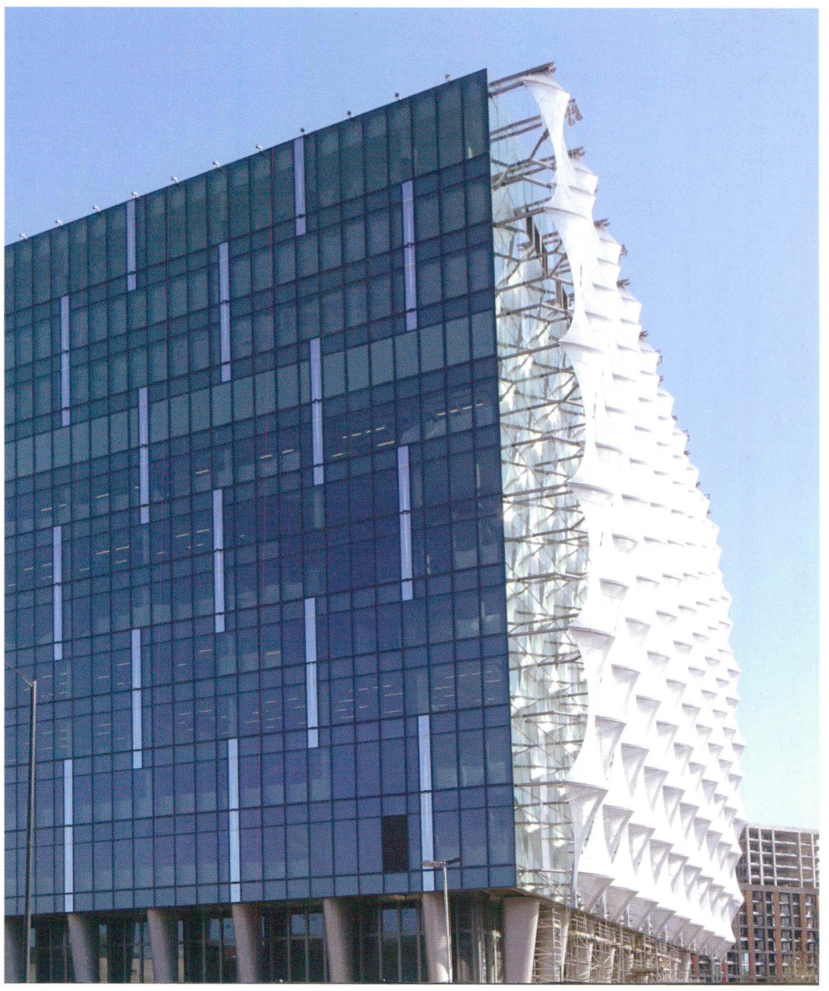
The building had thirty-two compact, cabin-like floors, each equipped with the latest gadgets and space-saving solutions such as hinged tables and sliding doors. There was a large living room with a terrace on the upper floor and a restaurant with a bar in the basement, for community use.

Built with smooth concrete painted pink, Lawn Road Flats proclaimed the modernist message with its presence and activity in that London suburb landscape. In the 1930s, the building was a center for the bourgeois intelligentsia of London, with Agatha Christie and Walter Gropius among its residents. The Bauhaus master Marcel Breuer designed the Isobar (converted into four apartments in the 1980s), where the sculptors Barbara Hepworth and Henry Moore were regulars.

After World War II, the social pulse of Lawn Road Flats declined, and in the 70s it passed into public hands and, despite being protected, it was poorly maintained and became uninhabitable. In 2001, it was rescued by the Isokon Trust, which invested 2.3 million pounds in recovering 25 flats for shared ownership sale and another eleven for the open market.

In 1999 the building was protected and the design of the rooms could not be modified. Apartment number 15, occupied by Gropius, was restored to provide an authentic historical record of the original rooms, as well as the wooden panels of the Pritchard penthouse, while the other floors were finished with current features [104:246].





New American embassy in Nine Elms

Construction of Security

The heavy concrete and steel barriers, which separate pedestrians from road traffic, have become familiar on bridges in central London since the Westminster and London Bridge attacks in early 2017. Since September 11, the London's urban landscape has been marked by security measures, some crude and invasive, others almost imperceptible. The immediate aftermath of September 11, 2001 showed a reinforced defensive strategy of possible targets around key business and government sites, such as the US Embassy in Grosvenor Square, converted into a 'virtual citadel' surrounded by fences, high bollards of concrete and armed guards.[6]

This strategy was maintained and, in 2003, the Houses of Parliament were also lined with linear concrete barriers, which were subsequently painted black to make them more "aesthetically pleasing."[7] Large and conspicuous actions of HVM (hostile vehicle mitigation) systems are still used, as shown by the barriers installed along the London bridges in June 2017. However, the physical and technological safety devices have evolved profoundly and are shaping London in new and often unexpected ways.

Unlike the introduction of hostile perimeter barriers, current counter-terrorism measures are incorporated in the early stages of the project process. The new US embassy, located in Nine Elms and whose inauguration is expected in 2018, is a good example of the aesthetic and technical turn towards 'stealth' security, integrated into the landscape and structure of the building. This allows the architectural firm KieranTimberlake to boast about a project based on ideas of "openness" and "transparency" without walls or fences,[8] even if the embassy is protected against explosions by 30 m of helical green space and a sheet of water that works like the defensive moat of a medieval fortress.

The building is a lustrous cube adorned with solar panels, built with explosion proof 15 cm thick laminated glass sheets.[9] Bollards of concrete and steel hidden between hedges of English yew trees surround the two hectares plot and a wall with seats and abrupt changes of level, including a traditional 'ha-ha' (a recessed wall with a triangular pit), will prevent the access of any vehicle that manages to cross the outer ring of bollards.

The project of the United States Embassy is not unique; in fact, it is representative of a change towards the integration of security in design, making it less intrusive and less visible. The use of discreet security cameras, heavy urban furniture in the form of benches, planters reinforced with steel and concrete, or giant concrete



Security barriers on Westminster Bridge



Banks and bollards in King's Cross



Bollards in Whitehall



Security arches in Trafalgar Square

signs, such as 'Arsenal' letters at the entrance of Emirates Stadium, are increasingly used in London.

King's Cross Station offer another interesting example in relation to the safety project at the stations. The recommendations of the Department for Transport include increasing the "distance of separation against explosions" by extending to the maximum and "as far as possible the distance between vehicles and station."[10] In this sense, the adjacent King's Cross Square acts as a buffer zone or effective separation area, allowing the total exclusion of vehicles just in front of the station while mitigating the effects of a car bomb on the façade of the building, in case an explosion occurred in the adjacent Pancras Road or Euston Road. Construction materials, such as polyvinyl butyral (PVB) used for laminated glass, are also incorporated into the internal and external structure in order to minimize the effects of an explosion.[11]

Following these guidelines, HVM systems are also installed around the station in the form of bulky concrete and granite seats designed without gaps to "prevent something from being hidden under them."[12] In addition, the scattered planting of a few London plane trees in granite planters and the absence of water facilities result in a vacuum that facilitates surveillance. To avoid the use of litter bins, which could be a threat, private cleaning personnel are hired to collect the garbage. The lighting is also used as a security device to house the security cameras both in the station and in discrete points around the square. The most intrusive HVM measures are heavy, deeply anchored steel bollards, which line King's Cross Square at 120 cm intervals and define where the intensified safety zone begins and ends

With the exception of the bollards, most of the physical security elements have a discreet and not very prominent design: they do not try to impede the movement of people but, on the contrary, passers-by move through the square in a fast and safe way. The purpose of all these security measures is not to instill fear or attract attention, but to deter and prevent criminal and terrorist acts. In addition, the presence of security devices seeks that visitors to the square and station feel comforted and protected with these security measures. Given the large number of projects with security measures, it is clear that the authorities identify security as a main interest of the public. However, the tangible result of prioritizing security measures over other interests produces a clean and safe, but bland and unwelcoming environment.

[Text written for this book by Katarzyna Blackman[13]]



New Scotland Yard



Anti-terrorism security in Exhibition Road

Music for Terror

Newly arrived in London and still on the Heathrow Express, I received an email from the South Bank Center, home of the London Philharmonic Orchestra (LPO): Dear, Following the incident at Westminster the security services have advised us to close the building and to cancel this evening's performance. We will be in touch later this week to organise refunds. Best wishes,

It was 5:33 pm on March 22, 2017, and on the street there were pairs of policemen with bulging yellow anoraks above their bullet-proof vests, walking calmly under the hum of helicopters in the air. The hotel receptionist informed me of an attack on Westminster Bridge, about 800 meters away, but I did not know exactly what happened. The BBC offered images of ambulances, injured evacuees and security fences. Half an hour later, videos of the witnesses began to appear, with images of people running, policemen directing them and groups of nurses assisting the wounded.

The interior of the Chamber was interspersed among these outside images, where the members of Parliament moved hastily, while an emphatic authority asked them to calm down and stay there for security reasons. At the gates of New Scotland Yard, the saddened Chief reported what happened a few meters away: a speeding car had run over a group of people on the bridge and the driver had fled to Parliament Square, where there had been a confrontation with the Police. There were twenty wounded of different gravity and four fatalities, among them the assailant who, before being shot down, had stabbed 'one of our own.'

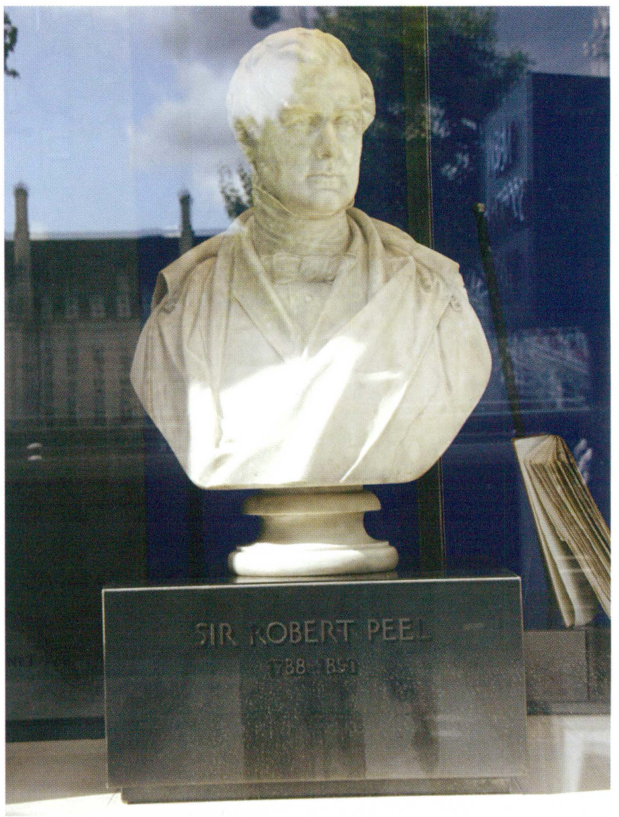
Then, the Prime Minister read with scant emphasis and little concentration a few lines on the determination of the British people and the defense of democracy against terrorism. At night the street was quiet, still with a lot of police but no longer helicopters, which reappeared in the morning. A video of that afternoon showed the Prime Minister pushed by members of security with weapons in hand towards a camouflaged car that, without reaching the doors of the courtyard, went backwards to remain in Parliament. There was already a fifth victim and twenty more wounded.

The next morning, the details became precise and the first assessments of time and place arrived. The Wall Street Journal recognized the incident as the most serious act of terrorism since 2005, when Islamic extremists coordinated several bombs on buses and trains that claimed 52 lives, shattering a sense of security here as the U.K. had managed to avoid every sort of recent mass attacks claimed by Islamic State.

On Thursday the 24th the Queen transferred her infinite gratitude and admiration to the members of the Metropolitan Police. The Prime Minister noted that a terrorist came to the place where people of all nationalities and cultures meet to celebrate what it means to be free and asked citizens to be vigilant but not intimidated. The mayor said that London is the best city in the world, and that we will never be intimidated by terrorism.

On Saturday the 25th there was a concert. It was part of the *Belief and Beyond Belief* cycle, an explanation in eight sessions of the meaning of human life in the 21st century, organized by Vladimir Jurowski in his year of farewell as Director of the LPO. The concert belonged to the thematic session titled, precisely, *How do we Live with Death*, and the program included two great works, the symphonic poem 'Death and Transfiguration' by Strauss and Mozart's 'Requiem,' directed by Nathalie Stutzman. After the Strauss, controlled coldly by the LPO, with the first chords of the 'Requiem Aeterna,' the director merged with the 160 voices of the choir of the LPO and the powerful orchestra gave itself up to supporting that exciting symbiosis.

It was a full version of the Requiem, orchestrated by Franz Süssmary as directed by Mozart and, after the shivering 'Dies Irae' of the choir, a deep bass voice began the strange 'Tuba Mirum,' where the trumpet, 'spreading its wonderful sound on the tombs of each country, will bring us all before the throne.' Then, the triple blow of the choir at the beginning of the 'Rex tremendae,' and the forceful



Robert Peel-New Scotland Yard

'Confutatis' become the inescapable anguish of 'Lacrimosa,' conveyed by choir and orchestra to the 2,500 seats of the Royal Festival Hall to stay definitively installed in the hearts of all. It is not easy to imagine a better tribute from so many moved people to the victims of what happened on Westminster Bridge, just 700 meters away.

That same day, March 22, the brand-new New Scotland Yard, located on the Victoria Embankment a few meters from the site of the attack was scheduled to be inaugurated by the Queen. AHMM's design is a radical remodeling of the Curtis Green Building, a building of the 1930s, formerly the headquarters of the MPs (Members of Parliament). The design incorporates into the building an elegant curved glass entrance pavilion, new pavilions on the roof and a reworking of the previous accommodation. The pavilion is flanked by a bust of Metropolitan Police founder Robert Peel on one side and an eternal flame in memory of its fallen, which flashes in the center of a pond on the other side.



Working Districts

1. City of London
2. Midtown
3. West End
4. Victoria
5. Paddington
6. Euston & Marylebone
7. King's Cross
8. Southwark
9. Southbank
10. Vauxhall Nine Elms Battersea
11. Whitechapel
12. Clerkenwell
13. Canada Water
14. Canary Wharf & Docklands
15. Earls Court
16. Coal Drops Yard
17. Stratford
18. Stratford
19. White City



103 Cannon Street

Office landscapes.

Areas of Opportunity

The proliferation of new buildings has raised a great diversity of constructions within the precincts of the City. That generates variety, which added to the different scale of the new and the previous gives rise to a powerful contrast, but one that brings a certain brutalism.

The constructive details of the new office blocks impose technological geometries within an environment dominated by the classical proportions of the narrow streets and low buildings that previously formed, or better shaped, the character of the old City. The contrast does not originate as much through new colors, because the technological materials have neutral gray, dark green, nickel-plated or black colors, but the reflection of the sky and of the light in the large glass panels comes into competition with the rich brick textures and stone of the façades of the old buildings.

There is also a strong contrast between the vital rhythms of the offices with those of the old buildings. Crowds of employees take to the streets at very specific times with the same objective of getting lunch and disappear from the scene in the next few minutes with the same speed, giving the streets a very different rhythm than that suggested by the narrow sidewalks. Very few restaurants and fast food places have tables or interior space of sufficient capacity to accommodate these masses of people in such a short time,





The Royal Exchange

Cannon St corner
Dowgate Street

so that all the corners, banks and sidewalks are filled with people sitting or leaning, in huddles or isolated, taking their quick lunch to return immediately to work.

The old buildings, with arcades and ornate lintels, coexist comfortably with the new architectures of steel, glass and polished stone. Not so much from their functional condition, as from the mere visual appreciation of their façades. The contrast of the old stone shaped into columns and arches with the new steel and glass bays is appreciated as a varied environment, just as the new bars get along well with the old offices. Within that strangled space, the few newly constructed public buildings strive to introduce the breadth of paths and covered spaces that spare office space. The example of the Cannon Street / Adietare Street area with the nearby New Court is quite explicit.

In densely built areas, new developments are difficult and expensive to carry out, but their high centrality makes investment safer. In addition, they must take into account the presence of monumental buildings, which must be respected and enhanced by facilitating their visibility. The surroundings of Victoria Station are a good example of this variegated complexity, where shopping centers are mixed with old offices and monumental complexes.

Living with the monumental.

Westminster Cathedral, located in a large open space near Victoria Station, was built in 1910 with quite complex intentions as it is the representation of the Catholic Church in the Anglican capital. For Antón Capitel, it is a risky and fortunate neo-Byzantine exercise by the architect John Francis Bentley, *who characterized the city with formal accents that were little used and paradoxically Catholic*. Once Gothicism was overcome, a revival *that avoids the direct Roman reference is based on an interpretation of Italian Romanesque and its affinity with the Byzantine* [28:158].

Respect for that presence, together with the desire to integrate its monumental aspect in new uses, motivates particular alignments and designs in offices and shopping centers. All this requires a landscape approach to planning, where visual analysis is of great importance.

In July 2010, the Mayor adopted the London View Management Framework Supplementary Planning Guidance (LVMF SPG) as a replacement for the guidance adopted in July 2007. The 2010 SPG identifies a number of strategically important views inside and outside of Victoria, many of which are based on views of World Heritage sites: the Palace of Westminster and Westminster Abbey. The new development should make a positive contribution to the character and composition of the Designated Views.

The conservation area audits adopted by the council and the draft of the Westminster Metropolitan Views SPD of October 2007 also identify a number of significant or important points of view, some of which could be affected by new developments in the planning documents of the area. These are mainly views of Buckingham Palace from the Queen Victoria Memorial and Westminster Cathedral from Victoria Street.

The impact on views from World Heritage sites and conservation areas such as Royal Parks, Birdcage Walk, Broadway and Christchurch Gardens, Grosvenor Gardens and Westminster Cathedral should also be considered carefully. Similarly, the views from and along Victoria Street that reveal the west towers of Westminster Abbey and its adjacent elements must also be carefully considered and respected.

Finally, new developments may affect the views of the city of Westminster from neighboring neighborhoods. These possible visual effects should be identified through visibility and visual impact analysis[14] (see p. 238).

Planning the walking routes.

By boosting public transport it is inevitable to brighten the walking tours with enough amenities to guarantee a certain permanent variety. The windows are a good source of variety, provided that they do not limit themselves to displaying the corporate identity of the large company that, by definition, must be identical to itself. They work much better than opaque façades, without changeable openings beyond that which comes out of their doors, whose uniformity deters daily passage.

We look for small stores, with varied shop windows, capable of offering a unique travel experience that encourages the street and invites people to return. The huge windows of the franchises do not work, because they have nothing to do with the place, they display the same clothes



Westminster Cathedral (Catholic cathedral)





Cardinal Place



Artillery Passage

or products as many other stores in the city, in turn identical to those of many other cities in the world. This task is often forgotten in urban planning, which leaves commercial premises at the mercy of the market, but when one thinks of the street as an object of the plan, it acquires great importance.

In the area of Liverpool Street Station, for example, the surroundings of the station must be capable of channeling the 73 million passengers a year who enter or leave through its doors to go to work. The *Liverpool Street Area Enhancement Strategy* recognizes *that movement on foot is by far the dominant movement mode in the area, with 100,000* pedestrians in the area around *Liverpool Street* station in the 3-hour am peak.[15] As the station is in a labyrinth of narrow streets, it forces to provide enough routes to guarantee that this crowd can pass. And the station will be more attractive the better are the experiences repeated daily during those trips.

The planning applies techniques of landscape analysis, in this urban case, to study its quality, character and textures and determine actions to be taken. For example: *the character and life of the area is evident in the fine grain of its streets and in the many active frontages with a consistent rhythm of public and residential entrances. In contrast, the blank frontages of the back of Devonshire Square lessen the quality of the public realm on Middlesex Street.*[16]



Liverpool Street St Area- entrances and façades [12:112]



Artillery Passage







Moore Lane

Public-private spaces.

This planning for pedestrians requires a special dedication to public spaces, a matter that seems clear and simple, but it is not. Moore Lane is a narrow street within the City, enclosed between high glass walls of different colors and tones, green, blue, white, gray, brown or black, sometimes very dark or lighter. Often the glass is full of complicated projections, as if someone were going to look at them from outside or from within.

Scarce and neutral posters warn of the offices housed in the buildings from their wide accesses, built as atriums to impress the visitor and controlled by a slender receptionist and corpulent security agents with dark suits and ties. These guards come quickly when anyone without a clerk's appearance tries to penetrate his sanctuary. With polite accent and good manners, they explain that this is a private space where you can not enter.

Often these are real public places and then you can enter but, inexplicably, you cannot take pictures. You can have a coffee there, take a nap or make a racket with ten friends, but you cannot take pictures, 'because it's a private space,' as they repeat over and over again.

On both sides of these atriums are positioned all possible brands of ubiquitous fast food in the City. They are always the same brands and are always crammed in the first two hours of the morning for breakfast and around one in the afternoon for lunch, but empty for the rest of the day and closed when night falls.

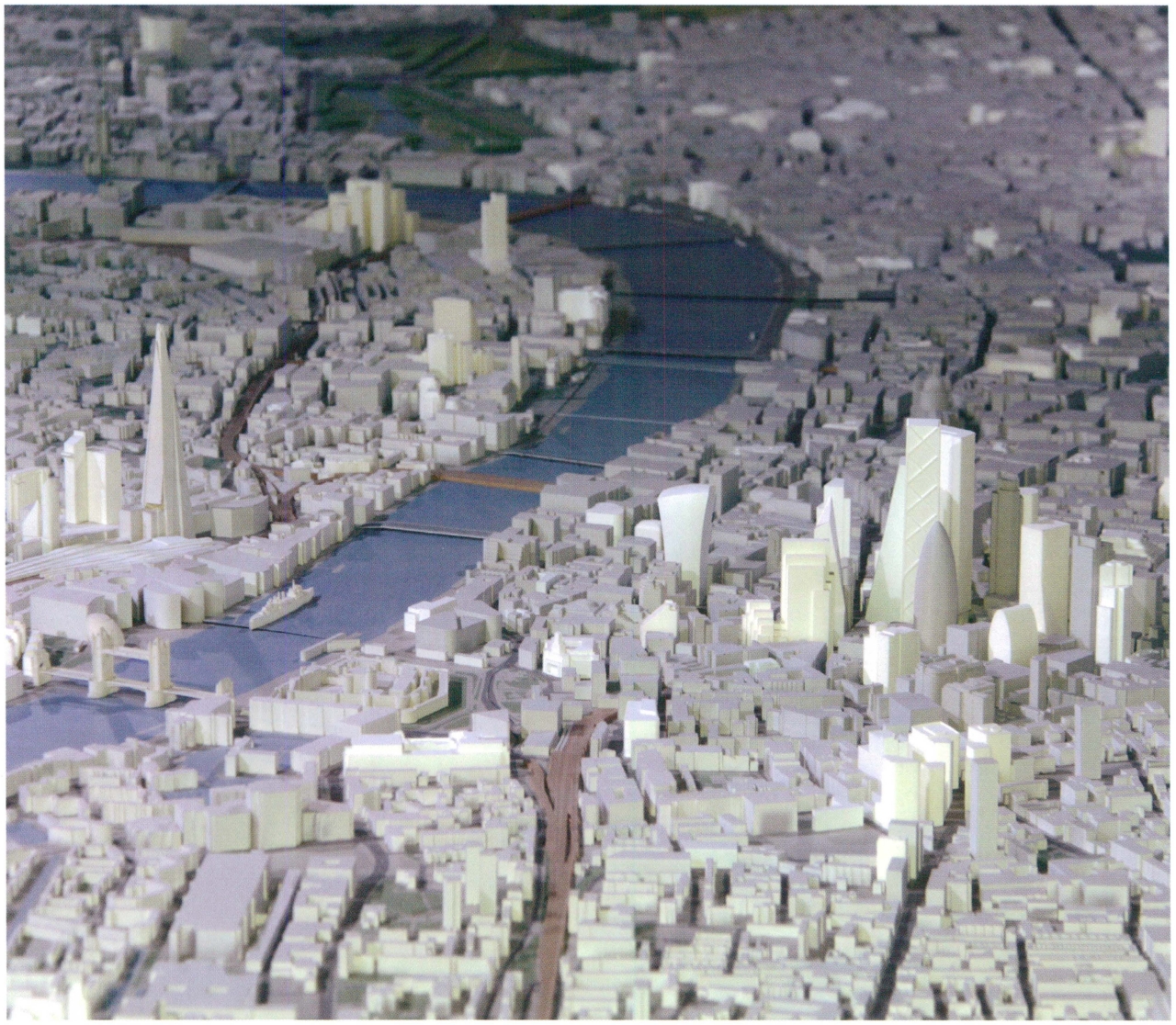




London Eye



Lloyd Building



Model in The Building Centre - The City-Shard

Icons in the City

Another place of great affluence is the Tower of London, in whose vicinity Norman Foster has built **Tower Place**, a beautiful square wrapped and covered with glass, supported by a slender structure of careful design. The square opens onto the church All Hallows by the Tower.

The Gherkin (Foster, 2004) -located at 30 St Mary Axe, known at the time as Swiss Re (a Swiss reinsurance company) and definitely nicknamed The Gherkin- is one of the most recognizable icons in the City by its tapered shape composed of families of diamonds, in clear contrast to the usual prismatic forms of office buildings. It was soon seen that it was only the beginning of a trend that, over the next few years, will populate the London skyline with tall and distinctive glass buildings suggesting recognizable familiar objects.

Beyond the purely formal, the Gherkin's 40,000-square-meter, 21-story project has its origins in the exploratory work of Norman Foster with Buckminster Fuller on the concept of Climatroffice, which integrated green garden spaces in the workplace. He also develops ideas seen in the seminal Willis offices of the 70s in Ipswich and, more recently, in the Frankfurt Commerzbank with its 'sky gardens.' The raised gardens re-emerge here as mini-atriums, facilitating much of the ventilation by natural non-mechanical means; the air conditioning is used only in a complementary way and the windows can be opened [104:295].

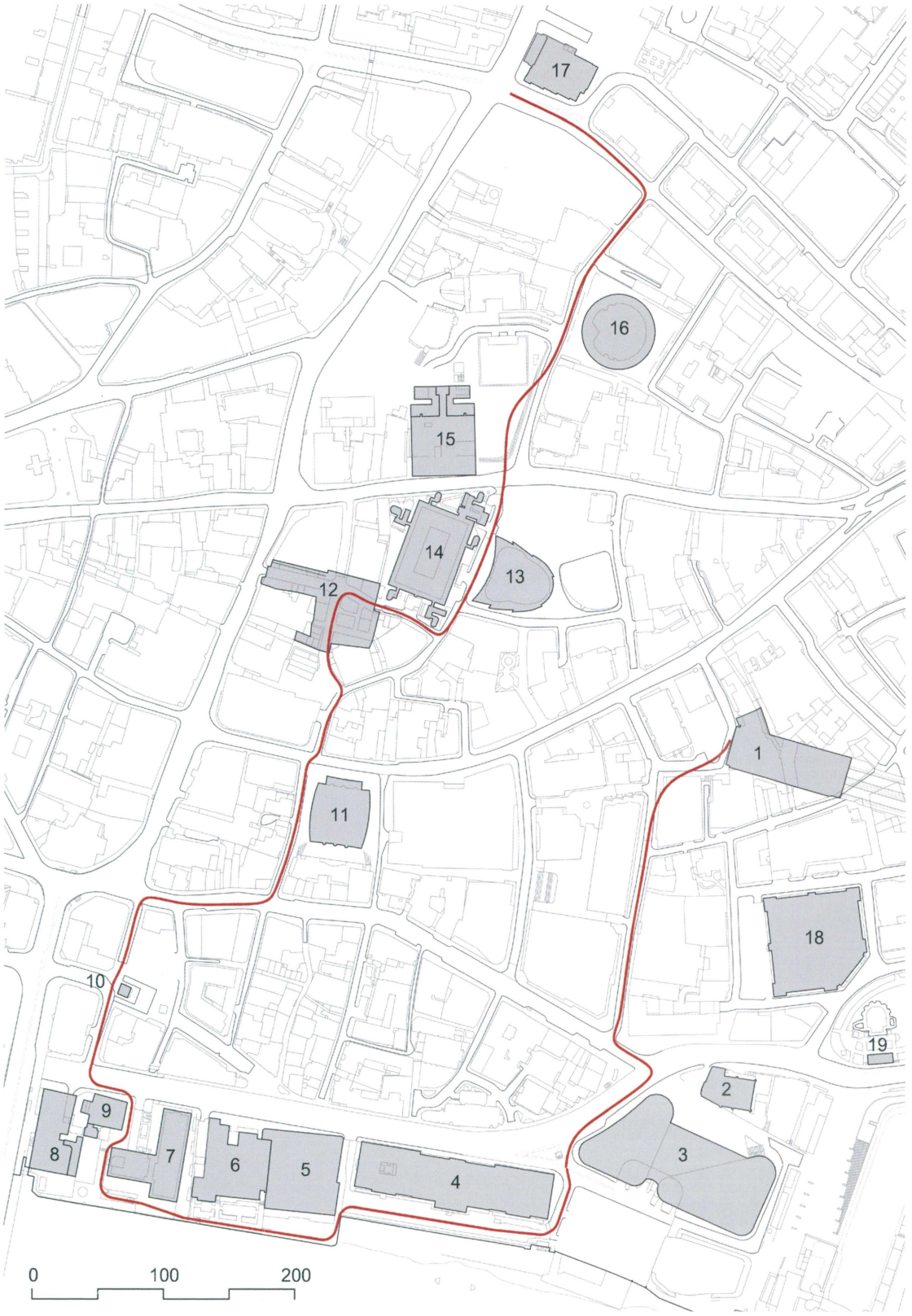


Lombard Street





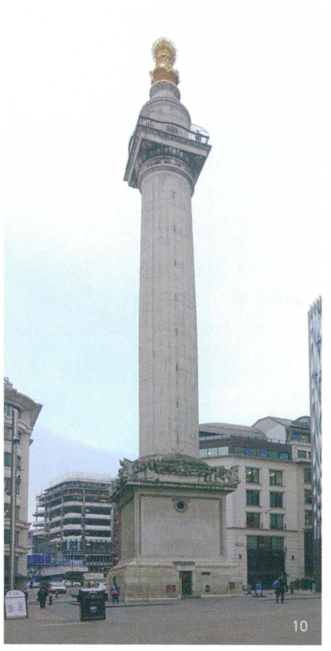
Tower Place

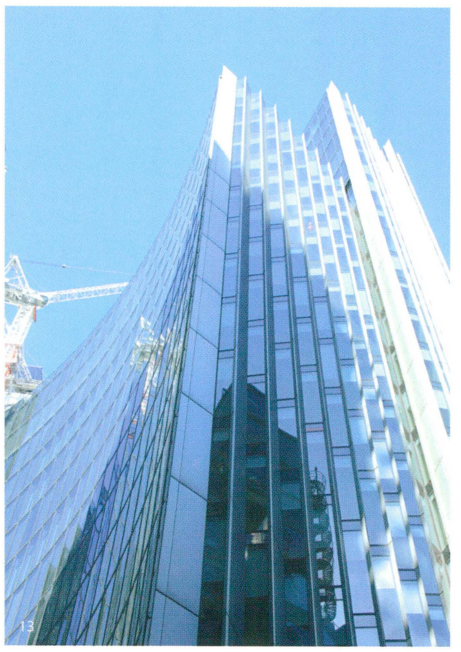










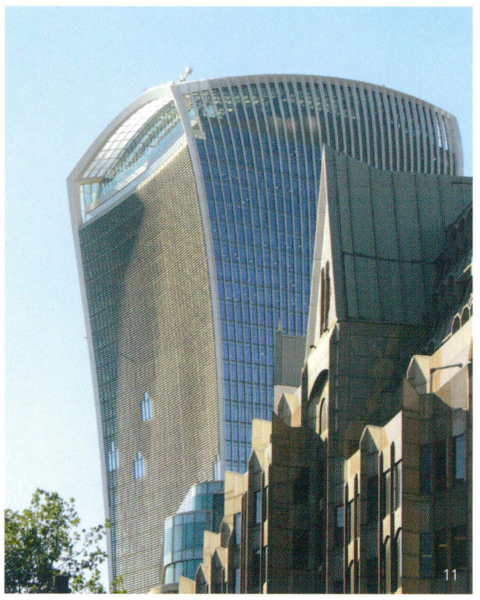


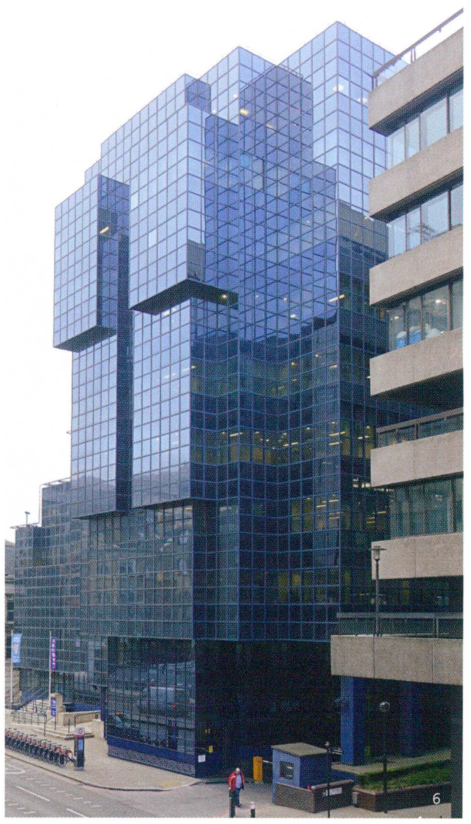
City itinerary

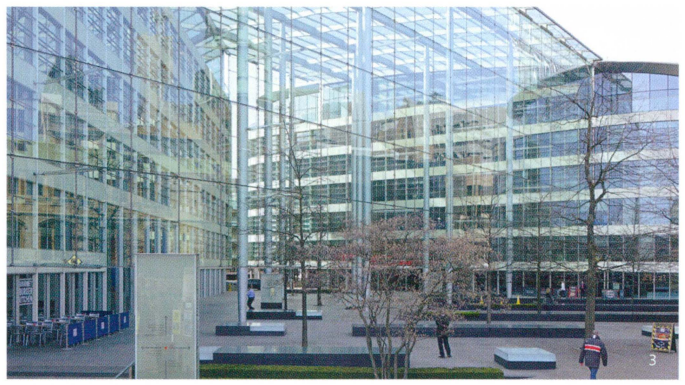
1. Fenchurch Station
2. All Hallows by the Tower
3. Tower Place
4. Custom House
5. Billinsgate Market
6. Northern & Shell
7. St. Magnus House
8. Adelaide House
9. St. Magnus The Martyr
10. The Monument
11. 20 Fenchurch Street
12. Leadenhall Building
13. Willis Tower Watson
14. Lloyd's of London
15. Leddehhall Building
16. 30st Mary Axe (Gherkin)
17. Heron Tower
18. Port of London Authority
19. Tower Hill Memorial


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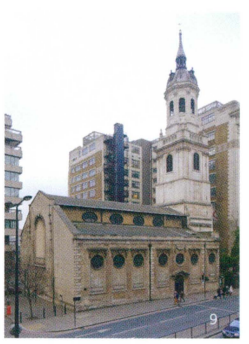

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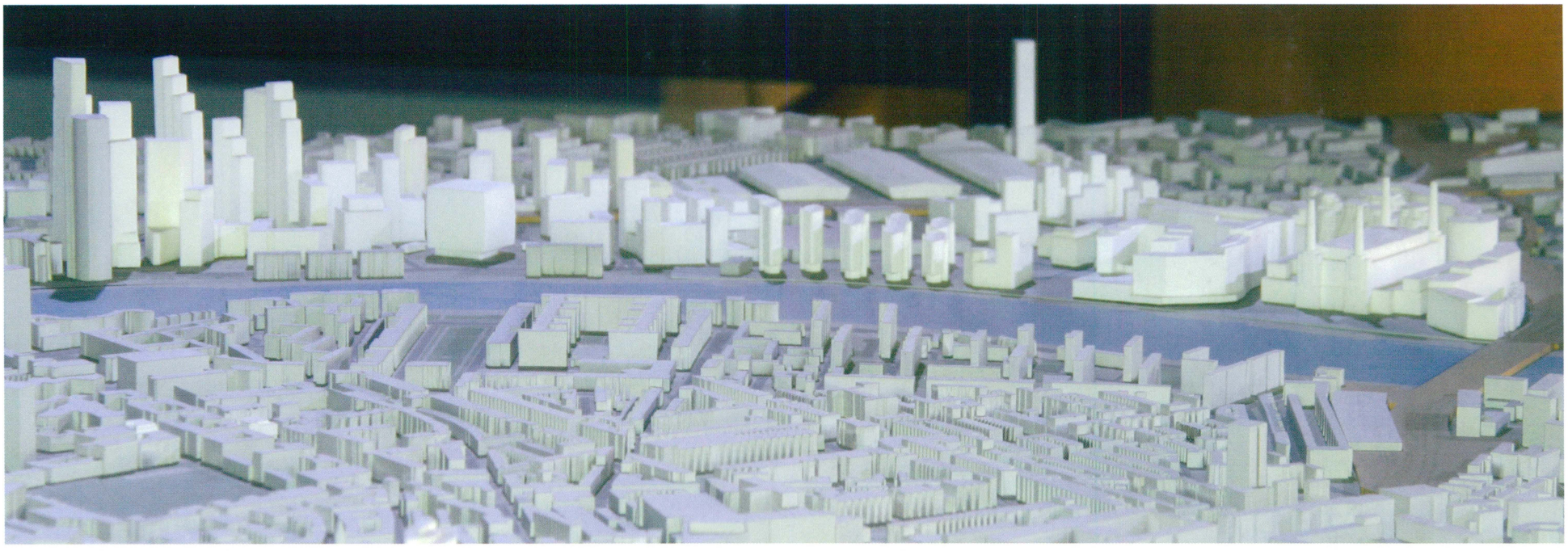

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Model in The Building Centre-Vauxhall-Battersea

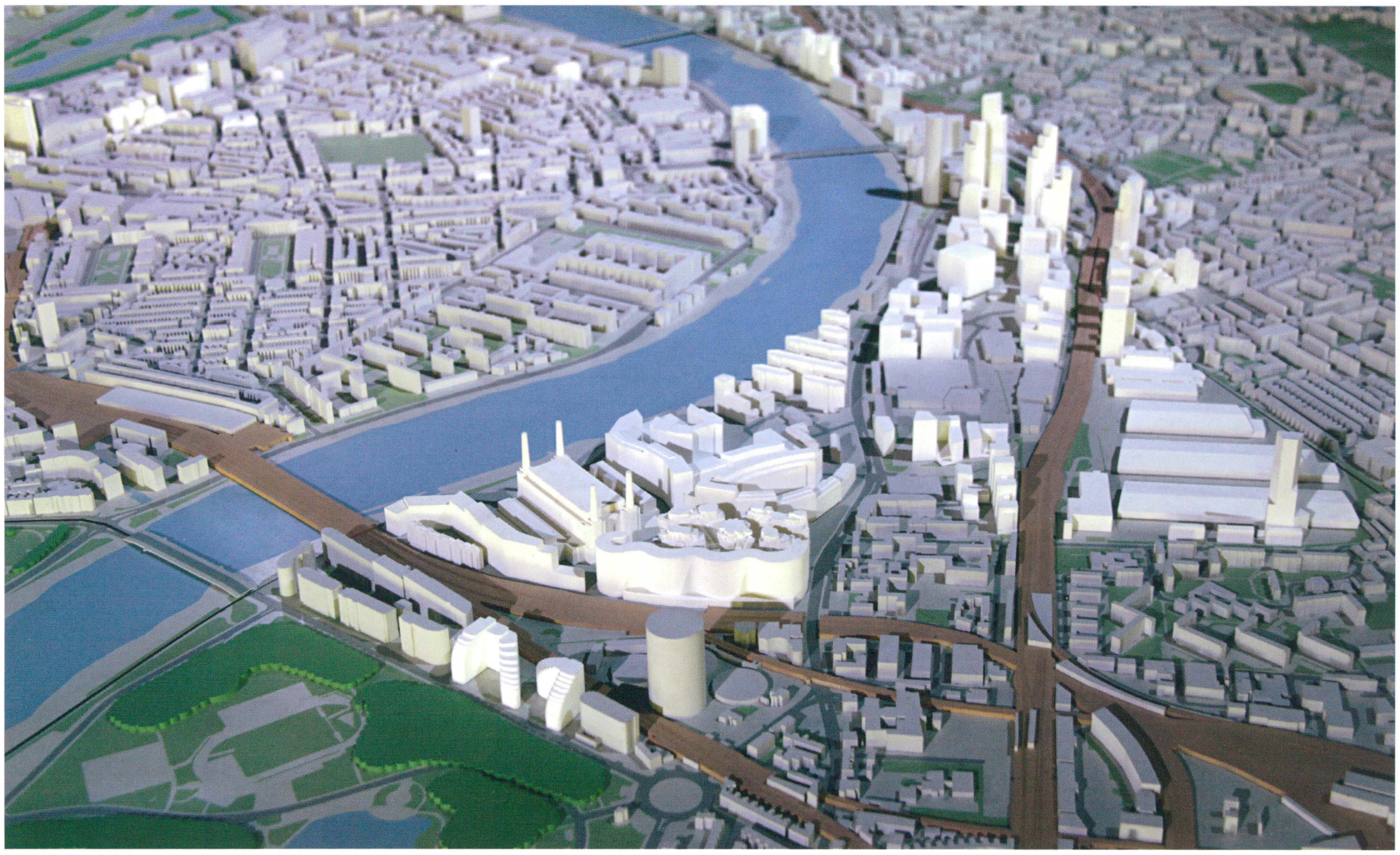
After the capricious glasses of these façades, rows of workers can be seen at long tables in front of their computers, without raising their heads and with some guard walking among them, without uniform but very similar to the watchmen of the big production chains of the first industrial revolution.

The interior landscape is monotonous, rows of workers, guards who watch over them, aseptic spaces, and fast elevators that go up to the floors where the space is cut, for the offices of the bosses. Above, the corporate pyramids are summarized in huge offices for one person, who presides over the building.

In London these public-private spaces abound, also called *pseudo-public spaces – large squares, parks and thoroughfares that appear to be public but are actually owned and controlled by developers and their private backers. The Guardian* has mapped 50 sites in London that meet these criteria and include large areas of open land around Paddington Station, almost seven acres of open space owned by the Arsenal Football Club in Islington, busy shopping plazas and restaurants in Covent Garden and Victoria.[17]

They also include outdoor areas such as the one around the London Eye, one of London's most iconic attractions, projected on the occasion of the Millennium by architects David Marks and Julia Barfield, along with engineer Jane Wernick of Arup and with British Airways as sponsor. With a height of 135 m and 32 capsules of 25 passengers, six months after its opening it had been used by six million people and after 17 years there are still large queues every day. To handle these crowds, a strong contingent of security guards and operatives is needed to order the public space and cordon it, preventing the entry of intruders.

Many of the new projects approved in recent years get their permits thanks to public use agreements for part of their accesses. With this, you can alleviate the chronic deficit of the dense city, where there are no places to sit in the sun, take lunch outdoors or chat with friends.



Model in The Building Centre- Battersea Power Station

Opportunity Areas.

Opportunity Areas are London's best source of Brownfield Land which have significant capacity for development - such as housing or commercial use - and existing or improved public transport access. Typically they can accommodate at least 5,000 jobs, 2,500 new homes or a combination of the two, along with other supporting facilities and infrastructure.

Battersea Power Station Area.

In **Battersea**, the rehabilitation of the old power station after 30 years of non-operation is used, from the start, as a catalyst for the development of the surrounding area. It was evident that a building of that relevance should not be demolished, but the idea of making a new museum or cultural center -a third Tate Gallery- did not guarantee the revitalization of that part of the city. Therefore, while the building is being renovated, with a vague interior program of restaurants and shops designed to take people to the area and give it 'life,' a huge investment in access and public transport is planned for the residences and offices located in the area.

Some of them have already been built on the right bank of the river at the height of Chelsea and Grosvenor bridges. The first step in this development has been the access road to Chelsea bridge where several residential complexes have been established. The next one is called Chelsea Bridge, the second Vista Chelsea Bridge and the third The Bridge. The closest development to the river has been structured in two large alignments, one along the access



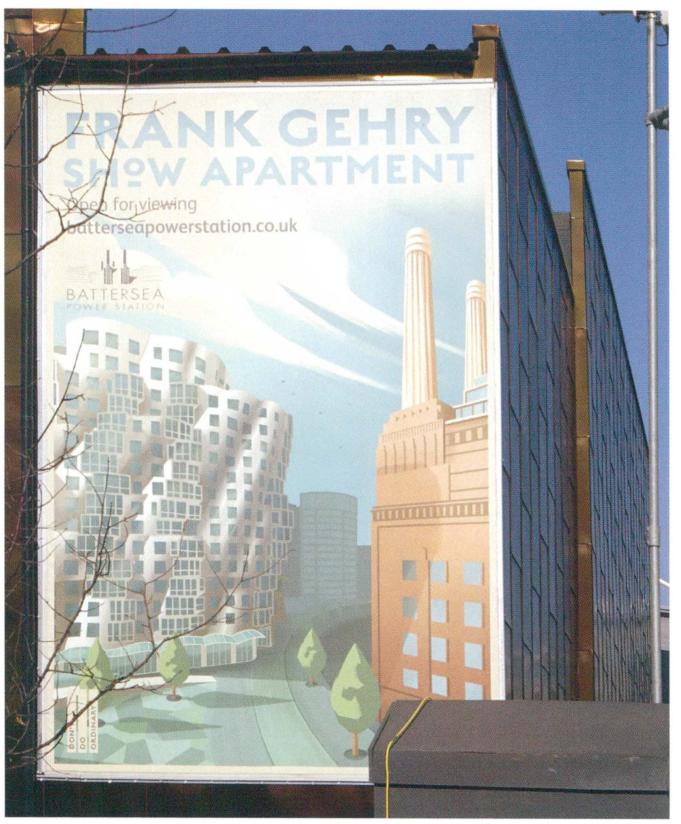
The Residence, Nine Elms



Riverside Courts



The Residence, Tideway Walk



Frank Gehry Apartments Poster

to Chelsea Bridge and another one attached to the access roads to Grosvenor Railway Bridge. Between them a garden has been built along a linear pond flanked by rows of trees, with more private gardens already on the edge of the houses.

Both developments end in a roundabout called Queens Circus, now largely suburban, with an overpass for the railway, built with a cast iron arch and buildings of almost rural character, low, isolated and of low density. On the other side of the access road to Chelsea Bridge stretches Battersea Park, a large rectangle that reaches up to Albert Bridge.

At the other extreme there are several major works to guarantee the feasibility of using this large area. Perhaps the most important is the construction of the new Battersea Station for the Northern Line extension, where several Spanish construction companies participate. This station will also serve the Nine Elms area, which runs along the river between the old Battersea power station and Vauxhall Bridge, and is bounded to the south by the great railroad wall that, after passing through Vauxhall and Lambeth, arrives at Waterloo Station.

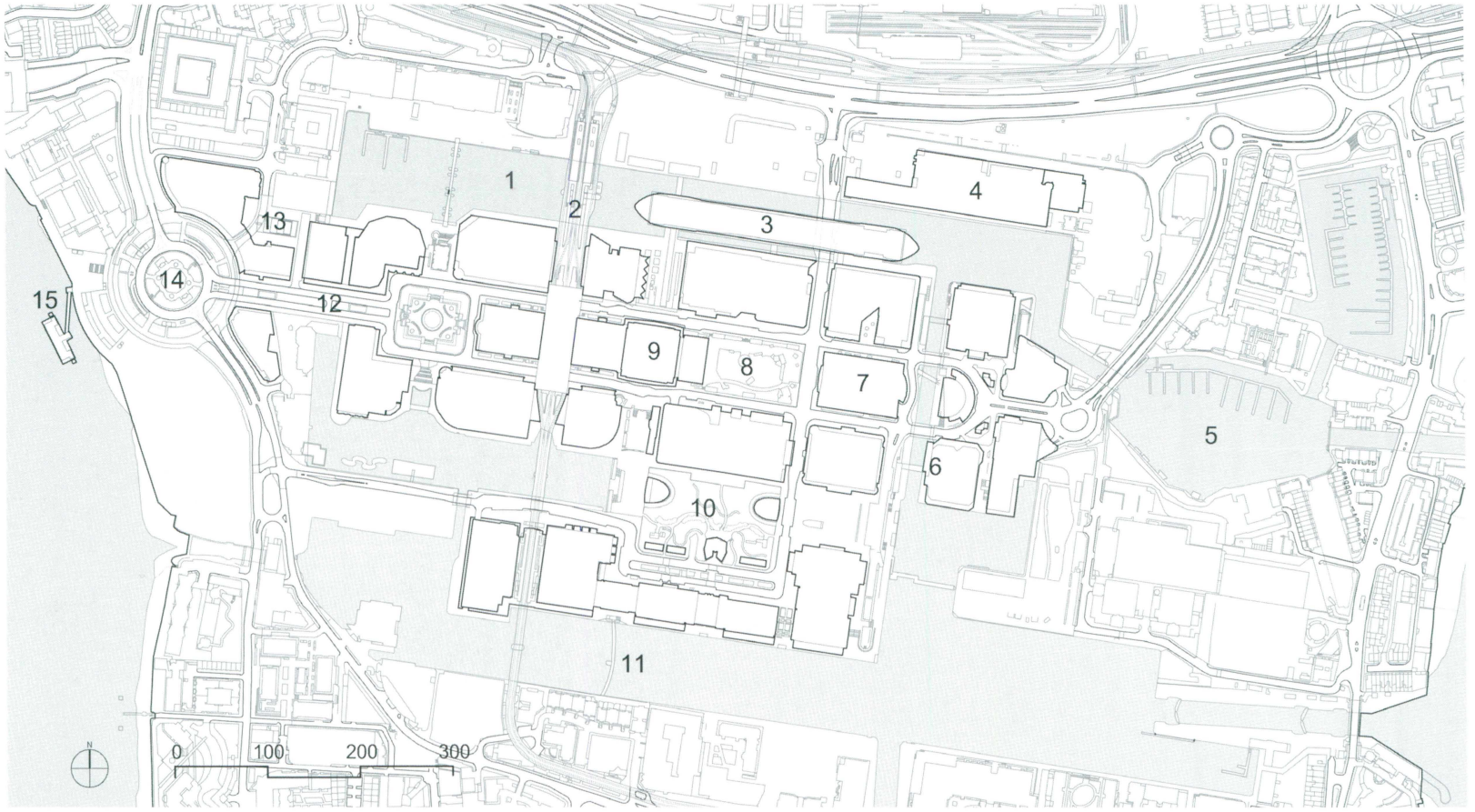
There new residences and offices are being developed along the river, including the new American embassy, already mentioned, and the New Covent Garden Market, an ugly sheet metal square, next to posters announcing Frank Gehry apartments, as lure of the neighborhood that in 2017 is bristling with cranes.

From the Docks to Canary Wharf.

After the First World War, the increase in length and draft of the ships was making the old docks obsolete, but the port traffic had ups and downs during the interwar period. From 1940, the docks and wharves of the Isle of Dogs became a priority for the Luftwaffe, which disabled the docks and reduced to rubble much of the streets and warehouses of the surroundings. After their partial reconstruction, they reached their high point towards 1961, with a traffic of 60 million tons, but their activity began to fall because the heavy industry and a large part of manufacturing began to leave London.

In 1980, **West India Docks** closed and the government reacted with a series of plans to rebuild the area that did not find echo among the port community. There was strong local opposition, in which the 'Association of Island Communities' - AIC played a major role, and which came to make a Unilateral Declaration of Independence in 1970, including the issuance of passports. The AIC continued to represent the local community during the development of Canary Wharf in the following decades.

The development of the 'new office city' of **Canary Wharf** began in 1987, and the buildings were completed on the eve of the recession, in the early 1990s. In 1999, however, the project housed 25,000 workers, and in about few years this figure more than doubled. The Docklands Light Railway was not enough for that volume of transport and the expansion of the Jubilee Line arrived just in time. The new station was designed by Norman Foster for an average volume of about 40,000 passengers per hour, which was reached in 2012.

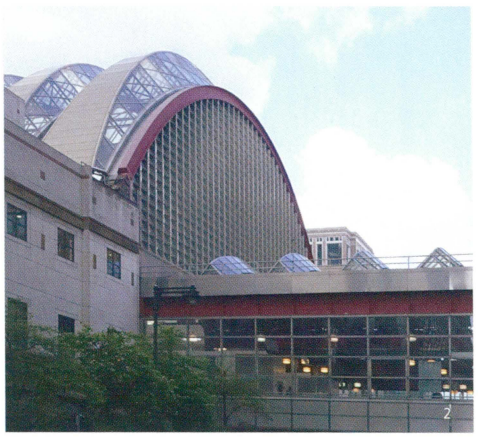


Canary Wharf

1. West India Quay
2. Canary Wharf Rail Station
3. Crossrail Place Roof Garden
4. Billinsgate Market
5. Blackwell Basin
6. Moving Bridges
7. Canada Square Parking
8. Canada Square
9. One Canada Square
10. Jubilee Park
11. South Quay
12. Willoughby Passage
13. Columbus Courtyard
14. Westferry Circus
15. Canary Wharf Pier



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Canary Wharf

The site of the Underground station is the former export dock, south of Canada Square, and was built by means of a large concrete box 300 meters long, which was sunk in the dock and cemented with deep piles. At the top of the station box, a park with a large land fill was created to gain weight and avoid the flotation of the box. The accesses to the east and west of the square are housed under canopies similar to those of the Bilbao Metro, but much wider, which provide natural light to the large lobby [104:20].

To the north of Canada Square, in the former import dock, another station has been built for the new Crossrail or Elisabeth Line, whose shops, restaurants and spaces are in operation, although the rail connections have not yet been completed. It is even more spectacular than the previous one, because the water of the dock has been maintained and the long building is in the middle, with the platforms under water and several commercial levels above, crowned by a spectacular garden partially covered by a wooden triangular structure and steel, with triangular glass panels alternated with holes.

The crossing of the railway, the road and the pedestrian paths on the two large docks of **West India Docks** and their communication channels requires numerous fixed and mobile bridges and footbridges that, in general, maintain a good level of design. The most surprising thing about the new city of offices are the underground cellars that link all the buildings by the base, in the way of long shopping streets with all the services, which form squares in their crossings, where they are located, and have access to shopping centers.









Canary Wharf-Towers

Canary Wharf -Crossrail Station [112:231]



Crossrail Place Roof Garden

Canary Wharf-acceso Jubilee Line Station

Shadwell Basin



Port of London Hermitage



Spirit Quay in Shadwell Basin



Shadwell Basin





Docks, walks and homes in other areas.

Greenland South Docks

Greenland Docks-Plover Way Colony

In **Canary Wharf**, the aspiration to control the evolution of the new office buildings, from the successive planning agencies and institutions, with plans to contain some uses and develop others, has been revealed as a simple chimera. The need for efficient public transport has finally prevailed, generating a dynamics of attraction and vacuum much more powerful than the urban regulations. Too often, public authorities at any level end up accepting that the few possibilities for solving the problems created by their own policies lie in what they were trying to avoid.

In the most distant ports, such as **Queen Victoria & Prince Albert Docks**, the tensions have been lesser, perhaps because the new uses of an airport or an exhibition and congress center -with several associated hotels- are of such scale and significance as to impose themselves on their own against any other possibility.

In the other port areas, the development has focused more on the residential sector and although there have been office nuclei, the results are more harmonious. In general, respect for the maritime legacy of docks and wharves has generated affinities of identity, perhaps not so powerful as to grant a strong character, but sufficient to generate habitable spaces, subject to lesser real estate tensions or the development of new businesses.

In places like **Shadwell Basin, Surrey Docks or Greenland Docks**, enclosures of intimacy have been created, places where people seem to live at ease, even though housing prices remain as prohibitive as in any other residential neighborhood that enjoys good connections.















Canada Water itinerary

1. Tunnel Mills
2. The Mayflower
3. Tunnel Wharf
4. Brunel Museum
5. Jubilee Grenway
6. Pier
7. Rotherithe Tunnel Shaft
8. Rotherite Bascule Bridge
9. Old Salt Quay
10. Surrey Water
11. Gasometer
12. Surrey Water bascule footbridge
13. Garter Way
14. Surrey Quays Bridge
15. Surrey Canal
16. Canada Water
17. Canada Water Library
18. Canada Water - Jubilee Line



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Canada Water-Jubilee Line Station



Surrey Docks-Old Salt Quay

Local development in the stations.

The large space consumed by the stations with their parks and warehouses, the bundles of roads and associated buildings, has been revealed as a great opportunity for the improvement and growth of the city. There are hundreds of hectares of publicly owned rail land located next to stations that are the most accessible and best connected points in the city

These are unique landscapes, full of formal pre-existences and obsolete singular buildings of great interest, usually protected but damaged or abandoned. The winding paths are coupled to the rectangular stiffness of the warehouses, to the forms of accompaniment of the buildings and to the circles of the gasholders to produce functional geometries, which are carefully collected and represented by the companies, by the geographical services of the administration (Ordnance Maps) or by insurance companies (Goad Fire maps).

The process of selecting buildings to be demolished and protected, in accordance with the heritage regulations, also seems interesting. It seems that the policy of recovering the most important singular buildings and ordering the surrounding spaces making room for new constructions takes hold as a way of contributing activity with greater prospects of success than those derived from a protection of the whole complex, always difficult to 'animate' beyond the usual museum or cultural center.



King's Place





Granary Square



Pancras Square



Arthouse Residential



Aerial view of King's Cross and St. Pancras, 1940
[©Tigermoon, Getmapping]

Gasholder Triplets



King's Cross & St Pancras

The old train track yard of the St Pancras and King's Cross complex originally occupied a large area north of the two stations, which was surrounded by a series of buildings attached to rail traffic, and had been the subject of important development proposals for many years. At the end of the 1980s plans were resumed to develop the place as a new city of offices, already with the criteria of densification and accessibility as vectors of the project. There was a first plan of the London Regeneration Consortium with Foster, in the form of a public park surrounded by buildings and towers, which did not prosper, and a very different one in 2001 by the developer Argent with the architects Allies and Morrison and Porphyrios Associates, as a new neighborhood full of streets and traditional buildings, where the most notable industrial buildings are to be located or 'embedded.' The plan was approved in 2006 and has been developed with projects by various architects.

In the area, two zones can be distinguished, one of triangular form located between the two stations and Regent's Canal, occupied by a development called Pancras Square and another one of greater surface located to the north of the canal where there were conspicuous railway pre-existences around the goods yard. The largest in scope is the barn by Lewis Cubitt, converted into a university space for the Central St Martins, part of the University of the Arts London, but there are other smaller buildings and a triplet of gasholders that are being fully rehabilitated as residences [104:32].


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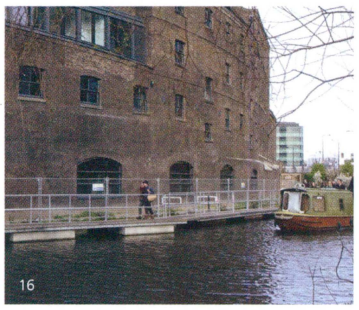

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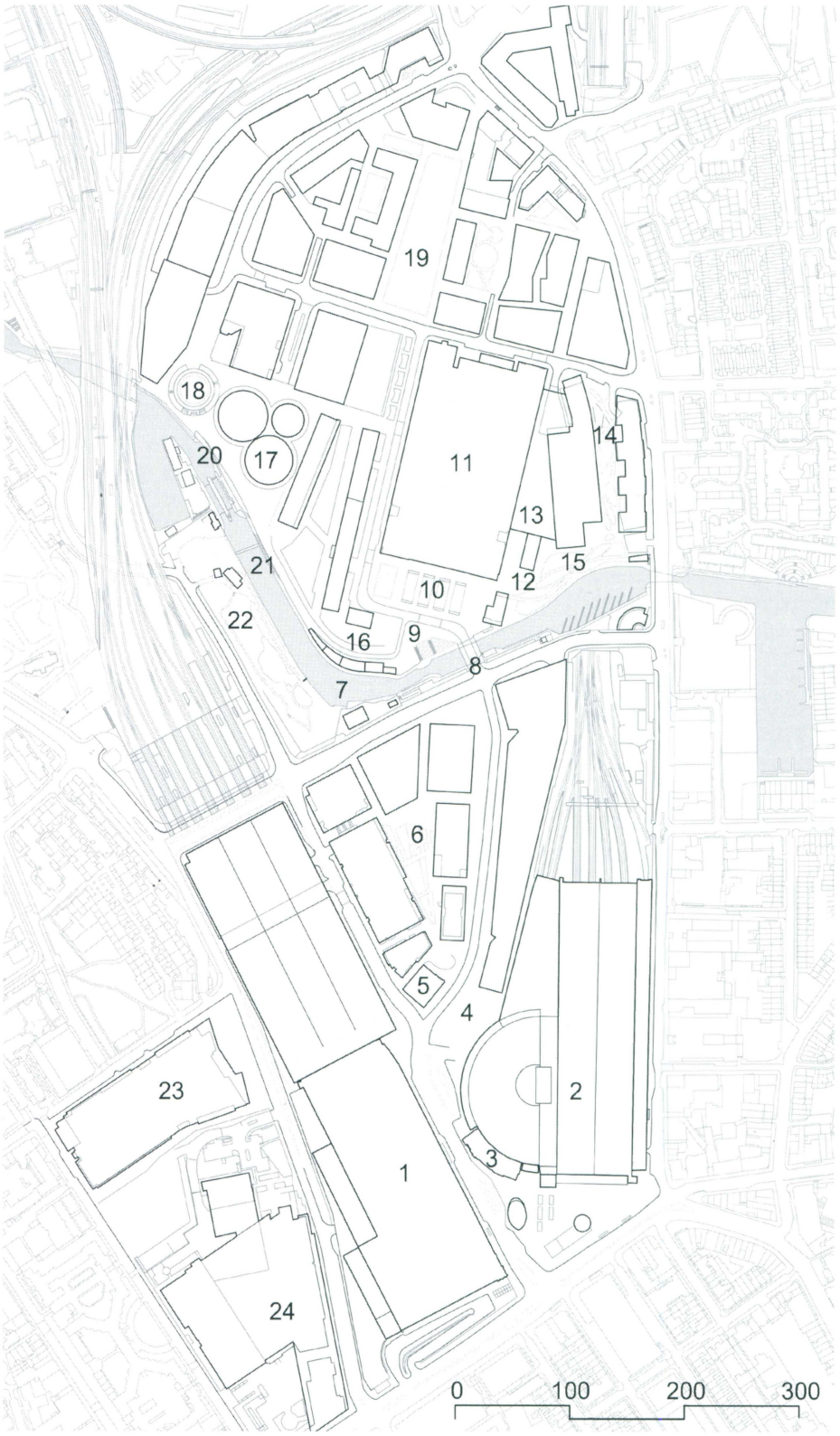

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St. Pancras - King´s Cross Area

1. St. Pancras Station
2. King´s Cross Station
3. Great Northern Hotel
4. Battle Bridge Place
5. German Gymnasium
6. Pancras Square
7. Regent´s Canal
8. King´s Bridge
9. Canalside Steps
10. Granary Square
11. The Granary (Central St. Martin School)
12. Regeneration House
13. East Handside Canopy
14. Arthouse Gardens
15. Wharf Road Gardens
16. Coal Drops Yard
17. Gasholder The Triplets
18. Gasholder No.8
19. Cubitt Park
20. St. Pancras Lock
21. Somers Town Bridge
22. Camley Street Natural Park
23. Francis Crick Institute
24. British Library

Paddington Station

The first plan for the development of Paddington Basin, a dock of the Grand Union Canal located parallel to Paddington Station, was approved in 1992 with a built-up area of 110,000 square meters of offices, but declined due to the economic recession. In 2000, a new plan was presented, with mixed residential and office uses, designed by Terry Farrell, who also designed The Point, the building located at the entrance to the dock that was first constructed. Then it was completed by 2005 with a series of residential buildings along the dock. The last phase, called Merchant Square, began to be built in 2010 and in 2017 it is practically finished, and the plot between the dock and the A4 motorway has yet to be built [104:330].

To the north of the station, Sheldon Square occupies the triangle limited by the tracks, the A4 motorway and the canal, which is the original site of Bishop Station, the temporary station of Paddington, built while buying the final land. It was also developed in those years, with projects by Allies and Morrison, Kohn Pedersen Fox, Sheppard Robson and Sidell Gibson Architects for 146,000 square meters of offices, 6,500 of studios and 500 of stores; it was finished in 2012.[18]

In the southeast corner of the station is the Post Office (31 London Street), closed in 2010 and sold in 2014 to Great Western Developments Ltd - GWD for 111 million pounds, which proposed a development of 8,000 square meters and 775 million pounds, called Paddington Cube, with a Renzo Piano project that includes a new station and a new lobby for the Bakerloo Line.[19]

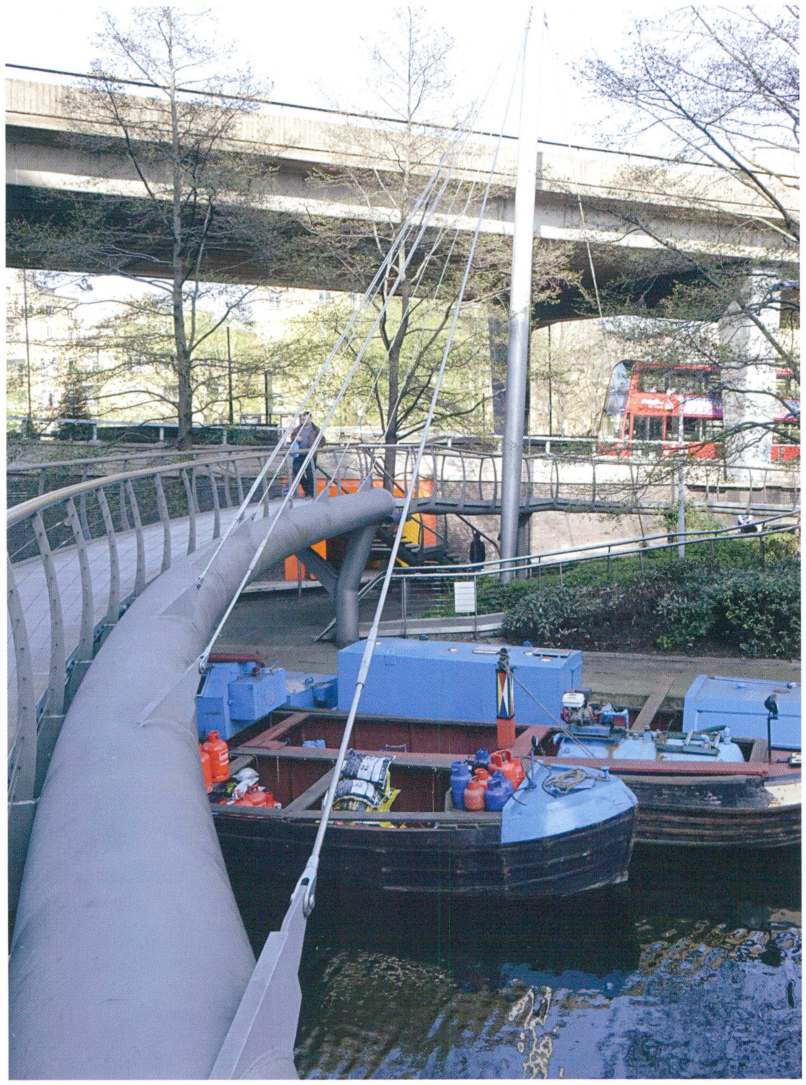
Finally, next to The Point, at 55-65 North Wharf Road the New Brunel's Building is currently being built, developed by Derwent London Plc and European Land and Property, with 17 floors and 23,000 square meters of offices, designed by Fletcher Priest.[20]





Paddington Basin

Sheldon Square



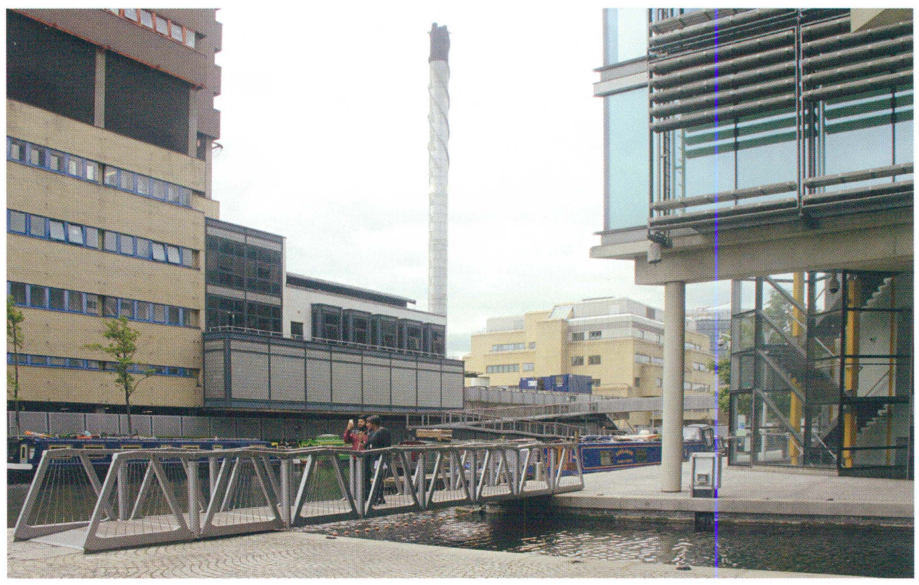


Grand Union Canal

Sheldon Square



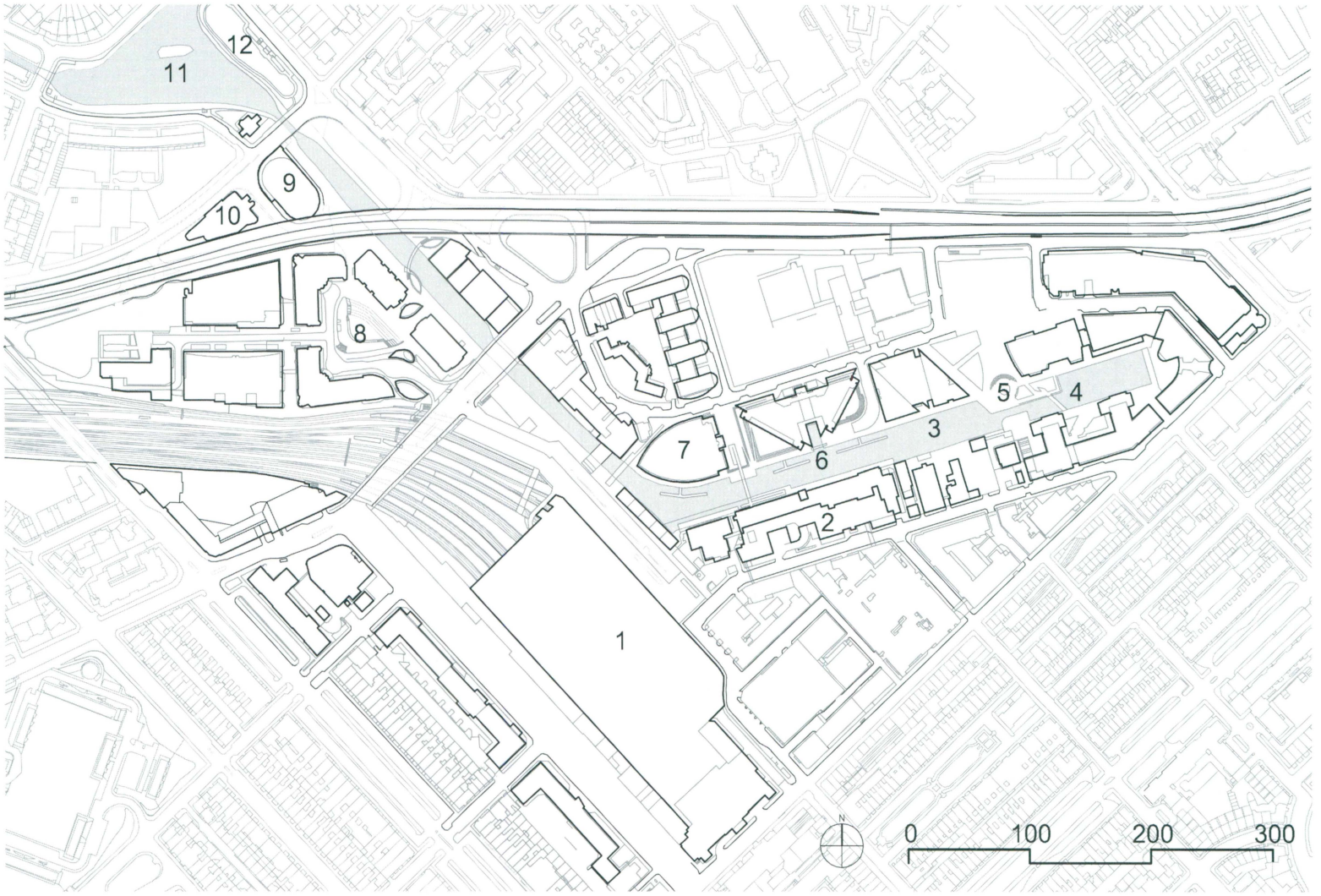
Paddington Station and Grand Union Canal



Bridge-Paddington Basin (Heatherwick studio & Anthony Hunts) - The structure opens by means of a series of hydraulic cylinders arranged on the beam platform of the bridge; as it rolls up, each of its eight segments rises simultaneously, until the two ends touch each other forming an octagon.[21]

Paddington Area

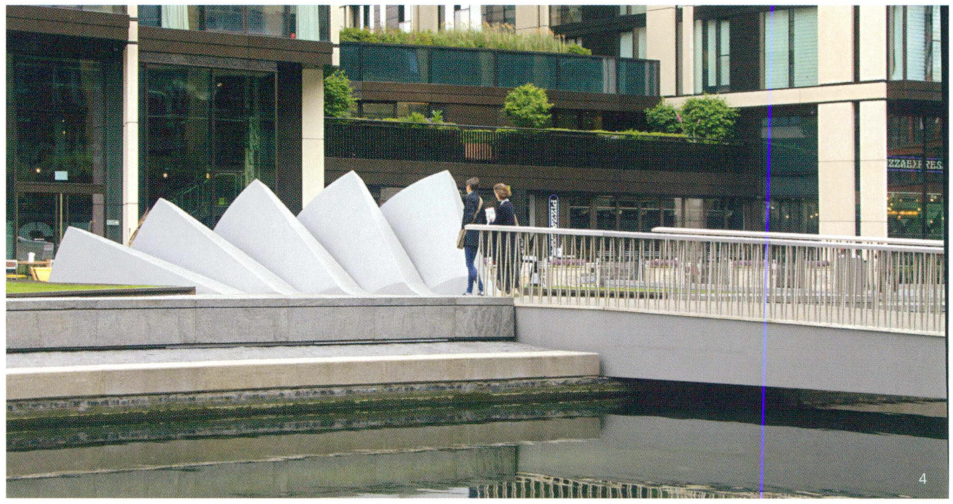
1. Paddington Station
2. St. Mary's Hospital
3. Paddington Basin
4. The Fan Bridge
   (or Mechant Sq. footbridge)
5. Merchant Square
6. Rolling Bridge
7. The Point
8. Sheldon Square Amphiteatre
9. The Rotunda
10. Battleship Building
11. Little Venice (Browning Pool)
12. Rembrant Gardens




















THE BATTLESHIP BUILDING



The Shard and London Bridge Station

When the tower opens in 2012, it becomes a new entrance hall for the station and the docks for buses are extended. In the same year, works worth 700 million pounds were started for the remodeling of **London Bridge Station** and the arches under the tracks. The project is signed by Grimshaw and Partners and developed by Network Rail as part of the Thameslink Program.

The operation consists of reorganizing the layout of the tracks to increase, on the one hand, the number of wagons of the trains, and on the other, the platforms with trains that stop at London Bridge. An access lobby is also enabled from Tooley Street and St Thomas Street and new spaces for shops and restaurants in the old street-level arcade. In order to obtain the vestibule it was necessary to excavate underneath the tracks, without stopping the service, while their old supporting walls were demolished and replaced by piles and lintels, with large diaphanous spaces below.

As for the skyscraper itself, **The Shard**, the diversity of functions it performs is remarkable. Its own program is already mixed, since it contains 54,000 square meters of office space; a five star hotel and 200 beds in the best eighteen floors; and fourteen apartments. In total, it is estimated that 7,000 people will work in the building.

Conceived by Renzo Piano as a fragment of glass, whose edges reflect the light and the changing clouds, like a shining beacon of solid pyramidal base, anchored to the station with shops and restaurants and endowed with an excellent accessibility, it seems the perfect instrument to energize a neighborhood like Southwark, leaving behind past remnants and connotations dragged for centuries to turn it into an indisputable part of the center and become its reference.

Its presence is the first thing that you perceive in the urban skyline and manages to orient it in another way. In a certain way, it has replaced St Paul's Cathedral in that function, previously the undisputed reference point of the city for many miles around. But Wren's dome led us to the unmistakable center of the City, while The Shard recovers the ancient and primordial centrality of London Bridge, the origin and embryo of the city. It orders its surroundings on the right bank and forces the river and its meanders to function as the primary geographic element of the City.

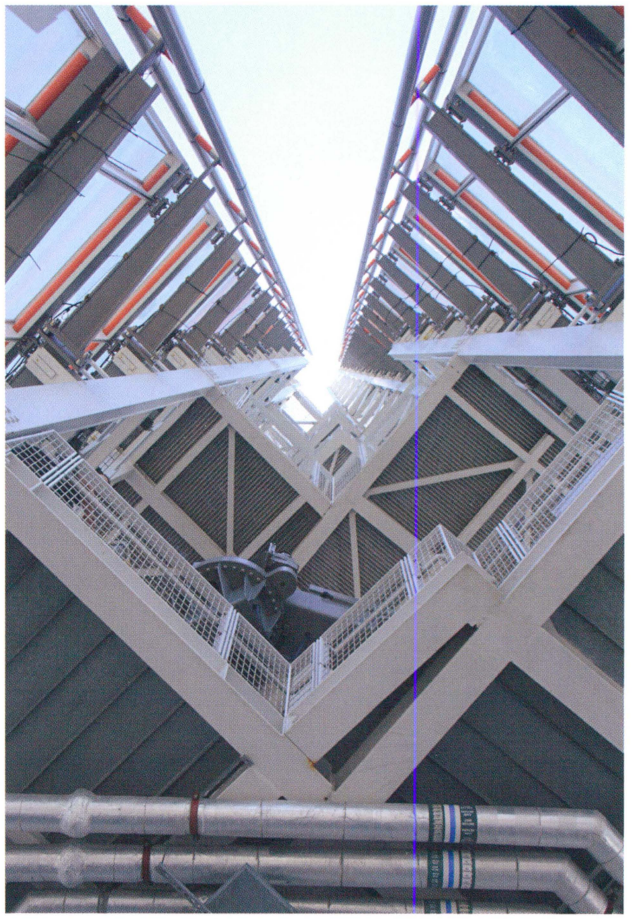
But its interest does not end with its size and position, and it offers a wealth of attractive details. In particular, its split ridges and its chipped top finish, while designed to reduce the risk of aerodynamic whirlwinds, provide an unprecedented break from the exterior-interior dichotomy at an unusual height of 300 m, as if the building had achieved the impossible to effectively tear a space devoid of consistency, to install itself and make 'its hole' a referent for the city.



The Shard - fitting of the base



The Shard-edges and summit



The Shard-edges





London Bridge Station


8


9


13



15


17


11


18

London Bridge Station

1. London Bridge Station
2. The Shard
3. Borough Market
4. Southwark Cathedral
5. Winchester Palace-Clinck Street
6. Winchester Wharves
7. Pickfords Wharf
8. Golden Hinde II-F. Drake Galleon
9. Minerva House
10. Montagu Close Place
11. Glazier's House
12. London Bridge
13. London Bridge 1
14. St. Olaf House
15. London Bridge Hospital
16. Cottons Centre
17. Hay's Gallery
18. HMS Belfast
19. More London Place
20. City Hall




16


5



3


19



1



7


6


20



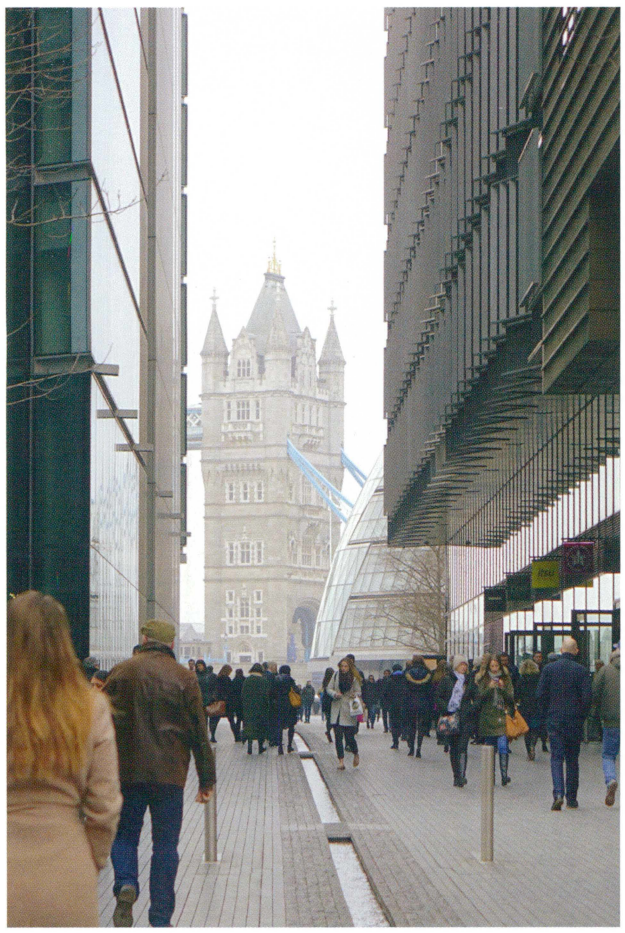
More London

City Hall



More London Place







More London Place towards Tower Bridge

More London Place towards The Shard



City Hall and More London

The headquarters of the Mayor of London and the Greater London Authority - GLA, projected by Norman Foster in 1998, lacks - deliberately - the scale and severity of the former County Hall, seat of the former London County Council and the Greater London Council, located downstream of Westminster Bridge.[22] The City Hall occupies a central place in the development of the neighborhood located on the south bank of the river, between London Bridge and Tower Bridge, and bordered on the south by Tooley Street and the railyard of London Bridge Station in Southwark.

Called More London, the new neighborhood includes six large office buildings; the largest of them houses the headquarters of Ernst & Young. For Powell, they are typical of Foster's recent commercial work in London: polished, efficient, scrupulously detailed and constructed with a well-proven formula. It is an international business development of high quality, with benefits for its developers and for the local community in terms not only of employment and regeneration, but also for opening the Thames to the interior of Bermondsey, contributing substantially to the rediscovery of the river as London's largest physical asset.

The plan of the area manages to open it effectively to the river, which significantly improves the value of the offices and neatly orders the whole. Most significant is the new narrow pedestrian avenue linking London Bridge Station with City Hall and Tower Bridge, along with two new squares and a series of reopened routes between Tooley Street and the river. The service streets are underground and there is only one car access in the plaza near the City Hall, with no parking spaces [103:92 and 94].

Moving Better in London

After a consolidation of companies in 1923

Throughout the twentieth century, the most relevant facts about the railway refer to its organization, which was always related to the economic evolution of the country and the periods of support or rejection of the automobile. In a succinct way, the first important event occurs on January 1, 1923, with the grouping of all the companies into four: the Great Western Railway; London and North Eastern Railway; London, Midland and Scottish Railway; and Southern Railway, the Big Four.

came nationalization in 1948,

As already mentioned, in the 1920s and 1930s, the idea was to develop road transport and the railway companies pressed -successfully- to prevent the construction of motorways, but stopped growing. After World War II, on January 1, 1948, the Big Four were nationalized to form British Railways (later called British Rail), which operated in six (later in five) regional authorities under the control of the British Transport Commission.

with cuts and reduction of lines in 1960

Initial changes were made to the service, which increased use and the network returned to profitability. With this, the roads and stations could be regenerated in a process that culminated around 1954, when road transport was privatized and railway revenues began to fall, until 1955, when the network ceased to be profitable again. In the mid-1960s, a new reorganization of the railways was carried out, with the reduction of many lines of mainly local traffic.

that ended up being privatized in 1994,

In the 1980s, the funding cuts made by Margaret Thatcher's government were compensated by increases in rates above inflation, and in 1994-1997 the railways were privatized. The ownership of the infrastructure went to Railtrack, which franchised the operation of passenger services to 25 private operators. Shortly after, serious accidents began that culminated in the worst of them all, which occurred in Hatfield on October 17, 2000.

and nationalized again in 2002.

It seems that the accident was caused by a fragmentation of the lane due to the development of microscopic cracks, which forced Railtrack to take preventive measures, imposing some 1,200 emergency speed restrictions throughout the network. Simultaneously, an expensive road replacement program began, which, together with the drop in traffic due to delays and works, led to the bankruptcy of the company and its replacement by the state company Network Rail in 2002.

Transport for London coordinates the modes

In 2000, a new period of coordinated management of transport by the public sector began in London, under the responsibility of the current Transport for London -TfL that integrates train, underground, light rail, buses, river transport and airports. London for Transport gained control of the Underground in 2003 and was organized into three groups - Underground, rail and surface services, with unique rates and means of payment (Oyster Card).

The subway group, London Underground, is divided into three units: BCV: Bakerloo, Central and Victoria lines; JNP: Jubilee, Northern and Piccadilly Lines; SSR (Sub Surface Railway): Metropolitan, District, Circle, Hammersmith & City and Waterloo & City lines. The rail group, London Rail, is responsible for the National Rail, London Overground, Docklands Light Railways and London Trams companies. The Surface Transport group coordinates London Buses, operated by the private sector, London Dial-a-Ride, London River Ser-



Waterloo Station

vices, London Streets and the taxi, cycling, bus station, security and traffic services.

The objectives of TfL are aimed at improving as much as possible the historical network of Underground and rail, building new connections and lines that increase their redundancy, multiplying the possible itineraries and facilitating transfers. To do this, new lines are introduced, building new sections and sharing the sections of greater centrality with the existing lines.

to improve their joint use

The two most important projects are the new Crossrail and Thameslink lines, which can be understood as structuring lines that, within the central area, assume the role of new orthogonal axes, a new *cardo and decumanus* of the city. Roman rationality is recovered with it, but with the railroad instead of road axes. These are projects that seem too big for somewhat flimsy reasons, but experts think they will change the way you move around London.

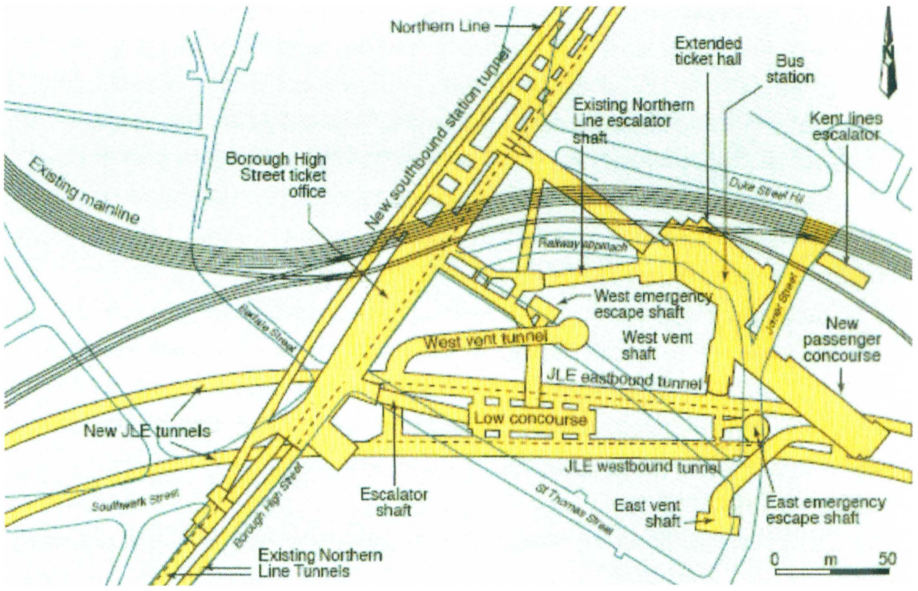
and start two big projects

To invest in new assets, including the East London Line, Thames Gateway Bridge, the West London Tram and the extension of the Dockland Light Railway, Transport for London has obtained permission from the Treasury to fi-

with new financing means,



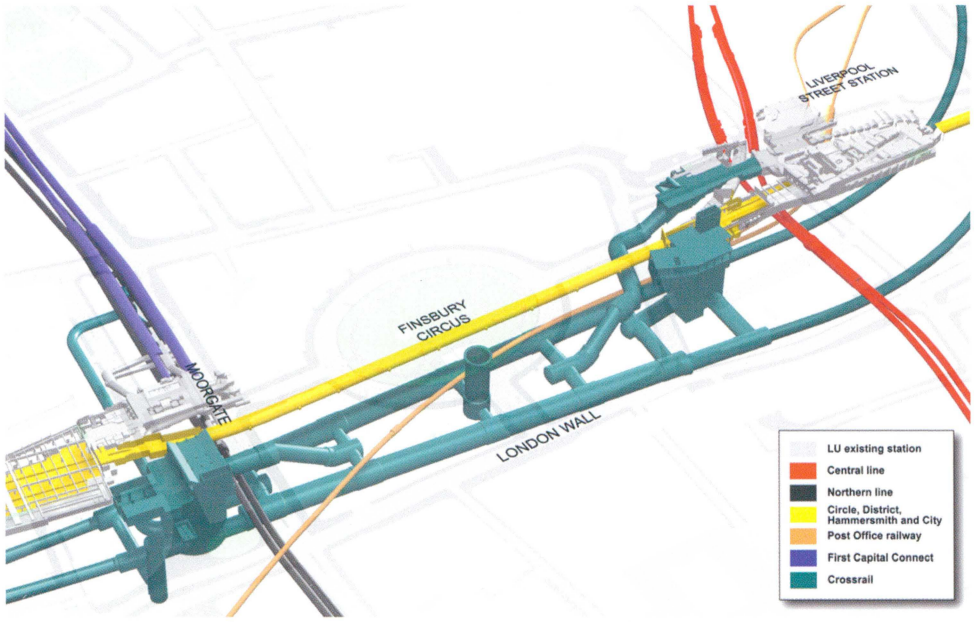
District Light Rail

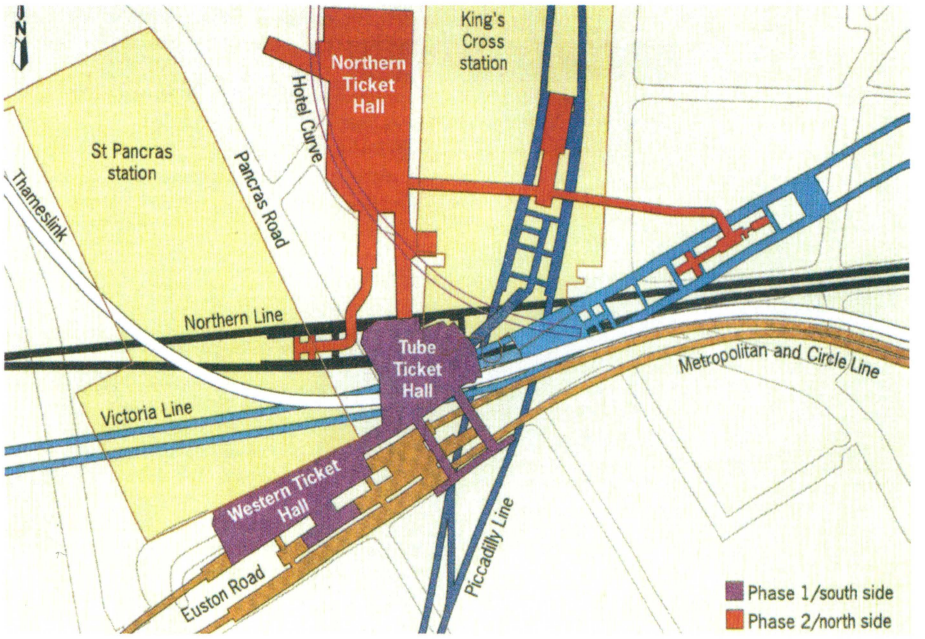


Waterloo and London Bridge [112:122]



District Light Rail





Liverpool Street Crossrail [112:204]

Confluence of lines in stations [112:157]

nance itself with new rules and has issued bonds to raise funds. This has improved the London bus system, is renovating its current Underground at a long-term pace and is building new lines. After many years of decline and lack of investment, significant resources are being devoted to network improvements, although it is still not possible to judge the quality of the renovation or how the new assets will work.

In addition, Congesting Charging was introduced in 2003 and has proven to be a successful example of demand management. Drivers entering an area in the city center during working hours must pay a charge of £8 per day. The traffic reductions have been in the range of 15 to 20%, with a higher cut in congestion. The mayor has advanced plans to extend the area westward.[23]

The mayor's transportation strategy aims to strike the right balance between encouraging Londoners to abandon car travel in more sustainable ways (walking, biking, and public transportation), with other measures that are essential but politically more difficult because of their coercive character,[24] since it is a case of increasing the market share of sustainable transport from 64% to 80% in about 25 years.[25]

a car reduction policy

This will put London at the level of the best cities in the world in terms of participation in the sustainable transport market, just behind Hong Kong. However, when one considers that Hong Kong has a population density four times greater than London, and that this is the main determinant of the market share of sustainable transport, this puts in perspective how ambitious the objective is.

The only way London can continue its history of economic success, while breathing clean air, reduce congestion and traffic accidents and make mobility in the city more equitable, is to densify while changing to modes of more sustainable transport.

and densification of the city.

But it is not enough to increase the capacity of public transport and make walking and cycling safer and more attractive. In addition to needing new

revenue streams,[26] it is necessary to reduce the number of highly polluting vehicles and those that make inefficient use of the road space, mainly private vehicles -cars and vans- with low-occupancy combustion engines.

London has a history of modal change that compares favorably with any city in the world. In the 17 years since the birth of TfL, the share of cars in transport in London has decreased from 47% to 36% and the proportion of sustainable transport increased by 11%.

With the current construction of tunnels

The classic "tubes" were dug by hand, with small tunnels and stations to minimize initial costs. This meant trains had to be very small, with a high cost per passenger, poor suspension and ride quality and no possibility of providing air conditioning. With mechanized tunnelling machines, the cost to build larger tunnels is much less, and offset by savings in rolling stock costs. Tube trains are expensive in part because everything is custom built to fit into the very small tunnels.

Virtually all underground railways built since the 1950s have larger tunnels, except in London. Larger tunnels would have cost a bit more, but the trains would have cost less, and attracted more paying riders. And with larger trains, it might have been possible to share the existing tracks between Canning Town and Stratford, while continuing the North London Line service, saving even more money [112: 111].

new lines are undertaken in the 1980s

Although the Victorian origins are still visible, London now has a truly modern railway system. In the first four decades of the century the nascent Underground network was integrated and spread throughout the metropolis. In contrast, the four decades after World War II were, in many ways, a period of managed decadence [112:XVI].

Starting in 1980, three large and essentially new railroads were built: the Docklands Light Railway, the Jubilee Line Extension and High Speed I, high speed from Europe. A fourth, Crossrail, is about to be completed. Each of these is a project of billions of euros. Two other projects, London Overground and Thameslink, are mainly carried out on infrastructures dating back to the nineteenth century, but have required some stretches of new construction and reconfiguration of services that, although relatively short, have a scale and a cost that makes them comparable to the new lines.

and now Crossrail from east to west,

Crossrail is a new railroad from Reading and Heathrow in the west, and Shenfield and Abbey Wood in the east, which requires 42 kilometers of new railway tunnels and another 14 kilometers of station and interchange tunnels, about 40 meters below some of the most important historic buildings in London. As of 2018, Crossrail trains are expected to transport some 72,000 passengers per hour through these new tunnels, which will increase capacity and reduce travel times for those crossing the capital.

The great expense of the Crossrail project has been justified by the improvement of the connectivity of companies and daily travelers. It is estimated that 48% of jobs in London will be located at less than 2 km, about 25 minutes on foot, from a Crossrail station. This will meet the demands for greater capacity of public transport and rapid access to airports, required by companies in the central areas of the City, the West End and Canary Wharf.



Crossrail-Moorgate works

Crossrail will allow 1.5 million additional passengers within 45 minutes of central London and will increase rail capacity by 10 percent, once completed. The line will significantly improve connections between and East and West London, cutting travel times for many journeys by half. Expanding development locations in East London, such as the developments around the Olympic Park at Stratford, will become more accessible and arguably become more competitive for attracting businesses and residents.[27]

Being the only access station to the three interior railway networks of the city, Farringdon Station will become one of the busiest stations in the United Kingdom. It will be an exchange station that will connect Thameslink, Crossrail and the London Underground. It is estimated that more than 140 trains per hour (including 24 Crossrail trains) will pass through the new station when it is operational in 2018.

which intersects with Thameslink in Farringdon,

Farringdon Station will be a key node to take passengers from outside London to the offices and business centers of the city and Canary Wharf. It will allow passengers to get from Farringdon to Tottenham Court Road in three minutes, to Paddington in seven minutes and to Heathrow in 31 minutes and will provide direct access to Gatwick and Luton airports.[28]

Farringdon is located on the central Crossrail line between Liverpool Street and Tottenham Court Road stations, with entrances on Cowcross Street in the west and Lindsey Street in the east, and platforms between 305 and 350 m in length. This design of long platforms with entrances for two stations of other lines facilitates connections without the need for corridors or passages, since the accesses are made with escalators from the ends of the platform.[29]

located and designed for transfers

The Crossrail Farringdon station consists of two 245 m long platform tunnels connected to two lobbies to the east and west. The western lobby will be shared with the Thameslink services and the east lobby, directly connected to the London Underground at Barbican Station, will provide access to the Met-

ropolitan, Circle and Hammersmith & City lines. It is estimated that the Farringdon Station, for Crossrail, will be used by 90,000 passengers a day, while the transfer services will be used by 150,000 passengers.

and financed with overbuilding rights,

To finance the station, in 2013 a six-story development located above the western lobby was approved. The design of John Robertson Architects foresees a building of 19,230 m^2 intended for offices with shops at the street level and entrance from the corner of Cowcross Street and Farringdon Road. The building will also enhance local views of the San Paul's Cathedral.

The second development on the station, designed by PLP Architecture, comprises a commercial and reception floor and five floors of columnless office space, which will be built above the eastern lobby in front of Smithfield market.[30]

while Thameslink goes from north to south

For its part Thameslink is a main route from north to south, with 68 stations and a 225 km route through London from Bedford to Brighton, serving the Gatwick and Luton airports. It also has a suburban circuit that serves Sutton, Mitcham and Wimbledon and a suburban line through Catford and Bromley South towards Sevenoaks. It was inaugurated as a direct service in 1988, and in 1998 it had reached a significant occupation, carrying more than 28,000 passengers at morning peak.

The Thameslink scheme has a budget of £5.5 billion to extend the service to another 100 stations and greatly increase the capacity in the central area of London to accommodate more frequent and longer trains, and its completion is scheduled for 2018. Its current advance rate is less than Crossrail's, but

Farringdon Station



it is not suffering so many changes of pace and seems more determined to recover parts of the old layout and improve the stations, with lower budgets than Crossrail.

The insertion of new high-performance lines on old routes forces us to overcome complicated situations that reach the roads and the stations themselves, now obliged to be longer, to have Underground connections and to offer several entrances to serve larger areas.

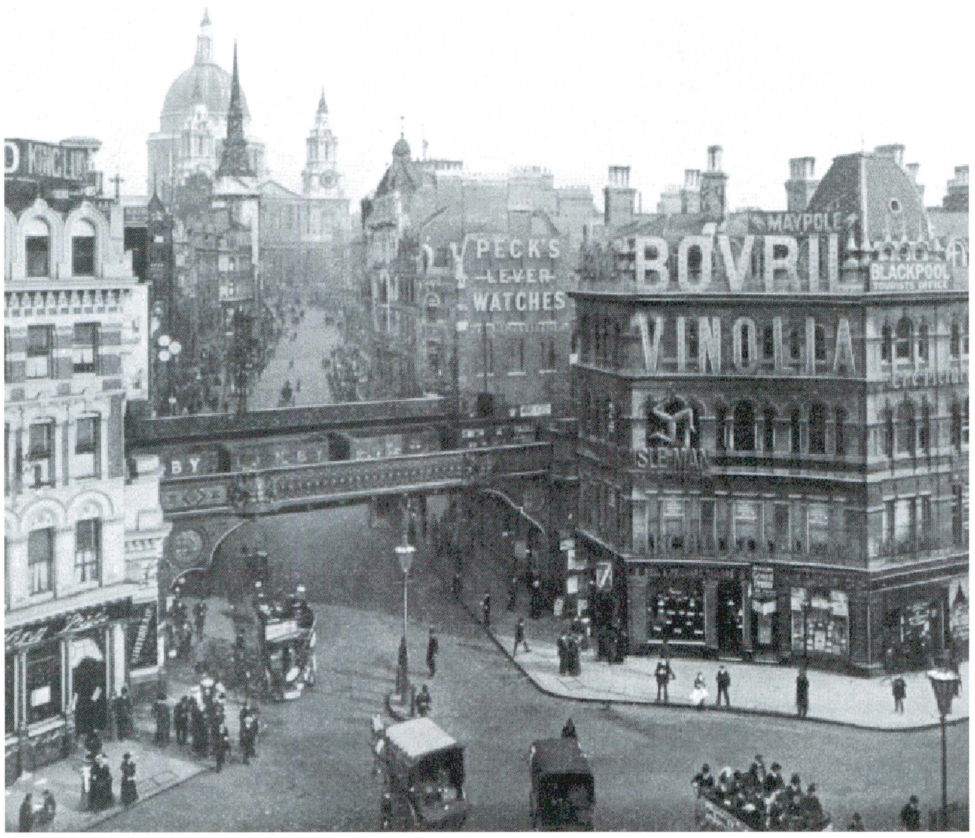
The **Thameslink** layout uses the old London, Chatham & Dover Railways - LC & DR line, which crossed the Thames by Blackfriars bridge and remained a long stretch with stone walls, up to Holborn. That line crossed Ludgate Hill Street (prolongation of Fleet Street) by the Ludgate Viaduct of 1880 in lattice beam -drawn by Doré and mentioned earlier- that had been replaced, well into the century by plate girders. In the 1990s it was decided to put the line underground and build a unified Underground station, from Ludgate Hill Station to Holborn Viaduct Station, demolishing the long high section, the iron viaduct and the elevated stations.

The resulting track profile went down from Blackfriars to enter horizontally in the new station and then climb to recover the old level in an excessively short section, which required a gradient of 4%, higher than permitted but salvageable with the current electric traction. The demolition of the old stone viaduct forced the line to be closed for 17 days, although the construction of the new station alongside to lower the tracks to it took a little more time. The work was financed with the granting of overbuilding rights over both stations [112:30].

with pending and old stations.

Ludgate Hill Viaduct-1880 [31]

Ludgate Hill Viaduct in 1970 [©Kim Traynor] [32]







Chelsea Harbour

Navigating the river,

with the help of marinas and piers.

Transport for London has also served river navigation along the Thames, with the Riverbus service, provided by high capacity and very fast catamarans between the main piers or jetties of the central urban stretch. It is accessed with the same rechargeable transport pass (Oyster Card), although the price of the trips is considerably more expensive than the Underground or the railway, but for certain destinations and journeys it can be faster.

Above all it has great acceptance among visitors and tourists, because it allows boat trips on the 'boulevard' of the city, under cover from inclemency if there is bad weather and with good views if it is clear.

Private recreational sailing has several marinas within the city, such as the luxurious Chelsea marina, called Chelsea Harbour, with access to the river endowed with locks from a dock surrounded by residential buildings, which extend well beyond the port to the abandoned Chelsea Power Station, in front of which a tall circular tower, the Chelsea Waterfront Tower, is being built.

Near the entrance to the port and upstream of Battersea Railway Bridge, there is one of the many floating platforms not only for boarding but for mooring for all types of boats, also linked to land by ramps, called Imperial Wharf Marina. On the south shore and just opposite is Oyster Pier, with the same functions for larger boats, and downstream on the same northern shore is Cadogan Pier, where many boats -generally dilapidated- that function as floating residences are moored.







Cadogan Pier at low tide

Chelsea Power Station



Chelsea Waterfront Tower

Battersea Railway Bridge

Further with Airports

As we have seen, one of the most important functions of the new mobility is easy access to the London airport system from any part of the city. The following tables show the five airports and their main accesses by Underground and rail. Of course, all have good access by road, with bus lines, parking and taxi services.

London Airports

	Heathrow T3	Gatwick	Stansted	Luton	London City
Million Pax/year	75,7	43,1	24,0	14,5	4,5
km to LON	24	39	50	44	12
Taxi-minute&€	50a70m-60a90€	90m-140€	<>60m-110€	>80m-115€	40m - 45€
Train-each min	Heathrow Exp-15	Gatwick Exp-15	NR each 15 m	NR each 60 m	DLR-10m
min-station	15-Paddington	30-Victoria	45-Liverpool Strt	25-St Pancras	20-Bank
Train service	excellent and expensive	crowded, bad	frequent and slow	good but few	like Underground
Underg.-min cntr	Piccadilly Line-55	No	No	Thameslink-30	Jubilee+DLR
Destinations	All the world	Europe-LowCost	Europe-LowCost	LowCost	Euro Capital
Safety	Frequent queues	Comfortable	Uncomfortable	Slow	Uncomfortable
Terminals	5-full of bars and shops, T5 good	1 ramps and corridors, old	1 good> stores	1-crowds	1-tight squeeze
Others	T4,T2 >hallways	Does not allow Uber	Far away	Bus to station	<destinations

Source: own elaboration with web data[33]

Hammersmith Flyover for the accesses to Heathrow, designed by G. Maunsell & Partners, and built in 1961 by prefabricated elements sewn with post-tensioned cables and later reinforced in 2011 with additional external cables to supplement the interiors, attacked by water filtrations.



The times and distances of the previous table are generic, referring to the nearest point of entry to London, in the case of roads, and the arrival station of the specific line by train, without taking into account the inner stretch in the city. If a specific route search engine is used from the same point in London at a precise date and time, a more approximate idea of the centrality of each airport can be achieved (at Heathrow T3 has been chosen, the airport's most central terminal; for T4 or T5 another 5 min must be added).

London Airports

Distances and times by car or public transport from Leicester Square

	Heathrow T3	Gatwick	Stansted	Luton	London City
Road km	33	46	62	55	14
Road minutes	80	110	85	90	45
Underground to station	Paddington	Victoria	Victoria	King Cross	Waterloo
Undergr.+accesses, minutes	38	47	110	58	35

Source: own elaboration with Google Maps data taken on July 1, 2017 at 5:00 p.m.

The planning of the new airports is, as in any large city, long and complex, but in London special attention is paid to train and Underground access, which is not so frequent elsewhere. A good example of the planning difficulties of an airport and its accesses was the choice of the location of the third airport in London, which fell to the little known airport of **Stansted**.

Plans for the third London airport.

Like Heathrow, Gatwick was far from being optimally located. It had been built on flat land and had a direct train service to Victoria Station, but was too close to the urbanized areas, and as early as 1947 the government had decided to build a new city nearby. In addition, it occupied lands of traditional recreational use for Londoners.

Gatwick had only one runway until the 1990s, but always considered the possibility of providing a second runway, which finally equated it with Heathrow. Although the government had pledged that Gatwick would not develop to its full extent, in 1960 a subcommittee of the House of Commons observed that some officials were evasive about its chances of growth. By then the question of a third airport was arising and the committee was concerned that, in its time, Stansted could develop as the third London airport following the Gatwick pattern.

Then began a long process of reports, hearings and counter-reports, which used sophisticated methods to choose the site of Cublington, which was then relegated in favor of another more suitable one in Foulness thanks to the simple opinion of an expert, and by a mixed solution of improvements in three airports because the previous one had an excessive cost. Finally it was built where and when the technicians wanted from the beginning, in Stansted, but twenty years later. The process is described by Peter Hall in detail in his book *Great Planning Disasters* (see summary in note[34]) [58:15-55].

Peter Hall's final assessment of this planning process offers two interpretations. One is linked to uncertainty due to changes in traffic figures and airport needs, which proved to be highly dependent on economic expectations, together with technological changes to reduce noise. And another more



Heathrow Airport T5

Access by road and rail.

conspiratorial one, regarding the aviation world lobby's capacity for pressure against the local powers that govern planning.

Parallel to these two possibilities, lies the classic disjunction between the incremental versus the once-and-for-all solution, inherent in any planning task. When the great solution by means of planning is better, but it involves high risk decisions in uncertain environments, the optimism or pessimism of society against these risks is decisive, lengthening the processes and causing abrupt changes in the evaluation of alternatives [58:54].

Heathrow was designated as the main airport in London after World War II, although the site had been chosen in 1942 by the Air Ministry as a bomber base, but already considering its civilian use. The first civilian flight used Heathrow in 1946, although the first permanent terminal in the current area was not opened until 1955. Until the mid-1960s, most passengers checked in at air terminals in central London, traveling by bus directly to the plane.[35]

In many ways, the site was ideal: a large area without major settlements, adjacent to the main road to London and the geographic center of southern England. Seven decades later, as the debate continues on the need to build a third runway, some politicians have suggested that the airport is in the wrong place, since most of the planes that arrive at Heathrow have to fly over central London, with sound impacts and security risks.

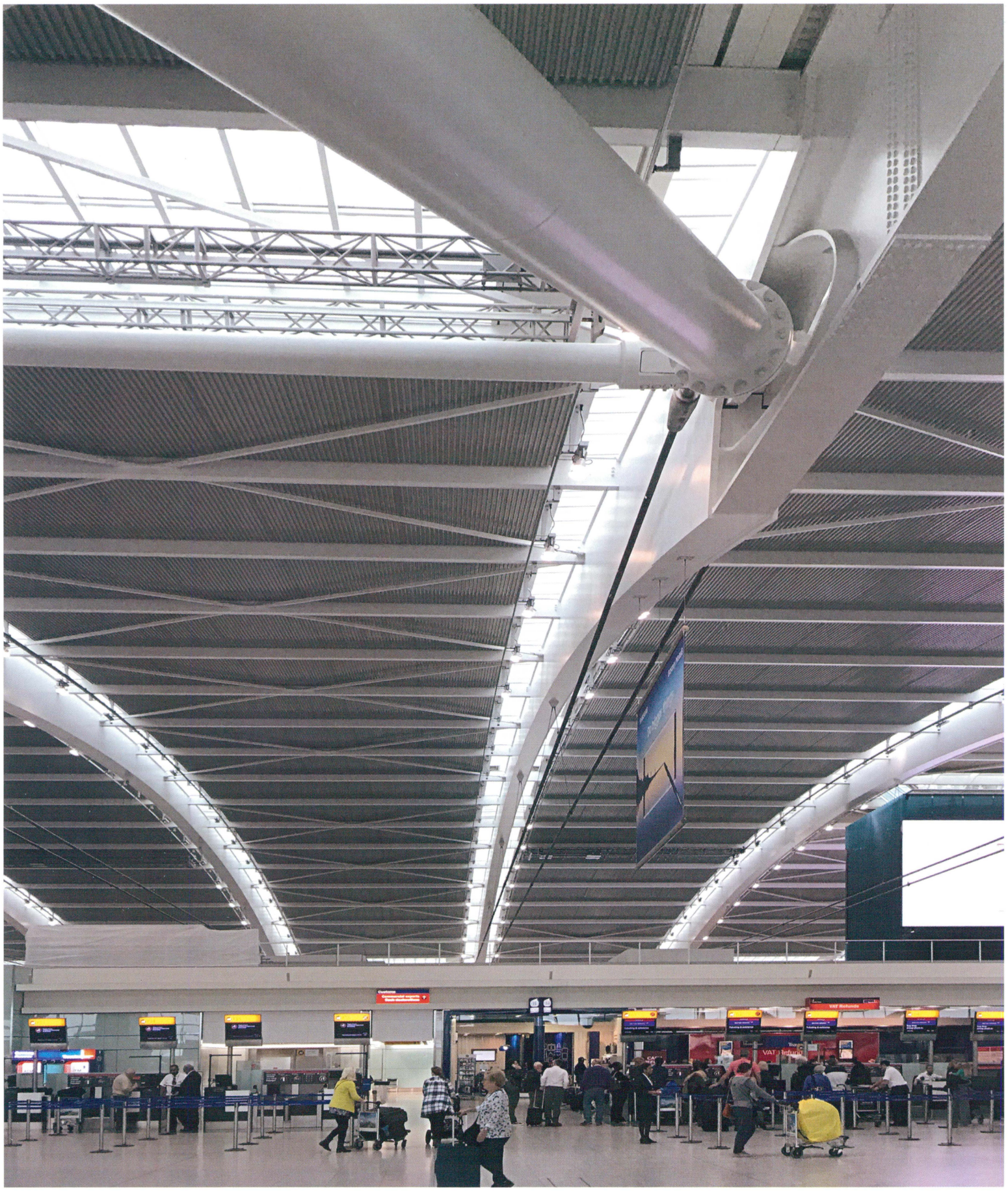
At that time, the speed and measurement of the growth of air transport was still not well known, but although it is now fully used, it has more capacity than almost any other airport in the world, with reasonable efficiency. And the alternative that was considered at that time, Fairlop Waters, would have been much further away from the shops, hotels and theaters of London's West End and would have worse access from the rest of the country.

According to Schabas, it could be said that *Heathrow is in exactly the right space – the closest site to Harrods with space for two full-length runways and the terminals to handle 80 million passengers per year* [112:14].

At first it was thought that road access with bus and taxi services would be sufficient to service **Heathrow** Airport. To improve them, it was decided to build the Hammersmith and Chiswick viaducts and add a branch to the M4 motorway to the west.

With some adjustment of the cost-benefit analysis, London Transport - LT could demonstrate that a 5.5 km extension of the **Piccadilly Line**, from Hounslow West to Heathrow Central (now Heathrow T1, T2, T3) was superior in both economic and financial terms to the recently built Victoria Line. It was recognized from the start that the line would be slow and not particularly comfortable, but it would provide excellent distribution throughout London, passing less than a kilometer from half of the hotel rooms in London, which is good for individual travelers and also for airport workers.

The only station of the airport would be located between the three original terminals, below the bus terminal, and connected to each one by long pedestrian tunnels. The Piccadilly Line did not provide perfect service to many trips, but it worked well enough in many others to be useful. Inaugurated in 1977, the line quickly captured a quarter of the trips to and from the



Heathrow Airport T5



Heathrow Airport T5

airport. Although it takes 48 minutes, with 17 stops between the airport and Leicester Square, the Piccadilly Line remains the cheapest and often the most reliable way to get to Heathrow [112:16].

When Terminal 4 of Heathrow and the Stansted Airport were completed, the British Airport Authority - BAA decided to build a fast rail link to Heathrow, following the model of the **Gatwick Express** launched in 1984, which had been very well received. In principle there were doubts about the attractiveness of a fast train, but the design of the service was successful in attracting travelers who were willing to pay a little more to travel faster and more comfortably. And the success increased when the arrival at Victoria Station was set up with direct elevators to the taxi stand.

When building the Piccadilly Line extension twenty years ago was decided, an attempt was made to introduce a **Heathrow Express** service that did not succeed, but the project generated a lot of interest. The debate focused on choosing the most convenient route and Termini station to better serve the West End and the City. The main candidates were Paddington, whose GWL platform offered four tracks but still operated with diesel traction, and Waterloo, which had two tracks. The first won because of its greater traffic capacity, which, in principle, made the service more reliable. At the airport, three stations were envisaged, one for Terminals 1, 2 and 3, another for T4 and one more for T5, with direct elevators from the baggage collection exit to the platforms.

The line was proposed as an agreement between BAA, which was in charge of the new line sections and the rolling stock, and British Rail - BR that arranged and electrified the main trunk and taxi service at Paddington Station. As the owner, BAA decided the brand, the level of service and the

rates; it received the revenues and paid the operating costs to BR, in charge of operating the service as BAA's contractor, including the amortization of its investment and a plus if the revenues exceeded 90% of the predicted levels. When BR was privatized, BAA bought its rights and became the sole owner, operating through another operator and paying for the use of the network.

Being a redundant service, with private financing and without subsidies, it was accepted from the first moment that BAA could charge the rates according to what the market would support. In 1992, a price of three times the Underground was envisaged, which could be one third of a taxi, proportions very similar to the current ones.

The opening of the line was delayed until 1998, due to the collapse of a section of tunnel near the terminals, which dragged down an office building and a car park. All in all, the line was a success from the start, capturing 15% of airport traffic, in line with expectations and achieving the expected profitability of the original investment [112:33].

The planning of the new **Heathrow T5** terminal was a new example of the slowness and swings of planning: in the words of Kenneth Powell, it *seems to underline the perversity of the British planning system* [104:47]. After a long period of generalized objections to a new terminal and - in general - to the expansion of air traffic in London, and after very expensive public inquiry, convened in 1993, the project was approved in 2001.

The nature of the project changed radically with the delays. The single-level terminal, proposed in the Rogers scheme, winner of the 1989 contest, was abandoned after the public inquiry ruled against the use of green belt lands for a parking lot. A redesign produced a scheme with a segregation of departing and arriving passengers on two levels, with 'cannons' for the entrance of natural light into the heart of the building.

Finally, it was decided to build a parallelepiped of about 400 x 180 x 40 m with a large roof from side to side, formed by large biarticulated arches supported on corbels cemented on the ground, with an independent lower supporting building that leaves the higher departures floor with a huge and spectacular space, completely free of pillars. Between the accesses and the main block there are several glazed patios; in one of them circulate the connection elevators with the Heathrow Express underground station and in the others there are fountains and trees. On the other side were two satellite buildings, parallel to the main one and of similar length, although only 50 m wide, joined by a fast automatic underground train. The terminal includes a new control tower.

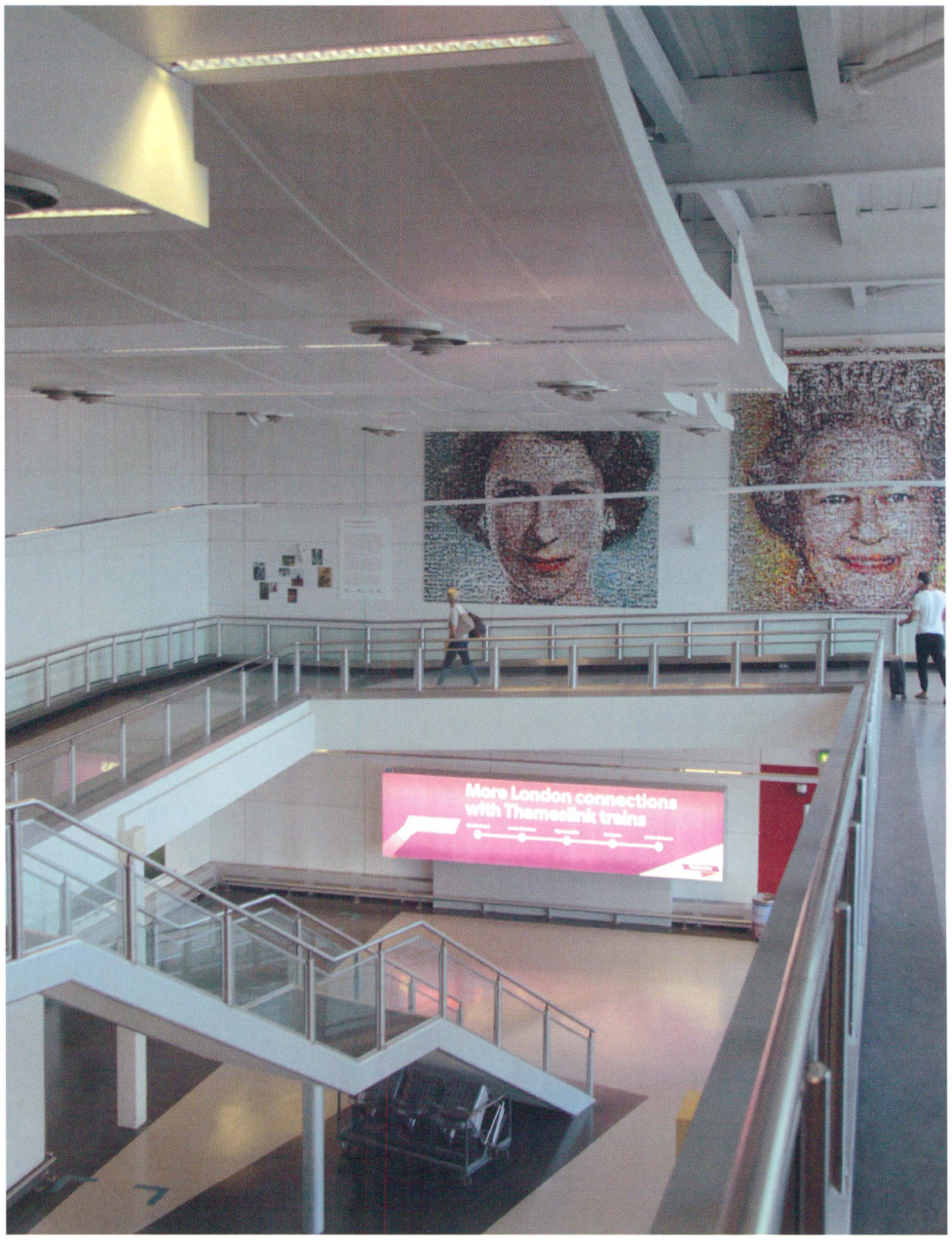
Terminal T5 was designed to handle 35 million passengers a year, but already in 2015, it handled 33.1 million passengers on 215,700 flights, which represented 44.6% of the passengers and 46.6% of the total flights of the airport, being its busiest terminal. It was designed by Richard Rogers, and the construction design was completed by aviation architects Pascall & Watson with Arup structural engineering and Mott MacDonald general engineering. It cost four billion pounds and its construction ended in 2008, almost 20 years after its conception.



Control tower. Heathrow Airport T5



Gatwick Airport



Gatwick Airport began operating in the late 1920s and operated commercial flights since 1933, to become the second busiest airport in the United Kingdom and the eighth in Europe. It has two runways, although it only operates with one because the second is very close and its function is to replace the first in case of obstruction or repairs, and two terminals. It is the base of operations for EasyJet, which offers more than a hundred destinations from there and accounts for 45% of its total traffic, followed by British Airways with 15% and Norwegian with 11%.

The first terminal was the building of a farm, but the second one, called the Beehive, is of more interest. It is a circular building built expressly as a terminal with telescopic covered access to aircraft walkways by A. M. Jackaman, who had bought the airport in 1933 and even registered a patent of the idea. From the terminal there were three daily flights to Paris, combined with fast train trips from Victoria Station. The Beehive is preserved and has been recently restored.[36]



Stansted Airport

The British Airways Authority - BAA took control of **Stansted** Airport in 1966 and immediately decided to build a new terminal with a capacity of 15 million passengers. Faced with the traditional arrangement of boarding gates in long tentacles, a central building with four satellites linked by means of a *people-mover*, a fast automatic train, was chosen. Two satellites would come into service from the first moment, while the other two would do so in 1996.[37]

The Stansted project was entrusted to Foster and Partners, who proposed a building with entrances and exits on a single floor plus a service basement, initially square in shape, but of a modular and indefinite nature, placed between the tracks and the south edge. The key piece of the design is the tree structural module, generator by addition of the entire roof, raised as a central element to support a square roof surface of 36 m on each side.



Stansted Airport



That central tree is formed by a prismatic structure of four 12 m high columns, gathered at the top with a square of bars of similar diameter forming the upper base. From the corners of this upper base, diagonally ascending stanchions emerge: four small ones inwards forming a central vertex and four large ones projecting outwards defining a square of 18 m on each side. To stiffen the structure, four tie rods are added from that central apex to the highest end of the posts.

Between the supporting shafts arranged at 36 m between axes, cover modules of 18 m on each side are supported on their upper ends, so that each tree supports a roof square of 36 m on each side. The three closed façades are supported by foundations and are fastened to the edge of the cantilevers, that is, 9 m from the line of axes of the trees, while the edge of the access to the aircraft area is a covered outdoor porch 18 m wide, formed by an additional line of trees.

From the point of view of structural design, the module and the resulting structure are impeccable and the resulting building is clean and transparent, showing a perfect integration with the structure. The natural light of the large square skylights located in the center of the 18 m modules is sufficient to adequately illuminate the building. In order not to introduce rainwater into the structure, the drainage was solved with a vacuum pump system that sucked up the water and led it through horizontal stainless steel pipes, 10 cm in diameter, to the edges of the building. The prismatic spaces inside the trees were used for ventilation and air conditioning, and as a support for signs and advertisements.

However, its operation has difficulties with passenger traffic, especially when boarding lines are formed that can not be adequately managed due to lack of space. In situations close to saturation, due to delays or incidents, the airport becomes uncomfortable due to lack of space and, although that is something general to all the others, in Stansted it seems more accentuated.





Minions in Buckingham Palace (Pierre Coffin, Kyle Balda, 2015)

Mary Poppins flying over the city of London (Robert Stevenson, 1964)

Spaces of Concurrence

London and Cinema

The British film industry is one of the most respected in the world and most of it is concentrated in the city of London. It had its Golden Age in the 1940s with the numerous productions of the studios of Alexander Korda and J. Arthur Rank. It has generated some notorious films, as well as important directors and actors -Alfred Hitchcock, David Lean, Laurence Olivier, Sam Mendes, Ridley Scott, Anthony Hopkins, Michael Caine, Liam Neeson, Judy Dench ...-. The London Film Festival (BFI London Film Festival) is the most important film event of the year in the United Kingdom since 1956 and usually takes place in October-November in the halls of the West End. Leicester Square is where most of the premieres are held and in it are concentrated several cinemas such as the Odeon, the Vue Cinema and the Empire Cinema.

London is one of the cities we know through cinema. Before World War I, its best-known scenarios -Big Ben, Tower Bridge, Trafalgar Square ... - were recreated, and after that shooting in the real outdoors began. There is a great diversity of environments, from the classics such as *Jack the Ripper* (Alfred Hitchcock, 1926) to Victorian London through characters such as *Dr. Jekyll and Mr. Hyde* (Rouben Mamoulian, 1931) or the films based on the novels of Charles Dickens, like *Oliver Twist* (David Lean, 1948).

Subsequently, with films like *My Fair Lady* (George Cukor, 1963) or *The Elephant Man* (David Lynch, 1980), the contrasts of the different neighborhoods and estates are reflected. The periphery of the city and the multiethnic suburbs are mainly incorporated from the 1990s, with works such as *Riff-Raff* (Ken Loach, 1990) or *My Beautiful Laundrette* (Stephen Frears, 1985). There are many current films filmed in the city of London and especially those that have the Thames as a backdrop, such as the James Bond boat chase through the river in *The World is Never Enough* (Michael Apted, 1999) or the incursion of several famous superheroes like *The Fantastic Four* (Tim Story, 2007). Here are some of them and in the notes the most emblematic scenes.[38]

Films shot in London

The Lodger: A Story of the London Fog (Alfred Hitchcock, 1926)

Blackmail (Alfred Hitchcock, 1929)

Dr. Jekyll & Mr. Hyde (Rouben Mamoulian, 1931)

The 39 Steps (Alfred Hitchcock, 1935 and Don Sharp 1978)

Oliver Twist (David Lean, 1948)

Passport to Pimlico (Henry Cornelius, 1949)

Stage Fright (Alfred Hitchcock, 1950)

The Man Who Knew Too Much (Alfred Hitchcock, 1956)

Indiscreet (Stanley Donen, 1958)

101 Dalmatians (Clyde Geronimi et al, 1961 and Stephen Herek, 1996)

My Fair Lady (George Cukor, 1963)

Mary Poppins (Robert Stevenson, 1964)

A Hard Day's Night (Richard Lester, 1964)

A Study in Terror (James Hill, 1965)

Blow-Up (Michelangelo Antonioni, 1966)

The Elephant Man (David Lynch, 1980)

An American werewolf in London (John Landis, 1981)

Dance With a Stranger (Mike Newell, 1985)

My Beautiful Laundrette (Stephen Frears, 1985)

Little Dorrit (Christine Edzard, 1987)

A Fish Called Wanda (John Cleese, 1989)

Riff-Raff (Ken Loach, 1990)

London Kills Me (Hanif Kureishi, 1991)

Richard III (Richard Loncraine, 1995)

Wilde (Brian Gilbert, 1997)

Sliding Doors (Peter Howitt, 1998)

Shakespeare in Love (John Madden, 1998)

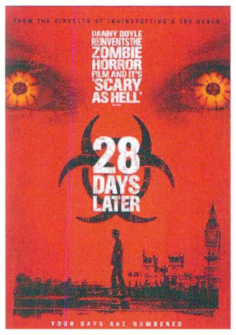
Lock Stock and Two Smoking Barrels (Guy Ritchie, 1998)

Notting Hill (Roger Michel, 1999)

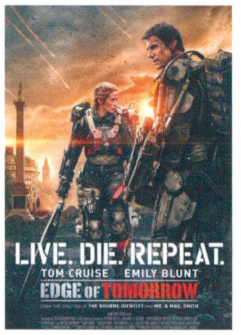
Entrapment (Jon Amiel, 1999)

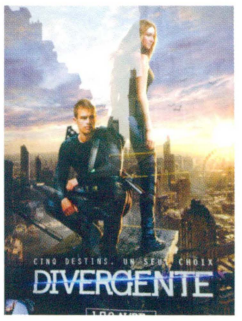
The World Is Not Enough (Michael Apted, 1999)

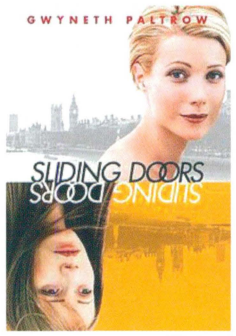
Harry Potter and the Philosopher's Stone (Chris Columbus, 2001)

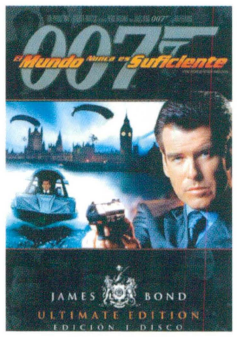






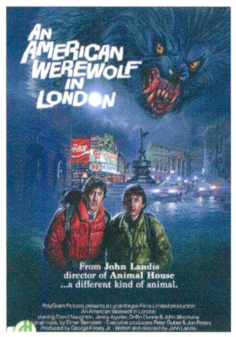


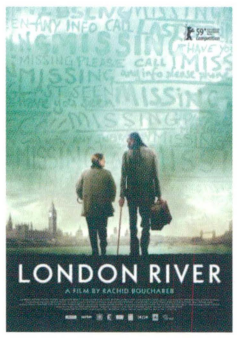


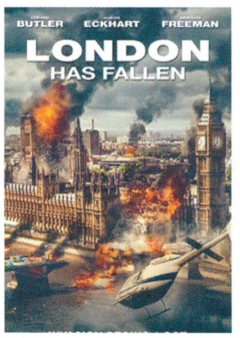


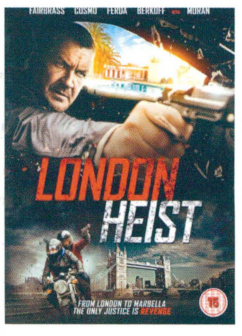


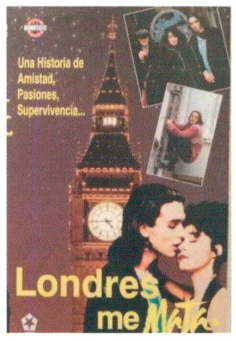


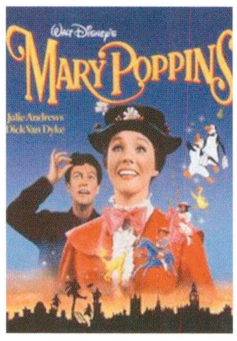


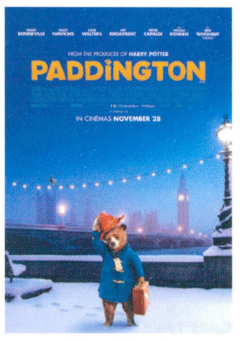


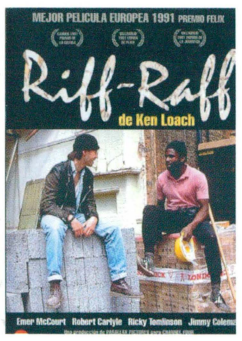




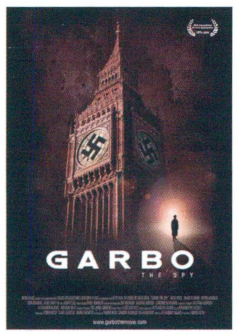




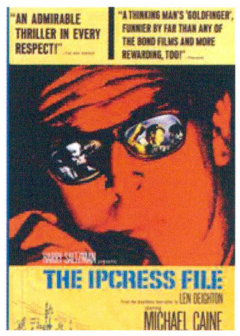




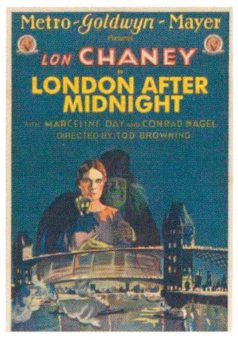


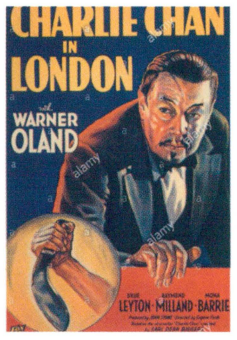


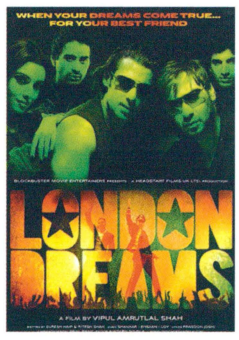


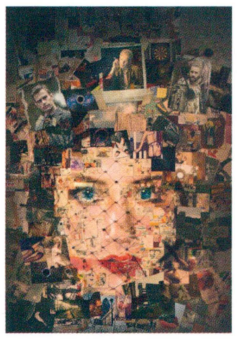


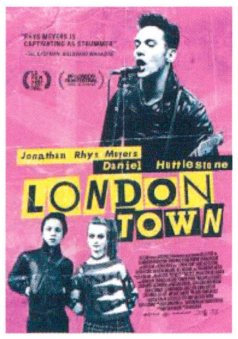


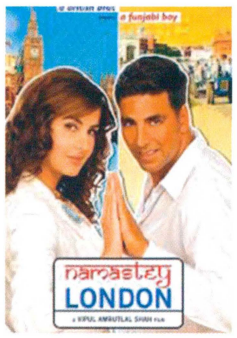


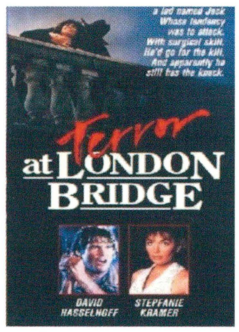


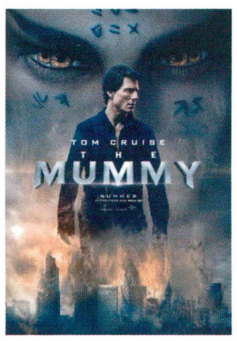




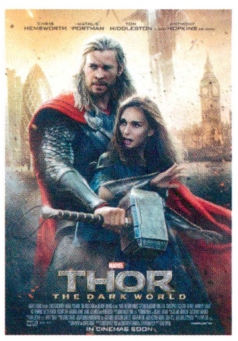


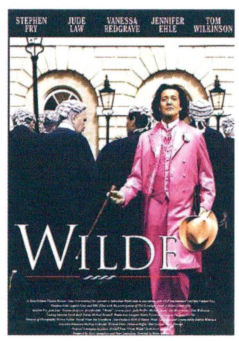










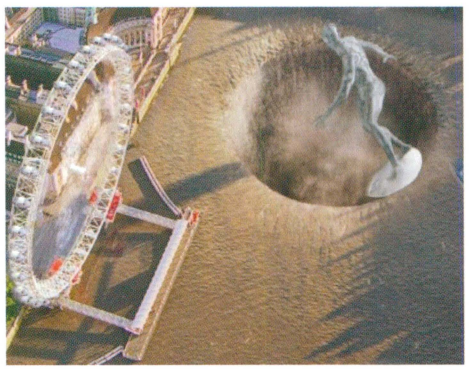


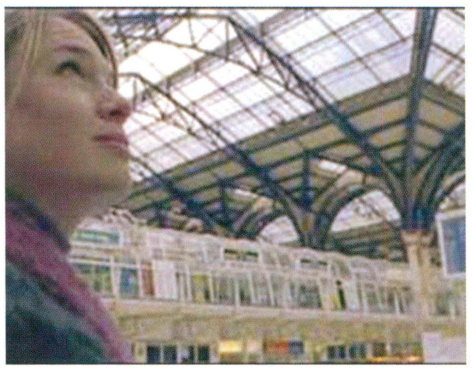
Bridget Jones's Diary (Sharon Maguire, 2001)
The King's Speech (Tom Hooper, 2010)
The Imaginarium of Dr. Parnassus (Terry Gilliam, 2009)
London River (Rachid Bouchareb, 2009)
London Has Fallen (Babak Najafi, 2016)
A Hundred Streets (Jim O'Hanlon, 2016)
Thor: The Dark World (Alan Taylor, 2013)
Edge of Tomorrow (Doug Liman, 2014)
Garfield 2 (Tim Hill, 2006)
Shanghai Knights (David Dobkin, 2003)
Divergent (Neil Burger, 2014)
1920 London (Tinu Suresh Desai, 2016)
London Heist (Mark McQueen, 2017)
Wonder Woman (Patty Jenkins, 2017)
A Hard Day's Night (Richard Lester, 1964)
101 Dalmatians (Clyde Geronimi, Wolfgang Reitherman, Hamilton Luske, 1961 and Stephen Herek, 1996)
Sliding Doors (Peter Howitt, 1998)
V For Vendetta (James McTeigue, 2005)
Richard III (Richard Loncraine, 1995)
The 39 Steps (Alfred Hitchcock, 1935 and Don Sharp, 1978)
Shaun of the Dead (Edgar Wright, 2004)
Shakespeare in Love (John Madden, 1998)
Lock, Stock and Two Smoking Barrels (Guy Ritchie, 1998)
Closer (Mike Nichols, 2004)
About a Boy (Chris Weitz, Paul Weitz, 2002)
The Ipcress File (Sidney J. Furie, 1965)
Withnail and I (Bruce Robinson, 1987)
The Mummy (Alex Kurtzman, 2017)
Assassin's Creed (Justin Kurzel, 2016)
London Dreams (Vipul Amrutlal Shah, 2009)
Garbo: The Spy (Edmon Roch, 2009)
Greetings London (Vipul Amrutlal Shah, 2007)
The Iron Lady (Phyllida Lloyd, 2011)
London Town (Derrick Borte, 2016)
London Fields (Mathew Cullen, 2015)
Charlie Chan in London (Eugene Forde, 1934)
London After Midnight (Tod Browning, 1927)
Guest in London (Ashwni Dhir, 2017)







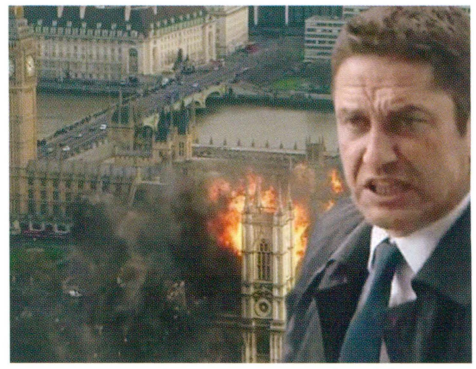


















▲ Thomas Sangster and Liam Neeson on the bank of the Thames, in Love, Actually (2003)

Great swirl in the Thames, in The Fantastic Four: Rise of the Silver Surfer (Tim Story, 2007)

Tom Hanks and Audrey Tautou in front of Westminster Abbey, in The Da Vinci Code (Ron Howard, 2006)

Filming on the outside of the British Museum, Blackmail (Alfred Hitchock, 1929)

▲ Harry Potter on platform 9 3/4 in King's Cross Station, in Harry Potter and the Philosopher's Stone (Chris Columbus, 2001)

Renée Zellweger at Liverpool Street Station, in Bridget Jones's Diary (Sharon Maguire, 2001)

Colin Firth and Geoffrey Rush with the Victoria Memorial in the background, in The King's Speech (Tom Hooper, 2010)

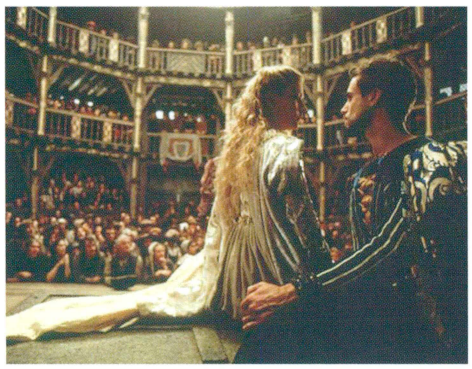
Robert Powell hanging from the Big Ben clock, in The 39 Steps (Don Sharp, 1978)

▲ Audrey Hepburn in Covent Garden, in My Fair Lady (George Cukor, 1963).

Vanessa Redgrave and David Hemmings in Maryon Park, in Blow-Up (Michelangelo Antonioni, 1966)

A devastated London behind Gerard Butler in London Has Fallen (Babak Najafi, 2016)

Hitchock shooting in London, Stage Fright (Alfred Hitchock, 1950)

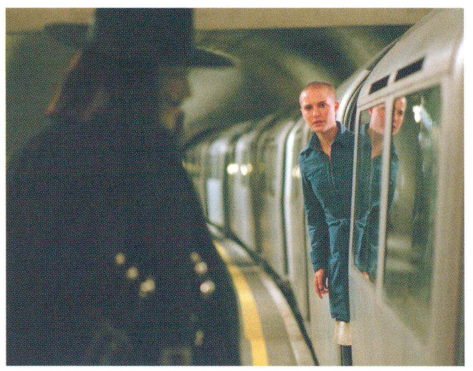


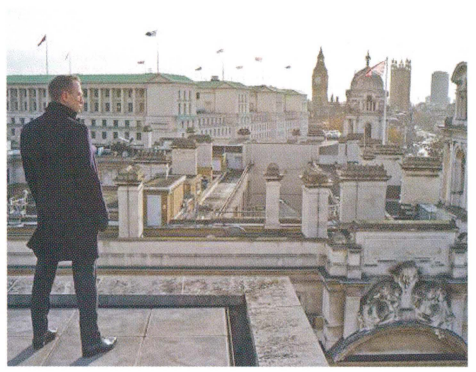


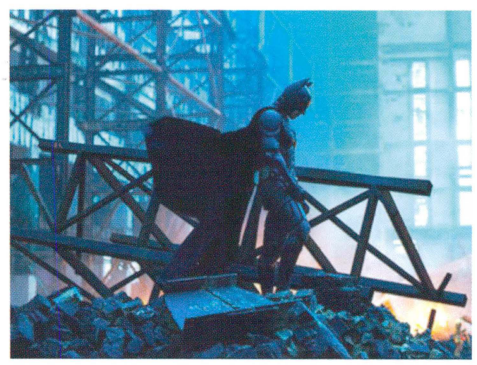










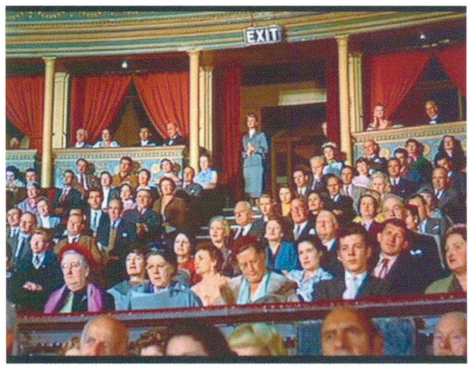


















▲ Gwyneth Paltrow and Joseph Fiennes in The Globe Theatre, in Shakespeare in Love (John Madden, 1998)

Hugh Grant and Nicholas Hoult in Queen Mary's Gardens inside Regent's Park, in About A Boy (Chris Weitz, Paul Weitz, 2002)

Gal Gadot in front of Tower Bridge, in Wonder Woman (Patty Jenkins, 2017)

Interior of the Albert Hall, in The Man Who Knew Too Much (Alfred Hitchock, 1956)

▲ The Winchester Tavern, Monson Road at Barlborough Street, New Cross Gate, in Shaun of the Dead (Edgar Wright, 2004)

Natalie Portman in the London Underground, in V For Vendetta (James McTeigue, 2005)

Gwyneth Paltrow and John Hannah in the Albert Bridge Waterloo and City Line Underground stations, in Sliding Doors (Peter Howitt, 1998)

Paddington Bear in front of Buckingham Palace (Paul King, 2014)

▲ Joely Richardson riding a bicycle with her dog in Trafalgar Square, in 101 Dalmatians (Stephen Herek, 1996)

James Bond (Daniel Craig) observing the London rooftops in Skyfall (Sam Mendes, 2012)

Boat chase under Glengall Bridge in Millwall Inner Dock, in The World is Not Enough (Michael Apted, 1999)

Cillian Murphy on Westminster bridge with Big Ben in the background, in 28 Days Later (Danny Boyle, 2002).

▲ Hugh Grant walking around Portobello Road Market, in Notting Hill (Roger Michell, 1999)

Batman (Christian Bale) in the old Battersea power station, in Batman: The Dark Knight (Christopher Nolan, 2008)

Views of the river from the Tate Modern, in Match Point (Woody Allen, 2005)

Griffin Dunne in the Tottenham Court Road Underground station, in An American Werewolf in London (John Landis, 1981)



Wembley Stadium



The soccer stadiums-
Wembley

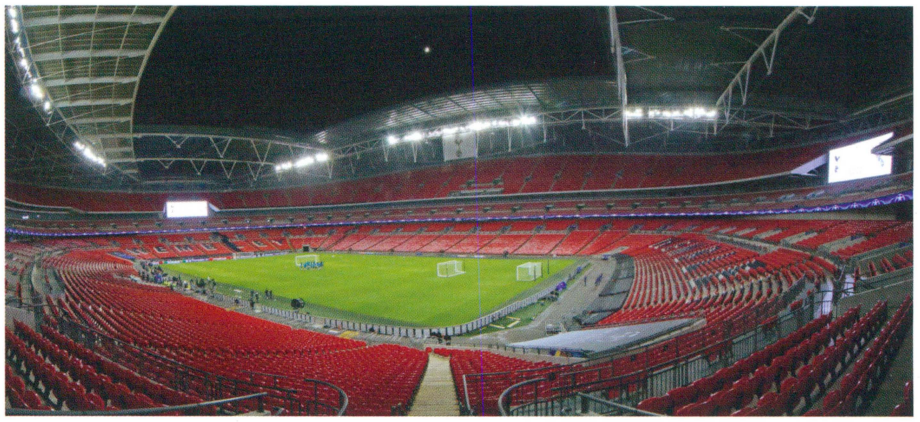
it was reformed
for the Olympic
Games,

Wembley Stadium is the headquarters of the English national team. Built in 2007 it is the largest stadium in the United Kingdom and the second in Europe with a capacity of 90,000 people.

During the football season, Wembley hosts the FA Cup final and semifinals, along with the FA Community Shield Cup and the Football League Cup. In addition, the stadium has hosted other European tournaments and all home games of the English national team. The Rugby Premiership and the Rugby Football Union Cup, football and boxing have also taken place at Wembley Stadium.[39]

The 1998 contest for the design and construction of the new English National Stadium was won by a team formed by Foster & Partners and HOK Sport Architecture (now Populous), which was joined by the consultant Mott MacDonald, although construction did not start until autumn of 2002, with the help of 100 million pounds from the National Lottery. Its total cost amounted





Wembley Stadium

to about 350 million and its capacity increased by 30% that of the previous stadium, built on that site in 1923 until its demolition in 2003.

The stadium was inaugurated in 2007, with the ambition of becoming *a benchmark for future stadium construction*, given the generosity of its facilities and services, the perfect visibility from all its seats and its flexibility to adapt to athletics and all kinds of events. Although the iconic 'twin towers' of the previous stadium were missed after the demolition, the new stadium affirmed its position in the London skyline thanks to its familiar free arch of 134 m height and 315 m span, which has a circular section with a larger diameter than the Eurostar tunnel.

The main novelty of the stadium is its partially retractable roof, capable of providing shelter from rain to all its seats, partially suspended from the reference arch, which aims to be *a dramatic symbol of regeneration* [104:151].

and wants to be a world reference.





Emirates Stadium

Arsenal stadium is the largest, although there are other football stadiums.

Emirates Stadium has been the headquarters of the Arsenal Football Club since 2006, and is located in the Islington neighborhood, about 500 m from its former headquarters on Avenell Road, Highbury, where was maintained since the 1930s and which has been replaced by housing. The new Emirates stadium, partly financed by the airline, is located in an old industrial area, next to the East Coast railway line, and has a capacity of 60,000 spectators.

With a total cost of 170 million pounds, the project is linked to a campaign to regenerate the surrounding area of Lower Holloway Road, which includes the construction of 2,000 new homes, different features and a new urban park. Its designer, *HOK Sport Architecture's Rod Sheard argues that sport is 'the world's first truly global culture. Consequently, the stadium will become the most important building any community can own.'*

The roof is suspended from the upper edge of the building formed by the bleachers and rests on two huge metal lattices of 220 m in length. Along with the glass-clad façades, the stadium acquires the appearance of an airport terminal rather than a traditional football field. The Islington neighborhood understands its presence as part of its effort to defend that sport is a regenerative force of the city [104:118].

Built in 1899, **White Hart Lane** is the headquarters of Tottenham Hotspurs, located in the Haringey neighborhood, in north London. South of the Thames, in the London suburb of Southwark, is **The Den**, which has been the headquarters of the Millwall Football Club since 1993. The headquarters of the Charlton Athletic Football Club since 1919 is **The Valley** stadium, in the Greenwich neighborhood, in southeast London. Finally, the seat of the Leyton Orient Football Club since 1937 is the **Matchroom Stadium**, also known as Brisbane Road and located one mile from the Olympic Stadium in the Waltham Forest neighborhood.







Emirates Stadium









Olympic Stadium

Olympic Pool

The Olympic Games, as an excuse

Initially, it was envisaged that the Olympic Games would focus on Newham and Stratford to help kick-start London's growth eastward, in an attempt to find a place for the additional 800,000 Londoners who, Mayor Livingstone predicted, would need to be housed in the next two decades. The development is concentrated in Stratford, which got the stadium, the swimming pool, an airfield, a hockey stadium and four covered stadiums, the Olympic City of 17,000 beds; and the Lower Lea Valley as the site of the smaller facilities.

The scale of the project is enormous, and resulted in a total reengineering of East London. Depending on how it is counted, the cost could be between two and four billion pounds: once the games are over, the action begins on all fronts. In fact, the stadium and the Olympic buildings, in themselves, are barely pretentious, except for the London Aquatic Center, with Olympic pool functions during the games, designed by Zaha Hadid, which becomes the center of all from the first glance at the complex.



Olympic Pool with the Stratford extension behind





Olympic Pool-London Aquatic Centre- Zaha Hadid

International Quarter- square with train and bus station





International Quarter-Stratford



Stratford Railway Station

With that exception, everything seems to be a mere support for the development of Stratford, of enormous importance for that part of the city, both for its position and for the extension of 73 hectares affected by the new Stratford City. The application for its development, presented in 2004, was the largest ever presented in London. The developers proposed a real estate development - residential, commercial and retail, of 1.2 million square meters, which foresee providing 30,000 jobs and housing for 11,000 people. The deliberate election of the Olympic Park site for the development of the 2012 Olympic Games, was from the beginning clearly and openly oriented to the advancement of Stratford, seeking support in the excellent connections required for the event that would then revert to the urban nucleus.

for the local development of Stratford,

The site formerly occupied by a factory and cargo depots is powered by a high-speed station, trains, Underground lines and preferred connections with the Crossrail northeast branch. To reach the stadium from the urban center where the stations are located, it is necessary to go through a large pedestrian avenue, flanked by shops and restaurants, which is the main axis of all the real estate development. There is no provision for vehicle access to this area or the park, although a large parking lot has been built on the border between the two.

supported by transport terminals

The planning of this International Quarter, carried out by Fletcher Priest Architects, Arup and West 8, is based on the interconnection of different zones with each other, with the Olympic Park and with the Stratford nucleus, which give rise to a series of important linked buildings for a uniform landscape treatment. The modeling of the terrain was based on the excavation materials of the high speed tunnels and station, which would involve a uniform elevation of about six meters above the original level [104:44].

The commercial avenue, with functions of link between them, overcomes the trunk of roads by means of a large bridge that leads into an entrance plaza to a shopping center, to two blocks of residences and to the Underground and railway stations. For its part, the Olympic residences for 17,000 athletes have



Olympic Park

and ennobled with parks and sculptures.

been integrated into new commercial and office developments, without acceptance problems.

The Olympic Park that organizes the Olympic facilities around it and will be a place for leisure and recreation for the residents of Stratford, is built as a recovery of the Lea River Valley. It was designed with a mainly urban treatment, specifically designed for future residents, with walks, squares, fountains and banks around a semi-canalized section of the river.

The complex is presided over by a high steel structure, with the name of Orbit plus that of its sponsor Arcelor Mittal, designed by the artist Anish Kapoor and the architect Cecil Balmond de Arup in 2011, with a vague air of Olympic torch wrapped in a spiral strip in metallic latticework, which reaches 18 m in height and was received by the critics with divided opinions. The spiral wrap houses some stairs that allow you to fit into the structure-sculpture painted with a strong red color, with varied and successive points of view over the built plan and landscape of the city. Another spiral tube, made of stainless steel, narrower and steeper, houses an exciting slide, only suitable for children, which is the most successful piece of the entire set of Olympic facilities, residences, offices and stations of Stratford.



Orbit AcelorMittal

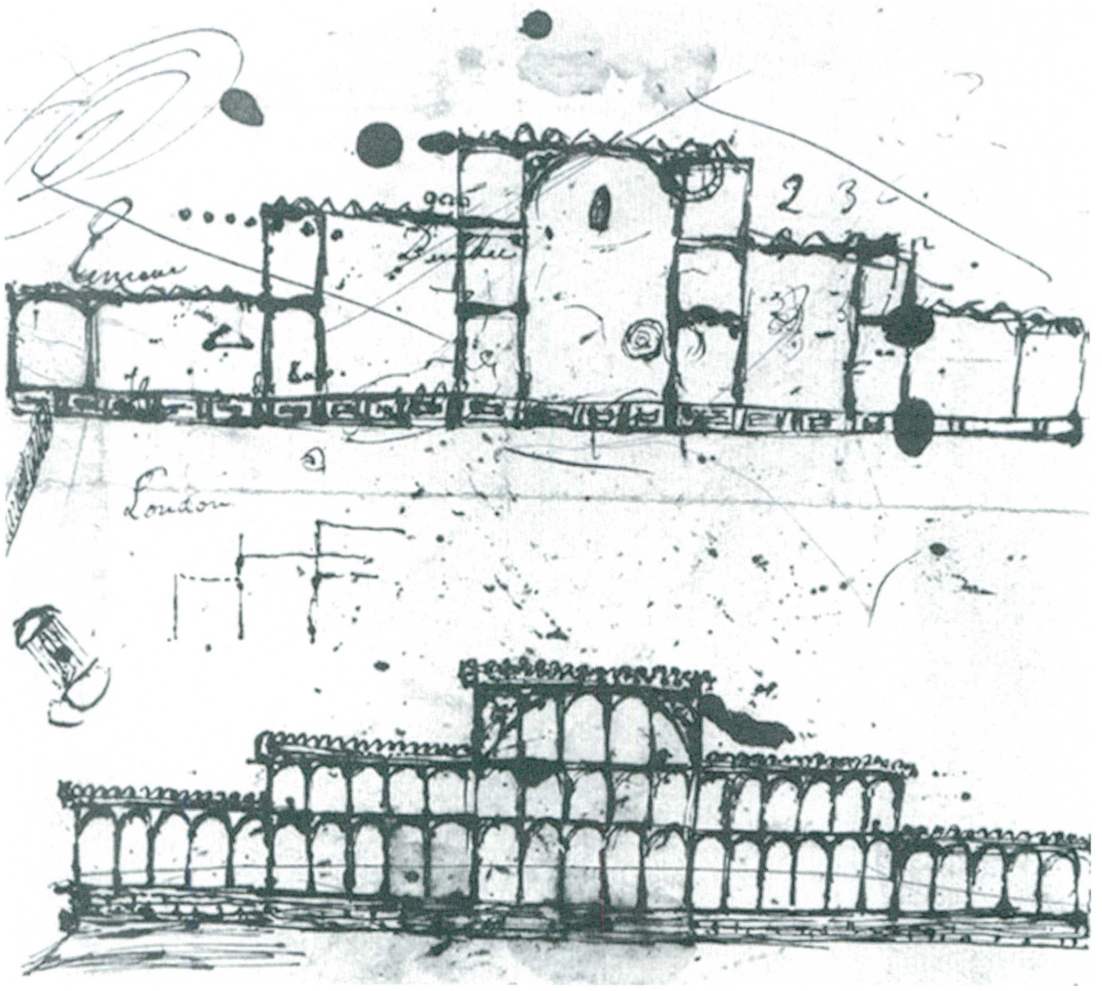




Lea river



Joseph Paxton in Sydenham



Sketch by Joseph Paxton in 1848

Crystal Palace in Sydenham

In his book *All That Is Solid Melts into Air*, Marshall Berman reflects on Dostoevsky's notes on his visit to Crystal Palace in Sydenham. These pages are taken here as a basis to reflect on the modernity of the building and the changes suffered by the design of its new site, after being disassembled from its initial location in Hyde Park [19:219-248].

Dostoevsky was a modern spirit. As soon as he heard of Crystal Palace, he promised to visit it. Perhaps he read one of the first and the most insightful of its descriptions, written in 1851 by the German Lothar Bucher and collected by Giedion [52:253-4]. Bucher was a curious character, who was a revolutionary in London in the 1840s, a journalist in the 1850s, a Prussian spy and intimate of Bismarck in the 1860s and 1870s - when he tried to recruit Karl Marx for Prussian services - and architect of the first wave of modernization in Germany.

Bucher was fascinated by the building, but framed its romantic beauty in a clear and precise analysis of the experience of its interior, a real space with a real structure. And he wrote: *We see a delicate network of lines (...) Instead of moving from the wall at one end to that at the other, the eye sweeps along an unending perspective which fades into the horizon (...) If we let our gaze travel downward it encounters the blue-painted lattice girders. At first these occur only at wide intervals: then they range closer and closer together until they are interrupted by a dazzling band of light -the transept- which dissolves into a distant background where all materiality is blended into the atmosphere.*

It seems evident that Bucher was inspired by the famous phrase *All That Is Solid Melts into Air*, used by his friend Karl Marx[40] in the Communist Manifesto of 1848, to write his analysis of the brand new building that emerged in the middle of Hyde Park when he lived in London. A beautiful phrase, also used in 1988 by Marshall Berman to title the book inspired by this reflection.

Dostoevsky managed to see the Crystal Palace in 1862. In his country, where the process of modernization had not been imposed, the modern attracted the masses but, lacking the support of reality, was forced to feed on dreams, fantasies more or less romantic. Undoubtedly, his image of Crystal Palace was influenced by the thousands of prints and little paintings of the building that circulated in Russia, where its success was greater than that obtained in Europe. However, his visit notes are surprising:[41] *"All ready-made and computed with mathematical exactitude" ... The building's tone is pompous and ponderous ... "This is all is so triumphant, majestic and proud that it takes your breath away ... you feel that something final has taken place here, taken place and ended." The building is meant to in-*



Crystal Palace Old Railway Station

timidate, to force the spectator to "become silent forever" … powerless to respond in any way but to say yes and shut up … "And I am afraid of this edifice, just because it is of crystal and can never be destroyed, and because one could not stick out one's tongue at it on the sly."

In view of these discrepancies, Marshall Berman wonders if Dostoevsky actually saw the building, if he came to enter that glass structure supported by thin iron profiles. A structure that surrounds nature instead of eliminating it, because the old and big trees of Hyde Park were not cut down, but included inside the building, where -as in a greenhouse- they grow tall and healthy.

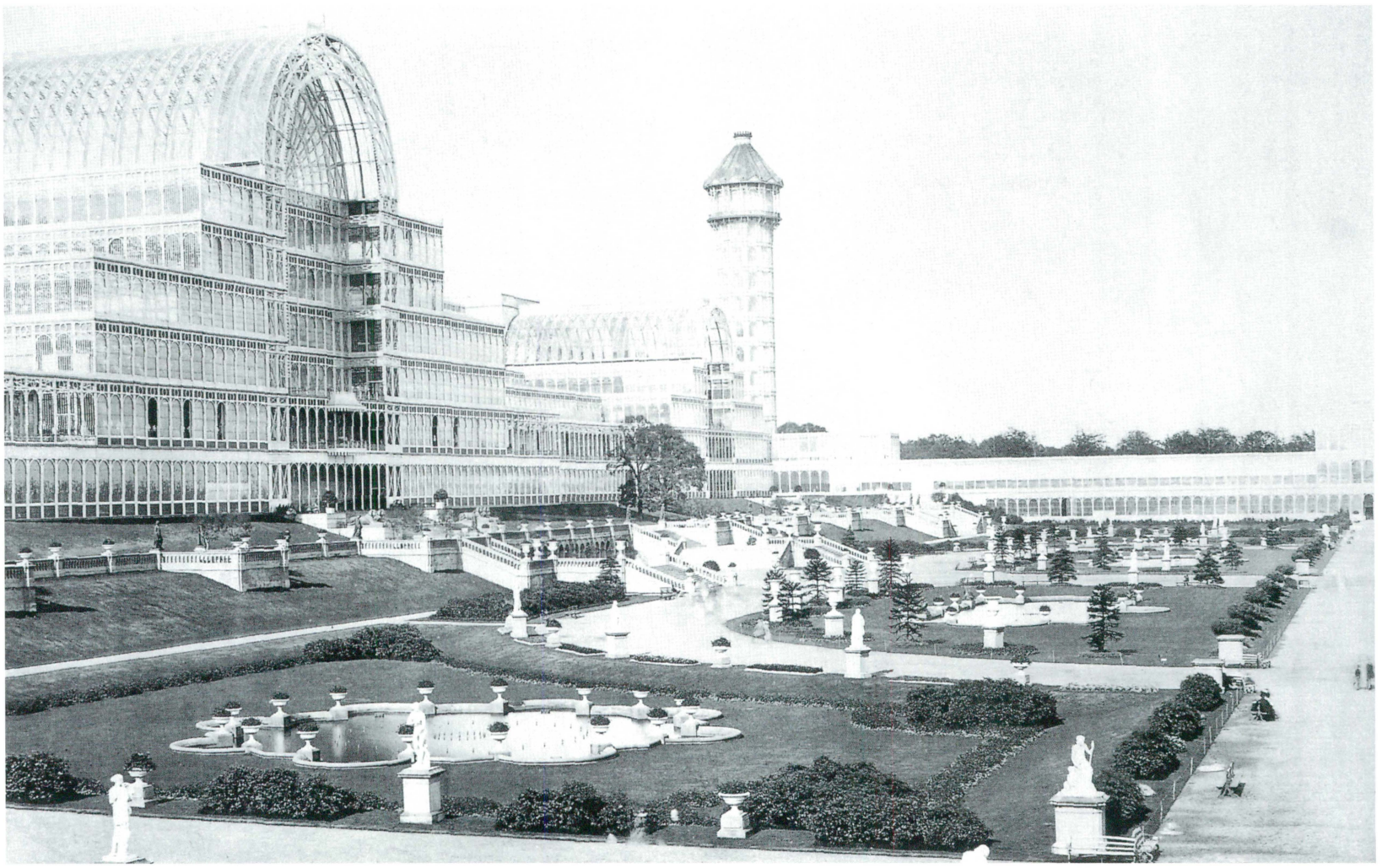
Furthermore, far from being routinely designed, it is the most adventurous and visionary building of the entire nineteenth century, only the Brooklyn Bridge and the Eiffel Tower, a generation later, would be comparable to its lyrical expression of the possibilities of an industrial age. This lyricism is clearly seen in Paxton's first sketch, in contrast to the heavy structures then in vogue in London. And its builders, far from presenting the building as definitive and indestructible, prided themselves on its transience.

But Dostoevsky rightly understood the conflictual nature of modern man, exposed to multiple influences. This causes anguish but also makes him free, because he does not submit to a single idea, although it prevents him from being in one piece as he was in other times.[42] Throughout his life, Dostoevsky fought against the destructive dimension of the modern, arguing that one could not live without beauty. He lived fascinated by the modernity radiated by Europe, and he valued decisively the presence of the new.[43]

Knowing his modernity, one wonders why Dostoevsky valued the Crystal Palace that way. Being a man sensitive to the new, he seems to have seen there the opposite of the values appreciated by the critics ten years before, when the building was inaugurated.

Berman thinks that Dostoevsky was influenced by a certain complex that was a mixture of shame for the backwardness of his country and envious anger at a symbol of development. He let himself be led, say others, by the impulse of his writings dominated by contempt and defiance towards the reality of modern life.

However, in the middle of the diatribe, we find in his notes a much more complex and interesting relationship of Dostoevsky with modern reality, technology and material construction -which could help us understand him- when he states: *I agree that man is pre-eminently a creative animal, predestined to strive consciously towards a goal and to engage in engineering, that is, eternally and incessantly, to build new roads,* wherever they may lead.



Crystal Palace of 1854
in Sydenham

Surprisingly, for a romantic artist like Dostoevsky, the fundamental symbol of human creativity is not art or philosophy, but engineering. This is particularly important for Crystal Palace, which was perhaps the first large public building conceived and built exclusively by engineers, without the participation of architects in the work.

Engineering plays a crucial role in Dostoevsky's vision of a correct life. But he insists that *engineers must follow the logic of own their visions,* "no matter where they might lead." *Engineering should be a medium for creativity, not computation; but this requires recognition that "the destination it leads to is less important than the process of making it."*

This defense of the autonomy of the process against any interference with its resulting form or its appearance depending on what that construction must represent is something totally new. It confronts directly with the architectural circles of London in the middle of the century, where its design pleased the public but not the ruling class, who accused it of a lack of monumentality and hurried to remove the building from there as soon as possible.

Maybe, as Berman points out, it is all due to a certain inferiority complex, spite or mere contempt for the new, but that explanation ignores two things.

First, that Dostoevsky was an engineer. He studied at the School of Military Engineers of St. Petersburg, so indebted to Betancourt that when he finished in 1843, he joined the Directorate General of Engineers in St. Petersburg, but left to write. In 1849 he was imprisoned for belonging to a liberal club and condemned to death for participating in anti-government activities. Minutes before the execution, the sentence was commuted to five years of forced labor. Betancourt also, after receiving promotions and honors for 15 years, lost the favor of the tsar for his liberal tendencies and had to retire, until his death in 1824.

Second, that the Sydenham building of 1854, visited by Dostoevsky in 1861, was very different from the Crystal Palace of 1851 in Hyde Park. It was not a simple disassembly, reassembled in another place. It had five floors instead of three, it was 50% larger in volume and had almost double the glazed area [101:40]. And it was arranged on a pedestal, which increased the height of the building to seven floors in certain areas, which was accessed by large staircases flanked by lions. In addition, a 75 m high tower was added on each side and the front esplanade was treated with an elaborate set of paths and fountains radically different



from the prairie dotted with trees of its original location.

The constructive principle of iron and glass porticoes was the same, but the plan and elevation are radically different. The 'reformed' design incorporated new axes and side aisles, which granted a monumentality with cathedral resonances to the structure, producing a building of totally different character.

One could argue about the authorship of the two projects, with the gardener Joseph Paxton and the engineer I.K. Brunel in Hyde Park, and the same Paxton, with the architects Owen Jones and Matthew Wyatt in Sydenham, but it does not seem necessary in view of the images. It is easy to venture that, by changing the size, altering the proportions and placing the building on a pedestal, the original fluidity that emerged from the interior toward the light and nature is lost with the new composition, stripping the building of its modernity.

In view of all this, we understand better Dostoevsky who, perhaps for being an engineer, realized that the building he was seeing was different from the one he had read about; perhaps because he was sensitive, he appreciated the differences of character between one and the other; and perhaps because he was modern, he was enraged to find the whiff of the old.

According to this, Dostoevsky's argument made sense: it betrayed the image that he had made of the building based on the descriptions and prints that had arrived in Russia, and its pretensions of monumentality ruined it. It seems clear that, trying to gain presence and rotundity, what vanishes in the air is not the building but its modernity.







Her Majesty's Theatre

Theatre Royal Haymarket

Recovery of theaters

Many privately owned West End theaters are of late Victorian construction with large buildings of neoclassical, Renaissance or Victorian façades and interior decoration. Although some have poor facilities for services and equipment, most have been recently renovated.

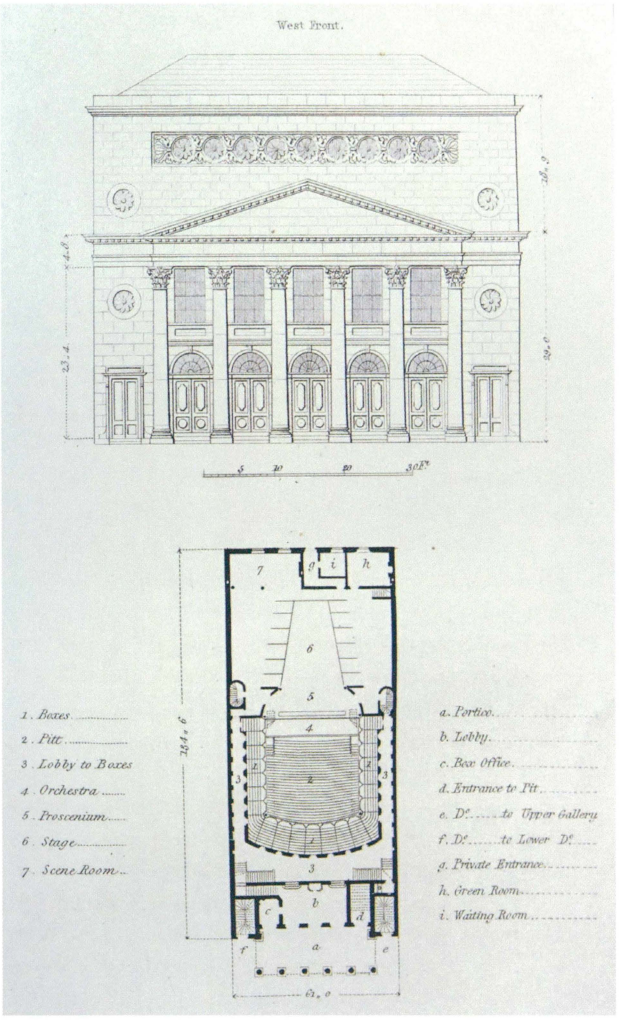
Among the oldest is the Theater Royal Haymarket, redesigned by John Nash in 1821 and which underwent a complete rehabilitation in 1994. Nearby is the Her Majesty's Theater in 1897, which showed *The Phantom of the Opera* for 30 years and the London Coliseum, designed by the theater architect Frank Matcham in 1904, one of the largest theaters in London, renovated in 2004.

The rogue Bankside neighborhood

In the Tudor era, Bankside was a roguish and daring neighborhood, famous for its brothels and theaters, which thrived beyond the overwhelming supervision of the city's fathers. The original Globe, of which Shakespeare, actor-manager and dramatist, was co-owner, was inaugurated in 1599 on a plot located southeast of the current one, but was destroyed by fire in 1613 and rebuilt in 1614, without the thatched roof.

The new theater operated until 1642, when it was closed by an order of Parliament that closed all the theaters of London, accusing them of being frivolous and lascivious. Years later, a new law of 1648 reinforced that policy, demand-





London Coliseum

Plan and west elevation, Pugin [105:344, vol.I]

ing the demolition of the theaters, declaring the actors rogues and vagabonds and imposing fines on the spectators. London theater, however, managed to overcome the puritanical spirit of the time and over the years it became the favorite entertainment of the city. Currently, the theater in London has more annual spectators than football.

In 1949, American actor, director and impresario Sam Wanamaker visited London and years later founded what will later be the Shakespeare Globe Trust, dedicated to the reconstruction of the theater and the creation of an educational center and permanent exhibition. During 23 years of effort, he raised funds, researched the original Globe and planned its reconstruction together with Trust architect Theo Crosby. Wanamaker died in 1993, when the cellars for the exhibition and some wooden bays of the theater had been built. Theo Crosby died in 1995 and the theater was finally opened in 1997.[44]

recovers the classic theater in 1997

From the beginning, a structure made of oak with a thatched roof, like the original theater, was thought of, with a capacity of about 1500 spectators, less than half of the previous one. This structure is based on a large circular concrete base, elevated above the river, with a museum and facilities inside. Around the circular building, Theo Crosby designed a series of historicist and fanciful buildings to frame the courtyard with [103:53].



Tate Modern

and welcomes modern art in 2000,

The Tate Gallery acquired the building of the Bankside Power Station, built by Sir Giles Gilbert Scott from 1947 to 1963, which had not been used since 1981, to exhibit Modern Art. Initially called Tate Gallery of Modern Art and then reduced to **Tate Modern**, the new museum which opened in 2000 had from the beginning a spectacular success with some five million visitors a year, which has contributed decisively to the regeneration of that area of Southwark, south of the river.

Its design is the result of a 1994 competition, won by the Swiss architects Herzog and de Meuron, whose project was very respectful of the interesting original building. Gilles Gilbert Scott, son and grandson of architects (his grandfather designed St Pancras Station) had already built the Battersea thermal power plant, which he simplified in this second project by gathering all the smoke outlets in a single central and prominent chimney of the building.

His greatest asset for the new museum was the large turbine hall, which the Tate allocated to large art installations made specifically for that large space by artists such as Eliason, Bourgois, or Kapoor, and which has become the most impressive and attractive public space in London.







Millennium Bridge

Also in the year 2000, the important **Millennium Bridge** was realized, a pedestrian footbridge that directly links St Paul's Cathedral with the Tate Modern and constitutes the best example of attraction between the two banks to win the city of those mentioned in Chapter 3. By linking so directly two buildings of great significance, the bridge has even more public success than the museum.

while bypassing the river towards St Paul's

Designed and built by Norman Foster, in collaboration with Arup and the sculptor Sir Anthony Caro, it is the first new crossing of the Thames since Waterloo Bridge. Within a week of being inaugurated as one of the Millen-

New Tate Modern

nium celebrations, the new bridge began to oscillate strongly under very small loads and was closed to the public for a year, while some active dampers were installed to minimize the possible resonance generated by the vibrations.

The bridge has a maximum lightness due to the high strength materials used and the low height of the cable supports (only 2.3 m). As a result, its layout is very stretched and provides a dynamic and tense character to the bridge, which is reinforced by the impeccable design of stacks, abutments, anchors and clamping brackets of the board.

The latest addition to the set is an extension of the museum, called by some **New Tate Modern**, which adds more than twenty thousand square meters of floor space, also made by Herzog and de Meuron in the back of the old building. After a first proposal of a kind of ziggurat as tall as the central chimney covered in glass, the architects made a second one in the same shape, but covered with brick, which was finally built [104:100].

and it expands again in 2016

Criticized by some as disrespectful of Scott's building, the texture of its brick lattice façades, capable of filtering light into the building, is a very interesting demonstration of the Swiss architects' mastery of design of these translucent screens, adapted here to the expressionist character of the old building.

More questionable, perhaps, is the additional volume of the eleven floors, with a new restaurant, a partner room and a rooftop terrace, as well as new facility plants and showrooms. The most applauded space of the expansion is the conversion into new rooms of the large underground fuel tanks, whose massive exposed concrete walls generate very attractive spaces.

The Universal Exhibition of 1851 produced great benefits and its proponent, Prince Albert, decided to build with them a large cultural district in Kensington, which is organized around Exhibition Road. This avenue oriented from north to south, from Hyde Park to Cromwell Road, serves as the backbone of this neighborhood, nicknamed Albertopolis. The Natural History Museum, Science Museum, Imperial College, the Royal College of Art and the Royal College of Music and the Royal Albert Hall, are located on its west side from south to north, and the Victoria and Albert is located east on Cromwell Road.

while other museums are modernized.

With the idea of improving the urban environment of the area, of narrow sidewalks and roads with heavy traffic, Mayor Boris Johnson launched a manifesto called London's Great Outdoors to develop a series of urban reform projects. Among them was the improvement of **Exhibition Road** with a project of 28 million pounds, designed by Dixon Jones and co-financed by the Royal Borough of Kensington and Chelsea, with the partners of the Westminster City Council project and Transport for London.

The project provides an extensive new pedestrian route that extends from South Kensington Station to Hyde Park, with new crossings at Cromwell Road and Kensington Gore. Although it is still open to traffic, Exhibition Road was paved with granite over its entire surface, eliminating curbs to limit traffic speed and doubling pedestrian space [104:29].

In addition to the general improvement of the street, rehabilitation works have been carried out in several of its buildings and museums. In the **Natural History Museum** (Alfred Waterhouse, 1881), headquarters of the embryo of



Hintze Hall-Natural History Museum

Natural History Museum



the British Museum, the famous Hintze Hall has been recovered, a large space presided over by Charles Darwin from the landing of an imperial staircase, which exudes a special atmosphere of knowledge.

The enormous diplodocus that occupied the center of the room has been replaced by the skeleton of a great blue whale, which hangs from the beautiful coffered ceiling decorated with square panels representing different botanical species. The room is a good example of the eclectic Victorian way of integrating the new techniques of iron and glass, with the old ornamentation of the molding, ceramics and sculpture. It is the only space of that beautiful museum not yet infantilized with tour panels and diagrams, in that vain universal attempt to convert natural science museums into Power Point presentations.

On its west façade an extension has been built in two phases. A first with the **Darwin Center** (HOK, 2002) dedicated to the museum's zoological archive,



Hintze Hall-Natural History Museum



Victoria and Albert Museum-façade of 1909





Victoria and Albert Museum-central patio, 1869

Victoria and Albert Museum

with 22,000,000 specimens of birds, birds and fish preserved in alcohol, some of which were collected more than 250 years ago, which allows, for the first time, a calibrated public access to its collection.

The second phase is a building of twenty thousand square meters and 80 million pounds (C. F. Müller Architects, 2009) to house collections and offices, which connects the HOK project with the Museum, replacing a utility building from between the wars. Its cocoon shapes and its crystal casing envelop a very technological space, with strict temperature and humidity conditions, which show it as something accessible and transparent. For the profane visitor, the construction of a glazed route above and around the archives and laboratories are to be appreciated, which allow a glimpse of that world without disturbing the scientists who investigate inside [104:55].

The **Victoria and Albert Museum**, on the other hand, has maintained its venerable character better, perhaps because the current pedagogues grant little interest to the culture reflected by collecting that inspires the museum. Built over a long period of time, first under the direction of civil engineer Francis Fowke, until 1869, then by other engineers and architects for 30 years, its main façade was completed by the architect Aston Webb in 1909.

It is very well conserved and has enlivened its access to the central courtyard from Exhibition Road with The Sackler Courtyard (Amanda Levete, 2017), a new patio of faceted planes paved with pieces of ceramics interrupted by some oculi that reflect the brick façades of the museum. At the same time they point out the new interior exhibition spaces of the underground extension, whose construction has required more ten years and has cost 48 million pounds.

Somewhat further north of Exhibition Road is the new building of **Imperial College**, (Foster, 2005) with its glass façades, tall freestanding columns and stairs of clear modern inspiration. Its floor opens to the street, while its el-





Imperial College

evation reflects the façades of the opposite sidewalk, so that the building is delivered to public space, as a perfect counterpoint to the vicious practice of making things private in a covert manner, spread throughout the city. Foster manages to demonstrate that the opposite can be done with benefit for the building and for the city.

Northwest of the street is the **Royal Albert Hall** (Engineers Fowke and Scott, 1871) which was funded by the Commissioners of the Great Exhibition and by an ingenious idea: the sale, in leases of 999 years, of individual seats, which entitles the tenant to attend any performance free of charge, with rare exceptions. In this way, about 1,300 seats were sold at £100 each [100:56], many of which occupy the boxes of the intermediate floors. The total capacity of 7,000 people is quite unique and together with the circular shape of the room they condition its acoustics.

Despite this, the Royal Albert Hall is one of the most popular sites for Londoners, perhaps because of its effort to bring music to the people, ex-





Royal Albert Hall

Royal Albert Hall-PROMS 2017

emplified by the unrivaled Proms. The BBC Promenade Concerts are a two-month cycle, from mid-July to September, with daily classical music concerts, which have been held in this room since the destruction of Queen's Hall in 1942.

The fans and the general public come year after year, to hear music in an informal atmosphere and in total communion. New directors and performers participate in the proms, before or after the best orchestras in the world, always to a full house. An audience that attends the concerts in absolute silence or with applause and sing-alongs as requested by the director of the day, after filling the more than a dozen bars and restaurants located in the circular corridors of the auditorium, from one and a half hour before the concerts, and which are replenished during breaks.

In one of the last concerts of this season, the Vienna Philharmonic tackled Richard Strauss's long An Alpine Symphony with the great auditorium overflowing. In the crowded central arena there were 500 people, to capacity, who stood, motionless for more than an hour and a half in a session without breaks, always tense and attentive, listening to the music at all times, without coughing or noise. There was only a single flutter of recognition, in the expected blow of the huge wooden mallet on wood, perhaps a more anecdotal than tragic point. There were few who sat on the floor and, just a little before the end, there were some spaces among the heads, immediately filled when they got up, expectant, shortly before the imminent end. At the end there were seven minutes of applause, during which not one of the 7,000 spectators moved.

British Library and British Museum

The behavior of collector Hans Sloane (1660-1753) is best understood after a brief review of his life and helps to understand that the British Library and British Museum are the product of a more scientific and less artistic mind than today their content suggests. It split off the Natural History Museum of London, created by him in the 1870s, in his time called the British Museum (Natural History), but its split-off took the name.

Sloane is a perfect example of pragmatism: he sticks to facts and collects them without subjecting himself to any human or divine will. *'His invention of the public museum is an artifact of imperial enlightenment ... an astonishing attempt to catalogue the entire world.'* In his imperial character there is also an assertion of political and commercial domination over territories extended from North America and the Caribbean to the south and east of Asia, and of the unstated yet implicit belief in British superiority over all other races.

Collecting becomes raiding, a form of exploitation, commerce, and colonialism, regardless of resistance. In this light, Sloane is less the heir of princely Renaissance collectors acquiring objects for their Wunderkammern (cabinet of curiosities) simply for their oddity than an Enlightenment figure, determined to research and classify the world.

British Library in St Pancras



At his death, Sloane described his collection as a manifestation of the glory of God, but it also was a mark of the glory of Britain. At his memorial service in Chelsea in 1753, Zachary Pierce, bishop of Bangor, declared that no age and no country had ever seen 'such an almost universal assemblage of things unusual & curious, of things ancient & modern, of things natural & artificial, brought together from almost all times, & almost all climates.'[45]

No building in London sums up the city itself as the British Museum, where recently two major restoration works have been carried out, the original library of King George III and the roof of the central courtyard.

The old library was one of the main reasons for the segregation of both museums and its central position, along with the artistic treasures, reaffirmed its vocation as a temple of universal humanist knowledge. The novelty and vigor of science and technology achieved their own space, but the ancient knowledge embodied in books and art continued to radiate its power over the city, remaining a monopoly of the British. The new museums of Kensington were dedicated to different specialties of knowledge, natural history, science and applied arts, but the name of the British Museum and its connotations of imperial power were reserved for the ancient knowledge.



British Library in St Pancras



Cover of the British Museum



This noble space, about 90 m long, was the first part of the museum built (1823-27), and remains the most admired work of Sir Robert Smirke. It housed the collection of more than 60,000 volumes of King George III and retained the splendid original bookcases. The documentary collection, administered in recent years by the British Library, was moved in 1998 to the new headquarters located next to St Pancras station, but the original bookcases were returned to the British Museum.

Its restoration achieves a consistent and credible recreation of what could be a library of the Enlightenment, with original shelves filled with old books brought from the House of Commons, covered with display cases of scientific instruments, sculptures, archaeological and ethnographic objects and some vases. The work exhibited there is the room itself, the space of the **King's Library** in its purest expression, without any exhibition device that highlights or identifies the objects, which give their individuality to the reinforcement of the room.

In the British Museum the new dome by Foster is impeccable from the point of view of design and cleanliness of the structure, but also important is its ability to transform a patio into a large space where everyone feels sheltered within the culture, independently of what they can understand of history, art or literature, or of any other manifestation of knowledge.

It is not a structure with pretensions of monumentality in size or meaning, it is a residual and not very lucid space, but its treatment with a new constructive principle -which is sophisticated and complex, but seems simple and easy to understand- is at the service of the vocation of this space as a collective area of knowledge and culture. In fact, Foster's roof *begs comparison with I.M. Pei's ambitious reworking of the Louvre as an exercise in the modernization not only of museum spaces but also of the relationship between museum and urban community.*

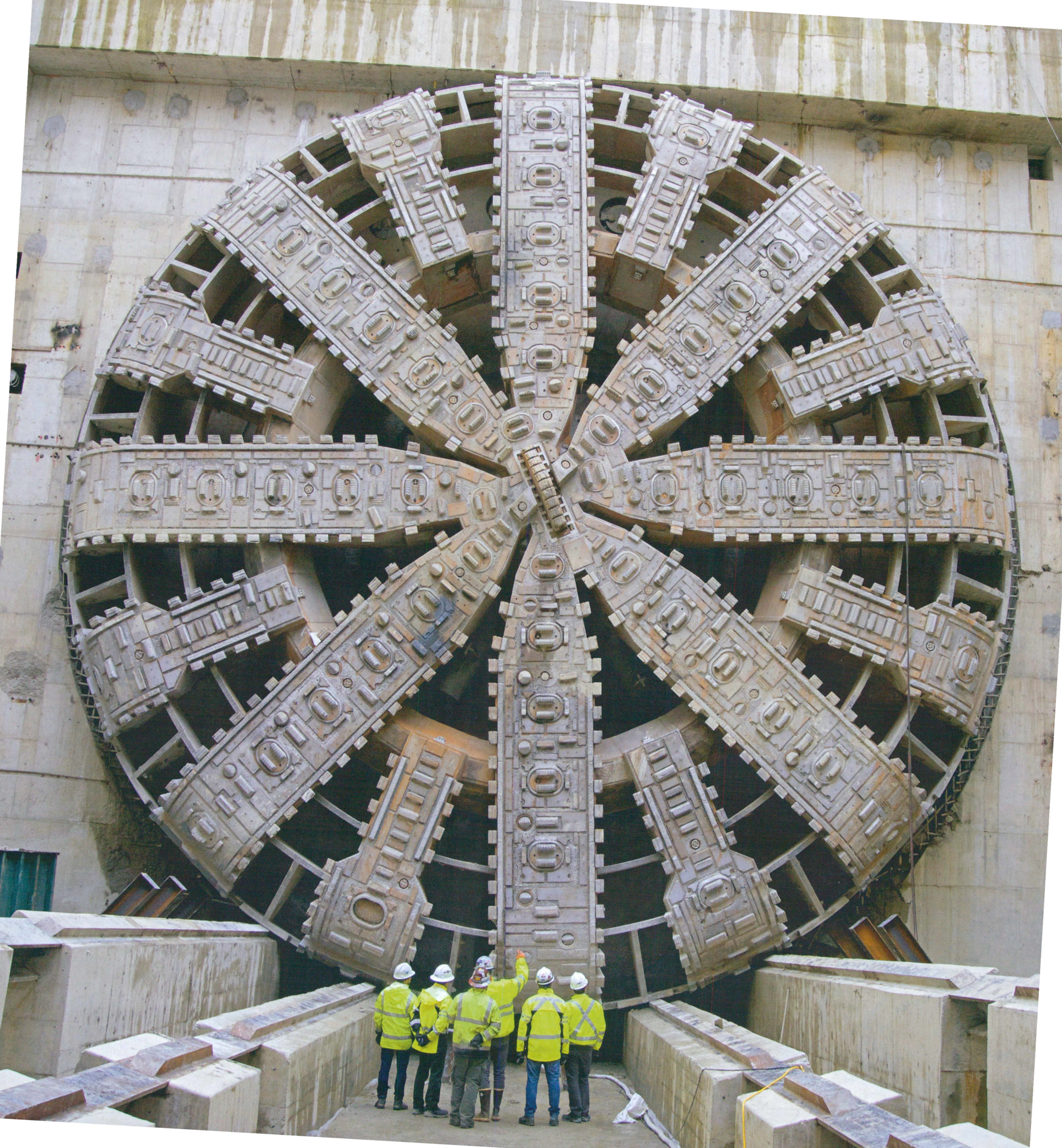
For some, the monumental gravitas and cool -even icy- aesthetic of the space are a deterrent to relaxing in the cafe areas, which admittedly seem incidental and somewhat transient, crushed by the grandeur of their surroundings. But they consider it an inevitable plan for accommodating the large number of visitors that day after day crowd the museum and as its only possibility for the future. It seems a poor argument, because a solution is never inevitable or unique, especially when they recognize that *the roof provides a calm, even light, regardless of external conditions, and its airy elegance contrasts with the solidity of the great staircases wrapped around the Reading Room* [104:86].

That roof is not a vault or dome, not even a toric vault, but a true squaring of the circle, which welcomes everyone and makes them feel part of a timeless and collective experience. The central staircase, which surrounds the central core near the dome, allows you to approach the capitals, cornices and pediments of this great neoclassical building, never within arm's reach and here brought to the level of the look, to feel the closeness of that lightweight iron and crystal structure.

* * *

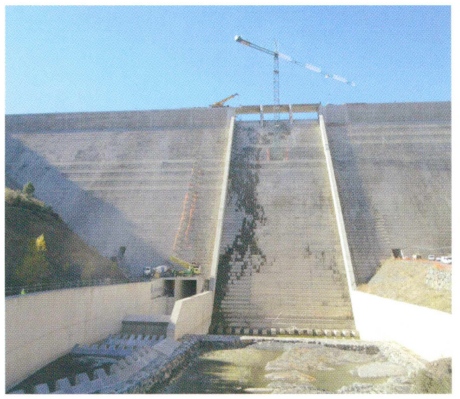
Going a step further, one could say that the light and modern dome of the British Museum houses the entire world brought to its capital, its most universal city. What is shown inside are not inert treasures, but active links with other worlds and times where London was and will always be present. In fact, the city is a constellation of hyperlinks, capable of making present places and times, near or far, just by looking at them.

That's London.

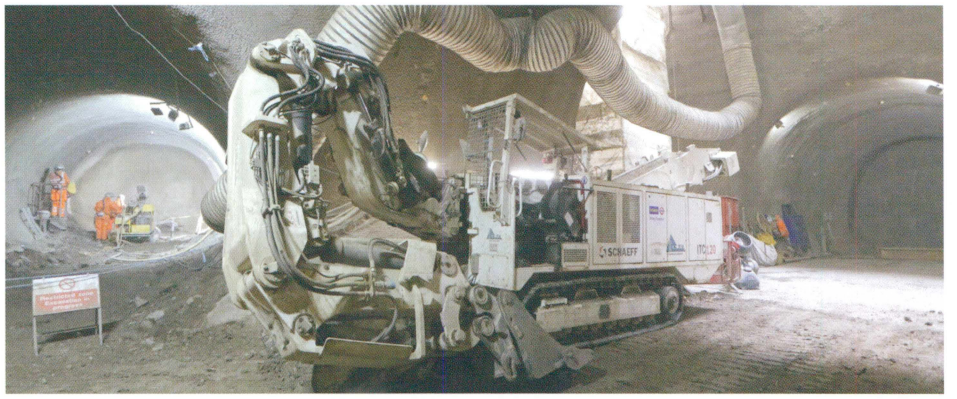


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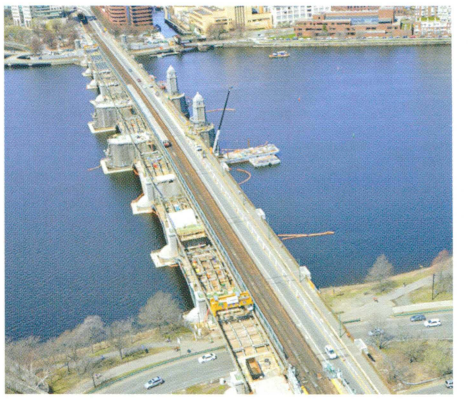
Recent works



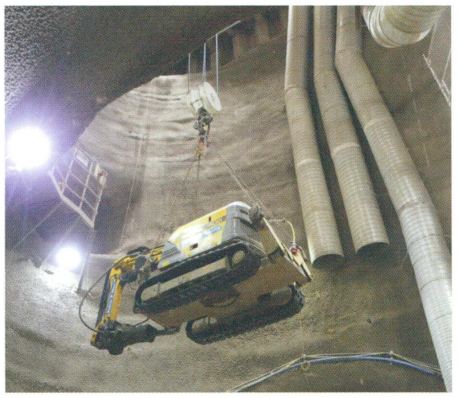
Enciso Dom, La Rioja



Bank Station Capacity Upgrade, London



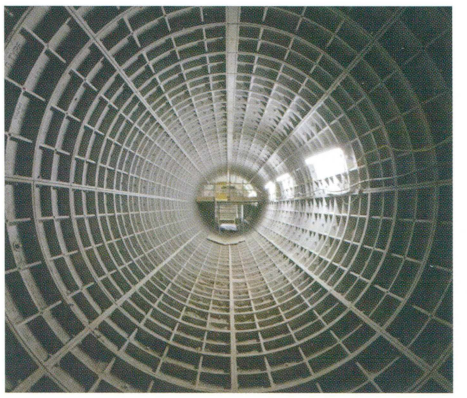
Longfellow Bridge, London



Bank Station Capacity Upgrade, London



Gotthard Basistunnel



Crossrail, London



San Francisco airport



Bank Station Capacity Upgrade, London



Crossrail C305 Whitechapel, London



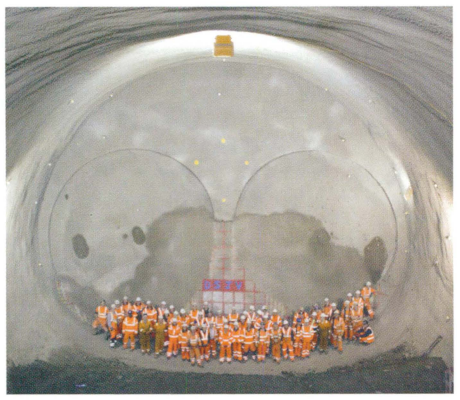
Bank Station Capacity Upgrade, London



Whilshire Grand Center



Longfellow Bridge, London. 2017



Crossrail, London



Crossrail, London. 2015



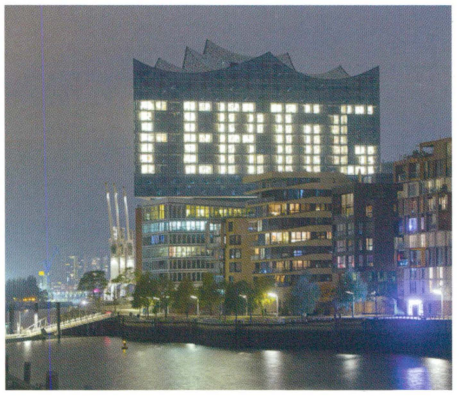
Bank Station Capacity Upgrade



Crossrail, London



Longfellow Bridge, London. 2017



The Elbphilharmonie FERTIG



VIV Maestro Armos, Madrid



DB Schenker Zentrale



SR 202L Freeway, Pulice, EEUU. 2015



Portsmouth Bypass, Ohio, EEUU



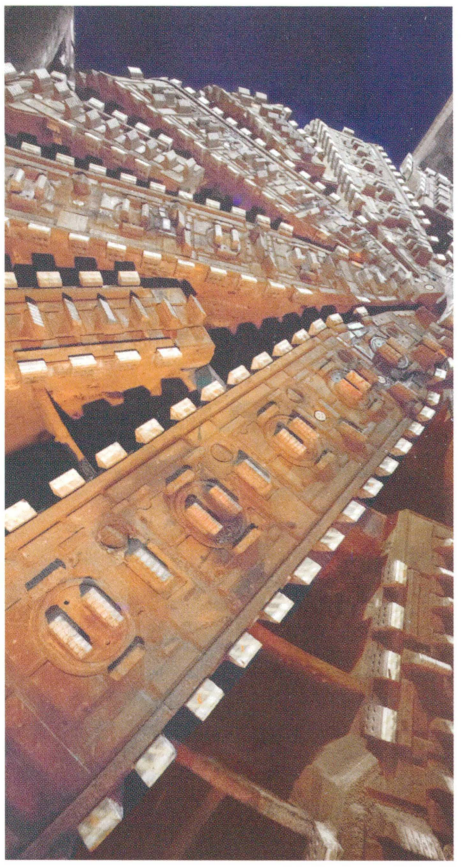
AVE Tr Urnieta-Hernani, Guipúzcoa



Calaveras Dam, EEUU



West Connex tunnel, Sydney, Australia



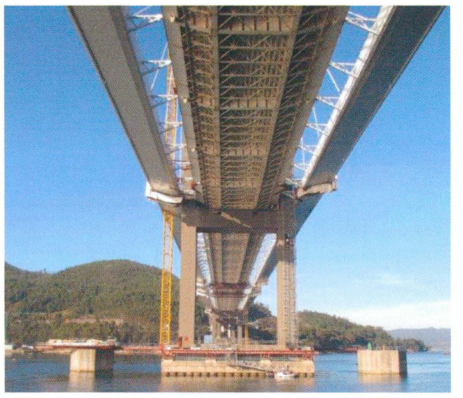
Seattle tunnel



Custom headquarters rehabilitation, Bilbao



Rethe-Brücke



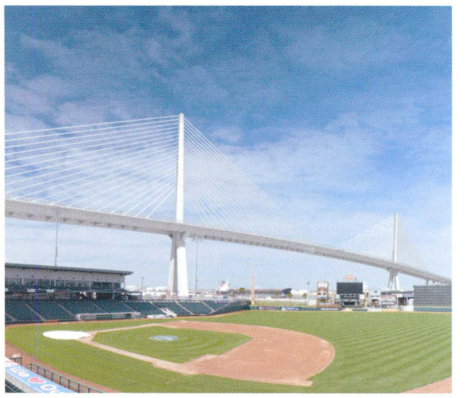
AP-9 highway link Cangas-Teis, Galicia. 2017



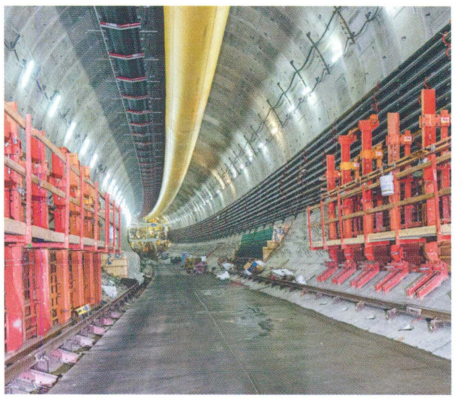
A-54 Lavacolla-Arzúa, Galicia



Ottawa LTR Tremblay Station, Canadá



Harbor Bridge, EEUU



Seattle tunnel, EEUU



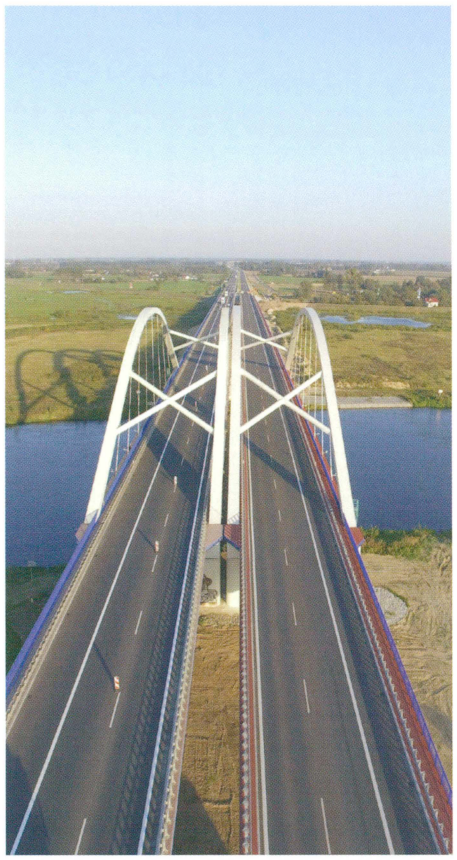
Custom headquarters rehabilitation, Bilbao



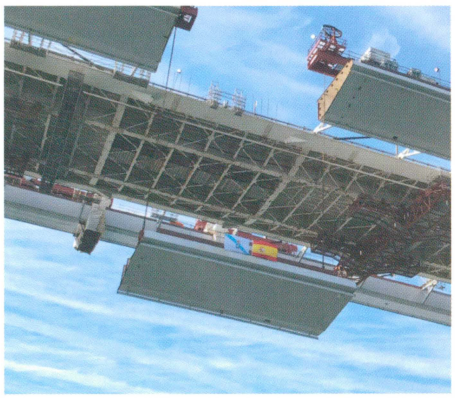
AVE, Hight-speed Rail Requena, Valencia



Crossrail, London



Gorzów Wielkopolski, Polonia



AP-9 highway link Cangas-Teis, Galicia



Salnés Hospital expansion, Galicia



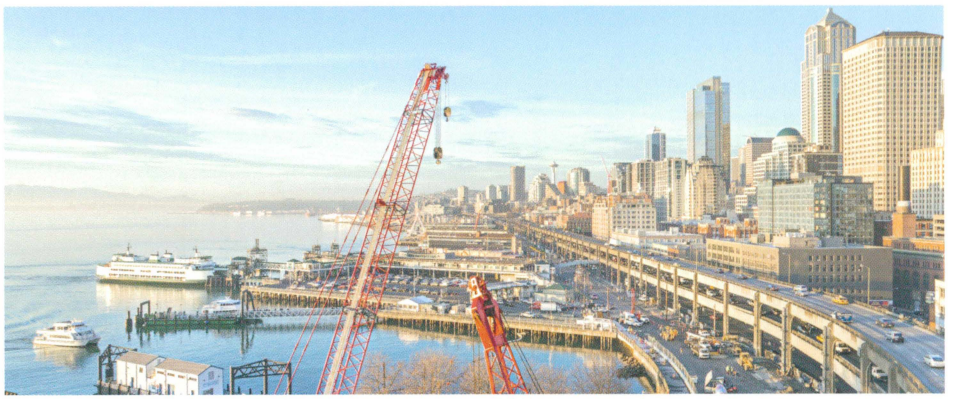
Mip Aerial Fore River Bridge



UTE Villa Urania, Barcelona



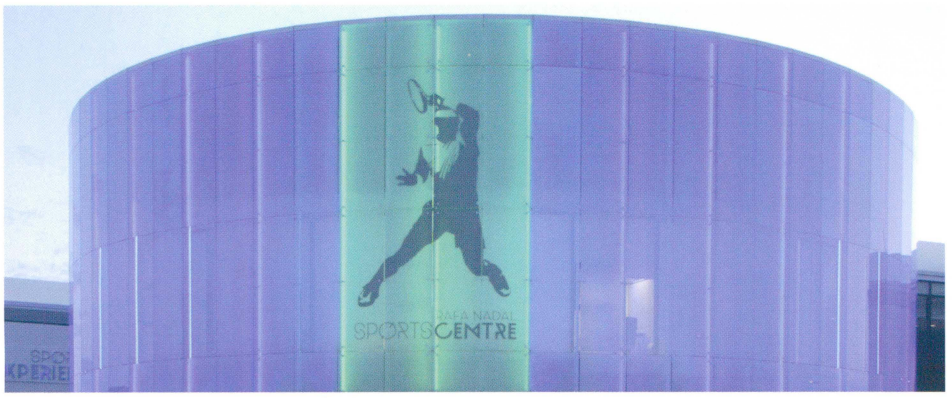
Underground Line 1 rehabilitation, Madrid. 2016



Seattle tunnel, EEUU



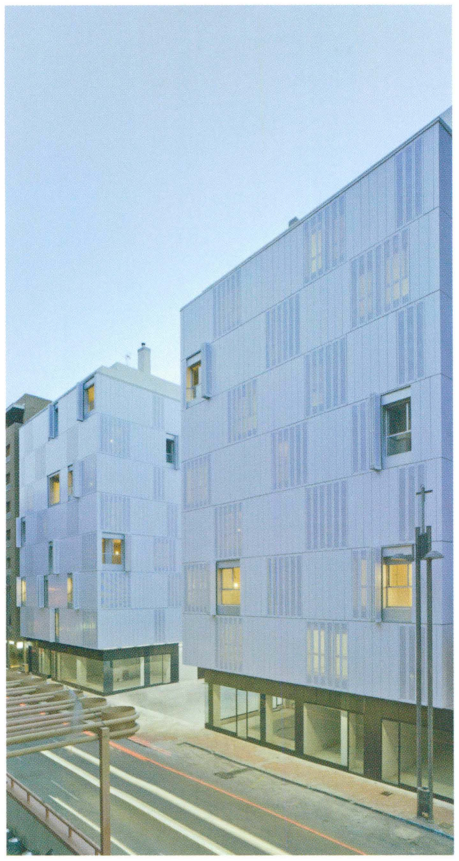
North Atlantic, EEUU



CIT Rafa Nadal. Manacor, Baleares. 2016



Seattle tunnel, EEUU



San Mateo building, Murcia. 2016



Seattle tunnel, EEUU



Sam Houston Tollway SE Widening,
West of SH 288 to West of Wayside Dr.



Mega building rehabilitation, Galicia



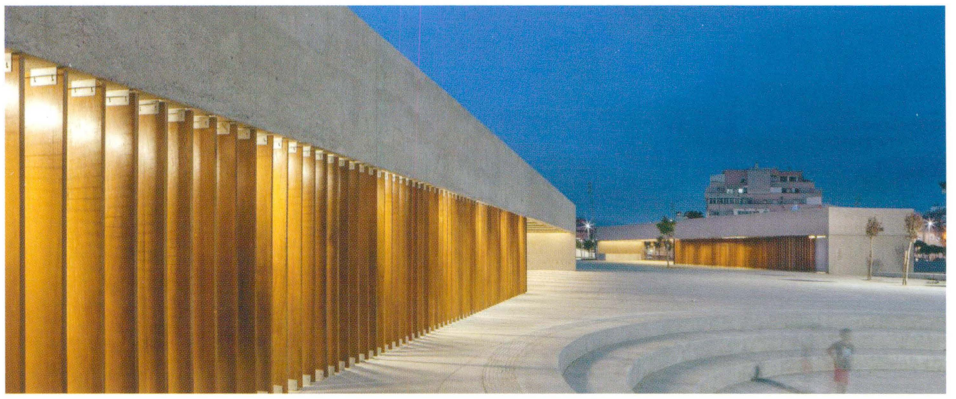
Crossrail, London



Royal North Shore Hospital Infrashore



Gateway WA Sky Ribbon



Los Bajos Park, Roquetas



West Connex, Local Roads, Sydney, Australia



New Bridge Queensferry Crossing, Scotland



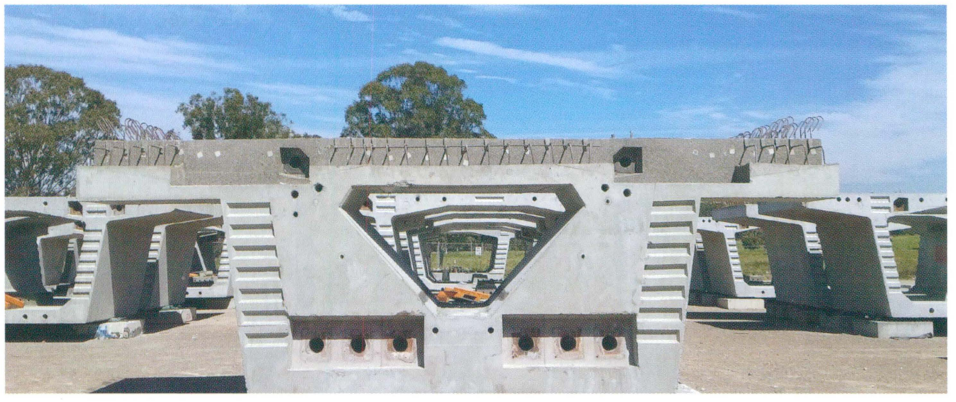
West Connex, Sydney, Australia



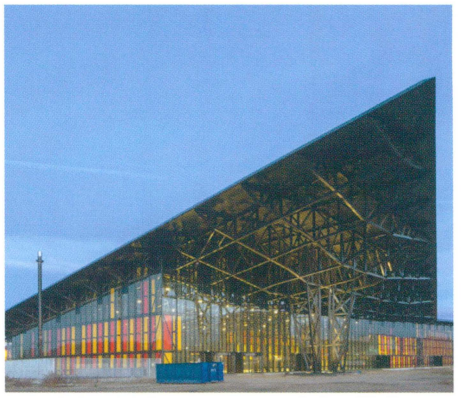
Southern Ohio Veterans Memorial Highway, EEUU



Seattle tunnel, EEUU



West Connex, Sydney, Australia



Exhibition and Congress Centre, León



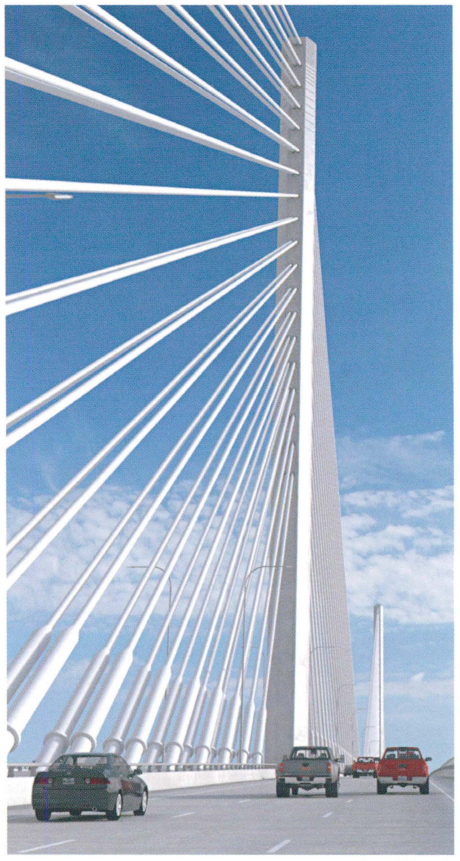
Armas Shipping, Puerto de la Cruz, Las Palmas



Los Bajos Park, Roquetas



San Cugat del Vallés Housing, Barcelona



Driver-View-day, Harbor Bridge, EEUU



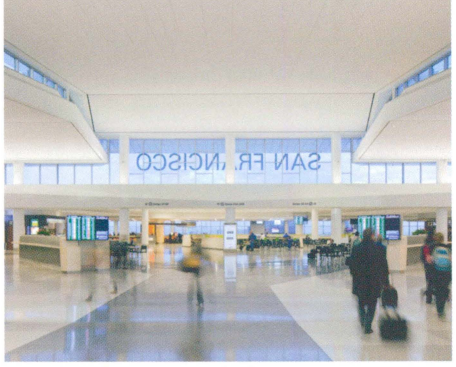
Toledo New Hospital



New Bridge Queensferry Crossing, Scotland



Highway Windsor Essex Parkway, Ontario, Canadá. 2015



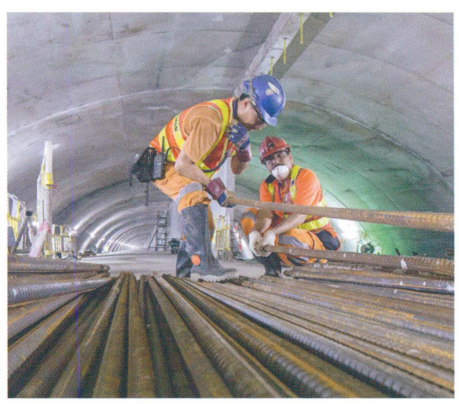
T2 San Francisco Airport



Enciso Dam, La Rioja



Multi-sports school room, Burgos



Etap Viveros, Madrid. 2016



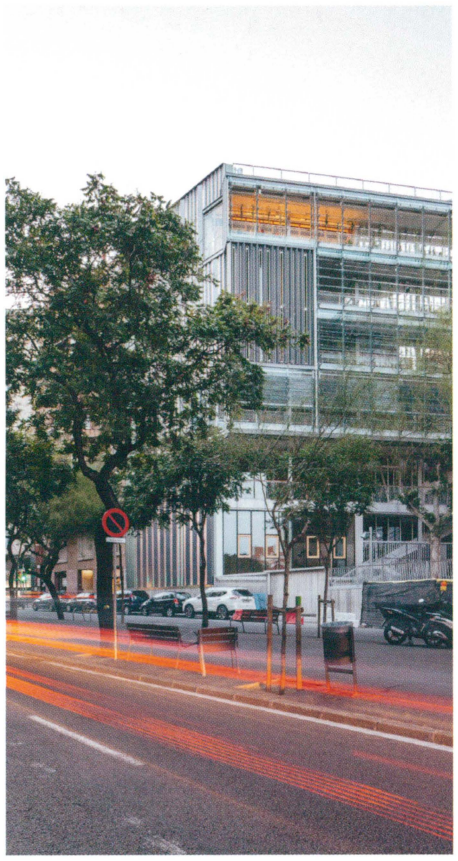
Logistic platform, Badajoz



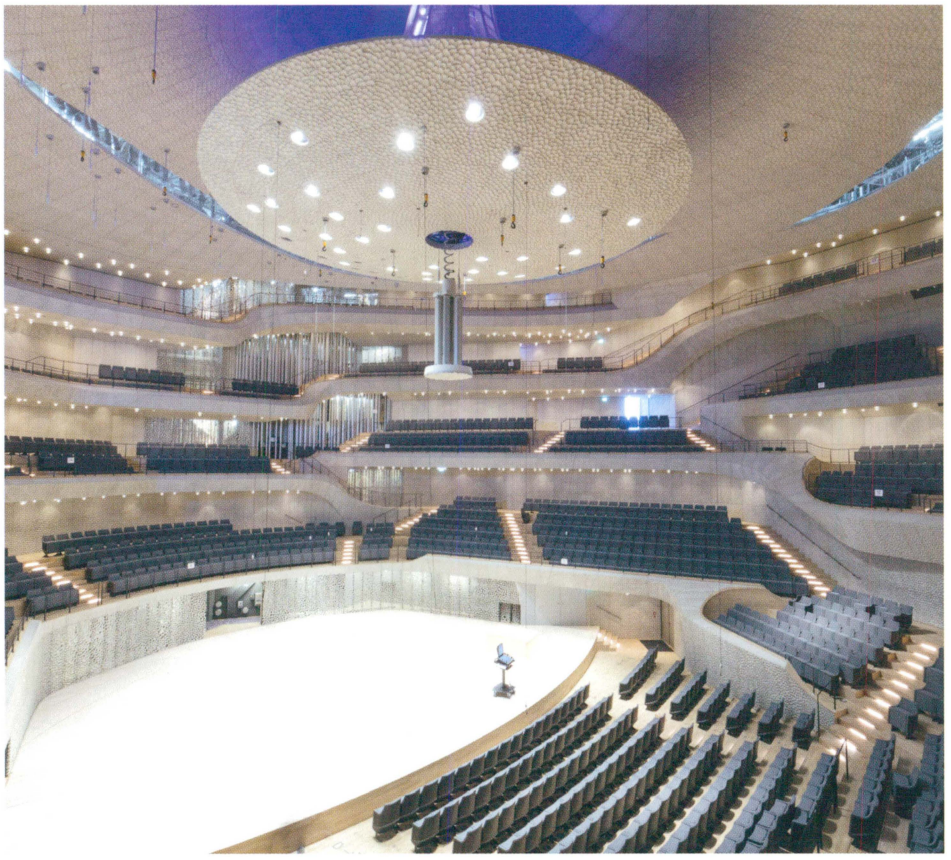
Exhibition and Congress Centre, León



Custom headquarters rehabilitation, Bilbao



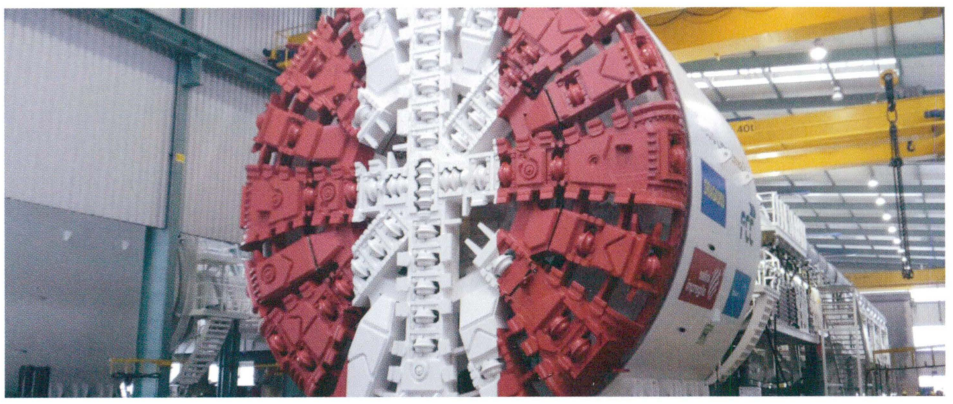
UTE Villa Urania, Barcelona



The Elbphilharmonie, Hamburgo, Alemania



Valdebebas Housing, Madrid



Lima Underground, Perú



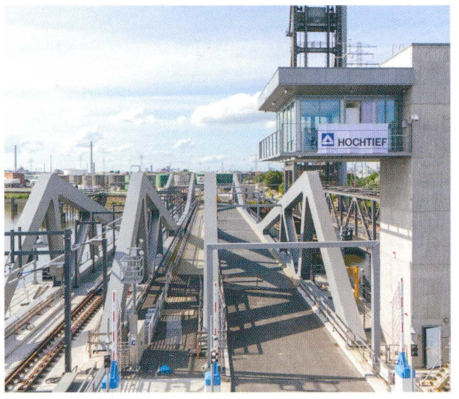
UTE Villa Urania, Barcelona



Queensferry Crossing new bridge, Escocia



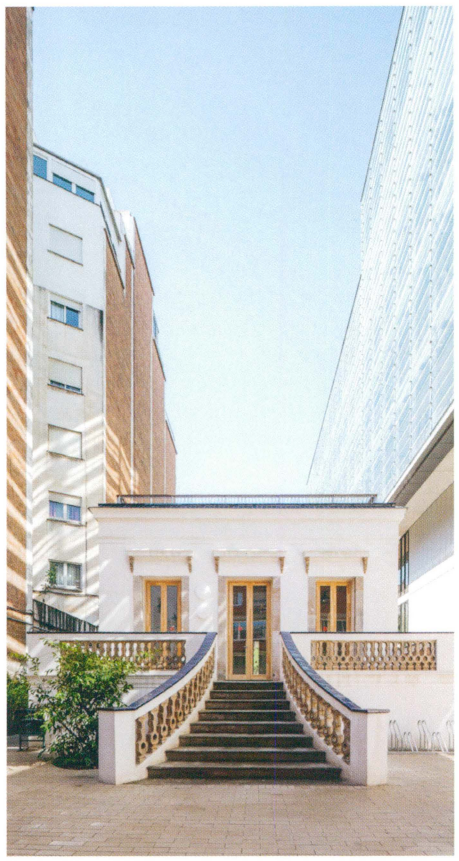
NEAHD. 2014



Rethe-Brücke



Popular Bank, Madrid



UTE Villa Urania, Barcelona



The Elbphilharmonie, Hamburgo, Alemania



Edar, Peñíscola, Castellón. 2016



Ottawa LRT, Canadá



Yesa Dam. 2017



Lima subway, Perú



7 | References, indexes and notes

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Notes

Chapter 1 Introduction

[1] Hobsbawm first published *The Age of Revolution: Europe 1789-1848* [64] and then *The Age of Capital, 1848-1875* [66], works subsequently completed with *The Age of Empire, 1875-1914* [66] and *The Age of Extremes, 1914-1991* [68] which then had a huge influence. In a 1995 essay on his work, Tony Judt claimed that it is difficult to value his *The Age of Revolution, because it has become so indelibly part of our sense of the period that all subsequent work either unconsciously incorporates it or else works against it. The Age of Capital, a masterly survey of the middle years of the last century that drew on a remarkable range of material and depth of understanding. That book remains, in my view, Hobsbawm's single greatest work, drawing together the many mid-Victorian transformations of the world and framing them in a unified and still forceful historical narrative* [77].

Chapter 2 Metropolis of the Revolution

[1] **According to translator José Juan Folguera in his introduction to** T. S. Eliot's *Four Quartets*: 254. http://cvc.cervantes.es/literatura/cauce/pdf/cauce16/cauce16_15.pdf

[2] A visit to Antón Capitel in London in 2012, when he spent a sabbatical year writing his book on London, gave me the fortune to share his quarters and listen to his ideas about the city, then elaborated in his *Londres. Ciudad disfrazada* (*London. City in Disguise*) [28], 2013, and later summarized in a short and excellent article with the title *Londres. La capital más grande de Europa* ("London. The largest capital in Europe"), published in 2016 in the now-extinct magazine *Ahora Semanal*, num.43 (22-28 July), Madrid, from where this quote is taken.

[3] Quoted by Leonardo Benevolo in [16:20].

[4] Any more or less canonical explanation of the Industrial Revolution begins with the story of a technological innovation based on previous scientific advances, which replaced the workforce with steam engines powered by coal combustion. This delocalized energy made it possible to locate industries near cities, causing their exorbitant growth, and developed the birth of new means of transportation that made possible the expansion of trade and the acceleration of the process by accumulation of capital.

[5] Hobsbawm remembers the English and Irish professional foremen and laborers who built lines far from their homelands, the engineers and mechanics of Newcastle or Bolton who went to manage the new railroads of Argentina or of New South Wales. And then he mentions the hard men in top hats who organized and presided over these vast transformations of the human landscape - material and spiritual. Thomas Brassey (1805-1870), who at times employed eighty thousand men on five continents, was merely the most celebrated of these entrepreneurs, the list of his overseas enterprises an equivalent of the battle honors and campaign medals of generals in less enlightened days: the Prato and Pistoia, the Lyons and Avignon, the Norwegian Railway, the Jutland, the Grand Trunk of Canada, the Bilbao and Miranda, the Eastern Bengal, the Mauritius, the Queensland, the Central Argentine, the Lemberg and Czernowitz, the Delhi Railway, the Boca and Barracas, the Warsaw and Terespol, the Callao Docks.

With these entrepreneurs of the railway went with them the cadre of (mostly British and Irish) foremen, skilled workers and elite labor. Since the construction of cities, factories and railways was a worldwide phenomenon, they could not necessarily rely on a local labor force, but developed a corps of nomadic laborers (known in Britain as the 'navvies'), such as still characterizes the great construction projects all around the world [66:72-3 and 237-8].

[6] The English example was soon followed by many European companies, first German and then French, sometimes driven by English engineers or inventors in the development of their patents, or by way of deeds. In Germany, for example, the first companies to specialize in prefabrication of bridges were Harkort in Haspe and Benkiser. Then there were new specialized companies, such as the Johan Friedrich Klett mechanical constructions workshop in Nuremberg, founded in 1837 together with three English engineers; in Kannstatt in 1845, later called Esslingen; or the workshops of Sterkrade in 1864 and Dortmund in 1872, both in Prussia; or the factories of Lauchhammer and the Königin Marien-Hütte, both in Saxony [89:97].

By 1890, the bridge construction factories had undergone a great development and, with the integration of engineers for calculation and construction, they

carried out most of the assignments. They worked in collaboration with a local contractor for the foundations and with an architect for the design and construction of the stone piles, at that time quite ornate. In many cases, the sections of these companies dedicated to the construction of bridges ended up becoming specialized companies, such as Ph. Holzmann, whose foundation dates back to 1856 [5:153].

[7] The road consisted of cast iron plates with an L section fixed to stone blocks, with a width of 1,270 mm. The traction was provided by horses, which, without substantial slopes, could move five or six wagons of about 3.5 ton, at about 4 km / h.

[8] According to Carroll Meeks, *the bolder the engineers grew in designing metal train-sheds the more timid the architects became in designing the head-house. Instead of accepting the proffered challenge, they fell back upon safer commissions: churches public buildings, mansions. Only large dwellings might be handled in a free manner, since their respectability was assured by their owner's social or financial position. There can be no doubt that the vast head-houses now demanded made the integration of them with the enlarged train-shed more and more difficult. Some architects felt that the two elements were so discordant in character that unification was - impossible, and that no relationship more subtle than contiguity could be attempted* [88:92].

[9] Designed by P.C. Hardwick, the façade of the GWR Hotel is flanked by two large towers that frame a central pediment, with Peace, Fullness, Science and Industry reliefs to reflect the self-confidence of the Victorian era. It was inaugurated with a ceremony by Prince Albert in 1854.

It had 103 rooms spread over four main floors, with the servants in two upper mansards and the kitchens and services on the ground floor. Later it was extended to about 250 rooms and in 1938 it was much altered with the demolition of the garage door at the main entrance and with a new interior decoration in Art Deco. After World War II, it was part of the BTH state group and was sold in 1983. Now it's the Hilton London Paddington.

[10] He criticizes the purported indifference of the *British engineer,* who *has so long held pre-eminence* but exclusively *concentrating upon the immediacy of his problem*, and compares him with *his younger Continental brethren: the German engineer* who *sees his task in relation to the community who are to use this, to the workers who are to serve in it*.

[11] As Carroll Meeks relates, *the chief contestants being the French and the English. In 1846 Eugene Flachat built the widest roof span in the world at the Entrepôt de Marais, a rigid four centred iron arch 118 feet long. The next lap was to the English, who were designing one of 150 feet. Turner and Locke, assisted by William Fairbairn*, who had just finished Britannia Bridge with Robert Stephenson, for the new station of the city of Liverpool, *the third in fifteen years… Although the first ribs had failed when tested at the foundry in Dublin, the shed was subsequently accomplished in one span 153 feet wide and 374 feet long. Nearly complete in 1849, and finally finished in 1850, it became one of the largest spans in the world* [88:39].

[12] *The architects of* **Paddington II** *station and train-shed, Brunel and Sir Matthew Digby Wyatt, had set out valiantly "to avoid any recurrence to existing styles, and to try the experiment of designing everything in accordance with the structural purposes, or nature of the materials employed, iron and cement."* Carroll Meeks believes that *the laudable goal was not achieved, for the detail was borrowed from almost every ancient style, but it was recombined in an interesting and vigorous manner* [88:68].

[13] The station underwent several renovations, such as the addition of two Underground lines in 1907 and the electrification of services to Warford in 1922. The railroad was merged again in 1923 to form the London Midland and Scottish Railway-LMS, which was *the largest private company of the British Empire*.

On the occasion of the centenary of the station in 1938, LMS announced its remodeling but the war stopped the process, without it being possible to build anything. In 1959, British Railway-BR announced a complete remodeling in 1959, which included the demolition of the Portico and the Great Hall and caused a battle for its conservation. Prime Minister Harold Macmillan declined to intervene and the two works were demolished in 1962.

[14] The design also contains a series of interventions in layers, including the restoration of the eastern flank building and the revitalization of others. With all this, the King's Cross station will provide a more adequate service to the 50 million annual passengers that circulate through it.

[15] According to its JMP authors, the latest transformation of King's Cross Station involves three different ways of doing architecture: reuse, restoration and new construction. The roof and the buildings of the edge have been adapted and reused, its main cataloged Grade I façade has been restored with precision and a new and highly expressive western vestibule has been designed as a central piece and 'beating heart' of the project. https://www.e-architect.co.uk/london/kings-cross-station

[16] For its part, the slender lighting lamps respect the axis of symmetry of such a noble structure but, incomprehensibly, they are placed too close and upset the hierarchy generated by the main axis, eliminating its 'space of understanding,' now clogged with things.

[17] Then it reached an agreement with the Leicester and Hitchin Railway -LHR, which agreed to share its access rights agreed with the Great Northern Railway -GNR to King's Cross, separating itself from it very close to the station.

[18] St Pancras was one of the London stations to provide boat-train services to the ports, where they combined with long boat trips. In its case, it did it with the London line, Tilbury and Southend Railway (LTSR), to Tilbury Docks located downstream of London on the left bank of the Thames, for travel to Australia and Scandinavia.

[19] In principle, for the new line, called Channel Tunnel Rail Link - CTRL, a tunnel was planned from the southeast, passing through Blackfriars and Farringdon stations, to the vicinity of King's Cross, where a new Underground station would be built.

But it was an expensive and not very 'visible' solution and other proposals arose, among which the one defended by Michael Heseltine, Secretary of State for the Environment, who planned to use it to regenerate the depressed area of the East End. It was orchestrated by a longer route that passed through Stratford -where a new station was available- and arrived in the north to St Pancras, not without suffering a cumulus of modifications, collected by Michael Schabas in [112:136-164].

Once the arrival of the high-speed line in the north was decided, the choice of St Pancras or King's Cross as a terminal involved the possibilities of distributing passengers through Underground connections, better in King's Cross, although more congested. In addition, all this involved other projects of the Underground network, mainly to the north-south Thameslink line planned from Blackfriars with an intermediate station in Farringdon, where it intersects with the other major Crossrail project.

[20] They were destined to three railway services: the East Midlands ones would use the western platforms, Eurostar the intermediate ones and the Kent ones the eastern ones. Passenger access to these platforms would be made from a rear vestibule connected by a bridge, but it seemed a very intrusive solution in the historic station and the idea of entering below prevailed.

[21] All this, together with the changes of King's Cross, alleviate the narrowness of the accesses by New Road, previously the only ones, to both stations.

[22] Five lines for traffic from South to Westminster. Traffic from south London entered the City through London Bridge Station, but Westminster had worse access. Two new railroads, the London Brighton and South Coast Railway - LB & SCR and the London Chatham and Dover Railway - LC & DR, tried to fill that void with a single station in Victoria, but of segregated use for each of them.

On the other hand, the transfer of Crystal Palace to Sydenham motivated the creation of a branch from the London and Brighton Railway-LBR in 1854. While it was still under construction, the West End of London and Crystal Palace Railway planned a line from there to London, with a temporary station in Battersea and a later bridge over the Thames. In addition, three other companies, the Great Western - GWR, the London & North Western - LNWR, and the East Kent Railway - EKR, showed interest in a route for the railways of southern England by the Grosvenor canal route, whose terminal initially called Grosvenor ended up receiving the name of Victoria Station.

Two stations and a hotel in a building. After a series of mergers and acquisitions, the companies LB & SCR and London Chatham and Dover Railway -LC & DR took on the construction of this double station. The side of the LB & SCR or Brighton side was opened in 1860, while after a subsequent agreement with the GWR, the LC & DR opened the Chatham side in 1862. In the northwest corner of the building the Grosvenor Hotel was built, with 300 rooms and managed independently from the station.

In 1898 the Brighton side was demolished and in 1899 the joint operation of the two companies was agreed upon, under the name of South Eastern and Chatham Railway (SECR). The Chatham side was also renovated with a new roof and opened in 1908. The station specialized in boat - train services, with the plus of first class Pullman services, with lines to Ostend and Calais via Dover, and Rotterdam via Gravesend, while the Brighton side served Dieppe via Newhaven. See: https://en.wikipedia.org/wiki/London_Victoria_station and the books of Michael Schabas [112] and David Wragg [145], for more complete information.

[23] A few airy buildings have been built on the station and, currently, the station is again undergoing a major remodeling of lobbies and accesses to improve its entrances and connections with the Victoria, District and Jubilee Underground lines. The reform is not yet finished, both because of its complexity and because it is the old and dense area of Westminster, plagued by old buildings and crossed by significant flows of vehicles and passengers in all directions.

[24] The structural contribution of each station is summarized in the following table:

Railway stations - Types and measures (m) of the structure

Began	Finished	Name	width	bays	span	high	long	Type
1851	1852	King Cross	64	2	32	22	244	laminated wood bows
1852	1852	Fenchurch Street	32	1	32			half-moon lattice
1852	1854	Paddington 2	73	3	31		213	arched beams
1859	1866	Victoria	73	2	38	19	226	cable-stayed arch
1862	1864	Charing Cross	50	1	50			bowstring
1863	1866	Cannon Street	58				207	bowstring
1863	1876	St Pancras	74	1	74	30	210	arch lattice
1874	1875	Liverpool Street	85	4	33	23		lattices
Subsequent span record								
	1888	Penn, Jersey City	77	1	77			arch lattice
	1893	Philadelphia Reading	78	1	78			arch lattice
	1893	Philadelphia Broad St.	91	1	91			arch lattice

Source: [88:169-174] and own elaboration

[25] Num. 29 of 18 February, 1875: 133. Cited in [88:90]

[26] To make a *spatial* reading of this historical account, support has been sought in Landscape Ecology, a scientific discipline born in the 1980s to analyze landscapes or geographical spaces. After exposing different landscapes in distant areas of the planet, Forman and Godron declare that they all share a common fundamental structure, composed of spots and corridors on a background matrix, whose operation is governed by a series of also common basic principles [49:23].

In synthesis, the theory establishes a structure that develops from the spatial relationships between components, through the distribution of materials and species in relation to sizes, shapes, number, classes and configurations of the ecosystems. The operation is the result of the interactions between these spatial elements, that is, the flows of energy, materials and species and between the components. The smallest spatial elements, visible at the managed spatial scale, are the tesserae.

These tiles are grouped in **spots** or areas characterized by their size and by the shape and nature of the edge, **corridors** or bands characterized by their width and connectivity, whose breaks and **nodes** control their conduit and barrier functions, and an enveloping **matrix**, whose role is dominant in the dynamics of the landscape. The corridors can form **networks**, in turn characterized by the types of intersection,

their grid and the size of the mesh. In the general conformation, **centers** and **edges** can be detected according to the groupings and figures formed by the combination of lines and areas of those components.

[27] http://www.tom-carden.co.uk/p5/tube_map_travel_times/applet/

[28] Connectivity. When a Metro network is represented in a graph, the stations are the vertices and the roads are the edges. When crossing several stations on the tracks, each Metro line generates a route between two vertices. Several lines can circulate by an edge (track), so that that vertex (station) offers several routes. The gamma index of network connectivity is the ratio of the number of links in a network to the maximum possible number of links in that network. The number of links present is counted directly. The maximum possible number of links can be determined by counting the number of nodes present. With three nodes present, only three links are possible, but with four nodes present, three additional links are possible, making a total of six. Assuming no new intersections are formed, the maximum number of links rises by three each time a node is added. Thus, we have the gamma index for connectivity

$$\text{Index} = L/L_{max} = L/3(V - 2)$$

where L is the number of links, Lmax is the maximum possible number of links, and V is the number of nodes. The gamma index varies from zero, indicating that none of the nodes is linked, to 1.0, indicating that every node is linked to every other possible node.

According to the scheme of the network and the following table, within zone 1 there are 54 stations (vertices) of 11 lines that draw a closed ring, crossed by several lines. The ring is formed by 27 stations of the Circle Line, doubled in some sections by the Metropolitan and the Hammersmith & City Lines in the north and by the District Line in the south and the west, that offer several routes in the same platform of each station.

The scheme reflects the dominant directions of the other lines: the Central Line crosses it from east to west, the Northern Line crosses it from north to south, the Bakerloo Line follows a diagonal and the Piccadilly Line the other, while the Jubilee and Victoria lines also cross practically from north to south with some swerves.

Connectivity of the network lines

Lines	Station=V	Routes=R	Arista=L	L/3(V-3)	L/V	R/V	R/L
Bakerloo line	10	61	24	0,24	2,40	6,10	2,54
Central Line	12	48	23	0,23	1,92	4,00	2,09
Circle line	27	219	49	0,48	1,81	8,11	4,47
District Line	20	108	35	0,34	1,75	5,40	3,09
Hammersmith & City Line	11	84	24	0,24	2,18	7,64	3,50
Jubilee Line	7	39	16	0,16	2,29	5,57	2,44
Metropolitan Line	9	68	18	0,18	2,00	7,56	3,78
Northern Line	12	60	28	0,24	2,33	5,00	2,14
Piccadilly Line	11	50	21	0,21	1,91	4,55	2,38
Victoria Line	6	40	18	0,18	3,00	6,67	2,22
Waterloo & City Line	2	13	7	0,07	3,50	6,50	1,86
Zone 1	54	395	97	0,62	1,80	7,31	3,11

Note: Arista = way between two vertices or stations; route = Underground lines between two stations

Centrality through intermediation. This concept follows a logic different from most indicators of centrality. In fact, the importance does not depend so much on the location of the vertex as an end point, but on whether it is used or not to join other two vertices, taking the shorter paths. This is particularly relevant in the case of public transport. A station can be much used because it is close to an important place, but another station can be even more used because it serves as a transfer point to reach many locations.

Metro	Vertex	Arista	Min.	Max.	Average	Sum	Index
Berlin	32	43	22,10	110,40	40,97	1311	2,17
Madrid	48	79	2,03	265,19	72,77	3493	2,18
Paris	78	125	40,07	630,73	152,50	11895	3,02
NY City	77	109	10,74	683,15	162,45	12509	4,46
London	83	121	7,69	1240,29	185,84	15425	4,59

[29] According to Juan Benet, the stations of *King's Cross, Charing Cross and Paddington were the first outposts of the 'industrial arts' which, borrowing a few forms drawn from historical styles - Gothic and Renaissance, mainly - transferred to new materials, had to dominate civil architecture from the last century until the 'belle époque'* [9:51].

Chapter 3 Capital of the Empire

[1] To inhabit the world, the first thing is to erect a fence to calibrate meetings, to build a horizon with which to embrace the world as an exercise of one's own being. With this, you define borders to stay safe in community, controlling who and how crosses [7:14].

[2] The act of building borders is subject to many meanings. Their presence can evoke hostility in case of attack and defense, but also negotiation when there is willingness to relate. Borders can be both permeable and insurmountable, they can be a limit or constitute a starting point, a place to be and communicate or go into no man's land, between two opposite worlds that have nothing in common, even when they are in contact [129:19].

[3] Above the skyline are the signs of White-hall, Scotland Yard, Suffolk House, Yorke House, Salsburry h., New Exchange, Convent Garden, S. Clement, The Waterhouse, S. Andre in Holborne, S. Pauwls Church, Haygat, Bow Church, Guildhall, Alhallouws great, S. Lorentz Poultney, the Royal Exchange, S. Michael's, S. Petris, S. Magnes, Gray Church, S. Dunston in the East, Alhallows barking and The Tower.

On the river, next to the north bank, are the signs of Savoy, Somerset House, Arundel House, Essex House, Temple Stayres, Temple, Blackfreyars, Baynards Castle, Paulus wharfe, Queene hythe, The 3 Cranes, Stiliard, Cole harbour, The Old Swan, Fishmongers Hall, The Bridge, Lyon kay, Billings gate, Castonhouse, Tower Wharfe, S. Catryns.

A couple of boats anchored in the center of the river are identified as the Eel Ships. On the shore of Southwark appear The Globe, Winchester house, Southwark, and downstream of the bridge appears S. Olafe

[4] https://upload.wikimedia.org/wikipedia/commons/5/5f/1647_Long_view_of_ London _From_ Bankside_-_Wenceslaus_Hollar.jpg

[5] Capitel, Antón; 2016. *Londres. La capital más grande de Europa*. *Ahora Semanal*, num.43 (22-28 July), Madrid (see note 2)

[6] Francesco Jacquier, Tommaso Le Seur and Ruggiero Giuseppe Boscovich. See: López Manzanares, Gema; 2001. Teoría de estructuras y restauración en el siglo XVIII: la cúpula de San Pedro de Roma. OP Obra Pública, 57 (2001): (48-59). And also: López Manzanares, Gema; La estabilidad de la cúpula de S. Pedro: el informe de los tres matemáticos. http://ruc.udc.es/dspace/bitstream/handle/2183/10583/HC%2037.pdf?sequence=1

[7] The writer and historian Gillian Tindall discovered the truth behind the myth of the building in her 2006 book *The House By The Thames: And The People Who Lived There*. It turns out that number 49 Bankside was actually built in 1710, the same year that St. Paul's Cathedral was finished, which dismantles the theory that Wren was based there during the decades it took to build his masterpiece. Tindall believes that the plaque was in the house in which Wren lived, but a few houses to the east, where today stands a modern block of flats behind the Founders Arms pub. See: https://memoirsofametrogirl.com/2013/12/18/cardinals-wharf-bankside-history-survivor-of-early-18th-century-the-globe-tate-modern/

[8] https://en.wikipedia.org/wiki/John_Burns. (visited 14/8/2017)

[9] Museum of London.

[10] The piers at the dock edges were 1.8 m thick brick with buttresses sewn with iron staples every 4.5 m, cemented on gravel with addition of clay to waterproof the foot and the back of the walls drained with gravel, and they have behaved well since its construction.

[11] Regent's Canal has a length of 13.8 km and a vertical drop of 25.8 m, saved by means of 12 locks. Construction began from Paddington in 1812, came to Camden in 1816 and to Limehouse in 1820. Between the Old Ford Lock and Mile's End Lock, locks 8 and 9, it is connected by the Hertford Union Canal to the Lea River, and in lock 12, called Commercial Road Lock on the road that passes over, it enters Limehouse Basin.

[12] This layout requires two tunnels, in Islington of 886 m and in Maida Hill of 251 m, which have a very fair gauge and were two bottlenecks for the canal traffic. In 1826 a tugboat was introduced that took half an hour to tow four barges.

[13] The piles of the central span are reinforced with platforms to avoid being hit by the ships, which centers the elevation of the bridge and gives it a more monumental air than if they were all the same. The walls of the tympanums are treated with ashlar masonry, as well as the voussoirs, with quite marked head joints. In each pile there is a highlight that marks the discontinuity of the spans in a very classical way.

[14] In particular, his trilogy of bridges: Veurdre, Boutiron and Châtel de Nèuvre, on the Allier, made between 1911 and 1923 with the contractor François Mercier. Its three arches of 38, 45 and 38 m laid out were built in reinforced concrete and covered with Portland stone, and have hydraulic jacks inserted into the key for decentering and controlling residual stresses, as had been done ten years earlier in France. It was designed around 1928 by Alfredo Dryland, the engineer of Middlesex County where the bridge is located, in collaboration with Consider Constructions Ltd, which arose from the French engineer Armand Considère, a pioneer of zunched concrete, and with the architect Herbert Baker.

[15] Kennard, J.; 1979. Sanitary Engineering: Water Supply. In: [120: 489- 503]: 494.

[16] Rawlinson, J.; 1979. Sanitary Engineering. Sanitation. In: [120: 504 - 519]: 508.

[17] The low-level sewer began at Pimlico and followed the river line from the vicinity of Vauxhall Bridge. From Westminster Bridge to Blackfriars it was one of the many structures contained in the Victoria Embankment, but from Blackfriars it headed north below Queen Victoria Street and through Tower Hill, Cable Street and Bow Street in the city center.

It passed under the river Lea in a tunnel and extended with two branches to Homerton and the Isle of Dogs, with a total length of about 19 km.

[18] The level of the Barking and North Woolwich lines had to be lowered to allow the passage of the collector without excessive loss of height in the sewerage network. In the same way, it was necessary to raise five roads between 1.8 and 4.8 m to allow the collector to pass under them.

[19] The low-level south sewer ran from the main street of Putney to Deptford, with a branch to Bermondsey, and between the two they drained an area, much of which was below the high mark and before subject to frequent floods by the flow of old sewers. The combined length of the culvert and the branch was a little over 19 km.

[20] The Board finally reconstructed 266 km of old major culverts, twice the length of the interception system itself, and the new storm relief culverts. On the other hand, 1,770 km of new local sewers were built by the viceregents under the supervision of the Board, and all the plans were inspected and approved by Bazalgette [61:99].

[21] Budgeted construction costs amounted to 1,156,981 pounds for Victoria, 1,014,525 for the Albert and 269,591 for the Chelsea Embankment, which would be financed through a new fund, the *Thames Embankment and Metropolis Improvement Fund*, in turn nourished by the fees for coal and wine collected in the port of London [61:144].

[22] Its chains rested on four square pillars of brick of 2.20 m side that formed the corners of the towers, with a similar disposition to Clifton Bridge. To achieve a vertical reaction of the chains, the saddle rested on two greased rollers, supported on a casting plate. This arrangement allowed shorter and inclined side chains than the central ones, and placed them at a lower level in the abutment.

[23] *The Engineering* published a review of its demolition where it recalled the amount of its construction, 102,245 pounds, of which only 17,000 corresponded to 700 tons of iron structure, while the ashlar of the towers cost 60,000 and the access 17,000 pounds. The figures justify the abandonment of masonry for bridges in the following decades, replaced first by iron or steel and then by the concrete [The Engineering, Jan 23, 1863:48].

[24] The shield consisted of twelve vertical frames of cast iron, each with three compartments one on top of the other, covered with pieces of cast iron mounted

on rollers. These pieces were moved forward, to receive the thrusts of the lands while the coating was being built. On the front face, horizontal planks were removed one by one from top to bottom, to dig into the hole. Each vertical frame was pushed forward by other jacks leaning on the brick lining already built. In this way they advanced about 12 cm, so that the wooden planks would never be left without support, achieving a rhythm of about 2 m / week [62:30].

[25] The first serious flood occurred in May 1827, when some 165 m of tunnel were built, and progress was halted until September, as it was necessary to redo several pieces of the shield to replace the damaged ones. In January 1828, with 182 m of tunnel already built, the water returned to penetrate the tunnel. Isambard Brunel was on the shield when the disaster happened and he was seriously injured in one knee. The tunnel was again emptied of water and the gap covered with clay, but the company's finances did not bear the expenses and had to be closed. The shield was left in its place and was imbibed with a brick and Roman cement masonry similar to that of the cladding [62:38].

[26] See the assessment by Antón Capitel in [28:14 a 17]

[27] Dieslelkamp, Edward J.; 1982. Richard Turner and the Palm House at Kew Gardens. *Transactions of the Newcomen Society*, 54 (1982-1983): 1-26

[28] Dieslelkamp, 1982:9

[29] Privatised London: the Thames Path walk that resembles a prison corridor. *The Guardian*, 24 feb 2015,

Chapter 4 Modern City

[1] Dickens, Charles; 1839. Oliver Twist:107

[2] http://www.locallocalhistory.co.uk/transport/index.htm

[3] replaced in 1991 by a reinforced concrete slab.

[4] http://housingprototypes.org/project?File_No=GB008

[5] http://manchesterhistory.net/architecture/1970/middlesexestate.html

[6] They can be consulted on the website of the London School of Economics - https://booth.lse.ac.uk/map/14/-0.1717/51.4908/100/0

[7] *And if the clubs* [North of Hyde Park] *from which, as from an opera-box, one looks out across the parks towards Buckingham Palace-if those clubs are not, for social traditions, for standing, for gravity, or for place, 'in it' with the older clubs near Pall Mall or about Whitehall, they are at least more pagan in the sense of being more humanly enjoyable to the uninitiated. A man can, in these places, lounge so utterly and entirely*.

[8] The underlying problem was the total freedom of the dissidents to establish places of worship but, according to the local laws of the City, those dedicated to the Anglican church were forced to finance themselves through their own parishes, where there was never money. The arrival of Anglican Queen Anna and a Tory government earlier this year, led to the provision of funds from a coal tax for the churches and the government could subsidize the parishes. Here, contrary to what Rasmussen said, the city lost chances for their independence, but pragmatism prevailed.

[9] Sinclair mentions other systems: *the old hospitals, the Inns of Court, the markets, the prisons, the religious houses are the others. They have their disciples, aware of the older relations.*

[10] For example: *The highway authority has no right and is not under not liability to repair any way dedicated to the public since 1835, unless either a) the provisions of section 23 of the Highway Act, 1835, have been complied with, b) an agreement has been made under section 146 of the Public Health Act, 1875, or c) the road has been declared a public highway pursuant to section 152 of the Public Health Act, 1875; always remembering that in districts where Part III of the Public Health Amendment Act, 1890, has been adopted the provisions of section 41 of that Act take the place of section 152 of the Public Health Act, 1875, and in districts where the Private Streets Works Act, 1892, has been adopted the provisions of sections 19 and 20 of that Act replace both section 152 of the Public Health Act, 1875, and section 41 of the Public Health Acts Amendment Act, 1890* [18:18].

[11] Borsay, Peter; Furnée, Jan Hein; 2016. *Leisure cultures in urban Europe, c.1700-1870: A Transnational Perspective*. Manchester University Press, Manchester.

[12] It had all started in New York, where Frederick Law Olmsted and Calvert Vaux had started up a new type of park lanes with traffic route and segregation characteristics, soon assimilated for the new roads destined to the automobile. The Eastern Parkway in 1874 and the Ocean Parkway in 1880 were conceived, first as accesses to the large urban Prospect and Central Parks, and then as elements of connection between them and with Coney Island, as the origin of a whole regional leisure and recreational system.

Subsequently, achievements such as the Henry Hudson Parkway (1908.1925) and the Merritt Parkway (1938-1940), the first medium-sized and limited-access highway in Connecticut, were the first paths to combining the aesthetics of scenic and recreational roads with the efficiency of high-speed highways. They represented a significant advance in the evolution of American road design, assuming for the first time the aesthetic principles and the very name of parkway to the direct service of the automobile [8:91 and 105].

In Germany, the first motorways were inspired by those American achievements, contrary to the more functionalist criteria and defenders of the greater speed and efficiency of the straight routes, preferred for military purposes. Although some sections of the first German highway from Frankfurt to Mannheim had been laid out with relatively long straight alignments, for high performance and speed trials, the following realizations were closer to the traditional image of winding roads, seeking greater attunement with nature.

The curves of the road were understood as a model of harmony between the beauty of the landscape, the layout and the achievement of the objectives that drove its construction. Its designers Fritz Todt, Alwin Seifert, Hermann Schurhammer, Hans Lorenz and others had shown how a technical work of gigantic dimensions such as motorways could be inserted into the landscape.

In the Straße exhibition of 1934, Seifert said: The roads of the Third Reich should become as beautiful as those of our ancestors, as perfect in the sense of our time as theirs were for them: works of sublime harmony between compliance with the technical objectives, the inscription in the landscape and the link with the people. At the end of the 1930s, this aesthetic of landscape roots acquired pretensions

of totality, in tune with the Third Reich's policy, which used them extensively as an image of the achievements of national socialism [9:206].

[13] http://www.locallocalhistory.co.uk/transport/index.htm

[14] Finally, about half of the ring network was built, although most do not have highway standards and there are large lacunae. It should be noted that there are practically no high standard roads in South London, in the areas of Elephant & Castle to Purley, and from Kingston to Greenwich. Although the area is well connected by electrified railways and suburban buses, road trips are terribly slow [112:13].

[15] The green belt has endured fairly well and remains untouchable, but some exceptions have been made, especially for the motorway service areas. When the M25 was opened, there were criticisms that 300 km could be driven without any opportunity to stop to use the toilet or fill the tank. Four Motorway Service Areas (MSA) and a newer one in Cobham were developed in 2012. Although serving the needs of the body was the main motivation, the UK government also benefited from the MSAs. Usually, these were built on land purchased by the Highways Agency at agricultural land prices. Although development costs are high, as they sometimes involve expensive bridges and ramps, the sites are then leased to private operators who enjoy a local monopoly. As the greenbelt regulations prevent the development of competitive service areas around junctions, MSAs have virtually guaranteed a high volume of traffic and profitability [112:13].

[16] Extracted from: Sudjic, Deyan; 2005. Governing the ungovernable?. https://LSECiti.es/u4e621438

Chapter 5 Global City

[1] Blake, William; Erdman, David V. (ed.); 1965. *The Complete Poetry and Prose of William Blake*. Anchor Books, Doubleday, New York, 1988. Jerusalem. The Emanation of The Giant Albion: 147. Trad. Esp.: Xavier Campos Vilanova; prologue by Francisco Fernández Fernández. -: Publicacions de la Universitat Jaume I, Castelló de la Plana,1997.

[2] https://urbanage.lsecities.net/newspapers/london-europe-s-global-city-1-1. The Greater Greater London. Published in November 2005.

[3] Kennedy, Maev; 2017. Charterhouse in London opens to public for first time in 400 years. *The Guardian, 20170126*, modified 20170915.

[4] See previous note.

[5] Wells, Pritchard and his wife Molly were devotees of Modernism and the Bauhaus, and, having seen the introduction of communal and high density life in Europe, they hoped to take the idea to London.

[6] Coaffee, Jon; 2009. *Terrorism, Risk and the Global City: Towards Urban Resilience*. Farnham: Ashgate Publishing: 241.

[7] See previous note.

[8] http://www.kierantimberlake.com/pages/view/88/embassy-of-the-united-states-of-america/parent:3> [visited 5 June 2017].

[9] Wainwright, Oliver; 2016. 'Fortress London: The New US Embassy and the Rise of Counter-Terror Urbanism', *Harvard Design Magazine,* No. 42 S/S.

[10] Department for Transport, *Security in Design of Stations Guide*. London, 2012: 15.

[11] https://www.everlam.com/about> [visited 25 July 2017]

[12] Department for Transport, *Security in Design of Stations Guide*. London, 2012: 23.

[13] Katarzyna Blackman received a distinction at King's College London in 2017 for her Master's Thesis *Securitization of the Built Environment; Politics and Public Space at King's Cross, London*, which deals with security measures in public spaces in London and in particular, around King's Cross.

[14] Victoria Area Planning Brief, London SW1. Supplementary Planning Document. Adopted July 2011. City of Westminster: 47- points 4.2.18 *et seq*.

[15] Colin Buchanan Liverpool Street Interchange Study Final Options Report, 2009.

[16] Key Opportunity Areas. Liverpool Street Area Enhancement Strategy: 112.

[17] *The Guardian*, Monday, July 24, 2017, modified on Friday, September 15, 2017.

[18] http://www.sidellgibson.co.uk/projects/mixeduse/paddington-central/.

[19] https://www.architectsjournal.co.uk/news/renzo-piano-submits-reworked-paddington-quarter-plans/10011788.article

[20] https://www.derwentlondon.com/properties/55-65-north-wharf-road1.

[21] Heatherwick Studio; 2008. Retractable footbridge. Paddington. *Paisea*, June 2008:038

[22] There was a series of previous projects, which declined in the recession of the early 1990s, but Foster started building in the 2000s.

[23] Travers, Tony; 2005. London: Bringing London Together. https://urbanage.lsecities.net/essays/london-bringing-london-together

[24] The politically difficult part is in measures to contain the number of vehicles and in the imposition of taxes on road transport. This needs to be developed in detail and it is likely that its effect is not enough, but it does not seem possible to achieve the stated objectives without some type of penalty to the cars.

[25] Begg, David; 2017. Mayor's Transport Strategy a Breath of Fresh Air. *Transport Times, 21 June 2017*.

[26] In principle, public transport should operate without subsidies after 2019 and steps are being taken in this direction: for the first time in decades, Transport for London has reduced public transport costs.

[27] https://urbanage.lsecities.net/search?city=%5B1%5D&content_type=%5B%22data %22%5D.

[28] http://www.railway-technology.com/projects/crossrail-farringdon-station-london/ (visited 2017/07/20)

[29] The excavation of the Farringdon tunnel has been carried out by four tunnel boring machines called Phyllis, Ada, Victoria and Elizabeth.

[30] The contractor of the project is the UTE of BAM Nuttall, Ferrovial and Kier (BFK), with a contract of 200 million pounds sterling (327 million dollars) for the main works of the project of Farringdon station, signed in November 2011. BFK is responsible for the excavation, construction, mechanical construction, electrical and construction of the two halls, as well as similar works in the double platform tunnels and associated transversal passages.

[31] *Two Hundred and Fifty Views* of *London.*

[32] https://en.wikipedia.org/wiki/Ludgate_Hill

[33] http://edition.cnn.com/travel/article/which-london-airport-pick/index.html-20171112

[34] Despite the initial pressure, the officials refused to cooperate and the parliamentary committee blamed inaction on the experts from the Ministry of Aviation, as they seemed to be waiting for the need for the third airport to be so manifest that Stansted became inevitable. In response, the government formed in 1961 a committee of experts from the world of aviation and commissioned them a report on the need for a third airport and, if so, where and when it should be built.

The report of the experts delivered in 1963 came to say that Heathrow and Gatwick, even with two runways each, would not have the capacity to absorb the traffic of 1973 and that a third airport with two parallel and independent lanes was necessary. They also reported that, after examining a dozen sites, the only one indicated was Stansted [58:15-55].

The problem with these estimates was whether or not to accept the increase in the size of the aircraft, since the limiting factor was the number of takeoffs and landings per runway, which, in turn, implied the need for large investments to manufacturers and airlines. As for the site, the severe air traffic control difficulties of a third airport in the south and road access in less than an hour reduced the choice to a few sites, east and west. Stansted, the committee said, was the only site that reasonably complied with all the demands and had to be developed in the early 1970s to eventually become an airport comparable to Heathrow.

The report generated the expected protests, focused on the territorial inadequacy and negative environmental effects, but also with their access by road, which required what was stipulated to be more than an hour, and noise. The Essex County Council then commissioned a new independent report, which was delivered in 1966 and concluded by saying that, *it would be a calamity for the neighbourhood if a major airport were placed at Stansted*. He continued to affirm that such a decision could only be justified by national necessity and that this need was not evident. The government did not agree to appoint a new more balanced committee and produced a white paper in 1967 that it published together with the 1966 report. For the government, the option of taking advantage of nearby provincial airports was not viable, because most of the demand came from the southeast. And after examining again in more detail another new series of sites to the west, north and east of London concluded, again, that Stansted was the best option.

That generated a passionate debate in the House of Commons in June 1967, accusing the government of not having carried out the urban planning required for projects of that size and having appointed reviewers of the report as some of its editors, incurring evident conflicts of interest. For their part, the local ecologists produced a black book, where they emphasized the level of noise ignored by the government. The matter came to the House of Lords, where it was the subject of a very critical debate in December 1967, which led to the appointment of a new commission - the 'Ruskill Commission' - to make an independent report on the 'Third airport of London.'

According to Peter Hall, this commission carried out a model investigation of great power for two and a half years, using novel techniques such as cost - benefit analyzes on a large scale, which were tested for the first time for a large project. In particular, the methods of unit cost valuation and value aggregation systems were developed and improved after numerous investigations.

The report began again with a list of 78 sites that was examined for seven months until it was reduced to four, including Stansted, and after detailed analysis reduced to the one site in Cublington, Buckinghamshire. The preliminary report with that choice was published in January of 1970 and was submitted to a public hearing until the summer, obtaining an "enormous volume of critical comments."

However, almost at the end of the commission's work, Prof. Colin Buchanan announced that he could not accept the choice of Cublington and, to the surprise of his colleagues, he could not accept the rest of the report, except the part about temporal programming of the necessities that he considered very successful.

His disagreement was expressed in a passionate writing defending 'good' planning, against the cold and meticulous cost-benefit analysis, as he had done from the beginning against his colleagues. The central reason for his disagreement was the loss of the rural character of the landscape close to London, produced in three of the four sites analyzed -among which Cublington was the worst to cut across the open field belt between London and Birmingham- and that the only possible site was Foulness.

The report generated the expected protest in Cublington, the most economically favorable site, where a campaign similar to that of Stansted was organized, taking advantage of the Buchanan fissure to divert the decision towards Foulness, environmentally more defensible. The press, the planners and the people supported Foulness and as a result, in April 1971 the decision was made to build there the third airport in London, specifically on the site of Maplin Sands, in Essex.

With this, the whole process started again, but the estimates of air traffic had moved downwards and those of costs upwards, which forced to reconsider other more practical options, combining improvements in the three airports of Gatwick, Stansted and Luton. In those years, aircraft noise was significantly reduced and the other environmental problems of these improvement solutions were very similar, so finally the problem was that Maplin's 650 million pounds of cost were more than twice as much as the following alternatives.

After seven years of new debates, in August of 1978 a new advisory committee was created on airport policy and where airlines and airports were located, which definitively abandoned the Maplin option and, as had happened in 1967, left on the table again the future of Stansted, finally chosen as the third London airport in 1979.

[35] The British Overseas Airways Corporation-BOAC used a terminal near Victoria, originally built for train-boat passengers to Southampton. British European Airways -BEA initially used the space on Kensington High Street. During this period, flights were sometimes changed in the short term to Northolt, Croydon, or even to the more remote former military airfields. Of course, compared to today, the number of passengers was small, about three million in 1956, but it grew by about one million each year.

[36] https://en.wikipedia.org/wiki/Beehive,_Gatwick_Airport, 13 Nov 2017

[37] Powell, Kenneth; 1992. *Stansted, Norman Foster and the Architecture of Flight*. Fourth Estate and Word Search, London: 18.

[38] Scenes

Filming on the outside of the British Museum, *Blackmail* (Alfred Hitchcock, 1929)

Hitchcock shooting in London, *Stage Fright* (Alfred Hitchcock, 1950)

Interior of the Albert Hall, in *The Man Who Knew Too Much* (Alfred Hitchcock, 1956)

Roger and Anita walking their dogs in St. James Park, in *101 Dalmatians* (Clyde Geronimi et al., 1961)

Audrey Hepburn in Covent Garden, in *My Fair Lady* (George Cukor, 1963).

George Harrison running into Marylebone Railway Station, in *A Hard Day's Night* (Richard Lester, 1964)

Mary Poppins, flying over the city of London (Robert Stevenson, 1964)

Vanessa Redgrave and David Hemmings in Maryon Park, in *Blow-Up* (Michelangelo Antonioni, 1966)

Robert Powell hanging from the Big Ben clock, in *The 39 Steps* (Don Sharp, 1978)

Griffin Dunne in the Tottenham Court Road Underground, in *An American Werewolf in London* (John Landis, 1981)

Robert Carlyle and Jim Coleman, in *Riff-Raff* (Ken Loach, 1990)

Battersea Power Station, in *Richard III* (Richard Loncraine, 1995)

Joely Richardson riding a bicycle with her dog in Trafalgar Square, in *101 Dalmatians* (Stephen Herek, 1996)

Gwyneth Paltrow and John Hannah at the Albert Bridge Waterloo and City Line Underground stations, in *Sliding Doors* (Peter Howitt, 1998)

Gwyneth Paltrow and Joseph Fiennes in The Globe Theatre, in *Shakespeare in Love* (John Madden, 1998)

Boat chase under Glengall Bridge in Millwall Inner Dock, in *The World is Not Enough* (Michael Apted, 1999)

Hugh Grant walking around Portobello Road Market, in *Notting Hill* (Roger Michel, 1999)

Hugh Grant and Julia Roberts in a bank in Notting Hill Park, in *Notting Hill* (Roger Michel, 1999)

Harry Potter on platform 9 3/4 in King's Cross Station, in *Harry Potter and the Philosopher's Stone* (Chris Columbus, 2001)

Renée Zellweger in the Borough Market area, in *Bridget Jones's Diary* (Sharon Maguire, 2001)

Renée Zellweger at Liverpool Street Station, in *Bridget Jones's Diary* (Sharon Maguire, 2001)

Hugh Grant and Nicholas Hoult at Queen Mary's Gardens inside Regent's Park, in *About A Boy* (Chris Weitz & Paul Weitz, 2002)

Cillian Murphy on Westminster Bridge with Big Ben in the background, in *28 Days Later* (Danny Boyle, 2002).

Jackie Chan and Owen Wilson with the English Royal Guard, in *Shanghai Knights* (David Dobkin, 2003)

Thomas Sangster and Liam Neeson on the bank of the Thames, in *Love, Actually* (Richard Curtis, 2003)

Julia Roberts and Clive Owen at the National Portrait Gallery Restaurant with views over London, in *Closer* (Mike Nichols, 2004)

The Winchester Tavern, Monson Road at Barlborough Street, New Cross Gate, in *Shaun of the Dead* (Edgar Wright, 2004)

Jonathan Rhys-Meyers and Emily Mortimer in front of Westminster Bridge, in *Match Point* (Woody Allen, 2005)

Natalie Portman in the London Underground, in *V For Vendetta* (James McTeigue, 2005)

Houses of Parliament blowing up, in *V For Vendetta* (James McTeigue, 2005)

Views of the river from the Tate Modern, in *Match Point* (Woody Allen, 2005)

Garfield with Big Ben, in *Garfield 2* (Tim Hill, 2006)

Tom Hanks and Audrey Tautou in front of Westminster Abbey, in *The Da Vinci Code* (Ron Howard, 2006)

Great swirl in the Thames, in *Fantastic Four: Rise of the Silver Surfer* (Tim Story, 2007)

Silver Surfer at the London Eye, in *Fantastic Four: Rise of the Silver Surfer* (Tim Story, 2007)

Batman (Christian Bale) in the old Battersea power station, in *Batman: The Dark Knight* (Christopher Nolan, 2008)

Colin Firth and Geoffrey Rush with the Victoria Memorial in the background, in *The King's Speech* (Tom Hooper, 2010)

James Bond (Daniel Craig) in Trafalgar Square, in *Skyfall* (Sam Mendes, 2012)

James Bond (Daniel Craig) observing the London rooftops, in *Skyfall* (Sam Mendes, 2012)

Big Ben, in *Edge of Tomorrow* (Doug Liman, 2014)

Paddington Bear, in front of Buckingham Palace (Paul King, 2014)

The Minions, at Buckingham Palace (Pierre Coffin & Kyle Balda, 2015)

A devastated London behind Gerard Butler, in *London Has Fallen* (Babak Najafi, 2016)

Samantha Barks next to the Thames, in *100 Streets* (Jim O'Hanlon, 2016)

Gal Gadot in front of Tower Bridge, in *Wonder Woman* (Patty Jenkins, 2017)

http://ffffilm.com

https://tokyofoxbeyondthemovies.wordpress.com/2014/09/04/london-filming-locations-notting-hill-1999/

[39] During the 2012 Games, Wembley Stadium hosted nine games in the men's and women's soccer championships, in which Mexico won the men's gold and the United States the women's. Along with sailing, soccer was the only sport of the 2012 Olympic Games played outside London, while the stadiums of Manchester, Glasgow, Newcastle, Coventry and Cardiff also hosted matches.

[40] *All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face with*

sober senses his real conditions of life, and his relations with his kind. Karl Marx. Communist Manifesto, February 21, 1848

[41] *Notes from Underground*, book I, chap. 9.

[42] As he states in these sentences, written in 1869 and still valid today: *At that time people seemed to stick so to one idea; now, they are more nervous, more sensitive, more enlightened—people of two or three ideas at once—as it were. The man of today is a broader man, so to speak—and I declare I believe that is what prevents him from being so self-contained and independent a being as his brother of those earlier days* (*The Idiot,* 1869, IV:5).

[43] *In Crime and Punishment*, 1867, the protagonist, divides individuals *into two categories, inferior (ordinary), that is, so to say, material that serves only to reproduce its kind, and men who have the gift or the talent to utter a new word.*

[44] There is no certainty about what the first Globe was like. Printed panoramas, like those of John Norden and Wenceslaus Hollar, give an idea of the exterior of the theater; written testimonies of foreign visitors, construction contracts and a sketch (of the Swan theater) point out details of the interior. In any case, The Globe itself was not a truly circular building. The archaeological excavation of the Rose Theater in 1989 revealed what most scholars had suspected for a long time, that Elizabethan theaters were polygonal buildings. In the same year, a small portion of the site of the first Globe was excavated, revealing that it was a 20-sided building with a diameter of 30 m (100 ft.).

http://www.shakespearesglobe.com/about-us/history-of-the-globe/rebuilding-the-globe

[45] Delbourgo, James; 2017. *Collecting the World: Hans Sloane and the Origin of the British Museum*. Harvard University Press. Reviewed in: Uglow, Jenny; 2017. Collecting for the Glory of God. *The New York Review of Books*. October, 17 2017:34.

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