

Scientific “marvels” in the public sphere: Barcelona and its 1888 International Exhibition¹

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Abstract

This paper examines the scientific culture of the 1888 Barcelona International Exhibition from different perspectives. Firstly, it emphasises how controversy rather than consensus imbued the everyday life of the city during that exceptional event, from April to December 1888. Secondly, the article discusses how science—including science, technology and medicine—became a tool in political debates about the pros and contras of the exhibition. Thirdly, through the careful analysis of particular case studies (public fasting, captive ballooning, electric and optical wonders, and live animal displays), the paper contributes to gaining a deeper understanding of the scientific culture in international exhibitions.

Keywords: international exhibitions, science popularization, urban history of science, Barcelona, scientific controversies

1. Introduction

In 1986, the Spanish writer Eduardo Mendoza, in his novel *City of Marvels* [*La ciudad de los prodigios*], depicted the city of Barcelona in the nineteenth century in the following terms:

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“... 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. But all this progress had demanded a colossal effort. Barcelona [...] laid drained, exhausted. Foul emanations seeped from cracks, rancid exhalations rendered unbreathable the air in the streets and homes. Weariness and pessimism held sway among the population [...] but there were plenty of opportunities in Barcelona for people with imagination and enterprise”.²

Of course, Eduardo Mendoza is not an historian of science, but in his eagerness to emphasise scientific progress in the city, he placed Barcelona as a centre of innovation throughout the nineteenth century. Nevertheless, Barcelona can be perceived as a centre or as a periphery; as a dynamic place in terms of nineteenth-century Spanish patterns of scientific progress and industrialisation, or as a second-class European industrial city. Today this remains a historiographical challenge.³

Some years ago, the British historian of science, Jack Morrell, tried to convince us that the history of science in nineteenth-century Bradford, in northern England, mattered as much as the achievements of the great luminaries in Manchester or even in London. He admitted that many historians of science probably “...think that it is pointless to study science in places [such as Bradford, and perhaps Barcelona], which have not been associated with eminent savants and their discoveries. Others may regard [this sort of] provincial science as a hyperborean cave from which the talented were fortunately released by a beckoning metropolis”. But Morrell also reminds us that the supposed “provincial” science help us as historians “to recognize the complexities which the yearning for metropolitanism obscures”.⁴

² Eduardo Mendoza, *City of Marvels* (London: Collins Harvill. 1990), p. 12 (1st Spanish edition, Seix Barral, Barcelona 1986). [my emphasis]

³ For the centre-periphery debate in history of science see: Kostas Gavroglu et. al., “Science and Technology in the European Periphery. Some historiographical reflections”, *History of Science*, 2008, 46: 1-23.

⁴ Jack B. Morrell, “Wissenschaft in Worstedopolis: Public Science in Bradford, 1800–1850”, *The British Journal for the History of Science*, 1985, 18 (1): 1 -23, on pp. 1-3.

No doubt, locality matters. It is already known that in recent years, a great deal of historical work has been carried out to analyse the role of specific sites and places in the shaping of scientific knowledge. Since 1998, when Jon Agar and Crosbie Smith edited *Making Space for Science* in order to examine the spatial foundations of science from several perspectives,⁵ a huge range of scholars have tackled the problem of space in the history of science. In 2003, in his book *Putting Science in Its Place*, geographer David Livingstone provided an impressive list of places in which science could be made in the past: houses of experiment (labs), cabinets (and museums), in the field (ships and tents), gardens of display (botanical and zoological), spaces of diagnosis (hospitals), churches, courts, pubs and coffee houses, libraries, lecture theatres, salons, observatories, etc. Livingstone questioned the universal status of science in the following terms: “Scientific knowledge is made in a lot of different places. Does it matter where? Can the location of scientific endeavour make any difference to the conduct of science? And even more important, can it affect to the content of science?”⁶ In his view, to which I subscribe, the answer to these questions is yes. In fact, it is not hard to admit that every scientific activity involves continuous interactions with specific sites.⁷ Even Fyfe and Lightman’s recent work on science in the marketplace has emphasized the importance of specific places for the popularisation of science and the establishment of particular relations between experts and their audiences.⁸ In the case of science museums, Sophie Forgan’s work has been particularly relevant.⁹

As Livingstone and others have suggested in recent years, the city is a useful container of places of scientific practices. In 2003, Sven Dierig, Jens Lachmund, and J. Andrew Mendelshon’s *Science and the city* (special *Osiris* volume), laid the foundations for further investigation on the urban history of science, on the interactions between the city itself and the loci and drama for the circulation of

⁵ Jon Agar; Crosbie Smith, (1998) *Making Space for Science: Territorial Themes in the Shaping of Knowledge*. (London: Macmillan, 1998)

⁶ David N. Livingstone, *Putting Science in Its Place: Geographies of Scientific Knowledge*. (Chicago: University of Chicago Press, 2003), p. 1; Simon Naylor, “Introduction: historical geographies of science – places, contexts, cartographies”, *The British Journal for the History of Science*, 2005, 38 (1): 1-12.

⁷ Sven Dierig, Jens Lachmund, J. Andrew Mendelshon (eds.) *Science and the city, Osiris*, 2003, 18, p. 10.

⁸ Aileen Fyfe, Bernard Lightman, *Science in the Marketplace: Nineteenth-Century Sites and Experiences*. (Chicago: Chicago University Press, 2007).

⁹ Sophie Forgan, Graeme Gooday, “Constructing South Kensington: the buildings and politics of T. H. Huxley’s working environments”, *The British Journal for the History of Science*, 1996, 29: 435-68; Sophie Forgan, “Building the Museum. Knowledge, Conflict and the Power of Place”, *Isis*, 2005, 96(4): 572-585.

knowledge.¹⁰ They distinguished four main interconnections, co-productions between science and the city:

1. The intersection between scientists and politicians gave rise to what was known as *urban expertise*.
2. Science played a crucial role in the *cultural representation of the city*: new literary genres, daily papers, photography, films, marketing¹¹.
3. Scientific activities were deeply embedded in the social and material infrastructures of the city; that is to say specific *places of knowledge* can only be properly understood through their role within the urban context.
4. There was a significant level of interaction between *science and urban everyday life*.¹² So historians had to try to describe its dramas and loci.¹³

It is precisely at the intersection between urban expertise, cultural representations, places of knowledge and everyday practices that a new history of urban history of science can emerge. Thus, in the framework of a more ambitious research project aiming to write the urban history of science of the city of Barcelona in the period 1888–1929, this paper attempts to develop a specific case study, which focuses on several manifestations of that urban scientific culture during the 1888 International Exhibition, which took place from May to December that year. In fact, international exhibitions are ideal examples for the analysis of specific practices in concrete urban sites.

Although the literature on the role of science in international exhibitions has increased enormously in recent decades,¹⁴ the subject is still elusive and hard to

¹⁰ Sven Dierig, Jens Lachmund, J. Andrew Mendelshon (eds.) *Science and the city*, ...

¹¹ Steven Ward, *Selling Places: The Marketing and Promotion of Towns and Cities, 1850-2000*. (London: Spon, 1998)

¹² On everyday urban practices, see: M. Gee, T. Kirk, J. Steward (eds.) *The City in Central Europe: Culture and Society from 1800 to the Present*. (Aldershot: Ashgate, 1999); Peter Fritzsche, *Reading Berlin 1900* (Cambridge MA: Harvard University Press, 1996); Michel de Certeau, *The Practice of Everyday life*. (Minneapolis: University of Minnesota Press, 1998); Setha M. Low, *Theorizing the City: The Urban Anthropology Reader* (New Brunswick, N. J.: Rutgers University Press, 1995). See also: Antonio Lafuente; Thiago Saraiva, “The Urban Scale of Science and the Enlargement of Madrid (1851-1936)”, *Social Studies of Science*, 2004, 34(4): 531-569.

¹³ My emphasis.

¹⁴ Robert W. Rydell, *All the world's a fair. Visions of Empire at American International Expositions, 1876-1916* (Chicago: Chicago University Press, 1984); Robert W. Rydell, *World of Fairs. The Century-of-Progress Expositions* (Chicago: Chicago University Press, 1993); Paul Greenhalgh, *Ephemeral vistas. The Expositions Universelles, Great Expositions and World's Fairs, 1851-1939* (Manchester: Manchester University Press, 1988); Jim A. Bennett, *Science at the Great Exhibition* (Cambridge University Press: Cambridge, 1983); Brigitte Schroeder-Gudehus (ed.) *Industrial Society & its Museums* (Langhorne: Harwood Academic Publishers, 1993); Schroeder-Gudehus, B., Rasmussen, A. *Les fastes du progrès. Le guide des expositions universelles 1851-1992* (Paris: Flammarion, 1992); Robert Brain, *Going to the Fair. Readings in the Culture of Nineteenth-Century Exhibitions* (Cambridge: Whipple Museum of the History of Science, 1993). Brain placed science in the heart of social stability; spaces of

tackle: too many actors, objects, spaces, public addresses, urban constraints, political projects, taxonomical debates, among many other factors suffuse the nightmare of the historians when attempting to tell something new and interesting about that kind of public event. The problem is even more serious when we try to examine second-class, peripheral international exhibitions, which apparently look like “copies” of the big scenarios in London, Paris, Vienna, or Chicago, and seem to reproduce standard patterns of display strategies and showcasing.

To overcome these difficulties, this article will provide new useful examples to further explore the abovementioned four levels of interaction between science and the city. In the “jungle” of actors, objects and events that constitute the core identity of the exhibitions themselves there are lots of *microhistories*, which deserve further attention. In the same way historians defend the epistemological value of a particular case study compared to big historical narratives, particular episodes inside the exhibition, and in the city as a whole might shed some light on the complexities of this new urban history of science, which is gaining new space in our academic landscape.

This paper does not intend to create a full reconstruction of the 1888 Barcelona World Fair. On the contrary, it only examines the urban history of science in the city by analysing an impressionistic selection of particular episodes from April to December 1888. The point here is, that during the months of the International Exhibition, the city showed its most dynamic side; full of activity and public displays and addresses, even beyond the restricted area of the official event. Using several “narrow”, “provincial” examples—borrowing Jack Morrell’s spirit when addressing the Bradford case—I will try to show that the science surrounding international exhibitions was more tinged with controversies than consensus. In addition, in peripheral contexts such as Barcelona in 1888, regardless of Mendoza’s positive statements, scientific backwardness was often placed at the centre of public debates on the nation’s progress. Local resistances, in permanent tension with foreign visitors and luminaries, also played a significant role in the shaping of the local scientific culture.

To further strengthen all of these arguments, I shall begin by introducing the reader to the main sound data of that international fair. Then, I shall move onto the analysis of the role of science in local political disputes. Finally, public fasting

representation, order of things, juries, prizes, classification, machines, international standards, nationalism/internationalism, showcases.

experiments, balloons, electric wonders and live animal displays, will help us to trace unexpected nuances of that specific urban history of science.

2. An introduction to the exhibition

Although there has been some scholarly work on the Barcelona 1888 Exhibition, a lot remains to be done in terms of analysing the role of science in that public event.¹⁵ Major historical research refers to urban growth, from the fall of the medieval walls in the mid-nineteenth century to the famous plan of the “Eixample” and the construction of the modern city from the 1860s onwards.¹⁶ Other efforts were devoted to historical comparison of the 1888 and 1929 exhibitions,¹⁷ but also to public commemorations, such as the centenary in 1988, which, while informative, lacked a more profound historical analysis.¹⁸

From all the above mentioned literature, a standard account informs that, after years of hesitation and even frequent public controversies on the pros and cons of organising it, the mayor of the city, Francesc Rius i Taulet (1833–1889), led the project with the support of local and national elites. In doing so, the Barcelona City Council radically transformed the old Ciutadella into a new park for science, industry,

¹⁵ Ramon Grau; Marina López, *Exposició Universal de Barcelona. Llibre del centenari* (Barcelona: L'Avenç, 1988); Manuel Guardia, Albert García Espuche, “1888 y 1929. Dos exposiciones, una sola ambición”, en Alejandro Sánchez (ed.) *Barcelona, 1888-1929. Modernidad, ambición y conflictos de una ciudad soñada* (Madrid: Alianza Editorial, 1994), pp. 25-43; Edmond Vallés, *Història gràfica de la Catalunya contemporània. De l'Exposició Universal a Solidaritat Catalana 1888-1907*, Vol I (Barcelona: Edicions 62, 1974); Joan García Massó, *Memòries d'un liberal catalanista*. (Barcelona: Edicions 62, 1987); Josep Pich (ed.) *Memòries de Conrad Roure. Recuerdos de mi larga vida*. Vol. IX. *La Restauració dels Borbons (II). L'Exposició Universal de Barcelona de 1888* (Vic: Eumo, 1999), VIII, pp. 67-141.

¹⁶ Pere Hereu et al., *Arquitectura i ciutat a l'Exposició Universal de Barcelona de 1888* (Barcelona: UPC, 1988); Ignasi de Solà-Morales, *L'Exposició Internacional de Barcelona, 1914-1929: arquitectura i ciutat* (Barcelona: Fira de Barcelona, 1985)

¹⁷ *Barcelona y sus exposiciones 1888, 1929. Suplemento Extraordinario de Las Noticias* (19-05-1929).

¹⁸ Among the most relevant primary sources of the 1888 Barcelona Exhibition, it is worth mentioning: Juan Artigas Feiner, *Guía itineraria y descriptiva de Barcelona, de sus alrededores y de la Exposición Universal ilustrada con cuarenta vistas y tres planos (el de Barcelona, el de sus alrededores y el de la Exposición)*. (Barcelona: Librería y Tipografía Católica, 1888); Ateneu Barcelonès. *Conferencias públicas relativas a la Exposición Universal de Barcelona* (Barcelona: Busquets y Vidal, 1889); *Exposición Universal de Barcelona 1888. Catálogo General Oficial* (Barcelona: Sucesores de N. Ramírez y C^a, 1888); Josep Franquesa Gomis, *Recort de la Exposició Universal de Barcelona de 1888. Poesia de Josep Franquesa i Gomis. Premiada ab una medalla oferta per l'Exm. Ajuntament de Barcelona en los Jochs Florals del any 1890* (Barcelona: La Renaixensa, 1890); Carlos Frontaura, *Barcelona en 1888 y París en 1889 (narraciones humorísticas)* (Valencia: Pascual Aguilar, 1889); Antonio García Llansó, *La Primera Exposición Universal Española, por Miembro del Jurado Calificador, designado por el Imperio del Japón y de la Comisión representativa de los expositores de las Islas Baleares* (Barcelona: Luis Tasso, 1888); C. Gumà, *Guía Cómica de l'Exposició Universal de Barcelona*. (Barcelona: Llibreria Espanyola de López, 1888); Saturnino Lacal, *El libro de honor. Apuntes para la Historia de la Exposición Universal de Barcelona. Premios concedidos y dictámenes que los productos expuestos merecieron del jurado internacional. Por el inspector especial del mismo Don Saturnino Lacal con la colaboración de distinguidos jurados* (Barcelona: Tipografía de Fidel Giró, 1889); Juan Valero de Tornos, *Barcelona tal cual es, por un madrileño (de ninguna academia)* (Barcelona: Sucesores de N. Ramírez, 1888); Juan Valero de Tornos, *Conato de Historia y descripción de la Exposición Universal de Barcelona* (Barcelona: Pedro Ortega, 1888); Juan Valero de Tornos, *Guide illustré de l'Exposition Universelle de Barcelona en 1888. De la ville, de ses curiosités et de ses environs*. (Barcelona: G. de Grau et Cie, 1888).

and art.¹⁹ The fortress of the Ciutadella was built by Philip V in the early eighteenth century, at the end of the War of Succession, to punish and control Barcelona inhabitants, who had resisted against the Bourbon dynasty in favour of the Habsburgs and defended their political freedom. More than a century and a half later, Barcelona was a province of the restored monarchy and suffered from tensions with the central political power in the Court in Madrid, with the economic, industrial leadership of the kingdom mainly situated in Catalonia, in particular, in its powerful textile industry. In addition, Catalan culture, which had suffered from a long period of marginalisation, seemed to be reborn with the “Renaixença”, a dynamic cultural movement claiming the recovery of Catalan language and literature. Extended to what is known as “Catalanism”, this movement supported the progressive development of a political framework that secured economic, political and cultural autonomy from Spain. As will be discussed later in the paper, the whole project of the 1888 International Exhibition should therefore be analysed in this particular context of competing nationalism and political ideologies.

In the new Ciutadella (Figure 1), pavilions of science (*Ciencias*) (5), arts (*Bellas Artes*) (4), industry (22), agriculture (7), hall of machines (*Galería de máquinas*) (29) made their own space together with remarkable buildings such as the “*Hivernáculo*” (13), the “*Umbráculo*” (15), the Eiffel-like iron bridge (39) – linking the exhibition ground to the harbour, the Triumphal Arch (2), the Martorell Museum (14), and the restaurant *El Castell dels tres Dragons* (11). The whole endeavour contributed to a deep urban transformation of the city (Figure 2), which transcended the strict areas of the exhibition. Examples include the building of the Columbus Monument (1), in honour of the discoverer of America, and the construction of the ephemeral International Hotel (*Hotel Internacional*) (3), which became the meeting point of national and international elite visitors. In the city, those impressive constructions, near the exhibition ground, were also complemented by other spaces such as panoramas (9, 10, 11), the equestrian circus (8), the maritime exhibitions, which, together with other buildings and showcases became the attraction for visitors.

¹⁹ Antonio García Llansó, “La Exposición Universal de Barcelona”, *La Ilustración*, 385, 1888, p. 182.

Of a total surface area of 465,000 m², roughly 100,000 m² were devoted to buildings to display products from Barcelona, Catalonia and Spain as a whole, but also from many other nations.²⁰

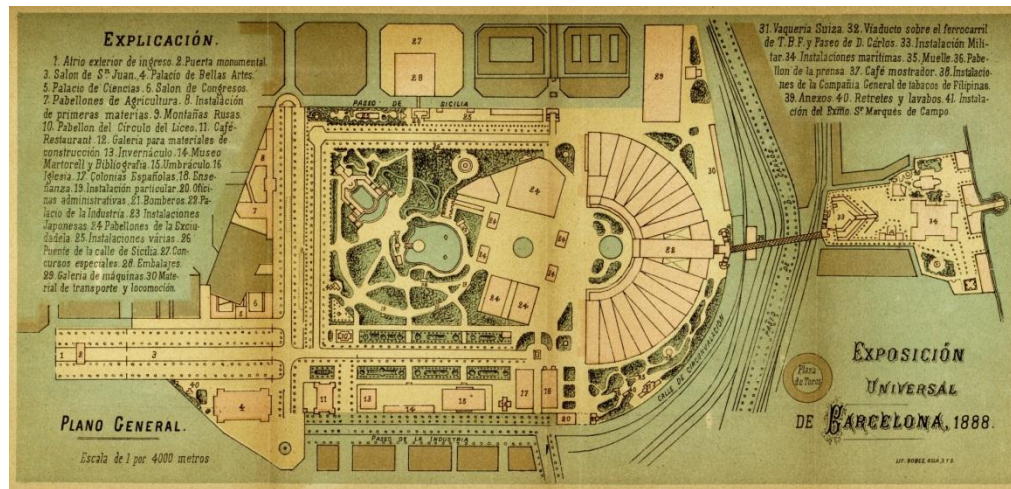


Figure 1 - Sites of the 1888 Exhibition (in the Ciutadella Park). Triumphal Arch (2); *Palacio de Bellas Artes* (4); *Palacio de Ciencias* (5); *Salón de Congresos* (6); *Palacio de Agricultura* (7); Café-Restaurant (11); *Hivernacle* (13); Martorell Museum (14); Umbracle (15); *Palacio de la Industria* (22); *Galería de Máquinas* (29), Juan Valero de Tornos, *Guide illustré de l'Exposition Universelle de Barcelona en 1888. De la ville, de ses curiosités et de ses environs*. Text de Direction artistique de Juste Simon. G. de Grau et Cie. Barcelona, 1888.



Figure 2 - Sites of the 1888 Exhibition (in the city, outside the Ciutadella park) Columbus Monument (1); Gran Hotel Internacional (3); Equestrian circus (8); Panorama Waterloo (9); Panorama Plewna (10); Panorama Montserrat (11); Roller coasters (12); Maritime Exhibition (13), Juan Valero de Tornos, *Guide illustré de l'Exposition Universelle de Barcelona en 1888. De la ville, de ses curiosités et de ses environs*. Text de Direction artistique de Juste Simon. G. de Grau et Cie. Barcelona, 1888.

²⁰ *Exposición Universal de Barcelona 1888. Catálogo General Oficial*. (Barcelona: Sucesores de N. Ramírez y C^a. 1888). In practice, the surface was distributed as follows: 4,200 m² Barcelona; 3,200 m² Spain; 500 m² Belgium; 2,500 m² France; 1,000 m² Austria; 600 m² Hungary; 1,600 m² Germany; 500 m² Italy; 1,600 m² England; 1,000 m² Russia; 1,000 m² Portugal; 1,000 m² USA; 1,000 m² Spanish America *América española*. In terms of foreign contributions, French products were hegemonic, close to 2,000 exhibitors; followed by Germany (200), England (200), Italy (128), United States (86), and at a lower level: Austria–Hungary, Belgium, Bolivia, Chile, China, Colombia, Denmark, Ecuador, Holland, Honduras, Japan, Mexico, Paraguay, Portugal, Argentina, Russia, Sweden, Norway, Switzerland, Turkey, Uruguay.

Although the public had access to the exhibition from 8 April onwards, the official opening ceremony took place on 20 May 1888 at the *Palacio de Bellas Artes*, in the presence of the Spanish royal family, the main political authorities of the Spanish Restoration Monarchy, including the Prime Minister, Mateo Sagasta (1825-1903), and his government. They were accompanied by foreign royal families and ambassadors, other civil, military and ecclesiastic authorities, noblemen, the City Council, members of the provincial Council of Barcelona and other representatives from scientific, literary, commercial and industrial circles. The crowd, around 30,000 people, gathered enthusiastically at the Ciutadella.²¹ Although figures of visitors were uneven, there is a general agreement that more than one million visits had already taken place by December that year, when the whole event was close to its end.

The exhibition was also an excellent occasion to hold international meetings. It is worth mentioning for instance, the *Congreso Nacional Pedagógico* (National Pedagogic Conference), which was held in the *Paraninfo* (Great Hall) of the University of Barcelona. The conference hall of the *Palacio de Ciencias* hosted other conferences such as the *Congreso de Jurisprudencia* (Jurisprudence Conference); *Congreso médico-farmacéutico* (Medical–Pharmaceutical Conference); *Congreso nacional de Arquitectos* (National Architecture Conference); *Congreso nacional económico* (National Economics Conference); and the *Congreso internacional de ingeniería* (International Engineering Conference).²² Curiously, the popular *Congreso espiritista* (Spiritualist Conference) took place outdoors during the Exhibition, with a significant female audience and international representatives.²³ All those conferences, in spite of their unbalanced scientific quality—as contemporary actors often denounced—brought a hint of cosmopolitanism to the exhibition, which reinforced the whole project.

All these data are perfectly in line with standard accounts provided by official guides and discourses given by elites who were closely involved in the organisation of the event. However, behind that rhetoric of success and progress, laid plural views and voices on the pros and cons of the exhibition, and more importantly, as we will see in the next sections, on contemporary actors' diverse assessments of the “quality” of the science exhibited and the role of science in the cultural endeavour as a whole.

²¹ García Llansó, “La Exposición Universal de Barcelona”, *La Ilustración*, 395, 1888, 339.

²² Lacal, *El libro de honor. Apuntes para la Historia de la Exposición Universal de Barcelona*, Cap. VIII

²³ Pich (ed.) *Memòries de Conrad Roure*, IV, p. 132.

3. Local science for local politics

Historians have focused recently on the role that science played in the creation of new cultures of control in the so-called “second industrial revolution”, in which urban growth, museums, and obviously international exhibitions would have acted as powerful cultural weapons for the interests of urban elites.²⁴ Miriam Levin has stressed recently how objects, networks, institutions and social elites that led science projects shaped city life with urban plans for expansion, and with a “scientific” reformulation of the past in museums to legitimise linear progress, but also to imagining the future in world fairs.²⁵ For the latter she provided the example of Paris in 1889 with the famous *Galérie des machines* that accompanied the Eiffel Tower, or the *Palais de l’électricité*.²⁶ Likewise, Sophie Forgan examines the way in which urban elites shaped London’s life and culture through science in museums and exhibitions from the 1870s to the 1st World War. In her view: “London’s culture of change in this period was characterized by enthusiasm for technological modernity (accompanied by a sense of progressive evolutionary development), a devotion to free enterprise and respect for local autonomy, and a keen attachment to historical continuity”.²⁷

Of course, the elites’ interests, perceptions and projects were also fundamental in Barcelona, but, as in many other local contexts, their public discourses and ambitions took a particular shape. Far from the triumphal narrative of progress appearing in official guides, the exhibition was from the beginning captured in a bitter debate on the enterprise as a whole. Conservative discourses were in general favourable towards the exhibition, but liberal middle classes expressed more reluctance in public, and working class organisations were often bitterly critical.

Take for instance the monarchic conservative journalist Juan Valero de Tornos (1842–1905). Valero considered the event a success.²⁸ For him, great heroes could be found without difficulty in the official catalogue among local political and economic elites, whereas the critics were perceived as provincial and narrow-minded. In fact, the exhibition’s board of directors was composed of local politicians and

²⁴ Miriam Levin, Sophie Forgan, Martina Hessler, Robert Kargon, Morris Low, *Urban Modernity. Cultural Innovation in the 2nd industrial revolution* (Cambridge MA.: The MIT Press, 2010).

²⁵ Miriam Levin, “Dynamic Triad: City, Exposition and Museum in industrial Society”, in *Urban Modernity*, 1-12, p. 11-12.

²⁶ Miriam Levin, “Bringing the future to Earth in Paris, 1851-1914”, in *Urban Modernity*, pp. 13-73, p. 33.

²⁷ Sophie Forgan, “From Modern Babylone to White City: Science, Technology and Urban Change in London, 1870-1914”, in *Urban Modernity*, 1870-1914.

²⁸ Valero de Tornos *Cuarenta Cartas*, p. 9.

entrepreneurs,²⁹ and an official commission with scientists, architects and urban planners.³⁰ In a similar vein, the writer and journalist, Carlos Frontaura (1834-1910) was radically in favour of the exhibition, close to Joan Mañé i Flaqué (1823-1901) and the conservative position of his newspaper, the *Diario de Barcelona*. On a fictional trip to the exhibition, Frontaura described a visitor who contacted the leading actors of the organisation of that event, and enjoyed the company of Colonel Francisco López Fabra, the president of the jury, during his visit to several pavilions. The visit to the *Palacio de la Industria* and its textile machinery, together with the Eiffel-style iron bridge vividly impressed that visitor – Frontaura's alter ego.³¹

However, in spite of all this triumphalist rhetoric, elite's public addresses were by no means homogeneous. Hegemonic discourses on the supposed benefits of heavy public investments in the Exhibition were counterbalanced on different fronts.³² As stated before, the contrast between Spanish, politically centred interests in Madrid and the aims of the Catalan industrial and cultural elites soon became a source of deep controversy. Dissenting voices, especially among Catalanist circles, were led by the lawyer and writer Valentí Almirall (1841-1904), one of the founding fathers of modern political Catalanism.³³ Almirall published several critical articles in the journal *La Veu del Centre Català*, in which he expressed the reasons for his rejection of the Exhibition.³⁴ He blamed the organisers for the serious delay in the public works and building of pavilions, for a too-hasty opening ceremony, for the low number of visitors and for the political control of the event by the Court in Madrid.³⁵

²⁹ Francesc Rius i Taulet, honorary president; Josep Pujol i Fernández, executive president; Francisco López Fabra, vicepresident; Eugenio Serrano Casanova, general secretary; Carlos Pirozzini, Secretary; Manuel Girona, Royal Comissionate; Manuel Porcar Tió, vocal; Josep M^a Nadal, vocal; Félix Macià Bonaplata, vocal; Ramón Macaya Gibert, vocal; Andrés de Sard Rosselló, vocal; Ramón de Manjarrés, vocal; Francisco Sitjà, vocal. Pich (ed.) *Memòries de Conrad Roure*, IV, p. 67.

³⁰ Asuntos generales: Duran y Bas; Obras: Elías Rogent; Contabilidad: F. Gumá; Técnica: Bernardino Martorell; Instalaciones: Ramón de Manjarrés; Propaganda: Frederic Nicolau; Servicios interiores: José Vilaseca; Servicios exteriores: Evaristo Arnús; Festejos: Frederic Marcel; Premios: Francisco López Fabra; Expositores: Camilo Fabra. *Exposición Universal de Barcelona 1888. Catálogo General Oficial*.

³¹ Frontaura, *Barcelona en 1888 y París en 1889*, p. 50. Several journalists working at the *Diario de Barcelona* published articles on the 1888 Exhibition: Mañé i Flaqué, Luciano Ribera, Francisco Miguel y Badía, Vidal y Valenciano.

³² For the plurality of voices surrounding the Great Exhibition of 1851 in London, see: Louise Purbrick (ed.) *The Great Exhibition of 1851. New interdisciplinary Essays* (Manchester: Manchester University Press, 2001).

³³ García Llansó, "La Exposición Universal de Barcelona", *La Ilustración*, 389, 1888, 243-244.

³⁴ Valentí Almirall, "En l'actualitat", *La Veu del Centre Català*, 33, 26-5-1888, 195-196; 34, 16-6-1888, 202-203.

³⁵ *La Veu del Centre Català*, 33, 26-05-1888, 195-196. He denounced the lack of visitors even after the presence of the monarchy in the city. "Fa dos mesos que va obrir-se, y ab tot y haver estat á Barcelona la Regenta del Regne ab tota sa Cort, y un gran número de prínceps y personatjes, no ha fet en els primers 50 dies mes de seixanta mil entrades. Aquest resultat es tant pobre y mes aquí, que deixa molt enrera los càlculs que nosaltres havíem fet y que varen ser considerats com pessimistes"; "Y tot això ho fa Barcelona volentse posar no ja al nivell, sino per damunt de París, Londres, Viena y Filadelfia. Totes aquestes grans ciutats van fer llurs exposicions ab la ajuda

Others who reinforced Almirall’s position believed that the support Rius i Taulet was receiving from the Spanish government was part of a plan to beat Almirall and his Catalanist–federal project. In a public lecture at the *Ateneu Barcelonès*, a prestigious cultural institution that monopolised political debates in the city from the late nineteenth century onwards, the writer and journalist Josep Yxart (1852-1895) listed his main objections towards the project: the local and national economic crisis that the city was suffering at the time; the industrial weakness of the nation; the proximity in time to the 1889 Paris Exhibition; but also the lack of experience in these ambitious events; the lack of a reliable urban transport and communication network, together with the decadence of the old town and its difficult renewal.³⁶ In a similar way, others such as the electrical engineer Antonino Suárez Saavedra (1838-1900) criticized the enormous public investment of money instead of putting it to more “useful” projects such as urban sewage, water pipes, street pavements, and even public monuments and artistic statues.³⁷

But uneasiness also came from the lower classes. As occurred elsewhere, local urban elites in Barcelona encouraged the working classes to visit the exhibition. The Barcelona board distributed cheap tickets in working-class suburbs for potential visitors on Sundays. In the same way, railways and tramways offered cheaper prices for workers on those days,³⁸ and workers from other Spanish cities were granted

efectiva del Estat, que va concedirlos grans subvencions a tota perdua. Barcelona no reb més que un avens de diners del Govern, que després deurà tornarli, quan la ruïna sigui completa. Al pensar en això, no podem deixar d'exclamar: ¡Es que'ns hem begut l'enteniment? Lo que hem indicat es prou trist, pero no ho es menos la síntesi que vam treure de la nostra visita a las obras de la Exposició. Tenim la seguretat que liNo s'obrirà pas lo dia senyalat, o sigui lo 8 d'abril!! Tanta es la nostra seguretat que acceptem una posta ab qui vulgui ferla”, *La Veu del Centre Català*, 8, 03-12-1887, p. 44; “¿Se volen mes datos? Aquí van: La Exposició de Filadelfia [1876], com entrada máxima, va tenir en un sol día 250.000 visitants. La esmentada de Paris [1867], lo diumenge día 27 de octubre, va tenirne 173.923. La de Viena [1870], lo día 2 de novembre va tenirne 135.675. La pobra de Barcelona, l'endemà mateix de la inauguració per la Regenta, quan al port hi havia 20.000 marins de guerra y a la ciutat s'hi havia reunit la gent de la provincia, va arribar a 7000 entrades i!” *La Veu del Centre Català*, 34, 16-06-1888, p. 202.

³⁶ Joseph Yxart, “La exposición por fuera”, in *Ateneu Barcelonés, Conferencias públicas relativas a la Exposición Universal de Barcelona*, 117-142, p. 123.

³⁷ “Me preguntaba yo a mi mismo, no imbuido en la oposición sistemática de tal o cual periódico, sino en virtud de mi propio criterio, si los millones que se iban a gastar en edificios, que luego habían de venir a tierra, no tendrían en parte mejor empleo en realizar las grandes obras de las cloacas de desinfección y en dotar de abundantes aguas a esta capital, reformas ambas brillantemente desarrolladas y sostenidas desde este mismo sitio por ilustrados miembros del Ateneo; me preguntaba si parte de esos millones no estarían mejor empleados en las reformas internas de la población, en el adoquinado de las calles del ensanche, en monumentos y obras de arte distribuidos convenientemente...”, Antonino Suárez Saavedra, “La electricidad en la Exposición Universal de Barcelona”, in *Ateneu Barcelonés, Conferencias públicas relativas a la Exposición Universal de Barcelona*, 373-403, p. 373.

³⁸ (15-XI-1888): “Deseando la Comisión ejecutiva que puedan visitar la Exposición los obreros de esta capital y sus subúrbios, he dispuesto que se distribuyan 60.000 entradas valederas para los tres domingos próximos...Se remitirán un número proporcional de entradas a cada uno de los expositores de todas las demarcaciones que tengan sus industrias en esta capital o sus alrededores a proporción de la importancia de las instalaciones que tienen hechas para que puedan distribuirlas entre sus obreros o trabajadores...” Arxiu Administratiu de Barcelona, Box 42585. “...con las empresas de ferro-carriles y tranvías la concesión de billetes baratos de ida y

admission to the Barcelona fair by their own private firms and by the public administration.³⁹ Among the lower classes, science was praised and admired—sometimes too uncritically—but its appropriation by the upper classes was bitterly rejected. All those actions of “polite despotism” did not stop criticism by workers’ organisations. This was for instance the case of *El Productor*, a socialist newspaper that bordered on anarchist ideas, which, in anonymous articles, denounced issues such as the false rhetoric of peace, the commodification of knowledge, and the corruption of the juries.⁴⁰ From that political perspective, the exhibition was a “bourgeois” display of luxury goods and waste, of no interest to workers. Horse races, bull fights, concerts, fireworks, military parades: “in a word, wealth, wealth, a lot of wealth...in front of all this waste, we have to show our nakedness; in front of all this amusement, our protest meetings”.⁴¹

But science played a central role in the debate. Critics such as Almirall presented the whole event as “scientifically weak” and backward. Almirall perceived the *Palacio de Ciencias* (Figure 3) as miles away from the scientific “temples” of the great exhibitions in London, Paris, Vienna, Chicago and Philadelphia. His words of disappointment are worth mentioning:

“...we have to admit that this exhibition does not hold any of the character of those fairs called universal fairs up until now. Apart from the industry pavilions, all the rest does not even nearly reach those bazaar exhibitions that take place every year by the dozen. The Science Pavilion in itself is capable of disappointing the pretensions of the most exaggerated. Four pots of pills and drugs, a desert of dynamite and some vulgar tasks of schools, constitute Spanish science in its entirety. Even the halls of the industry pavilion have been artificially filled”.⁴²

vuelta, valederos durante la tarde del sábado hasta la mañana del lunes”, Carlos Pirizzini’s correspondence. Pirozzoni to Louis Rouvière (03-08-88). Ms 5031-I. Biblioteca de Catalunya. Barcelona

³⁹ This was for instance the case of the Diputación de Madrid, which funded the trip of a group of skilled industrial workers “moldedores de hierro, obreros mecánicos, caldereros, maquinistas” to visit at the Exhibition any display related to their own metiers. Arxiu Administratiu de Barcelona, Box 42585.

⁴⁰ *El Productor, Periódico Socialista*, 20-04-1888, 04-05-1888, 14-12-1888.

⁴¹ “...en una palabra, riqueza, riqueza, mucha riqueza...En frente de este despilfarro, debemos mostrar nuestra desnudez. En frente de estas diversiones, nuestras reuniones de protesta”, *El Productor, Periódico Socialista*, 04-05-1888

⁴² “...hem de confessar que la tal Exposició no té cap caràcter de les que fins avuy se han dit universals. Fora dels pavellons de la indústria, tot lo demás no arriba de tros a qualsevol de aqueixes exposicions bazars que’s celebren cada any per dotzenas. Lo Palau de ciencias per si sol es capás de tirar per terra las pretensions dels mes exagerats. i Quatre pots de píldoras y específichs, unes postres de dinamita y algunas labors vulgars de escoles, constituyesen tota la ciencia espanyola. Les mateixas naus del Palau de la Industria se han omplert artificiosament.” *La Veu del Centre Català*, 34, 16-06-1888, p. 20216.

Conrad Roure (1841-1928), a republican lawyer and follower of Almirall, regarded the exhibition as low scientific level, lacking of foreign luminaries and significant scientific novelties.⁴³



Figure 3 - The *Palacio de Ciencias* (Science pavilion), *La Ilustración. Revista Hispanoamericana*, 1888, 410:580.

Joan Molas' (1854-1904) satirical poem addressed the problem as follows:

“Being of science the site
There is, generally speaking,
A lot of industry and little science
Few problems are solved
No questions are asked...”⁴⁴

In a similar line, in another satirical text, C. Gumò expressed his reluctance toward the quality of the content of the science pavilion as follows:

⁴³ Pich (ed.) *Memòries de Conrad Roure*, IV, p. 127.

⁴⁴ “Sent de Ciències lo local/hi ha, parlant en general/molta indústria y poca Ciència/s’hi resolen pocs problemes,/no’s planteja cap qüestió...”, Joan Molas Castas, *La Gran Exposició. Poema Festiu a lo que siga. Dividit en varios cants y escrit ab varietat de metros per Dibuixos de R. Miró Falguera*.....l’autor d’aquest poema, acompanyat de Mossen Borra, cèlebre bufon del segle XV, visitarà la Exposició Universal de Barcelona de 1888. 3^a edició (Barcelona: F. Giró. 1888). (my emphasis)

“You can see, then, that it was
 a big inconvenience
 naming such a big mess
 a science pavilion;
 Thus, the formal visitor
 often says, when leaving the exhibition:
 The pavilion is very good
 But the science...very bad”.⁴⁵

Nevertheless, as a reaction to that discrediting of science, local inventors and Catalan and Spanish firms claimed their intrinsic value and quality, and proudly exhibited their achievements in the science pavilion, but also in the *Palacio de la Industria*. Official guides emphasized concrete achievements made at the *Palacio de Ciencias*.⁴⁶ The science pavilion exhibited around 500 books from local publishers on: maths, physics, natural science, medicine, pharmacy, religion, statistics, agriculture, industry, navigation, literature, music and drawing.⁴⁷ Any object was automatically associated with the name of a local inventor.⁴⁸ Moreover, at the *Galería de máquinas*, local prestigious firms such as *La Maquinista Terrestre y Marítima* and *La Nueva Vulcano* exhibited their last novelties.⁴⁹ The Catalan metallurgy industry displayed new engines and machines. Although great foreign names of invention were engraved on the entrance walls of the *Galería* (Papin, Fulton, Franklin), there were constant demands to dignify local achievements.⁵⁰

⁴⁵ “Vejin, pues, si no ha sigut/Un capdell d’incoveniències/Da’l nom de Palau de ciencias/a un desgavell tan gruixut/Per xò’l visitant formal/Sol dir, quan surt a carré:/Lo palau está molt bé;/Pero las ciencias...molt mal”, Gumà, *Guia còmica*, p. 70 (my emphasis)

⁴⁶ Frontaura, *Barcelona en 1888 y París en 1889*, pp. 62-63.

⁴⁷ Frontaura, *Barcelona en 1888 y París en 1889*, p. 72; being the main local publishers: Bastinos, Montaner y Simón, Espasa, Cortezo, Sucesores de Ramirez.

⁴⁸ Chemistry and physics instruments (Jordi, Rubert, Solet), glass and ceramics, (Tallada, Lora); aircraft plans (Fradera), orthopedics (Calusoles, Casanoves, Cortacans), Municipal School for blind and deaf, stuffed animals (Malagrida Jornis), Chalk, alabaster (Juan Omedes), collections of minerals, (Manuel Gispert Pujals), azulejos (Tremoleda), gas pipes (Vda. De Manuel Tomás), electric wires (Vilafranca), chirurgical operations chairs (Macià), compressed air devices (Marsillach), vaccination apparatus (Macaya), a therapeutic bed (Mir), an aerotherapy instrument (Díaz de Liaño), astronomical instruments (Santolaria y Miralles/Morales Valero), chemicals from Barcelona apothecaries, works by students of municipal schools, and around 300 Catalan machines and instruments for agriculture. Carlos Frontaura, p. 68

⁴⁹ *Barcelona y sus exposiciones 1888, 1929*.

⁵⁰ Valero de Tornos, *Cuarenta Cartas*, pp. 234-244. The Exhibition held an “Edison” section. Justus von Liebig’s meat extract was regularly advertised and displayed: “Compañía Liebig. Verdadero extracto de carne Liebig. 10 Medallas de Oro y diplomas de Honor. Caldo concentrado de carne de vaca utilísimo y nutritivo para las familias y enfermos. Exigir la firma del inventor Barón Liebig de tinta azul en la etiqueta. Se vende en las principales

Just as a small example, we know that Albert Billeter (1815-1895) and his astronomical, geographic clock was particularly popular, but also a peculiar machine, the “esciographe”, invented by Mr. Tarrés i Puigsech.⁵¹ But visitors were also fascinated by the “Escuder boule” because of its constant circular movement under a kiosk in the exhibition.⁵² Photographic cameras, telegraphs, telephones, medicinal plants, chemicals, experimental physics instruments, and other objects made by local inventors and firms were also exhibited and widely publicised.

As occurred ten years later, with the Spanish 1898 colonial crisis and the loss of Cuba and the Philippines, in 1888, science was at the centre of public debates.⁵³ Unlike scientific optimism and the rhetoric of progress of the official standard accounts, science was at the core of other controversies, which were tinged by local political and cultural issues. In addition several spectacles and public shows became part of the intrinsic amusement of the fair, but they also brought to the fore serious debates on the public image of science and the local mechanisms of scientific authority and political power, which also deserve further analysis in the following sections of the paper.

4. Controversial medicine

At the end of August 1888, the Italian hunger artist, Giovanni Succi arrived in Barcelona. In 1885, he came across a liquor in Rome, the “yanos water”, which he supposedly had discovered during his African trips. The liquor numbed his stomach and allowed him to fast for days and days; he ingested small quantities of this narcotic to avoid symptoms of hunger, and only drank Vichy mineral water and some purgatives.⁵⁴

Succi had been subjected to public experiments of 30 days’ fasting in several European cities (Figure 4 (1)).⁵⁵ After taking active part in the Spiritualist

Droguerías, Farmacias y Casas de comestibles. El extracto de carne Liebig ha obtenido otro Diploma de honor en la Exposición Internacional Farmacéutica de Viena (Austria) en 1883”, *La Ilustración*, 1888, 395, p. 352.

⁵¹ Valero de Tornos, *Guide illustré de l’Exposition*, pp. 189-190.

⁵² “Escuder, un fabricante ingeniosísimo que ha logrado fijar la atención de todos los visitantes de la Exposición con el constante movimiento de una bola colosal en rededor de la cubierta del kiosco en que se exponen sus máquinas. Mucha gente se quedó sin saber cómo se daba impulso a la bola de Escuder, no viéndose correa, hilo, alambre ni cosa tal que pudiera ponerla en comunicación con el motor que hacía funcionar las máquinas”, Frontaura, *Barcelona en 1888 y París en 1889*, p. 68.

⁵³ Agustí Nieto-Galan, “The images of science in modern Spain. Rethinking the ‘polémica’”, in *The Sciences in the European Periphery during the Enlightenment*, ed. Kostas Gavroglu (Dordrecht: Kluwer, 1998), 65-86.

⁵⁴ Eusebio Martínez de Velasco, “El viajero italiano Juan Succi en el día vigésimo-octavo de su ayuno”, *La Ilustración Española y Americana*, 1886, 36: 182.

⁵⁵ “Y cuenta haber verificado uno de 60 días bajo el sol tropical del desierto de Nubia y otro en El Cairo, haciendo jornadas de 27 kilómetros a los once días de no haber ingerido la más pequeña porción de la sustancia alimenticia.

Conference held in Barcelona in early September, Succi was ready for his fasting spectacle at the *Palacio de Ciencias* in the exhibition itself.⁵⁶ His health and behaviour were checked daily by several local commissions to make sure that Succi was not ingesting any other kind of nourishment. By purchasing a ticket, the public was allowed to visit him in his room at the *Palacio de Ciencias*, and 20% of the revenue was donated to the poor (Figure 4 (2)).⁵⁷ He practiced gymnastics, horse riding and swordplay as a public demonstration of his perfect health condition day after day. There is evidence to believe that he received around 7,000 paying visits.⁵⁸

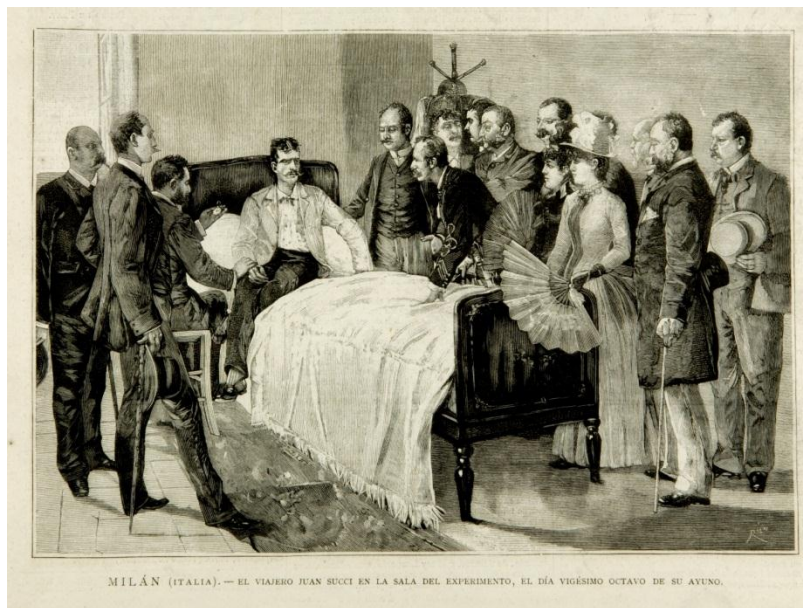


Figure 4 (1) - Succi in Milan in 1886. Eusebio Martínez de Velasco, “El viajero italiano Juan Succi en el día vigésimo octavo de su ayuno”, *La Ilustración Española y Americana*, 1886, 36:189.

Públicamente y bajo la observación directa de comisiones científicas ha practicado ayunos en París (diciembre de 1886), en Milán (agosto y septiembre de 1886); en Forlì (junio de 1886) y en Florencia (marzo de 1888). Avelino Martín y Montellá, *El ayuno de Succi. Contribución al estudio de la inanición* (Barcelona: Tipografía de la Casa Provincial de Caridad, 1889), p. 4.

⁵⁶ On the history of fasting artists, see: Walter Vandereycken and Ron van Deth, *From Fasting Saints to Anorexic Girls. The History of Self-Starvation* (London: The Athlone Press, 1994).

⁵⁷ “El día 20 comenzará su ayuno número 25, el famoso experimentador italiano. El ayuno durará treinta días y será vigilado por una Comisión médica. Durante los días de la experiencia, el señor Succi hará toda clase de ejercicios para demostrar que su estado es el de perfecta salud y que el ayuno no le hace á beneficio de estado alguno patológico de su estómago. Los ejercicios serán de gimnasia, equitación y esgrima principalmente, y estará en cualquier momento dispuesto a volver á la alimentación común, si así se lo ordenara la comisión médica. El señor Succi, durante los 30 días tomará solamente: el primero unas gotas de un licor destinado á adormecer la sensibilidad del estómago, y en los demás sólo hará uso del agua de Vichy y de la de Rubinat. Todos los días hará el lavado del estómago, analizándose luego aquel para probar si contiene alguna sustancia extraña. Durante la experiencia podrá visitarse al señor Succi mediante el pago de cierta cantidad. Estas cantidades serán intervenidas por la Comisión médica, y del producto total destina el señor Succi el 20 por 100 a los pobres de esta ciudad”, *La Vanguardia*, 16-09-1888, p. 2.

⁵⁸ Entry tickets for Succi’s spectacle were of two “reales” (half a peseta). Since the 20% of the revenue for the poor reached 700 pta, we can conclude that the approximate figure of official visitors was 7000. “Succi en el Ateneo”, *La Vanguardia*, 17-11-1888, p. 1.



Figure 4 (2) - The Conference hall of the *Palacio de Ciencias* (Science pavilion), *La Ilustración Española y Americana*, 1888, 125: 821.

Succi’s experiment was actually supervised by a local medical commission, led by the pro-homeopathy doctor, Javier de Benavent (1850-1930) and composed of prestigious physicians. But he was also under the control of a press commission of local and foreign journalists, together with a third commission comprising students of the Faculty of Medicine, and open to other persons broadly interested in the ‘progress of physiology’.⁵⁹ As well as all the members of the three commissions, there was a swordplay professor, a photographer, a translator and 3 guards. A series of medical indicators were measured daily in his body: blood and urine, weight, temperature, breathing, pulse, strength and spirometry.⁶⁰

Beyond the restricted area of the exhibition, Succi also contrasted the authority of his performance in other sites; on 19 September 1888, he was introduced by Benavent⁶¹ at the *Sección de Ciencias Exactas y Naturales* in the *Ateneu Barcelonés*.⁶² Seeking scientific recognition, Succi tried to convince the members of the *Sección* that his experiment was based on solid physiological principles. In his view, his earlier

⁵⁹ “Este ayunador sujetó su experimento a la inspección de tres comisiones: Una comisión médica presidida por el doctor Benavent, y en la que figuran reputados clínicos de esta ciudad. Una comisión de la prensa y una tercera comisión constituida por estudiantes de Medicina y amantes del progreso de la fisiología”, Martín y Montellá, *El ayuno de Succi*, p. 5

⁶⁰ Among medical doctors is worth mentioning: Salvador Badia, Ramón Roig, Juan Pijoan, Juan Bassols, Julián Guerrero, and Avelino Martín. Names of journalists were: Chiloni, Vera, Litrán and Cristiés. Javier de Benavent, *Ayuno Succi, por el médico homeópata Javier de Benavent y de Camón* (Barcelona: Tipografía de Busquets y Vidal, 1890), p. 5.

⁶¹ Benavent, *Ayuno Succi*; Benavent, *Propaganda Homeopática* (Barcelona: Imprenta de Collazos y Tasis, 1897).

⁶² *La Vanguardia*, 19-09-1888, pp. 2-3.

shows in different cities and the numerous recommendation letters from foreign doctors endorsed his credibility.

On 30 September 1888, as another test to control his health during that daring experiment, Succi, Dr Benavent, Dr Roig and the journalist Mr Chiloni rose up to 300 meters high in one of the greatest attractions of the exhibition, the captive balloon (*globo cautivo*). No dizziness or any kind of sickness or distress was reported in Succi.⁶³ Two weeks later, on 15 October, the city as a whole became a “jury” for Succi’s achievements. Accompanied by several members of the commission, Succi walked for one and a half hours through the streets, and rode a horse to show his unaltered physical skills and strength.

Nevertheless, controversy arose.⁶⁴ In fact, certain uneasiness about Succi’s spectacle reached the press. In the eyes of the more sceptical, that public spectacle damaged the authority of local science. The writer and journalist Federic Rahola i Trèmols (1858-1919) published a critical article in *La Vanguardia*, in which he listed all the inconveniences that Succi’s show meant for the city. First, fasting belonged, in his view, to a longstanding unfortunate Spanish tradition caused by economic and religious fanaticism; secondly, fasting was not appropriate for a science pavilion, which was designed to exhibit other kinds of “objective”, “rational” achievements. In Rahola’s own words:

“Please, confess that you have made a mistake: [...]. Your 30 days’ fasting in the midst of textbooks, products of scientific and literary associations, examples of the efforts of science and study in Spain, symbolizes the hardships and fasting to which the unhappy, who focus on scientific speculation and teaching, neglecting bullfighting, politics and stock markets, is condemned.”⁶⁵

Nevertheless, Dr. Benavent concluded that Succi’s case was an excellent example to discard the strict materiality of the human body.⁶⁶ Although enthusiastically encouraging Succi’s public experiment as a crucial practice in modern physiology and nutrition, Dr. Avelino Martín did not share Benavent’s spiritualist,

⁶³ Benavent, *Ayuno Succi*, p. 10.

⁶⁴ “...esclavo de la ciencia y de la observación popular”, “La instalación del hambre”, *La Vanguardia*, 21-09-1888. See also: Federico Rahola, “Carta a Succi”, *La Vanguardia*, 15-10-1888, p. 2.

⁶⁵ “Confesad que os habéis equivocado; ... Esta abstinencia prolongada de treinta días en medio de las obras de enseñanza, de los productos de Asociaciones científicas y literarias, de la muestra de los esfuerzos de la ciencia y del estudio en España, simboliza las privaciones y los ayunos á que viene condenado el infeliz que se dedica á especulaciones científicas y a la enseñanza, desdeñando la tauromaquia, la política y la Bolsa”. Federico Rahola, “Carta a Succi”, *La Vanguardia*, 15-10-1888, p. 2.

⁶⁶ *El Diluvio*, 24-11-1888.

homeopathic approaches to Succi's resistance. In Martin's views: “Succi was led to that series of experiments by a totally wrong doctrine. Nevertheless, [he concluded] he is a fanatic of his own ideas. He mixes rationalism and spiritualism...He admits ... the existence of an intrinsic force, susceptible to being transmitted and to influence humans beings”.⁶⁷ In response, Benavent emphatically stressed: “One man, two, eight, twelve, twenty, might be wrong, but several hundreds, is more difficult”.⁶⁸

Succi's spectacle was for many another “bad” example for the *Palacio de Ciencias* in the context of a peripheral international exhibition, in which the scientific “quality” of the display was often questioned and appropriated by local elites with different political purposes. Beyond the simple amusement of the average visitor in the fair, Succi also brought to the fore deep disagreements in the local context.

5. Flights, lights and other wonders

As Succi left his mark on the local scientific community in terms of the authority of medicine and physiology, other events in the exhibition again questioned the level of local science. In fact, the captive balloon soon became another target for satire and controversy (Figure 5). The balloon was installed inside the exhibition area, in the Ciutadella. It was 22 meters high and 20 meters wide, with two containers of coal gas, and was able to lift a maximum of 18 passengers up to 300 metres high.⁶⁹ It provided a magnificent view of the whole city, as Audouard, the official photographer of the exhibition impressively reported in his pictures.⁷⁰ As advertised in the press, the balloon lifted daily from early morning to night for 5 pesetas per ticket.⁷¹ It was intended to attract as many visitors as possible, complementing other amusements of the fair.⁷² Unfortunately, though, a lightning rod burned the balloon on Saint John's

⁶⁷ “Succi fue impelido a esta serie de experimentos por una doctrina completamente errónea. El, sin embargo, es fanático de sus ideas. Mezcla de racionalismo y espiritismo...Admite ...la existencia de una fuerza intrínseca en ellos, susceptible de transmitirse y actuar sobre el ser humano”, Avelino Martín y Montellá, *El ayuno de Succi*...p. 5.. “Mientras no tengamos Succis, experimentemos en animales, pero cuando se nos presente la ocasión de observar el fenómeno en el hombre rodeado de las precauciones indispensables para alejar la trampa y superchería a que tanto se prestan estas investigaciones, entendemos que el biólogo, que el médico tiene la obligación moral que le impone su carrera de estudiar y de experimentar...”, Martín y Montellá, *El ayuno de Succi*, p. 16.

⁶⁸ “Un hombre, dos, ocho, doce, veinte, pueden equivocarse, muchos cientos, ya es más difícil”, Benavent, *Ayuno Succi*, p. 28.

⁶⁹ *Barcelona y sus exposiciones 1888, 1929*.

⁷⁰ Vallés, *Història gràfica de la Catalunya contemporània*, I, p. 32.

⁷¹ “Globo Cautivo,—Exposición Universal.—Ascensiones diarias, si el tiempo lo permite desde las 6 ½ de la mañana á las 12, y de las 2 de la tarde al anochecer. Ascensiones nocturnas a precios convencionales.—Entrada al recinto del Globo, 0'50 pesetas. Billeto de ascensión, 5 pesetas. NOTA: Recomienda la empresa al público aproveche de las 6 ½ a las 12 de la mañana como las mejores horas para las ascensiones”, *La Vanguardia*, 25-06-1888, p. 2.

⁷² *La Vanguardia*, 20-06-1888, p. 1.

night (23 June), and its replacement had to wait until the end of August, to the great distress and many complaints of visitors.⁷³ The accident was a cause for serious concern in the city. As reported in *La Vanguardia*:⁷⁴

“At 5:15 p.m. an electric spark set fire [to the balloon], destroying it in several minutes. The poor [balloon] ended its days as it lived, tied by a cable. Perhaps it would have done better in liberty. The firm reported the accident with great sorrow, and stated that it had received a telegram from Mr Godard, promising to send another balloon in a few days. In this way the ascensions so loved by the public would resume. The balloon “Spain” is dead. We hope the balloon “Catalonia” will have a longer life. The material costs of the fire came to nine or ten thousand ‘duros’ [5 pesetas]. Only some ropes remained. The spark entered via the valve that opens and closes the gas flow from the meter”.

The accident caused huge technological pessimism, but it also became an excellent opportunity to revisit pro-Spanish and pro-Catalan public addresses, initiated by Almirall and the Catalanist circles some months earlier. The balloon change of name was by no means innocent. But other accidents contributed to further local debates. On the first of November, the popular aeronaut captain J. Huiz Budoy made his last and tragic ascension. After having successfully performed his spectacle at the Plaza de Toros—close to the exhibition area—during the last week of October, Budoy stumbled on a wooden block of his gigantic balloon and fell down to the ground from a considerable height. The block hit some people in the audience and numerous casualties occurred, several of whom were seriously injured and one of whom died. This tragic event added extra uneasiness to that kind of spectacle, calling for more security controls by local authorities.⁷⁵ It was precisely those technological

⁷³ Pich (ed.) *Memòries de Conrad Roure*, IV, p. 122; “Dintre d’un tancat de fustas, sòlidament amarrat, per una corda de cánem que un torn pren y deixa anar, trobém lo Globo cautiu, lluhent, tibet, serio, inflat, balancejantse ab un ayre mitj festí, mitj insultant, que sembla que digui a públich: -¡Que’n sou de petits germans!- Los espectadors que’l miran, se gratan un xic lo cap y esperen que’l mónstruo s’alsi per veure qué passarà. En efecte; ‘l cistell s’ompla ab quinze ó vint ciutadans, y hasta alguna ciueadana; lo jefe fa una senyal, la máquina dona voltes y’l globo’s comensa á alzar. - ¡Qu’és gros!- dihen las criaturas. ¡Si’s reventés!- pensa un crach. - ¡Expressions als de la lluna! – crida un altre ciutadá. Y’l globo entre tant s’eleva ab tanta solemnitat, que casi sembla un arcalde vestit de pontifical”, Gumà, *Guia Cómica*, pp. 85-86.

⁷⁴ “Era de presumir que fuera víctima de la tormenta el globo cautivo. A las cinco y cuarto una chispa eléctrica le incendió destruyéndole en breves momentos; el pobre ha concluido sus días como vivió, amarrado al cable de retenida. Acaso hubiera salido mejor librado estando en libertad. La empresa, al comunicarnos la noticia, con el sentimiento consiguiente, en el cual la acompañamos, nos dice haber recibido un telegrama de Mr. Godard comprometiéndose a enviar dentro de breves días otro globo igual, con el cual se reanudarán las ascensiones que tanto gusto daban al público. El globo España ha muerto; esperemos que tenga más larga vida el globo Cataluña. Las pérdidas materiales ocasionadas por el incendio del globo, ascienden á nueve ó diez mil duros. No han quedado del globo más que algunas cuerdas. La chispa eléctrica entró por la bálbula que cierra y abre paso al gas, desde el contador”, *La Vanguardia*, 25-06-1888, p. 2.

⁷⁵ “Lo de la plaza de toros”, *La Vanguardia*, 02-11-1888, p. 3.

failures that soon encouraged again public criticism and satire. In his satirical guide of the Exhibition, for instance, Gumà drew a cartoon in which he used the unforgettable experience of looking at the city from 300 metres high to criticise again the whole exhibition project and its low number of visitors, especially during the summer.⁷⁶

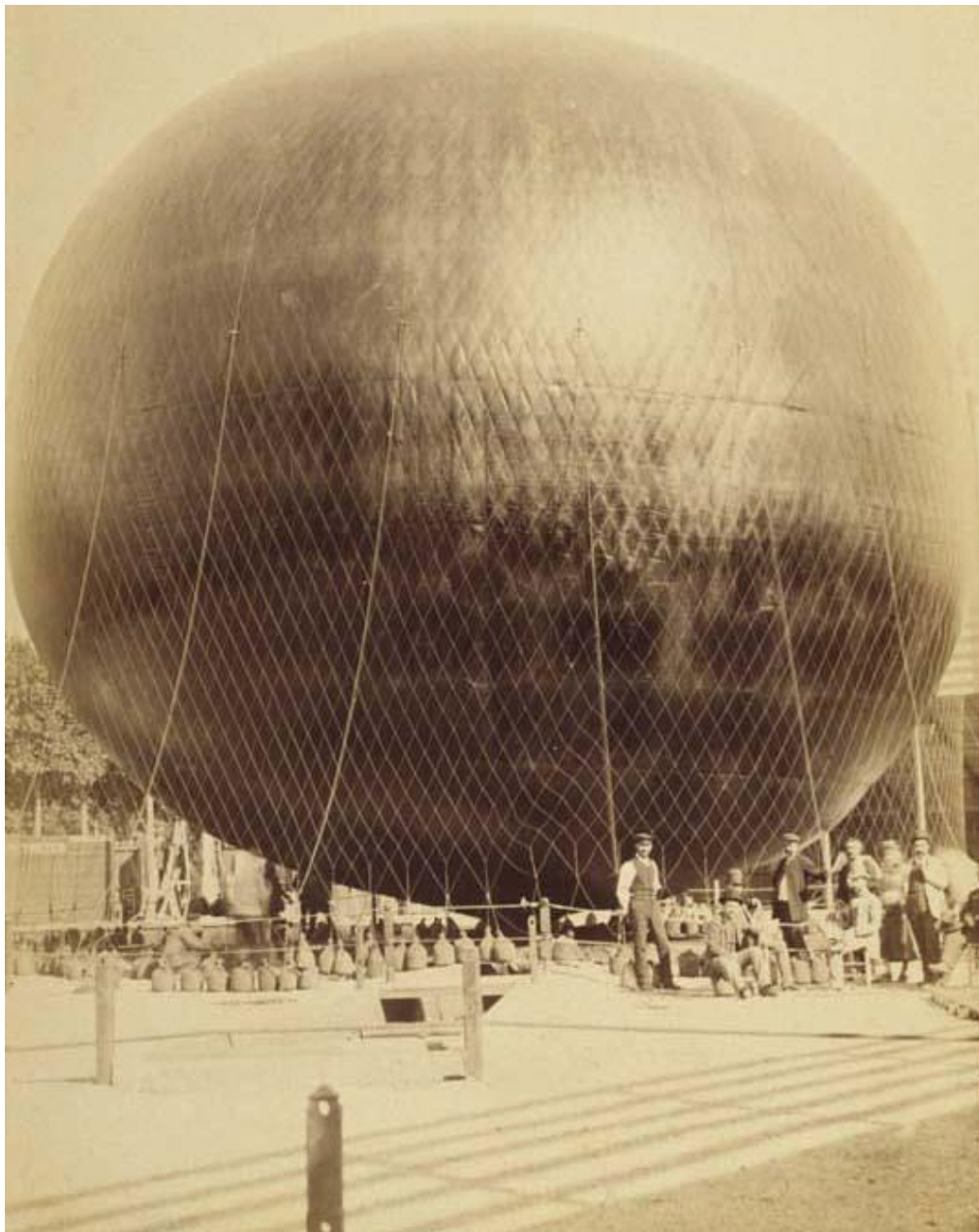


Figure.5 - The Captive Balloon. Arxiu Fotogràfic de Barcelona (AFB) Antoni Esplugas http://arxiufotografic.bcn.cat/es/galeria/exposicion-universal-1888_27_7 free access (last download 21-01-2013).

But all that distress did not hinder the public success of other spectacles of the so called *física recreativa*, which was clearly in between science and spectacle, between

⁷⁶ “- Look from up here we can almost see nothing. It seems that nobody is entering the Exhibition. - Yes, from up here, it seems so, but from down there it is the real truth”, Gumà, *Guia Còmica*, p. 73.

academic physical laws and pure, innocent entertainment. There was, for instance, the case of Miss Thaumia – half human, half dummy –, Miss Stella with her head appearing in the centre of a flying star, and the impressive jump of Canon Woman. Miss Stella's head was also used to produce spectacular effects in a black chamber known as *Metempsychosis*,⁷⁷ the latter being described in the press as follows:

“At the end of a dark chamber there is a cardboard bust that looks like plaster: like one of the numerous models for drawing antiquities. A lateral beam of light shines on it. Suddenly, the bust slowly comes to life. Its pores ooze with life and colour, flesh filters through the cardboard and a set of sparkling eyes appear in the bowls: it is indeed Miss Stella's head”.⁷⁸

All of this was complemented by other impressive visual spectacles, which challenged optical principles and human perceptions: the panoramas. Often associated with world fairs, the panoramas progressively became a fashionable urban spectacle throughout the nineteenth century. They consisted of circular painted fabrics measuring roughly 100 meters long by 10 meters high, displayed in temporary cylinder-like buildings in a trompe-l'oeil shape. Zenithal lighting helped spectators to get an impression of three-dimensional reality from an elevated central viewpoint. Visitors placed themselves in the centre of a circular enclosure, the walls of which were completely painted, together with a set of real objects placed closer to the audience and illuminated by the zenith.⁷⁹ In those optical experiments of the “pre-cinema” age, renowned realist painters and sculptors described details of famous battles, natural landscapes and other famous historical events.⁸⁰

During the exhibition, three panoramas were installed in the city.⁸¹ Designed by local artists, the Panorama Montserrat, on the back wall of the Palacio de Bellas

⁷⁷ Josep Yxart, *El año pasado. Letras y Artes en Barcelona* (Barcelona: Librería española de López, 1889), pp. 351-352.

⁷⁸ “En el fondo de una cámara oscura está el busto de cartón figurando yeso: como uno de tantos modelos para el dibujo de lo antiguo. Un rayo de luz lateral le alumbra. De pronto, el busto se anima lentamente, rezuman sus poros de vida y color, se filtra a través del cartón la carne, y en los cuencos asoman unos ojos que chispean: es la misma cabeza de la Señorita Stella...”, Yxart, *El año pasado*, pp. 351-352.

⁷⁹ Vallés, *Història gràfica de la Catalunya contemporània*, I, p. 196.

⁸⁰ Neus Moyano, “El panorama Waterloo a Barcelona (1888-1890), *L'Avenç*, 2008, 334: 42-49. See also: Jordi Artigas Candela, “La febre dels panoramas a la Barcelona de la fi del segle XIX”, in *L'origen del cinema i les imatges del segle XIX* (Girona: Fundació Museu del Cinema, 2001), 121-140.

⁸¹ “Panorama de Plewna.— Granvía — Abierto de día y noche. Entrada, 1 peseta...Gran Panorama de la Batalla de Waterloo.—Situado en la Plaza de Cataluña, uno de los lienzos más grandes del mundo, pintado por el célebre Verlat; esculturas y estatuaría del eminente Mr. Joris—Entrada 1 peseta.—Abierto al público desde las 8 de la mañana á las 7 1/2 tarde. Montserrat.—Panorama Dinorámico.— Recinto de la Exposición, al lado del Palacio de Bellas Artes.—Abierto desde las 9 de la mañana hasta las 11 de la noche, iluminado con luz eléctrica. Entrada 1 peseta. Durante las horas que está cerrada la Exposición, la entrada es por el Paseo de la Industria”, *La Vanguardia*, 25-06-1888, p. 2.

Artes in the exhibition area, used electric light; the Panorama Plewna, on the corner of Gran Via and Plaça Universitat, commemorated a battle between Russia and Turkey in 1877–78;⁸² and finally, the Panorama Waterloo, at Plaça Catalunya, reconstructed the famous battle with drawings by the French painter Paul Philippoteaux (1846–1923).⁸³ This latter panorama, which received almost 200,000 visitors in four months, had already been exhibited in 1885 in Anvers (Belgium) on a 120 x 15 meter canvas of delightful paintings by Charles Verlat with 300 statues by the sculptor Franz Joris.⁸⁴

Electricity provided other fascinations. The exhibition became an ideal event to place the electricity applications explicitly in the public sphere, as a way of transmitting sounds, as a new source of power for electric motors, and as a lighting alternative to gas.⁸⁵ Electricity played an important role in the *Galería de máquinas* with electric motors, voltaic arcs, and incandescent lamps,⁸⁶ but was also fundamental for the visitors’ amusement.⁸⁷ This was not an exception in Barcelona. As Iwan Rhys Morus clearly expressed: “Throughout the nineteenth century...electricity provided the technology for a whole range of vivid and spectacular demonstrations of nature’s powers, and of man’s powers over nature...[it] was very much about making this new power spectacularly visible and making it useful too”.⁸⁸ In fact, electrical lighting had already been used in former exhibitions in the UK, in London, Manchester, and Glasgow. In Paris, in 1881, incandescent lamps were shown for the first time at a large scale in the electrical exhibition which took place in the city.⁸⁹ So, back in Barcelona, electric lights accompanied numerous public events: in the maritime exhibition, parade ships were illuminated with electric lights; in the “arco-cascada” at the Plaça Catalunya; in the *Palacio de la Industria*; but also in the popular magic

⁸² It was substituted in the same place in 1889 by the Panaroma of the Paris siege.

⁸³ *Panorama de la batalla de Plewna, librada el 28 de noviembre de 1877: reseña histórica, pintado por M. Pablo Philippoteaux* (Barcelona: Imp. de Luís Tasso Serra, [18--?])

⁸⁴ Neus Moyano, “El panorama de Waterloo a Barcelona (1888-1890)”.

⁸⁵ “Las diversas aplicaciones de la electricidad, empleada como medio de transmisión de sonidos, como fuerza y como luz, que diariamente nos sorprenden, así como los perfeccionados aparatos que se inventan o modifican, auxiliares poderosos de la física y de la química, podrán estudiarse en el Palacio de ciencias...”, García Llansó, “La Exposición Universal de Barcelona”, *La Ilustración*, 1888, 390: 262-263. On the public role of electricity in early nineteenth London, see: Iwan Rhys Morus, *Frankenstein’s Children. Electricity, Exhibition, and Experiment in Early Nineteenth-Century London* (Princeton: University Press, 1998).

⁸⁶ Valero de Tornos, *Cuarenta Cartas*, pp. 245-247.

⁸⁷ Pich (ed.) *Memòries de Conrad Roure*, IV, pp. 122-123.

⁸⁸ Iwan Rhys Morus, *When Physics Became King* (Chicago: The University of Chicago Press, 2005), p. 86.

⁸⁹ John W. Stamper, “The Galérie des machines of the 1889 Paris World’s Fair”, *Technology and Culture*, 1989, 30(2): 330-353.

fountain, which was installed in the old arms square of the Ciutadella where its three dynamo electric elements provided fascinating colour changes for the audience.⁹⁰ It was precisely for the celebration of the *verbenas* in June that the enclosure of the exhibition was illuminated for the first time with electric lighting replacing gas lighting.⁹¹ Electric lighting was also used in the night parties at the maritime exhibition, an area that was connected to the Ciutadella by means of the Eiffel-like iron bridge. It also illuminated the *Palacio de la Industria* pavilion and Plaça Catalunya.⁹² The ideal “electric tour” of the Exhibition, with more than 2,000 Edison electric lamps, passed through the Ramblas, Passeig Colom (Hotel International), the exhibition, and inside it, the magic fountain and the night celebrations at the maritime display (Figure 6).⁹³ Gumà also reflected with great enthusiasm on those “new machines”, with no flame, gas or oil, which cannot be blown out.⁹⁴



Figure 6 - Electric lighting in the city. *La Ilustración. Revista Hispanoamericana*, 1888, 397 (front page).

⁹⁰ Lacal, *El libro de honor*, pp. 91-94.

⁹¹ Pich (ed.) *Memòries de Conrad Roure*, IV, p. 123.

⁹² Lacal, *El libro de honor*, p. 93-94.

⁹³ Duran i Bas quoted by Carlos Pirozzini (28-06-1888): “...debería intentarse, con invitación al efecto, que iluminasen sus edificios, no sólo la Transatlántica y demás que se levanten dentro de la Sección Marítima, sino los externos a la Exposición pero contiguos a ella”, Carlos Pirizzini correspondence. Ms 5031-I. Biblioteca de Catalunya. Barcelona.

⁹⁴ “Això que estan mirantse es lo lloch on se fabrica aquest llum que no fa flama, ni té blé, ni es de gas, ni es oli, ni bufant pot apagar-se...! Son las máquinas eléctricas! ¿Veuhén? Edison. No falla: aquest nom ho diu clá y net. Toquém pipa á pas de marxa, que allí hont hi ha electricitat es fácil electrisarse!”, Gumà, *Guia Cómica*, pp. 38-39.

On 9 of December 1888, a “procesion cívica” with representatives of all the nations taking part in the Exhibition celebrated the closing ceremony at the *Palacio de Bellas Artes*. Later, the whole procession went to the entrance of the *Palacio de la Industria*, where the *Comisario Regio* formally closed the exhibition. The towers of the *Palacio de la Industria* were illuminated with “luces de bengala” (fireworks), and a choir and orchestra played the *Himno a la Exposición* (the Exposition hymn). Then there were fireworks and the entire city was illuminated.⁹⁵

There is no doubt that the public was fascinated by electric light, but local experts’ accounts again expressed skepticism. The professor of electricity Antonino Suárez Saavedra considered that the electricity displays at the exhibition were not particularly brilliant.⁹⁶ In his view, electricity was already a déjà-vu at the exhibitions in 1888 and Barcelona inevitably suffered from a peripheral position in terms of the electrical novelties that were already designed for Paris 1889. He did, however, praise the *Sociedad Española de Electricidad* for its significant contribution to the lighting of several palaces and gardens, together with the magic fountain. His conclusions were compelling: “In electricity.a lot good and few new”.⁹⁷ Significantly, even one of the most glamorous manifestations of the fair could not escape controversy.

6. Amazing animals

At the exhibition, the *Museo de Ultramar* displayed a magnificent zoological collection from the Philippines.⁹⁸ The aquarium also became another very popular site in which a collection of animals was exhibited, divided into seven different sections in 14 showcases of reptiles, amphibians, fish, molluscs, crustaceans and insects.⁹⁹ But the main collections were displayed outside the exhibition ground:¹⁰⁰ the *Museu del Comte de Belloch* held an important zoological cabinet on Passeig de Gracia.¹⁰¹ In April 1888, the Redemback collection on Gran Vía included an elephant ringing a bell and a rich

⁹⁵ *La Ilustración*, 1888, 420: 751.

⁹⁶ Antonino Suárez Saavedra, “La electricidad en la Exposición Universal de Barcelona”, in *Ateneu Barcelonés, Conferencias públicas relativas a la Exposición Universal de Barcelona*, pp. 378-400.

⁹⁷ Suárez Saavedra, “La electricidad en la Exposición Universal de Barcelona”, p. 401.

⁹⁸ Pich (ed.) *Memòries de Conrad Roure*, IV, p. 100.

⁹⁹ “La tarde en la Exposición: El aquarium”, *La Vanguardia*, 02-07-1888, p. 2.

¹⁰⁰ Pich (ed.) *Memòries de Conrad Roure*, IV, p. 120-121

¹⁰¹ Valero de Tornos, *Guide Illustré de l’Exposition*, p. 60

collection of monkeys. It was advertised as “the most numerous and varied collection of wild animals in Barcelona”.¹⁰²

In August, Jean-Baptiste Bidel’s collection was displayed on Passeig de Gràcia with wild animals, some in cages and a spectacular camel. Bidel’s collection contained live lions, tigers, panthers, leopards, hyenas, elephants, camels, monkeys.¹⁰³ It became a very popular, “bad smelling” scientific curiosity (Figure 7).¹⁰⁴ Josep Yxart reported on a “Noah’s Ark” full of live animals in its tour of the Rambla, and remarked on the amazing amount of wild animals and zoological collections across the city.¹⁰⁵ He imagined a real parade of animals through the city with monkeys, cats, dogs, bears, panthers, tigers, lions, elephants, camels, and giraffes, together with the equestrian circus at Plaça Catalunya.¹⁰⁶



Figure 7 - Bidel’s collection of live animals in an earlier visit to Barcelona in 1877, *La Campana de Gràcia*, 26-08-1877, p. 5.

¹⁰² “Redenbach.— La más numerosa y variada colección de fieras que hay en Barcelona. Abierta desde las 8 de la mañana á las 12 de la noche. Exposición Zoológica de Mr. Cavatinas - Plazade Cataluña.— Las más hermosas fieras de todas clases Funciones ejecutadas por perros, cabras y monos amaestrados. A las 5 de la tarde y á las 9 de la noche, Entrada general, 2 reales”, *La Vanguardia*, 25-06-1888, p. 2

¹⁰³ *Catálogo de la Exposición zoológica de Mr. Bidel* (Barcelona. Tipografía de Oliveres, c. 1885)

¹⁰⁴ “...olor nauseabundo que emanaba del estiércol de tantos animales como había encerrados en las reducidas dimensiones de la barrera”, Pich (ed.) *Memòries de Conrad Roure*, IV, p. 121.

¹⁰⁵ “Seguirá a esta sección de animales vivos, la extravagante y siniestra de los seres inanimados, las figuras de cera y la artillería y caballería de cartón de los panoramas de Plewna y Waterloo”, Yxart, *El año pasado*, p. 91.

¹⁰⁶ Yxart, *El año pasado*, pp. 87-89.

Beyond the exhibition walls, those private collections of wild animals (colecciones de fieras) constituted an appealing urban route for local citizens and foreign visitors. This was part of a complex process, from the early-modern times of menageries, in which the private collection of animals in a cabinet de curiosités-like style represented wealth and social prestige and power, to the nineteenth century displays of live animals, which progressively became commodities, while at the same time, the animals become marginalised for everyday life.¹⁰⁷ In addition, beyond the academic walls, this was the time to give voice to different groups of amateurs in civic settings such as museums, schools, and zoos, but also in shows of private collections on the street, contributing to a more “populist” natural history.¹⁰⁸ From 1830 to 1880 an increasing number of popular travelling animal shows and circuses progressively contributed to the establishment of public zoos. In those sites, scientific research, conservation and colonial values, domestication of animals, and the amusement and education of urban citizens coexisted in complex ways that should be carefully explored in every local context.¹⁰⁹

The “animal culture” in Barcelona even took other forms. A camel from Bidel’s collection joined the parade for the opening ceremony of the Columbus Monument on 19 October 1888. Curiously, the Columbus Monument was surrounded by eight impressive statues of wild lions in a relaxed state of calm in contrast with the excitement of the live lions, cruelly whipped in Bidel and Redenbach’s collections. In those busy days of the exhibition these eight lions became a material symbol of the controversy between domesticated and wild animals, in the midst of that populist natural history that was spreading across the city.¹¹⁰ In addition, stuffed animals were kept at the Martorell Museum, a building in the heart of the Ciutadella, in a very convenient setting between the *Hivernáculo* and the *Umbráculo* in the exhibition area. The Museum was set up using the donations of the private collection of Francesc Martorell Peña (1822-1878) in 1878. It held an important

¹⁰⁷ R. J. Hoage, William A. Deiss (eds.) *New Worlds, New Animals. From Menagerie to Zoological Parks in the nineteenth century* (Baltimore: The Johns Hopkins University Press, 1996); Nigel Rothfels, *Savages and Beasts. The Birth of the modern Zoo* (Baltimore: The Johns Hopkins University Press, 2002). See also: Lynn K. Nyhart, *Modern Nature. The Rise of the Biological Perspective in Germany* (Chicago: University of Chicago Press, 2009).

¹⁰⁸ Nyhart, *Modern Nature*. pp. 1-34.

¹⁰⁹ Sally Gregory Kohlstedt, “Reflections on Zoo History”, in R. J. Hoage, William A. Deiss (eds.) *New Worlds, New Animals*, p. 6.

¹¹⁰ “...su autor no tiene la culpa de haber hecho a esos felinos tales como deben ser, y son realmente en sus horas de calma, y no tales como se los figura el vulgo por haberlos observado al natural hostigados por el látigo de Bidel o de Redenbach”, *Estudios sobre la Exposición Universal de Barcelona inaugurada en 20 de mayo y cerrada en 9 de diciembre de 1888* (Barcelona: Establecimiento tipográfico del Diario Mercantil. 1888), p. 113.

collection of vertebrate and invertebrate animals, together with fossils, as well as more than 12,000 minerals.



Figure 8 - The Columbus Monument and its lions. *La Ilustración Española y Americana*, 1888, 35: 168.

All those private collections of animals, public shows and early museums probably “preceded” — as the panoramas preceded the cinema — the foundation of the Barcelona Zoo in 1892, under the direction of the naturalist and taxidermist Francesc Darder (1851-1918). The initial collection of 36 mammals, 123 birds and 2 reptiles was soon increased with the purchase of the private collection of Luis Martí Codolar (? – 1915).¹¹¹ In 1899, Darder opened his *Museo Zootécnico* in the zoo, with new sections of comparative anatomy, embryology, hunting and fishing, a library and a reading cabinet. It also included an industrial area for the applied natural history that Darder extensively practiced.¹¹²

In spite of causing fears and bad smells, in a way, the 1888 Barcelona Exhibition became a huge display of wild and tame animals. They were displayed in public and private spaces, and raised great interest but also controversy: from exoticism and wilderness to domestication and control, from canonical examples of struggle for life to paradigms of human control on nature and society.

¹¹¹ *Anuario Estadístico de la Ciudad de Barcelona* (Barcelona: Imprenta de Henrich, 1902), p. 259.

¹¹² *Anuario Estadístico de la Ciudad de Barcelona*, pp. 309-10.

7. Conclusion

As several of the former examples have shown, this is a preliminary attempt to place the 1888 Barcelona International Exhibition in the broader framework of an urban history of science. For that purpose, I have tried to prove that this exceptional event has to be analysed as a complex manifestation of the city as a whole, beyond the restricted area of the Ciutadella: from maritime fireworks to Succi’s tour through the city centre, from the Columbus parade for the inauguration of the monument to the richness of animal displays in the exhibition grounds and along the *Ramblas*; from the fascination of the captive balloon to the popular Plewna and Waterloo panoramas; from electric lights at the impressive *Palacio de la Industria* to the lighting of the city streets.

In a similar vein, the paper has put a special emphasis on controversy and disagreement rather than on consensus. It has tried to overcome the legitimating account that we often find in official guides and public addresses to explore further the plurality of expert and lay perceptions. These are for instance the cases of Almirall versus Valero de Tornos; working-class voices at *El productor* confronting the conservative discourses of elites at the *Diario de Barcelona*; support of Succi’s fasting by Dr Benavent and medical reluctance’s by Dr Martín; praise of foreign luminaries on the walls of the exhibition palaces, contra claims of local inventors’ dignity; Catalan versus Spanish nationalism. In addition, the paper has also examined significant aspects of the political dimension of the Exhibition, which was often linked to science. Scientific progress or backwardness was used to legitimise particular political positions, from left to right, from Catalanism to the reinforcement of the central Spanish authority.

Going back to the already mentioned connections between science and the city, the 1888 Barcelona case and the micro cases sketched here might enrich the general framework of the aforementioned *Osiris* volume. Deep intersections between scientists, inventors and politicians contributed to the emergence of a local *urban expertise*. Assessing the scientific quality of the objects exhibited, local elites argued about the political, economic progress and the backwardness of the nation. Balloons, electric lights and sparks, parades, animal displays, panoramas, clearly contributed to the making of a *cultural representation of the city*. Walking through the city of Barcelona in 1888, a significant set of *places of knowledge* could be identified; the conference room at the science pavilion, the panoramas, the magic fountain, or Escuder boule, among many others, became significant places and sites to stimulate

scientific controversy and circulation of ideas. Finally, visitors and their plural views on science and progress provide us with valuable data on the *scientific culture of the everyday life*.

In a way, the 1888 Barcelona International Exhibition as a whole can be considered as a very rich primary source to write the urban history of science of the city of Barcelona at the end of the nineteenth century, an ambitious endeavour, which I hope to be able to develop in depth in future publications.