

Spreading the atom, encapsulating politics: a story of confinement on a nuclear containment building in Barcelona

Jaume Valentines-Álvarez¹

¹ CIUHCT, NOVA University of Lisbon, Portugal

Abstract. In 2005, the containment building of the first nuclear reactor in Catalonia was silently demolished in the streets of Barcelona. The destruction was the last step in the long history of invisibilization of a nuclear facility that had been inaugurated forty years before as a “radiant symbol” of the autarkic policies of General Franco's dictatorship (1939-1977). What did the containment building contain beyond radioactivity? What ideas about the atom and the nuclear dangers did it foster? This paper will focus on the history and geography of the nuclear building with the aim of exploring the intersection between the “politics of containment” and the “politics of invisibility”.

1 Introduction

It was two and a half months after the start of the first Covid-19 confinement measures in Barcelona. This city had been one of the most affected cities in Europe and went into a hard lockdown. After endless days leaving home just to put the bin bag in the waste container, I finally had the chance to get out from my own “container” between 8:00 pm and 11:00 pm and have my first walk outdoors in the urban outskirts. I started walking and walking, faster and faster, upper and upper, with mixed feelings of rush and anxiety. I climbed up to the top of the little hill Puig d'Ossa. There, I turned back and looked at the shining, ash-grey sea in the late afternoon. I felt like being a bird with the crowds swarming in the streets under my feet. My grandma's nest was over there. After a while, I realized that my gaze was exactly pointing to the location of the object I had been studying about for the last weeks. In the imaginary line between my eyes and the Mediterranean Sea, in the midst of the crowded streets of Barcelona, the containment building of the nuclear reactor of the School of Industrial Engineering had been part of the cityscape from 1962 to 2005¹.

¹ This research draws on the archaeological surveys inside the containment building taken in 2002-2003, and on archive sources from the Barcelona School of Industrial Engineering (“Ferran Tallada” Series), the Department of Physics and Nuclear Engineering, at this School, and the Archive of the Col·legi Oficial d'Arquitectes de Catalunya-COAC. Besides, the interviews and chats with some professors (especially, Manuel Sevilla and Xavier Ortega) have been of great help. I thank the Department of Physics and Nuclear Engineering for giving me the opportunity to enter into the nuclear building, to catalogue the scientific instruments of the department, and to reproduce documents. My research is also indebted to Francesc Barca-Salom, Guillermo Lusa-Monforte and Antoni Roca-Rosell,

My research focuses on the life and death of this containment building and bridges the study of the “politics of containment” and the historiography on the “politics of invisibility”. In *The Politics of Invisibility*, Olga Kuchinskaya underlined how scientific practices of producing representations have limited public visibility of Chernobyl radiation and its health effects:

“Making something visible is not a one-way process: imperceptible phenomena can also be made publicly invisible, and this production of invisibility is both work and a consequence of particular structural conditions”. [1]

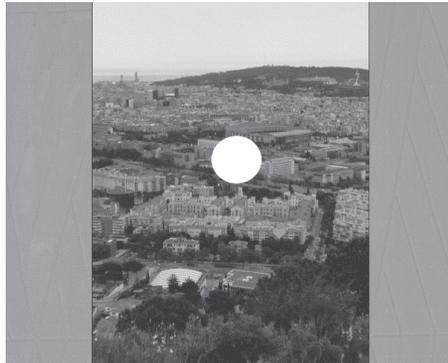


Fig. 1: Gaze over the city of Barcelona, 2020. Source: the author.

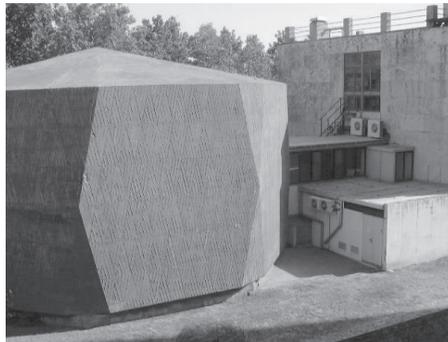


Fig. 2: The containment building of Barcelona's nuclear reactor, 2003. Source: the author.

The production of invisibility, however, does not just involve imperceptible things – be they human-induced products such as radiation and chemical toxicants, or natural beings such as microbes and viruses, as made (in)visible in Wuhan or Munich during the first months of 2020. [2] In my view, the production of invisibility for very perceptible things is also part of the politics of containing threats of many kinds – be they health risks, or social, gender,

from the Research Centre for the History of Technology (Barcelona School of Industrial Engineering), with whom I worked for ten years. A previous version of this paper was presented at the session “Atomic heritage”, organized by Egle Rindzeviciute and Anna Storm, at the Society for the History of Technology Annual Meeting, Milan, 24-27 October 2019.

economic and political threats. This paper deals with a very perceptible object which became socially invisible at the end of its life: a 16x16x9-meter block of concrete designed to contain radioactivity.

My research responds to a simple question that I started asking to myself when I was responsible for the heritage inventory of the Barcelona School of Industrial Engineering and its Department of Physics and Nuclear Engineering: How come that I never saw the nuclear building before? Was my myopia so severe? Had blindness spread as a pandemic over the city as in the book by the Nobel laureate José Saramago? Bit by bit, I realized that almost nobody seemed to be aware of the existence of the nuclear building in the Diagonal campus: the thousands of students, professors and university staff passing by it during the day; the tens of thousands of Barcelona Football Club supporters in many evenings; and – I guessed – the hundreds of sexual workers and clients at night. My own experience for fifteen years, first as a bachelor student, later as a grant holder and researcher, tells me that those little translucent technologies known as condoms – in fact, used to contain other kinds of risks – were much more noticed on the streets of the campus than the big opaque nuclear building. The scientifically designed wall of the nuclear building was then just another wall to paint graffiti.



Fig. 3: Outside the building: The wall, 2003. Source: the author.



Fig. 4: Inside the building: The core's site, 2003. Source: the author.

Since the worldwide announcement of the *Atoms for Peace* program in 1953, rivers of scientific ink, diplomatic documents and money have been devoted to publicly represent nuclear energy as eco- and socio-friendly and to banalize its dangers through very different means and in very different political contexts. [3] In particular, fun, and public displays have had a lasting role in making nuclear technologies commonplace. But what can be done when techno-optimist discourses fail, and nuclear fun do not make people laugh as it especially

happened in the decades of 1970s and 1980s? Another strategy is feasible: to move the elephant in the room below the table or inside a wardrobe. That is, to render it invisible, physically, and socially.

2 The story of the containment building up to 1977

My ongoing research on the containment building has two parts. The first one – which this paper is mainly based on – focuses on exploring how the nuclear facilities were spatially and rhetorically constructed in the city as a safe and proud legacy of the nation and the profession until the reactor stopped working in 1977. How come that the containment building was there, so perceptible to the regard of the citizens, visitors, and tourists? The second one – still in its starting phase – studies the progressive but non-linear de-making of that legacy for over 30 years. How did the building “disappear”? In both parts, I try to connect different matters of containment behind the story.

In order to study the material and symbolic construction of the nuclear building in different spatial scales, I will use a methodological approach borrowed from geography and urban history: multi-scalar zooming. In the following pages, I will zoom in from world politics to the very inside of the Barcelona reactor in four quick steps to try to answer the questions posed.

2.1 From the world to the nation

The story of our object starts, as many others do, in Geneva. Professors of the Barcelona School of Industrial Engineering attended there the first United Nations’ Atoms for Peace Conference in 1955, and started lobbying for the establishment of nuclear studies in Barcelona (Chair “Ferran Tallada”), which were to be complemented with a nuclear experimental reactor. [4, 5] Some years later, following the first diplomatic agreements of the Spanish dictatorship with the United States on nuclear energy matters, the containment building landed in the city. [6, 7] It was inaugurated in 1962 by key personalities of the regime and the Catalan industrial sector. A Catholic priest baptized the newborn reactor “so that this machine starts working with God’s blessing”. It was called Argos in honor to the Greek mythological boat searching for the Golden Fleece. The press widely spread the news and announced a “totally national atomic reactor” with “nationally-produced materials” and “with no danger to the citizens of Barcelona”.

2.2 From the nation to the city

Since the 1950s, cityscapes all over the world, from Chicago to Paris, from Stockholm to Kinshasa, were part and parcel of the nuclear globescape. In Barcelona, the nuclear reactor containment building was built in one of its main avenues, popularly known as Diagonal Avenue and officially called Generalísimo Avenue after the name of the self-styled military rank of the Spanish dictator Francisco Franco. The building became one of the founding stones for the creation not only of the renewed Barcelona School of Industrial Engineering, but also of a new urban area, the Diagonal university campus.

According to the experts in charge of the project, any radiation from the reactor was to be absolutely contained by the walls of the nuclear building and, therefore, its location was totally irrelevant and irrespective of scientific advice. Nuclear geographies were not shaped by security requirements and scientific decisions, but by other much more peremptory facts. On the one hand, a key fact was real state business and land speculation, for science does not just produce profits from its outputs but also from its “inputs”. On the other hand, another important fact was the politics of containment – not of radiation, but of the rising student movement, because protests against Franco’s dictatorship were gaining momentum in the city.

2.3 From the city to the building

Architectures of science played an important role in the making of fascism. [8] Unlike other geometric architectures of science in the first years of the Spanish dictatorship, [9] the modernist and internationalist aesthetics of the containment building (and of the School of Industrial Engineering) could be seen as an expression of the new period of economic liberalization and international commercial agreements in the 1960s, which mainly started after the 1959 Stabilization Plans.

The design and structure of the containment building was shaped by the negotiations between architects and engineers (and the tensions between aesthetics and technical requirements). The building was made as much for containing radioactivity as for spreading specific images of the atom and of the architectures of science in the city.

2.4 From the building to the core of the reactor

Alongside with the laboratories of the nuclear department, the spaces of the containment building were devoted to activities of research, teaching, and scientific popularization. To some extent, the circular and multilevel layout of the building devoted to “dissect” the atom could recall the anatomical theaters of the eighteenth century. At the lower level, in the center, behind the hundreds of heavy concrete cube blocks, the water tank, and lids of reinforced concrete and steel, there was the experimental Argonaut-type reactor.

For thirteen years, the reactor worked without a proper license and any risk coverage, and with an operational power that decreased from 10 kW to 1 W during the last years (mainly for security reasons). “No power for a bulb”, professors came to say. But what's important here is to think about how much was the power of 1 W. This particular 1 W had a key role in the production of the thousands and thousands of MW that nuclearized the Spanish landscapes during the late Francoism and the following decades (especially since 1969, when national energy plans considered the installation of 22.000 MW and 24 nuclear reactors in Spain, seven of them planned in one of the four Catalan provinces, Tarragona). In fact, the containment building was the training laboratory for the engineers who were to build and manage the Catalan nuclear power plants. The first one, in Vandellós, province of Tarragona (Vandellós I), was finished in 1972 and closed in 1989 after a “serious incident”: the turbine area burned out and a fair amount of radioactivity leaked towards the air and the waters of the Mediterranean. Popular beaches are very close to the site, and Barcelona is just one hundred kilometers away.

In this sense, we should reconsider whether the most disturbing legacy of the nuclear reactor for Barcelona were the four kilograms of U235 with a low residual activity that remained inside the reactor core, the irradiated materials and instruments, the structural defects of the building, or the low-dose radioactive leaks. Or it was rather the fact that the experimental reactor was a central node of the “networks of nuclear power” in Catalonia. [10, 11]

3 After 1977 and final remarks

This would bring us to the second part of my research, which is about to complete the “biography” of the nuclear building until its destruction in 2005: from making it and making it visible to making it invisible and “de-making” it.

For four decades, the Spanish dictatorship left a huge (and quite toxic) scientific and technological legacy, in particular in the form of nuclear objects and landscapes. The death of the dictator in 1975, in the context of the oil crisis, made a number of debates on politics, science and energy arise. Nuclear programs had a prominent place in these debates as they represented to many, on the one hand, a heavy and dangerous heritage of the so-called

“electro-fascist” policies, and, on the other hand, the final landing in the Iberian Peninsula of the US capitalist economy led by Westinghouse and General Electric.

The transnational protests against nuclear energy boomed in Barcelona and took many forms and targets, from huge pacific demonstrations with a hundred thousand people to neighborhood festivals, from tough reports of dissident experts to counterculture magazines, from humorous cartoons to direct actions against electric companies (even violent direct actions by the separatist armed group Terra Lliure). [12] Yet, there was never a protest in front of the containment building at the School of Industrial Engineering, not even a single mention against it. For example, when the anti-nuclear movement listed and mapped nuclear power plants, waste dumps, Uranium mines and other nuclear facilities... the reactor never appeared! (even when some anti-nuclear activities were organized at the School and some of their students, ex-students and even professors were fierce anti-nuclear activists).

In *Being Nuclear*, Gabrielle Hecht studied how the ontologies of nuclear things are “mutant”. [13] Nevertheless, it could be difficult to argue that a *nuclear* reactor is not considered as a “nuclear thing”. To look at the politics of invisibility allows us to think why the Barcelona reactor was not considered as a toxic object and a political target. “Containing” the containment building – that is, moving it out from the public sight, rhetorically disentangling nuclear physics from nuclear power, and making the nuclear reactor hibernate while waiting for new budgets, licenses and regulations – these strategies seem to be closely related to the policies of containment of the strong (in European standards) anti-nuclear resistance in Catalonia.

The building survived the peak of the anti-nuclear movement and kept storing a thousand of radioactive and irradiated elements for more than two decades. In the summer of 1992, the fuel was finally removed and silently transferred to the United Kingdom. Some days later, the Barcelona Olympic Games were inaugurated. However, the final decommissioning had to wait until the beginning of the twenty-first century. The only element preserved was the control board, which was moved to the National Museum of Science and Technology of Catalonia (though never exhibited), and the four hundred concrete blocks were recycled as rough material for a new breakwater next to Barcelona’s harbor. The containment building became an empty building, but just a short time.

In 2004, a new “training reactor” was officially inaugurated inside the same building: the Nuclear Power Plant Conceptual Simulator. This artifact brought a further dimension of containment and invisibility to our story. Students at the School of Industrial Engineering could be trained not just by putting a “true” reactor into operation, but also by learning the technical procedures for the management of a nuclear accident with huge radioactive contamination. All this in the “contained”, “aseptic”, “healthy” atmosphere inside the nuclear containment building in Barcelona.

Just one year later, the nuclear building was destroyed with no impact on the media and the academic life of the campus. What had been the “radiant” atomic face of Barcelona faded forever. The night had come. It was 22:15 pm on my mobile. Before coming back home, I looked again towards the dark sea. I imagined a radioactive blue glow emerging from the shining orange lights of the confined city.



Fig. 5: The bulldozer and the physical invisibilization of the building, 2003. Source: Google.

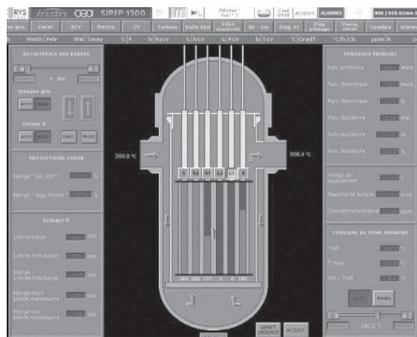


Fig. 6: The new reactor in the containment building, 2020. Source: J. Dies, et al. *Primer año de operación del simulador conceptual...* (ETSEIB, unpublished document).

References

1. O. Kuchinskaya, *The Politics of Invisibility. Public Knowledge about Radiation Health Effects after Chernobyl* (The MIT Press, Cambridge, 2014)
2. B. Latour, *The Pasteurization of France* (Harvard University Press, Cambridge, 1988)
3. J. Sastre-Juan, J. Valentines-Álvarez, eds. *Centaurus* **61**, 1-2 (2019)
4. F. X. Barca Salom, *Quad. hist. eng.* **IV** (2000)
5. G. Lusa Monforte, “Cátedras especiales y nuevo plan de estudios (1953-1957)”, in *Documentos de la Escuela de Ingenieros Industriales de Barcelona* (ETSEIB, Barcelona, 2012)
6. J. Krige, “Techno-Utopian Dreams, Techno-Political Realities: The Education of Desire for the Peaceful Atom”, in M. Gordin, H. Tilley, G. Prakash, eds. *Utopia/Dystopia: Conditions of Historical Possibility* (Princeton University Press, New Haven, 2010)
7. N. Herran, X. Roqué, eds., *La física en la dictadura. Físicos, cultura y poder en España, 1939-1975* (UAB Servei de Publicacions, Barcelona, 2012)
8. T. Saraiva, *HoST* **3** (2009)

9. L. Camprubi, *Engineers and the Making of the Francoist Regime* (MIT Press, Cambridge, 2014)
10. T. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Johns Hopkins University Press, Baltimore, 1983)
11. T. Hughes, “The Evolution of Large Technological Systems”, in W. Bijker, T. Hughes, T. Pinch, eds. *The Social Construction of Technological Systems* (MIT Press, Cambridge, 1987)
12. J. Valentines-Álvarez, A. Macaya-Andrés, *Centaurus* **61**,1-2 (2019)