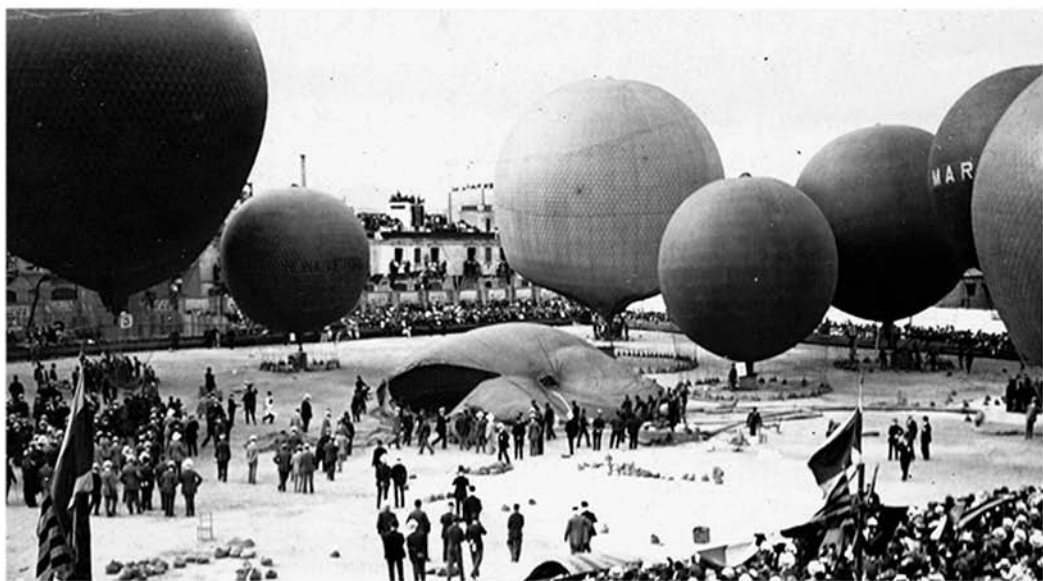


SCIENCE, TECHNOLOGY AND CULTURE, 1700–1945



Barcelona: An Urban History of Science and Modernity, 1888–1929



Edited by Oliver Hochadel and Agustí Nieto-Galan

Barcelona: An Urban History of Science and Modernity, 1888–1929

The four decades between the two Universal Exhibitions of 1888 and 1929 were formative in the creation of modern Barcelona. Architecture and art blossomed in the work of Antoni Gaudí and many others. At the same time, social unrest tore the city apart. Topics such as art nouveau and anarchism have attracted the attention of numerous historians. Yet the crucial role of science, technology and medicine in the cultural makeup of the city has been largely ignored. The ten chapters of this book recover the richness and complexity of the scientific culture of *fin de siècle* Barcelona. The authors explore a broad range of topics: zoological gardens, natural history museums, amusement parks, new medical specialities, the scientific practices of anarchists and spiritists, the medical geography of the urban underworld, early mass media, domestic electricity and astronomical observatories. They pay attention to the agenda of the bourgeois elites but also to hitherto neglected actors: users of electric technologies and radio amateurs, patients in clinics and dispensaries, collectors and visitors of museums, working class audiences of public talks and female mediums. Science, technology and medicine served to exert social control but also to voice social critique. *Barcelona: An Urban History of Science and Modernity, 1888–1929* shows that the city around 1900 was both a creator and facilitator of knowledge but also a space substantially transformed by the appropriation of this knowledge by its unruly citizens.

Oliver Hochadel is a Tenured Historian of Science at the Institució Milà i Fontanals, Consejo Superior de Investigaciones Científicas (IMF-CSIC), Barcelona. His research focuses on the relationship between science and its publics. Book publications include *El mito de Atapuerca. Orígenes, ciencia, divulgación* (2013), *Playing with Fire. Histories of the Lightning Rod* (edited with Peter Heering and David Rhees, 2009) and *Öffentliche Wissenschaft. Elektrizität in der deutschen Aufklärung* (2003).

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Preface

After having completed this book, we, the 18 authors, look at Barcelona differently. We thought we knew the city most of us live in pretty well. Yet the sheer richness of Barcelona's scientific culture around 1900 we helped each other to discover provides us with a lasting thrill. For quite a number of years many members of our local history of science community had come across a host of different 'urban' aspects in their research projects. What seems obvious now needed time to mature. In our local seminars, but also in many of the papers presented at international conferences the role of the urban space as an active agent in shaping scientific knowledge became more and more explicit. We realized that a common project addressing the interactions between science and the city in Barcelona was called for to bring those numerous individual research agendas together. In times of scarce research funds and our local research institutions being savaged by 'the crisis', we needed to find new models of collaboration to embark on a large-scale project and to overcome traditional disciplinary boundaries. In March 2012 we founded together with José Pardo-Tomás and Alfons Zarzoso the 'Barcelona Laboratory Science and the City. Scientific Culture in the City, 1868–1939: Sites, Actors and Practices'. This Laboratory was to serve as a base to launch a number of projects directed both at local and international audiences, at scholars and the general public: the gathering of relevant sources, the building of databases, the organization of academic meetings and the fostering of international collaborations, research projects and subsequent publications but also outreach activities, such as guided city tours, exhibitions and public lectures.

One of the projects of our Laboratory is this book. Its time frame is traditional, as it addresses the four decades between the two international exhibitions in 1888 and 1929, the formative period of modern Barcelona. Yet it was our intention to present new case studies and topics and to explore little known sources, urban spaces and actors. This ambitious endeavour required sheer manpower and we were fortunate to be able to count on so many colleagues from our local community. For each topic chosen we asked two historians – often a senior and a junior scholar – to research and write the article together. We, the two editors, also committed ourselves to pen the introduction together. In other words, this book was conceived from the beginning as the project of a team.

Pre-circulated papers of increasing length were discussed at three workshops held at the Institució Milà i Fontanals (IMF-CSIC) in 2013 and 2014. We all cherished the fruitful exchange seeing the project – and the book – becoming more intriguing and intellectually stimulating each time. Apart from the authors many colleagues were present at these workshops contributing with constructive criticisms and comments that substantially improved the volume. We are grateful to Annette Mülberger, Fernando Vidal, Miquel Carandell, Clara Florensa, Jon Arrizabalaga, Xavier Roqué, José Luis Oyón, Enric March and many others. An advanced draft of each article was sent out to two referees (see the individual chapters for their names). We would like to thank all 22 of them for most valuable criticism and numerous helpful suggestions. We are particularly grateful to the anonymous referee of the entire manuscript for his or her scrupulous reading and precise suggestions for improvement, that reflected an impressive understanding of *all* the topics addressed. And of course we would also like to thank the editors of the series for their support and input.

In recent years we presented parts of this project at several international workshops and conferences. We organized the sessions: ‘Science in the Public Sphere: Barcelona 1888–1936’, at the 4th European Society for the History of Science Conference, in Barcelona in November 2010; ‘Technological Cityscapes: Barcelona around 1900’, at the 39th ICOTHEC Conference, in Barcelona in July 2012; ‘Urban Peripheries? Science in “Second Cities” around 1900’, at the 9th STEP Conference in Lisbon; ‘Ciència i ciutat: una història urbana de la ciència: Barcelona 1888–1929’, at the 13th Trobada d’Història de la Ciència i de la Tècnica, Sant Feliu de Guíxols, both in September 2014. In June 2014 and thanks to the support of Neale Watson, we held the Third Watson Seminar on the History of Material and Visual Science in Barcelona: ‘How to Write an Urban History of Science: New Approaches and Case Studies’. We benefited enormously from the discussion with our colleagues from abroad. They helped us to sharpen our historiographical framework and to design a comparative approach for the urban history of science. We thank all the speakers and participants of these conference sessions and workshops for their stimulating contributions.

The project has been also funded by the ICREA-Acadèmia Research Prize, which one of us (ANG) was awarded in the period 2010–2015. The Spanish Ministry of Economy and Competitiveness contributed by financing the following research projects: (HAR2009–12918–C03–02) (subprograma HIST): ‘Science and Expertise in the Public Sphere: Barcelona (1888–1992)’; (HAR2012–36204–C02–02) ‘Scientific Authority in the Public Sphere in Twentieth-Century Spain’; and (HAR2013–48065–C2–1–P) ‘Science and the City. Natural History, Biology and Biopolitics in the Divided City: Barcelona and Buenos Aires (1868–1936)’. In addition, our History of Science research group in Barcelona: ‘Science, Technology and Medicine in Modern Catalonia (18th–20th centuries)’, has been funded since 2009 by the Catalan Government as a ‘Grup de recerca consolidat i finançat’ (SGR2009–887) (2014 SGR 1410).

A note on spelling: around 1900 the use of the Catalan language progressively became more widespread in the public sphere, in politics, administration, and the media, a sphere that had been dominated nearly exclusively by the Spanish language since the eighteenth century. What is more, Catalan grammar was not standardized until the 1920s. Therefore the period covered by our volume is characterized by a certain linguistic ‘confusion’, for example, with respect to the spelling of the first and second names of historical actors, of place names and institutions. Our ‘solution’ is to reflect as far as possible the spelling of the Spanish and Catalan primary sources – and thus the mix of languages and spellings.

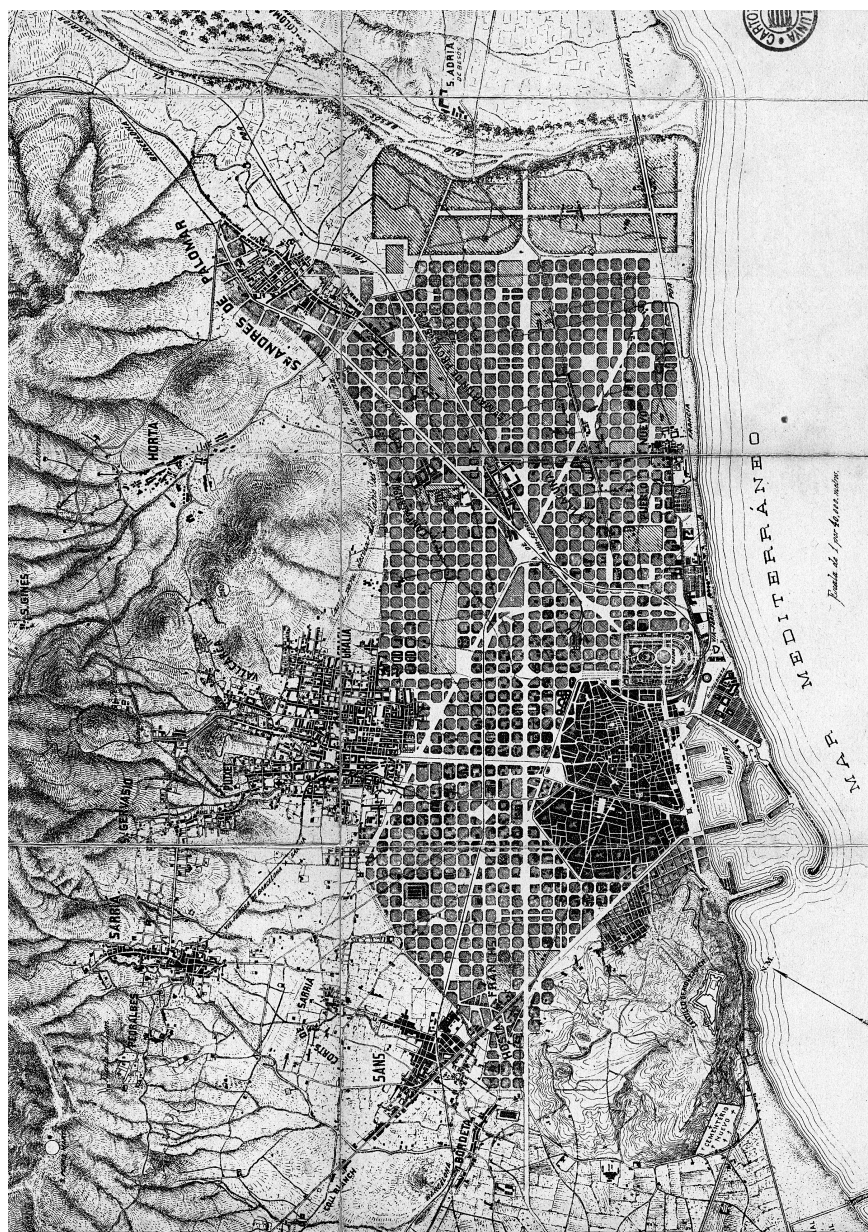
Much urban history of science remains to be explored. We very much hope that the case studies of this volume and the historiographical framework in which they are developed will stimulate further research – on Barcelona and many other cities. The comparative potential of this historiography seems enormous to us. It would require though not only transdisciplinary but even more so transnational collaborations.

Oliver Hochadel and Agustí Nieto-Galan
Barcelona, February 2015

Barcelona historical timeline

- 1860 The end of the medieval city: the construction of the Eixample (Ildefons Cerdà)
- 1868 Spanish Liberal Revolution (La Gloriosa)
- 1872 Foundation of the Ateneu Barcelonès
- 1873 First Spanish Republic
- 1875 Monarchic Restoration (Restauración)
- 1877 Public debates on Darwinism at the Ateneu Barcelonès
- 1880 First Catalanist Conference
- 1881 Foundation of the Ateneu Obrer de Barcelona (Workers' Athenaeum)
- 1886 Valentí Almirall, *Lo catalanisme* (federal, liberal Catalanism)
- 1888 **Universal Exhibition** at the Parc de la Ciutadella**
 - International scientific conferences (medicine, spiritism)
 - Founding Conference of *Unión General de Trabajadores* (UGT), socialist
- 1892 Josep Torres i Bages, *La tradició catalana* (Catholic, conservative Catalanism)
- 1893 Anarchist bombing at the Liceu Opera Theatre
 - New sewage system and hygienic programmes (Pedro García Faria)
- 1895 First telephone wire Barcelona-Madrid
- 1896 First cinema at the Rambla
- 1897 Old adjacent towns (Sants, Gràcia, Les Corts, Sant Gervasi, Sant Martí, Sant Andreu) incorporated into Barcelona
- 1898 Spanish colonial crisis. Loss of Cuba and the Philippines
- 1899 First electric tramways
- 1900 Opening of the Parc Güell
 - Modernisme movement
- 1901 Francesc Ferrer Guàrdia opens the Escuela Moderna
 - Funicular at the Tibidabo mountain
 - Foundation of La Lliga Regionalista (conservative Catalanism)
- 1903 First Congrés Universitari Català
- 1904 Opening of the Fabra Observatory at the Tibidabo mountain, Josep Comas Solà (director)
- 1905 First Electric railway to Sarrià
 - First Congrés d'Higiene de Catalunya

- 1906 Noucentisme movement
Enric Prat de la Riba, *La nacionalitat catalana*
Solidaritat Catalana as a Catalanist political movement
- 1907 First automobile
Foundation of the Institut d'Estudis Catalans
- 1908 Opening of the art nouveau Palau de la Música
- 1909 The Tragic Week – ‘La Setmana Tràgica’ (a violent social revolt)
International Conference on Esperanto
- 1910 Founding Conference of the Confederación Nacional del Trabajo (CNT), anarchist
- 1911 Opening of Saturno Park
- 1913 First Conference of Doctors of Catalan language (Congrés de Metges en Llengua Catalana)
- 1914 Yellow fever plague
Mancomunitat de Catalunya as an autonomous provincial government
- 1915 Public works at the Montjuïc mountain
- 1916 Francesc Carreras Candi, *La ciutat de Barcelona*
- 1918 The Spanish Flu
- 1919 Workers’ long strike at La Canadenca
- 1920 King Alfonso XIII’s visit to the city’s textile factories
- 1921 More than hundred deaths caused by social and political violence
- 1923 Visit of Albert Einstein
General Primo de Rivera’s coup d’état
- 1924 Radio Barcelona begins to broadcast
Opening of the first underground line: Plaça Catalunya-Lesseps
- 1925 Repression of Catalanist societies
- 1926 Death of Antoni Gaudí
Opening of Jorba stores
- 1927 Inauguration of Plaça Catalunya
- 1928 Zeppelin flies around the city
- 1929 International Exhibition** at the Montjuïc mountain
- 1930 Crisis of Primo de Rivera’s dictatorship
- 1931 End of the Monarchy: the Second Spanish Republic begins
Recovery of the Catalan Autonomous Government: Generalitat de Catalunya
- 1936 General Franco’s coup d’état
Spanish Civil War begins
Anarchist-communist revolution in Barcelona
- 1938 George Orwell, *Homage to Catalonia*
Fascist bombing of Barcelona’s civil population
- 1939 Franco’s victory, and massive Catalan exile, the end of the republican regime, and the beginning of a new dictatorship



Map 1 Barcelona in 1888.

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1 Introduction

*Oliver Hochadel and Agustí Nieto-Galan*¹

At the beginning of his novel *City of Marvels*, Spanish writer Eduardo Mendoza, sketches with a few brush strokes a scientific panorama of Barcelona in the nineteenth century:

[...] Barcelona was always at the forefront of progress. In 1818, the *first* regular stagecoach service in Spain went into operation between Barcelona and Reus. The *first* experimental gaslight system was installed in the courtyard of the Palace of La Lonja, housing the Chambers of Commerce, in 1826. In 1836, the *first* steam-powered motor went into operation [...] Spain's *first* railroad was built to link Barcelona and Mataró, dating from 1848. The *first* electric power station was likewise built in Barcelona, in the year 1873. The gap between Barcelona and the rest of the peninsula was enormous, and the city made an overwhelming impression on the newcomer.²

With an image of a city marked by technological innovation and brimming with energy and promise, Mendoza sets the stage for the meteoric career of his protagonist. *City of Marvels* begins in 1887 when the young Onofre Bouvila, barely a teenager, comes from the Catalan countryside to the bustling city. His first job is to hand out anarchist pamphlets to workers in the Parc de la Ciutadella, the site of the first Universal Exhibition in Barcelona to be celebrated the following year. As the story unfolds, Onofre rises from abject poverty to power and wealth propelled by his relentless criminal energy. Mendoza's novel ends in May 1929 on the very day the second major exhibition, the International Exhibition, opens this time located on the other side of town, at the foot of Montjuïc. In a spectacular ascent, Onofre rises vertically into the

1 We would like to thank in particular Dorothee Brantz and Mitchell G. Ash for numerous helpful suggestions and most valuable advice. We also benefited substantially from constant discussion with all the contributors of this volume.

2 Eduardo Mendoza, *City of Marvels* (London: Collins Harvill, 1990), p. 12 [our emphasis]. Original: *La ciudad de los prodigios* (Barcelona: Seix Barral, 1986). Mendoza takes some poetic license with respect to historical data.

air with a seemingly miraculous machine, leaving the masses speechless only to disappear into the Mediterranean Sea. He had urged a Catalan inventor and a German engineer to collaborate in order to develop this flying contraption. The machine has roughly the shape of a helicopter – the *dernier cri* of aeronautic technology at the time. Yet it lacks a propeller – a ‘wonder’ as Mendoza writes, tongue in cheek.

City of Marvels, first published in Spanish in 1986, was written amidst the great expectations created by the Olympic Games which Barcelona was to host in 1992. Once again, we might say, the city was eager to catch up with ‘modernity’ as it had done a century earlier, casting off the grey vestiges of the oppressive Franco regime (1939–1975). For Mendoza this era between the two international exhibitions in 1888 and 1929 serves as a mirror for his own present. Despite ‘being first’ on so many accounts, the Catalans – their ruling class of bourgeois industrialists – were unable to assume a leading political role in Spain. Instead they were being bamboozled by ‘Madrid’, the Spanish central power, who was reaping the cream of the two exhibitions for the greater glory of Spain. And – couched in the sometimes funny, sometimes bitter sarcasm of his ‘mock historical novel’ – Mendoza sees the same danger lurking on the horizon with the Olympics of 1992 in the making.³

In spite of Mendoza’s gloomy prognosis that a major international event such as the Olympic Games would be high-jacked once more by the Spanish state, Barcelona was able to gain the world’s attention and to maintain it. The Games did not only convert the city into a major tourist destination. Still in the Olympic year of 1992, art critic and journalist Robert Hughes lamented in his acclaimed book *Barcelona* the lack of international attention for the city and its history.⁴ Yet more than two decades later, the political and social history of Barcelona in our Mendozian timeframe (1888–1929) and until the end of the Spanish Civil War (1939) is much trodden turf. In those closing years of the nineteenth century and in the first decades of the twentieth century, rapid industrialization, the dramatic changes in the physiognomy of the city (its expansion and the new architecture) and the increasing social unrest with all its violent manifestations have attracted the interest of social historians, urban scholars, historians of architecture and of art, just as Hughes had demanded.⁵ Barcelona is known for its modernist art (art nouveau) and its architecture. Architects such as Antoni Gaudí, Lluís Domènech i Montaner and Josep Puig i Cadafalch and painters such as Joan Miró, Pablo Picasso and Antoni Tàpies are nowadays crucial for the marketing

3 Joan Ramon Resina, *Barcelona's Vocation of Modernity. Rise and Decline of an Urban Image* (Stanford: Stanford University Press, 2008), pp. 182–5.

4 Robert Hughes, *Barcelona* (New York: Vintage Books, 1992).

5 See for instance: Pere Hereu et al., *Arquitectura i ciutat a l'Exposició Universal de Barcelona de 1888* (Barcelona: UPC, 1988); Edmond Valles, *Història gràfica de la Catalunya contemporània*. 3 vols (Barcelona: Edicions 62, 1974–1976); Jordi Casassas, *Intel·lectuals, professionals i polítics a la Catalunya contemporània (1850–1920)* (Sant Cugat del Vallès: Amelia Romero, 1989); Alexandre Cirici Pellicer, *1900 en Barcelona: modernismo, modern style, art nouveau, jugendstil* (Barcelona: La Polígrafa, 1967); Pere Gabriel (ed.), *El Noucentisme* (Barcelona: Edicions 62, 1996).

of the city.⁶ More than that, historians from near and far have discovered Barcelona, from among other labels, as the ‘world capital of anarchism’ in the first third of the twentieth century as an intriguing object of investigation.⁷ Yet in our perception this thriving research on *fin-de-siècle* Barcelona is incomplete. This ever-increasing amount of scholarship rarely addresses at all the role of science (as science, technology and medicine) in this epoch.⁸

What we would like to borrow from *City of Marvels* is not only the time-frame but also Mendoza’s perceptiveness about the role of science. Nowadays it is a commonplace that the years between 1888 and 1929 were formative in the creation of ‘modern’ Barcelona.⁹ Yet what Mendoza clearly grasps is that scientific progress was both a driving agent and a tangible result of this process. *City of Marvels* abounds with references to technological innovation indicating a seemingly successful modernization. These four decades between the two international exhibitions seem to us an ideal historical window to pursue our project on the scientific culture of Barcelona.

At that time, the city was in a permanent state of construction. Between 1888 and 1929, Barcelona, the ‘Catalan Manchester’, as it was often referred to, grew substantially, to roughly one million inhabitants. Industrial growth demanded a new labour force and shaped its urban geography and architecture with new transport networks and infrastructures. The second industrial revolution brought electricity and chemistry to the already powerful textile industry run by steam. A substantial cluster of textile factories grew in highly industrialized areas such as Poble Nou, but also in the surrounding towns such as Sant Martí de Provençals and Sant Andreu del Palomar. In the search for cheaper sources of energy, other factories moved to the countryside next to the rivers to profit from hydraulic power. This network of circulation of raw materials, workers and finished products, shaped the scientific culture of Barcelona for decades.¹⁰

6 See for instance: Cirici Pellicer, *1900 en Barcelona*; Teresa-M. Sala (ed.), *Història de la cultura catalana: Barcelona 1900* (Barcelona: Edicions 62, 2007).

7 Relevant works in Spanish and Catalan are: Pere Solà, *Els ateneus obrers i la cultura popular a Catalunya (1900–1939). L’Ateneu Enciclopèdic Popular* (Barcelona: La Magrana, 1978); José Luis Oyón, *La quiebra de la ciudad popular: espacio urbano, inmigración y anarquismo en la Barcelona de entreguerras, 1914–1936* (Barcelona: El Serbal, 2008). In English: Angel Smith (ed.), *Red Barcelona. Social Protest and Labour Mobilization in the Twentieth Century* (London/New York: Routledge, 2002); Chris Ealham, *Anarchism and the City: Revolution and Counter-Revolution in Barcelona, 1898–1937* (Oakland: AK Press, 2010).

8 In the remainder of this introduction, we will only use the term science (scientific) understood in its broadest sense, including technology and medicine: John V. Pickstone, *Ways of Knowing. A New History of Science, Technology and Medicine* (Manchester: Manchester University Press, 2000).

9 For a textbook-like synthesis, see Alejandro Sánchez (ed.), *Barcelona, 1888–1929. Modernidad, ambición y conflictos de una ciudad soñada* (Madrid: Alianza, 1994).

10 For a history of industrialization on a regional level, see: Norman Pounds, *A Historical Geography of Europe* (Cambridge: Cambridge University Press, 1990). See also Jordi Nadal (ed.), *Atlas de la industrialización de España: 1750–2000* (Barcelona: Fundación BBVA, 2003). See also: Horacio Capel (ed.), *Las Tres Chimeneas: implantación industrial, cambio tecnológico y transformación de un espacio urbano*

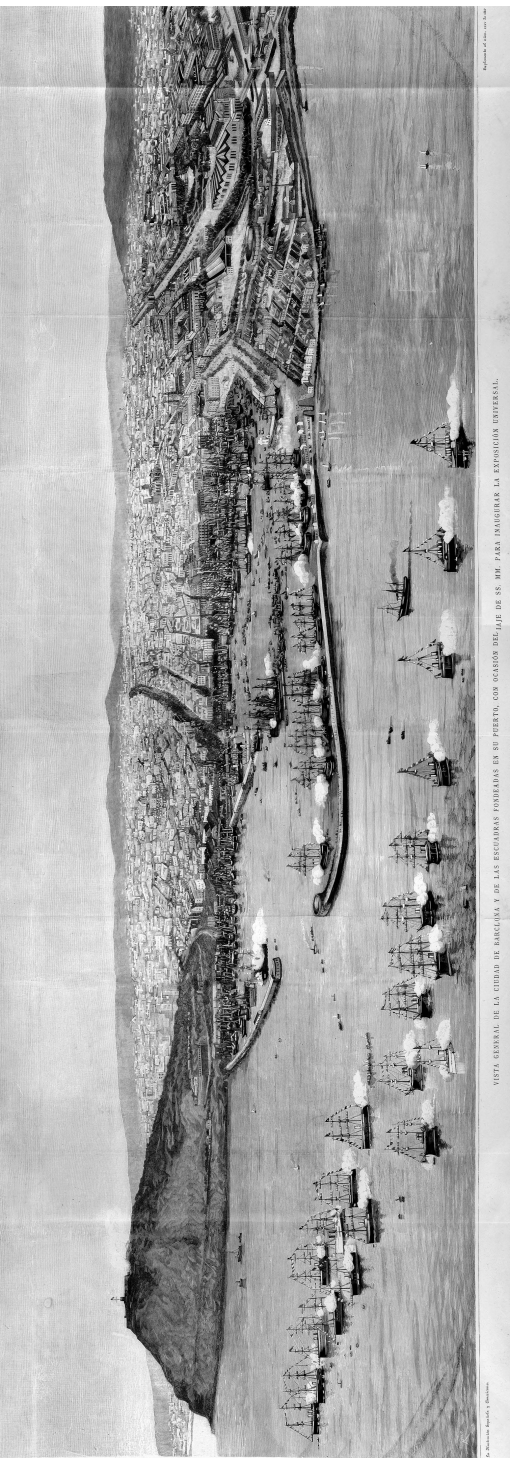


Figure 1.1 A general view of Barcelona and its harbour during the opening of the 1888 International Exhibition.

At the turn of the century, Barcelona's landscape of scientific institutions also changed dramatically. To name but a few of the most relevant ones: In 1882, the Museu Martorell, the first public museum (dedicated to natural history and related fields) opened in the Parc de la Ciutadella. In 1887, the Laboratori Microbiològic Municipal was founded, not least to fight or even better prevent the recurrent epidemics. The rise of Catalan nationalism at the very end of the nineteenth century led to a host of new institutions. In 1899, the Institució Catalana d'Història Natural was founded, in 1907 the Institut d'Estudis Catalans. The latter was an ambitious project for a new 'national' (Catalan) research centre embracing all fields of knowledge.¹¹

Yet the dynamic of the local scientific culture resulted – as in many other cities at the time – from a combination of this 'official' or 'elite' science with a vibrant 'public' or 'civic' science.¹² Obviously these two kinds of science are often intrinsically connected and hard to separate. In terms of civic science, Barcelona was home to a wide variety of activities and institutions: public lectures, exhibitions, university extension courses, collections of living wild animals, amateur astronomical observations, international conferences on popular but controversial fields such as spiritism, athenaeums and pedagogically highly innovative schools. Yet this thriving scientific culture, which often crossed social barriers, has been largely ignored by recent historiography. This is the *raison d'être* of this book: to write a new, genuine urban history of science of Barcelona.

Urban science

The thesis of this book is that the history of Barcelona between 1888 and 1929 cannot be properly understood without accounting for the role of science. So far there have been only some valuable but isolated case studies on the scientific culture of the city.¹³ Our goal is more than simply to add 'a bit of history of science', but to provide a new perspective on the cultural makeup of the city

barcelonés (Barcelona: FECSA, 1994); Mercè Tatjer, 'La indústria en Barcelona (1832–1992)'. *Scripta Nova*, 10 (2007), <http://www.ub.edu/geocrit/sn/sn-218-46.htm> (last accessed 26 January 2015); *150 anys d'història de la Maquinista Terrestre i Marítima, S.A. i de MACOSA: de la revolució industrial a la revolució tecnològica* (Barcelona: Dos Punts Documentació i Cultura, 2009); Pere Colomer, *Barcelona, una capital del fil: Fabra i Coats i el seu model de gestió, 1903–1936* (Barcelona: Ajuntament de Barcelona, 2014).

11 For a more complete list of scientific institutions, see: Alexandre Galí, *Història de les institucions i del moviment cultural a Catalunya, 1900–1936*, vol. 16: 'Acadèmies i Societats científiques' (Barcelona: Fundació Alexandre Galí, 1986); Antoni Roca-Rosell, 'Les possibilitats d'una producció científica catalana: entorn de l'acció de la Mancomunitat de Catalunya', *Recerques: història, economia, cultura*, 14 (1983): 81–95.

12 For the concept of civic science, see Lynn K. Nyhart, *Modern Nature: The Rise of the Biological Perspective in Germany* (Chicago/London: The University of Chicago Press, 2009).

13 There are some 'city guides' such as Xavier Duran and Mercè Piqueras, *Passejades per la Barcelona científica*. 2nd ed. (Barcelona: Ajuntament de Barcelona, 2003), which deal in a very general way with the history of science in Barcelona. For explicit historical scholarship, see: Matiana González-Silva and Néstor Herrán, 'Ideology, elitism and social commitment: alternative images of science in two *fin de siècle* Barcelona newspapers', *Centaureus*, 51 (2) (2009): 97–115. For the physical sciences, see the

and its attempts at modernization. In fact, we do not intend to write a 'separate' history of science in Barcelona around 1900. It would make no sense to neatly disjoin these spheres (art, architecture, science, medicine, politics and so on). They need to be understood as a seamless web with numerous intersections. This is obviously a tremendous historiographical challenge and runs the danger of stating truisms such as 'everything is connected'. Therefore we need to be more precise: what is lacking is not so much a history of Barcelona that also mentions the history of the municipal natural history museum; or the conflictive reception of Darwinism; or the visit of a foreign luminary such as Albert Einstein.¹⁴ What is lacking is an *urban* history of science of Barcelona. Such a history would have to focus on the specific conditions of knowledge production and circulation in these critical decades around 1900.

Starting in the mid/late nineteenth century, many new institutions, formats, media and technologies enter the urban stage. To name some obvious examples: public museums, urban parks, international exhibitions, electric lighting, private clinics, amusement parks, but also newspapers (only becoming a mass medium in the late nineteenth century) and illustrated journals, evening schools and new places of sociability such as the athenaeum, the cinema and eventually radio. Barcelona's *fin-de-siècle* medical doctors, patients and their clinics, public health programmes, anarchist and spiritist circles, amateurs, users, local experts and technological networks formed part of a complex cultural mesh. By means of a selection of actors, sites and scientific practices shaped in this specific urban context, we believe that the overall historical account of the city between 1888 and 1929 can be significantly enriched. Our basic assumption is that the urban space is both: a creator, incubator and facilitator of these practices of knowledge production and circulation but also an object substantially transformed by these practices. As urban scholars have argued, 'rather than a passive container of institutions and practices, urban space was a complex material and symbolic environment that was shaped by – and that in turn shaped – institutions in historically specific ways'.¹⁵

paper by Antoni Roca-Rosell and Xavier Roqué, 'Physical Science in Barcelona', *Physics in Perspective*, 15 (4) (2013): 470–98.

14 For the natural history museum (the Museu Martorell), see: Alicia Masriera (ed.), *El Museu Martorell, 125 anys de Ciències Naturals (1878–2003)*, vol. 3 (Barcelona: Monografies del Museu de Ciències Naturals, 2006) – and Chapter 3 in this volume; for the reception of Darwinism, see Agustí Camós, 'Darwin in Catalunya. From Catholic Intransigence to the Marketing of Darwin's Image', in *The Reception of Charles Darwin in Europe*, edited by Eve-Marie Engels and Thomas F. Glick (London/New York: Continuum, 2008), 400–12; for Einstein's visit to Barcelona, see: Thomas Glick, *Einstein in Spain. Relativity and the Recovery of Science* (Princeton: Princeton University Press, 1988), pp. 112–19; see also: Roca-Rosell, Roqué, 'Physical Science in Barcelona'.

15 Sven Dierig, Jens Lachmund and J. Andrew Mendelson, 'Introduction: Toward an Urban History of Science', *Osiris*, 18 (2003): 1–19, p. 5.