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Fun and Fear: The Banalization of Nuclear Technologies through Display

Jaume Sastre-Juan & Jaume Valentines-Álvarez

The silent and rusty rides of Pripyat's amusement park are one of the most enduring symbols of Chernobyl's nuclear landscape. It would have been dedicated on 1 May 1986, but Chernobyl's reactor number 4 had exploded just some days before. The accident was also instrumental in preventing the inauguration of what was about to become Germany's first fast breeder reactor in Kalkar. Construction of the German power plant began in 1972, and by 1986 the infrastructure was in place, but the political costs of putting it into operation at that time exceeded the huge investment that had already been made. In 1991, the project was officially cancelled, and the site was sold to an entrepreneur, who turned it into a resort with restaurants, hotels, and an amusement park. The 600.000 annual visitors can nowadays enjoy merry-go-rounds, roller coasters, and a huge swing ride located inside the cooling tower, which is painted with mountains and a blue sky.¹ The uneasiness that is produced when the silence of the childless Ferris Wheel at Pripyat is juxtaposed with the screams of joy at Wunderland Kalkar encapsulates the tensions between fear and fun, and between the exceptional and the banal, that are at the core of our concerns in this special issue.

Friends and foes alike, from military officers at the Pentagon to anti-nuclear grassroots activists, have agreed in giving exceptional status to nuclear technologies. Nuclear bombs were seen by some as weapons that would bring about perpetual peace through deterrence. And the most enthusiastic early proponents of nuclear power associated it with Edenic promises of energy too cheap to meter and food for all.² Many technologies, such as the spinning machine, the railway, or the internet, have also been historically promoted as having positive revolutionary effects, but few have been deemed so unique in their threats. Nuclear weapons opened new apocalyptic horizons by making the annihilation of human life on Earth technologically feasible.³ The health and environmental effects of such accidents as those in Chernobyl and Fukushima have led

¹ <https://www.wunderlandkalkar.eu/en> (last accessed: 11 February 2019).

² See, for example: Smith, 1991.

³ On early nuclear apocalyptic narratives, see: Kuznick, 2007. For a philosophical reflection about the anthropological consequences of the apocalyptic character of the bomb, see: Anders, 2011[1956].

survivors and witnesses like writer Svetlana Alexievich to talk about a radically new world for which human feelings and knowledge are not prepared.⁴ The temporal scale of radioactivity from nuclear waste has posed unprecedented questions.⁵ And the socio-political dimensions of the nuclear complex have made anti-nuclear activists, and such critics as Lewis Mumford, Jaime Semprún, or Langdon Winner, warn against its “inherently political” character, entailing the militarization and authoritarian management of society.⁶

How do nuclear technologies become commonplace? How have the borders between exceptionality and normality been drawn and redrawn over the last 70 years in order to make nuclear energy part of everyday life? In *L'Apocalypse joyeuse*, Jean-Baptiste Fressoz argues that the social acceptance of the technologies at the roots of the current environmental crisis has been produced through what he calls “small disinhibitions”, which “include all the *dispositifs* that make possible, acceptable, and even desirable, the technological transformation of bodies, environments, modes of production and forms of life”.⁷ Against the theories of “reflexive modernity”, Fressoz argues that knowledge of the dangers of these technologies had been usually available, but it was actively overlooked through the production of new ignorance, knowledge and sensitivities that led to “a certain modernizing unconsciousness”.⁸ The *dispositifs* devoted to circumvent the resistances to nuclear energy – one of the most globally contested technologies ever – include secrecy and censorship, the inscription of the nuclear in national identity, the management of

⁴ Alexievich, 1997.

⁵ Galison & Moss, 2015. The new temporalities and regimes of historicity opened by nuclear technologies were discussed at a workshop, “Revisiting the Nuclear Order: Technopolitical Landscapes and Timescapes”, organized by Bernadette Bensaude-Vincent, Soraya Boudia and Kyoko Sato (Paris, May 2018). On the history of nuclear waste disposal in the oceans, see: Hamblin, 2008.

⁶ Mumford, 1970; Semprún, 1986[1980]; Winner, 1986. These authors offer different versions of this argument from different intellectual traditions, but all of them emphasize not the risks of exceptional nuclear accidents, but the harmfulness of the everyday normal working of the sociotechnical system.

⁷ Fressoz, 2012, p. 16. In broad terms, Fressoz uses the Foucauldian concept of “dispositif” (sometimes translated in English as “apparatus”) to denote the heterogeneous set of discourses, practices, institutions, norms, etc., that shape power relations, knowledge production, and social behaviour.

⁸ *Ibid.*, pp. 9 and 16.

information after nuclear catastrophes, or the art of governing nuclear criticism.⁹ The production and management of affects, ranging from fear to fun, has also been an important chapter of this story.¹⁰

Since the 1950s, the social acceptance of nuclear energy has not only been mediated by techno-utopian dreams of cornucopian abundance and the awe of the technological sublime, but also by a playful and pleasant familiarization seeking to disassociate it from the bomb and to downplay its dangers.¹¹ From the 1950s Atoms for Peace travelling exhibits, through the early 1960s amateur experiments with irradiated seeds by the enthusiastic members of Muriel Howarth's Atomic Gardening Society, or Japanese pro-nuclear manga comics in the 1970s and 1980s, this heterogeneous set of practices persists to the present day.¹² Two contemporary examples are the cooling tower of the Cruas nuclear power station in the Rhône Valley (one of the most nuclearized regions in the world), with its art mural depicting a naked innocent child playing with water and a shell;¹³ and "Nuclear Boy", a 2011 short animated cartoon that explained the Fukushima disaster to Japanese children in terms of stomach ache and defecation.¹⁴

This special issue analyzes the role of fun and display, broadly construed, in shaping the cultural representation and the material circulation (or non-circulation) of nuclear technologies. In particular, the four case-studies, ranging from the United States and Great Britain to Portugal and Ukraine, and spanning from the 1950s to the 2000s, study how specific forms of public display and playful practices of cultural production were used in different political contexts as means to banalize (or de-banalize) nuclear energy. We will first address our main theoretical and historiographical signposts in relation to the

⁹ See, respectively: Wellerstein, 2010 (although more focused on the bomb than on nuclear energy); Hecht, 2009; Kuchinskaya, 2014; Brown, 2017; Topçu, 2013.

¹⁰ On nuclear fear as a tool of governance in the United States, see: Masco, 2006; Masco, 2008. On its mutations and continuities in the context of the so-called "War on Terror", see: Masco, 2014.

¹¹ On the nuclear sublime, see: Masco, 2004. For a discussion in the wider context of the technological sublime, see: Nye, 1994.

¹² Zwigenberg, 2012; Johnson, 2012; Cirkel-Bartelt, forthcoming 2019; Holmberg, 2016.

¹³ On the domestication (in the sense of nationalization) of nuclear energy through architecture in India and Pakistan, see: Leslie, 2015.

¹⁴ Hecht, 2013. The animation can be found in: <https://www.youtube.com/watch?v=5sakN2hSVxA> (last accessed: 6 February 2019).

keywords of the special issue (banalization, fun, display), and we will then present the ways in which the articles explore them.

The Banalization of Nuclear Technologies

Recent approaches to nuclear history have stressed the dynamic tension between the exceptional and the banal. In *Being Nuclear*, historian of technology Gabrielle Hecht has problematized the “exceptionalist” narratives about the nuclear, and has underlined the changing ontologies of nuclear things. On the one hand, Hecht warns against taking at face-value the contradicting discourses about the exceptional or banal qualities of nuclear technologies. On the other, she analyzes nuclearity as an unstable and contested technopolitical category. Uranium ore, for example, was made a banal mineral (by designating it as non-nuclear) in order to make its circulation as a commodity easier, and meanwhile was made an exceptional nuclear object so that the state where the mines were located gained access to the Board of the International Atomic Energy Agency.¹⁵ In a recent article, Sonja Schmid draws on Hecht’s notion of “nuclearity” and Foucault’s notion of “normalization” to explore from an STS perspective the different approaches to nuclear technologies by what she calls the “security community” (diplomats and policymakers concerned with nuclear weapons) and the “safety community” (scientists, engineers and private companies concerned with nuclear power). She argues that while the risks of nuclear technologies are usually made exceptional by the “security community”, they are routinely normalized by the “safety community”, in the sense that they are considered familiar and controllable, but also in the sense that they are quantified and regulated (to the point of including the management of catastrophes in the standard operations of the industry). According to Schmid, the artificial separation between these two communities of experts, with their different ontologies and practices, is in turn normalized, with the dangerous result of obscuring the shared technological materiality of nuclear weapons and nuclear reactors.¹⁶

In *The Nuclear Borderlands*, anthropologist Joseph Masco has explored the long-term psychosocial effects of the bomb in the United States through an ethnographic study of the nuclear complex in New Mexico. Masco analyzes how the official discourse about the bomb has oscillated between an apocalyptic terror that constantly mobilizes the imminent

¹⁵ Hecht, 2012. See also: Hecht, 2006; Hecht, 2010.

¹⁶ Schmid, 2018.

possibility of human extinction, and a normalization of nuclear weapons that renders them banal. According to Masco, both discourses perform the cultural work of hiding the everyday economic, social and psychological consequences of the nuclear complex, with the goal of preventing critical reflection and political action through either overstimulation or anesthesia.¹⁷ Masco emphasizes how “the US nuclear complex can only appear to be banal because an enormous national-cultural project has worked to make it so”.¹⁸ In this special issue, we explore, for different contexts and scales, and focusing on nuclear energy, how fun and public display contributed to these processes of banalization.¹⁹

Besides these approaches from the social studies of science, “banality”, “banal” and “banalization” have also been used as analytical categories in philosophy and social psychology. In her report of the trial to Adolf Eichmann in Jerusalem, Hannah Arendt famously explored the “banality of evil”. Her argument was that even the most extreme evil is not necessarily executed by exceptional people, but it is many times performed by ordinary people who obey orders and do not question authority.²⁰ The figure of Paul Tibbets and the team of the *Enola Gay*, who dropped the bomb over Hiroshima, could be thought as a nuclear parallel of this moral and political argument.²¹ In a different context, Michael Billig applied the adjective “banal” to nationalism in order to analyze how it is daily reproduced in familiar spaces by everyday objects, such as flags in official buildings, meteorology maps, or the discursive uses of “us” in newspapers, all of which act as constant reminders of nationhood even if they go unnoticed.²² Nuclear toys of the 1950s, such as the “Gilbert U238 Atomic Energy Lab” and the “Uranium Rush” board game, or souvenirs sold at nuclear

¹⁷ Masco, 2006.

¹⁸ *Ibid.*, p. 17.

¹⁹ The articles of this special issue focus mainly on nuclear energy. Although the banalization of nuclear weapons differs from that of nuclear energy (the banalization of the imminent possibility of a nuclear war has its own logic and techniques, as illustrated by Joseph Masco), the fact that they are closely interrelated spheres does not allow for a separate treatment of the subject.

²⁰ Arendt, 1963.

²¹ On Paul Tibbets and the atomic bombing of Hiroshima, see: Kuznick, 2008. A contrasting figure is Claude Eatherly, the pilot of a reconnaissance plane that also participated in the Hiroshima mission. In his correspondence with Eatherly, Günther Anders sees the socially conflicting behaviour of the ex-pilot as a tragic but hopeful sign of mental health and moral responsibility (Anders, 1962[1961]).

²² Billig, 1995. On euphemistic nuclearist uses of language, see: Hilgartner, Bell & O'Connor, 1983.

tourist sites, such as t-shirts with nuclear mushrooms, are part of what could be called “banal nuclearism” –that is, the banal means by which the nuclear complex is reproduced.²³ However, our main focus is not an exploration of banal nuclearism (even if the article by Jaume Valentines-Álvarez and Ana Macaya-Andrés deals with “banal anti-nuclearism”).²⁴ We are rather interested in the processes of banalization of nuclear energy, which can indeed be produced by the banal means just described, but also through displays in museums or other means that go beyond everyday experience.

In this sense, the philosophical treatment of “banalization” by Günther Anders is of interest. A disciple of Husserl and fellow emigré with Arendt, Adorno and Horkheimer, he was not only a quintessential nuclear exceptionalist, but also an engaged anti-nuclear activist.²⁵ In his 1956 book *The Obsolescence of Humankind*, Anders argued that the fact that people lived normal lives and did not revolt against the permanent possibility of nuclear annihilation pointed to what he called a “blindness of the apocalypse”, provoked by the gap between the ability of making the bomb and the ability of imagining its consequences and acting accordingly.²⁶ Regardless of his conviction that the threats of nuclear proliferation were consciously minimized, he theorized explicitly about the concept of “banalization” in the context of a phenomenological analysis of radio and television. In his essay “The World as Phantom and Matrix”, also included in *The Obsolescence of Humankind*, he understood banalization as the process of turning what is strange and distant -in temporal, spatial, or social terms- into something apparently domestic.²⁷ Along these lines, we could think of banalization as an inverted mirror of the concepts of the “uncanny” and “alienation”. The uncanny is something familiar that becomes strange and threatening. And alienation is to

²³ Several nuclear-themed toys, including the ones mentioned, can be consulted here: <https://www.oraui.org/ptp/collection/atomic toys/atomic toys.htm> (last accessed: 11 February 2019). On nuclear tourism, see: Gusterson, 2004; Shaughnessy, 2014.

²⁴ Valentines-Álvarez & Macaya-Andrés, 2019. As it will be developed in more detail below, the authors analyze the use by the Iberian anti-nuclear movement of such banal objects as pins, stickers, or fanzines to contest nuclear energy.

²⁵ The work by Günther Anders has been mostly ignored in the anglophone academic world. One of the very few introductions in English to the thought of Günther Anders is: van Dijk, 2000.

²⁶ Anders, 2011[1956].

²⁷ *Ibid.* For Anders the process of banalization is not opposed to alienation, but the other side of the same coin, because the resulting familiarization (which according to him is necessary to make alienation tolerable) is only apparent.

turn something intimate and our own into something external and objectified.²⁸ The process of banalization would be to make something which is alien and threatening into something familiar and commonplace, thus reducing the level of attention and scrutiny it deserves.

Our point in using the category of banalization is not to imply that the significance of nuclear technologies is necessarily downplayed in exhibitions. As the articles by Alison Boyle, Jaume Sastre-Juan and Tatiana Kasperksi make clear, nuclear energy is often portrayed as a safe and exceptionally benign achievement of human ingenuity.²⁹ However, it is banalized in the sense that it is presented in a familiar light that obscures its dangerous aspects or negative social consequences. Therefore, more than thinking of the pair banal/exceptional as a mutually exclusive opposition, we approach it as a dynamic tension. The goal of this introduction is not to set a rigid definition of banalization, but to sketch the borders of the problem in dialogue with the abovementioned theoretical approaches. The articles explore how the flexible use of this category can illuminate the specific cultural and political processes by which nuclear technologies have been made part of our everyday lives.

Fun and Nuclear Culture

From the 1957 Walt Disney film “Our Friend the Atom” to Matt Groening’s animated sitcom *The Simpsons* (1989-2019), with the shoddy Springfield nuclear power plant, amusement and fun have been part and parcel of the cultural history of nuclearization.³⁰ Sci-Fi films, theatre plays, music, comics, photo-journalism, artworks, or exhibitions have been used by the vast and interdisciplinary literature on “nuclear culture” as sources for analyzing the emotional history of the atom, and how it has shaped mindscapes and landscapes.³¹ Our understanding of these processes, and the very notion of “nuclear culture”, are still under debate. In the 2012 *BJHS* special issue on British nuclear culture

²⁸ This is a heuristical approximation. The concepts of the uncanny and alienation are complex, and the literature from the Freudian and the Marxist traditions, respectively, is vast. On the “nuclear uncanny”, see: Masco, 2006.

²⁹ Boyle, 2019; Sastre-Juan, 2019; Kasperski, 2019.

³⁰ Mechling & Mechling, 1995; Shaughnessy, 2014, pp. 55-67.

³¹ The literature on the cultural history of the nuclear is huge. See, among many others: Boyer, 1985; Josephson, 1996; Henriksen, 1997; Abraham, 2009; Bigg & Hennig, 2009; van Lente, 2012; Hogg & Laucht, 2012; Hogg, 2016. For an overview of recent research in nuclear history in general, see: Kalmbach, 2017. See also the publications by members of the research group “History of Nuclear Energy and Society”: www.honest2020.eu/publications (last accessed: 10 March 2019).

edited by Jonathan Hogg and Christoph Laucht, Jeff Hughes warned against the risk of reifying “nuclear culture” as a monolithic category. Hughes criticized the descriptive literature based on generic catalogues of “nuclear film” or “nuclear fiction”, and asked for contextualized analyses of the production, circulation, and appropriation of specific cultural practices.³² In this line, our goal is not to use “nuclear fun” as an analytical category, as Spencer Weart did with “nuclear fear”.³³ Rather than mobilizing an abstract notion of “nuclear fun”, we stick close to the particularities of our case-studies in order to analyze how situated forms of fun banalized nuclear energy for different political purposes.

As historians of emotions have pointed out, emotions are context-specific social constructions. Nuclear fear, for example, was not the same before and after the Cuban Missile Crisis or the Chernobyl disaster. It was not the same in New York or in Caldas da Rainha (Portugal) –to mention two places discussed in the articles. And it was not the same for a feminist anti-nuclear activist, a plumber at a nuclear power plant, or a member of a methodist church.³⁴ Emotions are also entangled with the social construction of knowledge and ignorance. The fear inspired by a nuclear waste dump being built next to home is not a visceral reaction, but a result of long epistemological processes. And, the other way around, “a great deal of emotion work [is] designed to create the appearance of disinterestedness or objectivity”.³⁵ In the emotional battlegrounds of nuclear history, different regimes of fear and anxiety, but also of fun and pleasure, have been co-constructed in relation to one another with different political goals.³⁶ For example, as shown in the article by Jaume Valentines-Álvarez and Ana Macaya-Andrés, the Iberian anti-nuclear movement used humour to spread fear in relation to nuclear reactors in the 1970s.³⁷ This regime of fear, however, had very little to do with the social anxiety produced by the government of the

³² Hughes, 2012.

³³ Weart, 1988.

³⁴ Examples of analyses of cultural representations of nuclear technologies that take into account gender, class, age, ideology, religion, and racialization can be found, respectively, in: Harvey, 2014, chapter 3; Hughes, 2012; Onion, 2014; Boyer, 1985, chapter 17.

³⁵ Goodwin, Jasper & Polletta, 2001, p. 15.

³⁶ The concept of “regimes of pleasure” comes from: Bennett, 1986. For a use of the concept to analyze the links between “regimes of pleasure” and “regimes of knowledge” in the amusement parks of early twentieth-century Barcelona, see: Sastre-Juan & Valentines-Álvarez, 2016.

³⁷ Valentines-Álvarez & Macaya-Andrés, 2019.

United States to legitimize its military program.³⁸ Likewise, the regimes of pleasure at play in anti-nuclear demonstrations were very different to the ones operating in the children's drawing contests analyzed by Tatiana Kasperski, or in the hands-on exhibits studied by Jaume Sastre-Juan.³⁹ Sociologist Helena Flam has emphasized how "the routine distribution of cementing emotions" such as pride, loyalty, shame or fear upholds social structures and power relations, and how antagonistic social movements develop emotional strategies of their own to counter the official management of affects.⁴⁰ In our articles, we show how fun and pleasure were central in underpinning official nuclear policies, and also in resisting them.

The study of the role of fun in the banalization of nuclear technologies must be placed in the broader context of the history of science popularization. In the last decades, the historiography on popularization has explored how the *mise en scène* of science in heterogeneous spaces, ranging from the halls of museums to the radio waves, was crucial both in epistemological and political terms.⁴¹ This literature has emphasized the role of fun and entertainment in the processes of construction and circulation of knowledge and technologies.⁴² Just as satirical caricatures shaped the circulation of the Darwinian theory of evolution, or the technological sublime of electrical spectacles in World's Fairs played a key role in the process of electrification, so too the use of fun in travelling exhibitions or in the pages of counter-cultural magazines shaped the process of nuclearization.⁴³ In this way, the articles in the special issue can be read as an invitation to reexamine the role of the production of affects in the construction of technological landscapes.

³⁸ Masco, 2006.

³⁹ Kasperski, 2019; Sastre-Juan, 2019.

⁴⁰ Flam, 2005.

⁴¹ For an overview of the literature, debates and evolution of this vast historiography, see: Nieto-Galan, 2016. The project "Les mises en scène des sciences et leurs enjeux politiques et culturels (19e-21e siècles)", coordinated by Andrée Bergeron and Charlotte Bigg, explores the political intersection between science, science policy and science popularization (<https://matap.hypotheses.org/>; last accessed: 9 March 2019).

⁴² Just to cite a few examples, regarding the electric spectacles of the Enlightenment, the Victorian scientific showmanship, and the hands-on science centers of the second half of the twentieth century, see: Bensaude-Vincent & Blondel, 2008; Fyfe & Lightman, 2007; Rader & Cain, 2014.

⁴³ Browne, 2001; Nye, 1990; Adams, 1995. On nuclear energy as a "public technology", see: Trischler & Bud, 2018.

The Politics of Nuclear Display

Always in tension with the secrecy that surrounds them, nuclear technologies have been publicly exhibited from very early on and for different political purposes. In the 1950s, exhibitions were staged all over the world to spread the gospel of the “peaceful atom”.⁴⁴ The commemorative musealization at some sites of nuclear military production in the United States, such as Oak Ridge, was put at the service of “radioactive nation-building”.⁴⁵ The display of working nuclear reactors was an instrument of scientific diplomacy, as in the case of the 1955 United Nations conference in Geneva.⁴⁶ Fairs and museums exhibited nuclear displays for commercial and corporate public relations purposes, from the 1949 British Industries Fair to the 1983 nuclear power section at London’s Science Museum.⁴⁷ Some sites of atomic devastation have also been put on display with contrasting narratives, from the Hiroshima Peace Memorial Park (1954) to the Trinity Test Site, with its famous obelisk (1965).⁴⁸ And the current debates about the potential uses of physical, social, and cultural remains of nuclear energy production raise new political questions around the notion of “nuclear heritage”.⁴⁹

⁴⁴ Forgan, 2003; Schmid, 2006; Zwigenberg, 2012. For an early example in which the military side and the issue of weapons control was not excluded from the defense of nuclear energy, see: Laucht, 2012.

⁴⁵ Molella, 2003; Gerster, 2013. On the concept of “radioactive nation-building”, see: Masco, 2006.

⁴⁶ Krige, 2010.

⁴⁷ Boyle, 2019; Levidow & Young, 1984.

⁴⁸ Gusterson, 2004; Masco, 2006b. Even the exclusion zone of Chernobyl has become a tourist attraction: Stone, 2013; Yankovska & Hannam, 2014. Chernobyl and Prypiat have their own entry in the site “Dark Tourism”: <http://www.dark-tourism.com/index.php/15-countries/individual-chapters/481-chernobyl-a-pripyat-ukraine> (last accessed: 12 February 2019).

⁴⁹ These issues are being studied by the following research groups led by Anna Storm (the first two of them) and Egle Rindzeviciute: “Nuclear Legacies: Negotiating Radioactivity in France, Russia and Sweden” (<https://nuclearlegacies.wordpress.com/>; last accessed 9 February 2019); “Atomic Heritage goes Critical: Waste, Community and Nuclear Imaginaries” (<https://atomicheritage.wordpress.com/>; last accessed 9 February 2019); “Nuclear Cultural Heritage: From Knowledge to Practice” (<https://nuclearculturalheritage.wordpress.com/>; last accessed 9 February 2019). See also: Storm, 2014.

In all these cases, the place of the nuclear in everyday life is at stake. In which ways is the exceptional or banal character of nuclear technologies negotiated through display? The first thing to note is that exhibitions are not banal. Visiting a museum, a heritage site, or the information center of a nuclear power plant, is not an everyday experience. Through the complex processes of selection, decontextualization and resignification, even the most ordinary object is rendered exceptional to some extent by being put on display. But this does not exclude that the dangers and effects of artefacts such as an atom bomb or a nuclear reactor can be banalized by being exhibited. The controversy over the display of the *Enola Gay* at the Smithsonian Institution's National Air and Space Museum, on the occasion of the fiftieth anniversary of the bombing of Hiroshima, illustrates this point.⁵⁰ In one of the hottest episodes of the 1990s "culture wars", the Air Force Association, veterans' organizations, and right-wing journalists accused the curators of presenting the United States as the only aggressor and ignoring their view that the bomb had spared the life of hundreds of thousands of American soldiers. The Smithsonian Institution cancelled the exhibition before its opening, but the plane was finally displayed in a decontextualized way as a nationalistic relic. The struggles over who decided what to exhibit, in what context, with what techniques of display, and through which narrative, show how the display of the *Enola Gay* was not banal at all. But, at the same time, the specific way in which the plane was finally displayed shows that the causes and consequences of the decision to drop "Little Boy" over Hiroshima can be hidden behind an impressive shining silver-plated plane with the US Air Force insignia.

To explore how the mechanisms of banalization are different in exhibitions than in textual or visual media, we engage with museum studies. The literature on the politics of display has analyzed how knowledge, affection, and power are simultaneously produced in ways that have to do with the arrangement of objects in space and the actions performed by the bodies of visitors.⁵¹ What is experienced by sentient bodies moving in space is as important as what is told (or untold) through labels, posters, or audio-guides. It is not the same to examine burned objects at the Hiroshima Peace Memorial Museum in the 1950s, to attend an audiovisual lecture-demonstration in an auditorium built on top of a working nuclear reactor at the New York Hall of Science in the 1960s, or to visit today the "Ground

⁵⁰ Harwit, 1996; Gieryn, 1998; Dubin, 1999, chapter 6. In 1994, the portrayal of the atom bomb and nuclear shelters was also at the center of the "science wars" controversy over the exhibition "Science in American Life" at the National Museum of American History of the Smithsonian Institution (Molella, 2003b).

⁵¹ MacDonald, 1998; Bennett, 2018.

Zero Theater” at the National Atomic Testing Museum in Las Vegas, which simulates an explosion using immersive special effects.⁵² In dialogue with these insights, and adopting a broad notion of display not restricted to museums, the articles of this special issue analyze how different regimes of display were mobilized to banalize nuclear energy.

From Push Buttons to Children’s Drawings

The geographical and chronological diversity of our case-studies offers a wide variety of contexts to analyze the different layers of the cultural processes by which nuclear technologies have been made part of everyday life. This does not mean, of course, that we make any claim to exhaustivity, nor that the particular countries studied (Great Britain, United States, Ukraine, Portugal and Spain) are more suitable than others for illuminating the banalization of nuclear energy. The four articles of the special issue, as well as this introduction, are informed by the collective discussions that took place during the 43rd ICOHTEC Meeting (Porto, July 2016) and the two-day workshop “Nuclear Fun: Banalizing the Atom in Public Display”, organized within Tatiana Kasperski’s Marie Curie project “Technology and Political Change: Nuclear Power in the Post-Soviet Union” (Universitat Pompeu Fabra, Barcelona, June 2017). While drawing on this common background, each of the articles engages with different historiographies and pursues the core concerns of the special issue into the following different directions.

The article by Alison Boyle explores the agnotological dimensions of banalization in the context of the early promotion of nuclear energy in the UK in the late 1940s.⁵³ In her article, Boyle uses the approach of “object biography” in order to follow the movements of a model of Britain’s first experimental reactor (GLEEP) throughout its many lives on display, involving different audiences, regimes of display and technopolitical goals.⁵⁴ The model was built by the Atomic Energy Research Establishment to be put on display at the 1949 British Industries Fair, with the main goal of promoting the commercial export of radioisotopes. In deliberate omissions in its design, the GLEEP model embedded the governmental policies of nuclear secrecy. In November 1949, the model travelled north to be used in a different exhibition, aimed this time at allaying the local concerns over the health effects of the

⁵² Gerster, 2013; Sastre-Juan, 2019.

⁵³ Proctor & Schiebinger, 2008.

⁵⁴ Alberti, 2005.

Windscale reactor, under construction in Cumbria. In this case, the production of ignorance, the concealment of the British weapons program, and the management of public anxiety were intertwined. Finally, Boyle follows the GLEEP model into its permanent home at London's Science Museum, as well as through a trip to the colony of Southern Rhodesia, showing how the official narrative of the peaceful atom played a role in the construction of post-war British identity.

The article by Jaume Sastre-Juan explores the role of the embodied experience of visiting a museum in the banalization of nuclear technologies in the United States in the late 1960s and early 1970s. While nuclear fear has been usually studied through textual and visual sources,⁵⁵ Sastre-Juan engages with the literature on the politics of display in order to analyze the role of tactility and bodily proximity in the nuclear fun at the New York Hall of Science. On the one hand, the push buttons and the cheerful atmosphere of its "atomic playgrounds" associated nuclear technologies to the innocence and domesticity of childish games. On the other hand, the immersive visit to the planned Atomarium, which consisted in an audiovisual show at an auditorium built over a real working research reactor, aimed at taming visitors' fears of living close to a nuclear reactor by situating them safely inside one. At a time in which the nuclear industry was pushing to build nuclear reactors nearer to metropolitan areas (in order to lower the price of transmission costs), eliminating the physical distance between visitors and displays was intended to reduce the affective distance between people and nuclear power plants.

The article by Tatiana Kasperski studies children's artistic contests organized by nuclear power plants' local information centers in order to explore the domestication of nuclear technologies in post-Soviet Ukraine. By analyzing the contents of the drawings, as well as their context of production and exhibition, Kasperski shows how nature, childhood and the nation were mobilized to make nuclear power domestic in a context of post-Soviet nation-building, economic crisis, and attempts at achieving energy independence from Russia. Always with the 1986 Chernobyl disaster as the background, Kasperski points to three interrelated aspects of this process of banalization.⁵⁶ First, the bucolic representations

⁵⁵ Weart, 1988; van Lente, 2012.

⁵⁶ Nuclear accidents, with the industry's efforts to normalize them and the anti-nuclear protests they trigger or reinforce, become battlegrounds in which the processes of banalization and de-banalization of nuclear energy are particularly visible. The outcomes of these processes have varied significantly depending on the accident and the different social, cultural, and political contexts (for example, the effects of Three Mile Island, in the peak of the global protests against nuclear energy, were not the same than the effects of Fukushima,

of nuclear power plants tried to present them as existing in harmony with nature, many times portrayed as a protective maternal figure. Second, the naive style of the drawings linked nuclear energy to the innocence and hopefulness associated with children. Third, the folk motives (national costumes, religious iconography, the figure of the Cossack) nationalized a formerly “Soviet-Russian” technology in an attempt to reconcile nuclear modernity with a revived national tradition. Finally, Kasperski reflects on what it meant to domesticate nuclear technologies for the inhabitants of “nuclear towns”, for many of whom these had always been a feature of the domestic landscape.⁵⁷

As a counter-point to the other case-studies, the article by Jaume Valentines-Álvarez and Ana Macaya-Andrés emphasizes how fun was not exclusively used to banalize nuclear technologies, but also to de-banalize them in order to protest against nuclear policies. In particular, they focus on what they call “anti-nuclear fun” (the use of humour and amusement in order to raise awareness of the dangers of nuclear technologies) in the Iberian Peninsula in the 1970s and 1980s, when grassroots anti-nuclear movements peaked after the fall of the Portuguese and Spanish dictatorships. Unlike the other articles, which deal in different ways with spaces dedicated to display, Valentines-Álvarez and Macaya-Andrés focus on the mundane things and daily spaces of what could be called, with Michael Billig, “banal anti-nuclearism”. Their analysis of the production, contents and transnational circulation of anti-nuclear “thin things” such as pins, stickers, badges, cartoons, posters, zines, or music performances, dialogs with the history of emotions in protest movements. The authors highlight the epistemological significance of humour and other playful cultural practices in the process of familiarizing society with the exceptional and daily risks of the “peaceful atom”.

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Even though the world is highly nuclearized in terms of nuclear power, and the current prospects for nuclear disarmament remain bleak, the public debate, the perception of risk, and the political contestation are substantially lower than a few decades ago. Together with many other reasons, this is, in part, the result of historical processes of banalization like the ones analyzed in this special issue. But the disinhibition, in Jean-Baptiste Fressoz’s terms, is not yet complete. Actually, if we feel uneasy with the contrast

in a moment of decay of the anti-nuclear movement, but when Chernobyl’s disaster was in everyone’s mind).

⁵⁷ For an analysis of the social, cultural and political historical dynamics of segregated “plutonium” cities in the United States and the USSR, see: Brown, 2013.

between the silence in Pripyat and the joy in Wunderland Kalkar, with which we started this introduction, it is because the banalization of nuclear energy has not been completely successful. At a time in which the shadow of the ecological catastrophes in the so-called Anthropocene has resurrected the promotion of nuclear power as a clean and redeeming energy, we hope that this special issue can help in taking fun seriously in the present and future debates about such a deadly serious issue.⁵⁸

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⁵⁸ On the eco-modernist discourses about nuclear power as a techno-fix for climate change, see: Hamilton, Bonneuil & Gemenne, 2015. For a critical analysis of the discourses about the Anthropocene, see: Bonneuil & Fressoz, 2016[2013].

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