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## The spatial inscription of science in the 20th century

Andrée Bergeron, Charlotte Biggß

### Abstract

With their landmark architectures, exhibitions and museums of science and technology partake in the spatial inscription of science in twentieth century landscapes. Unlike other beacons of progress, exhibitions and museums of science and technology double up, inside, as material arrangements of objects, visuals and texts aiming to confer meaning onto the modern world. They both embody and seek to order the spectacle of modernity while often being deployed with the aim of promoting particular visions of social and material progress. An approach sensitive to the material, spatial and experiential dimensions of displaying science and technology suggests that exhibitions and museums were in the twentieth century crucial sites for reflecting upon and promoting particular futures.

### Keywords

exhibition, museum, space, material, urban, architecture, design, future

*Such was the aim of the experiments: to project emissaries into Time,  
to call up the past, and to call the future to the help of the present.*

Chris Marker, *La Jetée*<sup>1</sup>

*La Jetée*, Chris Marker's striking photo-novel of 1962, is many things at once: a love story; an experimental science-fiction narrative about time-travel experiments carried out after a nuclear holocaust; a meditation on photography, film, memory and identity. It is also a visual reflection on the materiality of modernity.

It begins and ends on the viewing platform of the brand new Paris Orly airport, an exemplary 1960s modernist structure celebrating the coming age of mass air travel.<sup>2</sup> In the film, however, Orly airport is soon destroyed in the wake of World War III. Survivors are forced into the underground galleries of the Palais de Chaillot, where they subsist alongside ancient, damaged statues. Later, the nameless main character, subjected

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<sup>1</sup> "Tel était le but des expériences : projeter dans le Temps des émissaires, appeler le passé et l'avenir au secours du présent." *La Jetée*, directed by Chris Marker, Argos films, 1962. All translations are ours unless otherwise specified.

<sup>2</sup> See Vanessa Schwartz, "Dimanche à Orly. The Jet-Age Airport and the Spectacle of Technology between Sky and Earth," *French Politics, Culture & Society* 32:3 (2014): 24–44.

to experiments by shady scientists, travels in mind from the Palais' dark corridors to happier times, spent with a woman in the sunny gardens of the Paris Natural History Museum, and contemplating "eternal," taxidermied animal displays in the Museum's Zoological Gallery.

This is also a film about museums: the broken statues belong to the Musée des monuments français, the first French museum, invented to display the remains of revolutionary iconoclasm.<sup>3</sup> In the 1960s this Musée was housed in the Palais de Chaillot, itself a remnant of the Paris 1937 international exhibition. Museums were not mere backdrops for Chris Marker. As in the earlier film he made with Alain Resnais and Ghislain Coquet, *Les Statues Meurent Aussi*, Marker questioned with insistence the meaning of the museum.<sup>4</sup> *La Jetée* asks: would the museum of the future be a house for stuffed animals and amputated statues, the frozen witnesses of pre-apocalyptic times? Would it literally be, in its underground storage spaces, a shelter for the remainder of humanity? Or would the technology of time-travel turn memory itself (and by extension Marker's filmic photo-album) into a new kind of museum?

Modernity in its industrialized, urban, progressive guises has since the nineteenth century been the object of keen public display by its promoters in Western, westernizing and colonized nations. Faith in science and technology was materially, durably etched in landscapes, from train stations and airports to infrastructures of communication and energy production, from the monumental architectures of institutions of learning and of industrial might to the urban planning projects that did not always remain utopias, and even to the ruins caused by increasingly powerful technologies of war.<sup>5</sup>

With their landmark architectures, exhibitions and museums of science and technology partook centrally in the spatial inscription of modernity, and continue to do so into our own age of newfangled science centers designed by star architects. Unlike other beacons of modernity (but like Marker's photo-novel itself), exhibitions and museums of science and technology double up, inside, as material arrangements of objects, visuals and texts aiming to confer meaning onto the modern world. They both embody and seek to order the spectacle of modernity that Baudelaire and others after him claimed was one of its very hallmarks, while promoting particular visions of the future.

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<sup>3</sup> See Dominique Poulot, *Musée, Nation, Patrimoine, 1789–1815* (Paris: Gallimard, 1997).

<sup>4</sup> *Les Statues Meurent Aussi*, directed by Chris Marker, Ghislain Cloquet and Alain Resnais. Tadié-Cinéma, 1953.

<sup>5</sup> See Thomas Hughes, *Networks of Power. Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983); Sophie Forgan, "The Architecture of Science and the Idea of a University," *Studies in History and Philosophy of Science* 20:4 (1989): 405–434; Antoine Picon, *French Architects and Engineers in the Age of Enlightenment* (Cambridge: Cambridge University Press, 1992) and later publications; Peter Galison and Emily Thompson (eds.), *The Architecture of Science* (Cambridge, Mass.: MIT Press, 1999); Lino Camprubi, *Engineers and the Making of the Francoist Regime* (Cambridge, Mass.: The MIT Press, 2014); Christian Hottin, *Les Sorbonne. Figures de l'Architecture Universitaire à Paris* (Paris: Publications Universitaires de la Sorbonne, 2015); Myriam Baron, Armelle Choplin, Matthieu Delage, Leila Frouillou and Loïc Vadelorge, "L'espace universitaire francilien entre logiques planificatrices et pratiques étudiantes," *Données urbaines* 7 (2015): 98–106; Sonja Smid, *Producing Power. The Pre-Chernobyl History of the Soviet Nuclear Industry* (Cambridge, Mass.: MIT Press, 2015); Stuart Leslie, "Atomic Structures: The Architecture of Nuclear Nationalism in India and Pakistan," *History and Technology* 31:2 (2015): 220–242; Stuart Leslie, *The Architects of Modern Science* (Pittsburgh: University of Pittsburgh Press, forthcoming).

## Thinking and writing in and with space

One way of exploring the meaning and significance of museums and exhibitions is to think of them as projects that essentially seek to materially inscribe science and technology in space. Long before exhibitions came to be perceived as media, museums were conceived as devices creating meaning through carefully-produced arrangements of objects in dedicated spaces.<sup>6</sup> Ordering objects and specimens in space has long served the purpose not only of reflecting the current state of knowledge, but has been considered as a technique for producing learned knowledge. The unique materiality and organization of a building, a room, of a showcase frames spaces in a way that enables a correspondence to be established between the physical arrangements of artefacts and scientific conceptualizations.<sup>7</sup> This is perhaps most obvious in natural historians' careful layout of botanical gardens and plant collections that help produce and embody their systems of species classification. Linnaeus characteristically wrote in 1790 that "order, the determination and the certain state of the objects are indispensable conditions for a [natural history] collection to have the degree of utility that can make it precious and confer onto it great interest."<sup>8</sup> This vision was powerfully expressed in Paul Otlet's Musée international project, discussed here by Yann Giraud and Loïc Charles, but also in the alignment of machines in the New York Museum of Science and Industry spaces in the early 1930s examined here by Jaume Sastre-Juan, that materialized an evolutionary conception of industrial innovation.<sup>9</sup>

The characteristic form of the exhibition can perhaps be understood as a kind of *writing in space*. The product of an intention, that of its conceptors, an exhibition possesses all the attributes of a text — a text made of objects rather than signs, that arises from the installation (in the sense used in contemporary art) in a given space, of objects chosen, brought in and erected specifically to be experienced.<sup>10</sup> This literal *museo-graphy* is

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<sup>6</sup> On exhibitions as media, see Jean Davallon, "Pourquoi Considérer L'exposition Comme Un Média?," *Médiamorphoses* 9 (2003): 27–30; Roger Silverstone, "Museums and the Media. A Theoretical and Methodological Exploration," *The International Journal of Museum Management and Curatorship* 7 (1988): 231–241; Miriam R. Levin, "Museums as Media in the Emergent Global Context," *Curator: the Museum Journal* 49/1 (2006): 31–35. On museum spaces see, e.g. Suzanne MacLeod, *Reshaping Museum Space* (Abingdon: Routledge, 2005); Sophie Forgan, "Building the Museum. Knowledge, Conflict and the Power of Place," *Isis* 96:4 (2005): 572–585.

<sup>7</sup> See John Pickstone, "Museological science? The Place of the Analytical/Comparative in Nineteenth-century Science, Technology, and Medicine," *History of Science* 32:2 (1994): 111–138; Anke te Heesen and Anette Michels, *Auf/Zu. Der Schrank in den Wissenschaften* (Berlin: Akademie Verlag, 2007).

<sup>8</sup> "L'ordre, la détermination, et un certain état des objets sont des conditions indispensables pour qu'une collection [d'histoire naturelle] ait le degré d'utilité qui peut la rendre précieuse et lui mériter un grand intérêt." Jean-Baptiste de Lamarck, "Mémoire sur les Cabinets d'Histoire Naturelle, et particulièrement sur Celui du Jardin des Plantes, contenant l'Exposition du Régime et de l'Ordre qui conviennent pour que celui-ci soit vraiment Utile" (1790), reprinted in Marcel Landrieu, *Lamarck, Le fondateur du transformisme: sa vie, son oeuvre* (Paris: Société Géologique de France, 1909), pp.42–51.

<sup>9</sup> Loïc Charles and Yann Giraud, "Seeking the 'Museum of the Future': Public Exhibitions of Science, Industry, and the social, 1910–1940," *History of Science* (this issue); Jaume Sastre-Juan, "'Science in Action': The Politics of Hands-on Display at the New York Museum of Science and Industry," *History of Science* (this issue).

<sup>10</sup> These objects are very diverse in nature and include specimens, instruments, artefacts, texts, images in motion or not, devices conceived expressly for the exhibition, scenographic elements, plinths, etc.. On exhibitions as texts, see Jean Davallon, "L'écriture de l'exposition: Expographie, Muséographie, Scénographie," *Culture et Musées* 16:1 (2010): 229–38; Jean Davallon, *L'Exposition à l'œuvre. Stratégies de communication et médiation symbolique* (Paris: l'Harmattan, 1999), p.67.

deciphered by setting the bodies of visitors in motion.<sup>11</sup> The movement of bodies through space transforms the intention of the exhibition makers into an array of unique narratives.<sup>12</sup> The exhibition, and by extension the museum, is then not only the place where "spatialized thoughts" materialize, as Martha Fleming aptly puts it when she describes the chain of work that goes into making an exhibition, but it is also the place where visitors' own "spatialized thinking" unfolds, as they wander through the show.<sup>13</sup> Conceiving of science exhibitions and museums as spatial inscriptions, in other words, acknowledges and supports the view that these objects can be analyzed in a particularly fruitful way by focusing on their spatial, material and experiential dimensions.<sup>14</sup> It is no coincidence that two of the five authors in this collection are also exhibition makers, designer and curator of collections, whose historical work is informed by their experience of dealing with objects, spaces, and the experiences these can convey.

A further way of thinking of science museums and exhibitions as spatial inscriptions is to consider them, in the spirit of Marker's photo-novel, within the physical and cultural landscapes in which they are embedded. Going back to the original definition of the museum not only as a collection of artefacts but also as designating the building housing it, we can explore the significance of particular architectural choices, such as the collaboration between Otlet and Le Corbusier here, or of their specific localizations in the economy of the city and the nation.<sup>15</sup> How were perceptions of science and technology transformed when their display moved in New York from the Scientific American to the Daily News and later to the RCA buildings in the Rockefeller Center?<sup>16</sup> How did these structures contribute to embody and promote particular visions of science and society? Focusing on materiality and space helps situate museums and exhibitions in the wider cultural, political and economic realm, in keeping with geographical approaches to thinking about the physical and imagined spaces

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<sup>11</sup> Davallon, *L'Exposition à l'Oeuvre*, p.7 (note 10).

<sup>12</sup> Serge Chaumier, *Traité d'Expologie : Les Ecritures de l'Exposition* (Paris: La Documentation française, Coll. Musées-Mondes, 2012), p.31.

<sup>13</sup> Martha Fleming, "Embodied Ephemeralities: Methodologies and Historiographies for investigating the Display and Spatialization of Science and Technology in the Twentieth Century," *History of Science* (this issue).

<sup>14</sup> As developed by ethnographic and material approaches to the museum by Tony Bennett, *The Birth of the Museum. History, Theory, Politics* (London: Routledge, 1995); Sharon MacDonal, *Behind the Scenes at the Science Museum. Materializing Culture* (Oxford and New York: Berg, 2002); Mirjam Brusius and Kavita Singh, *Museum Storage and Meaning. Tales from the Crypt* (London: Routledge, 2018). See also the references given in Martha Fleming's contribution in this issue.

<sup>15</sup> Charles and Giraud, "Seeking the 'Museum of the Future'" (this issue). On the architecture of museums see Sophie Forgan, "The Architecture of Display. Museums, Universities and Objects in Nineteenth-Century Britain," *History of Science* 32:2 (1994): 139–162; Carla Yanni, *Nature's Museums. Victorian Science and the Architecture of Display* (Baltimore: Johns Hopkins University Press, 2000); Friedrich von Bose, *Das Humboldt-Forum. Eine Ethnographie seiner Planung* (Berlin: Kulturverlag Kadmos, 2016); Michaela Giebelhausen, "Museum Architecture: A Brief History," in Sharon Macdonald (ed.) *A Companion to Museum Studies* (Oxford: Blackwell, 2006), pp. 223–44. On the urban contexts of science and technology see Sven Dierig, Jens Lachmund, and Andrew Mendelsohn (eds.), *Science and the City, Osiris* 18 (2003); Robert Kargon and Arthur Molella, *Invented Edens. Techno-Cities of the Twentieth Century* (Cambridge, Mass.: The MIT Press, 2008); Oliver Hochadel and Agustí Nieto-Galan (eds.), *Barcelona: An Urban History of Science and Modernity, 1888–1929* (London and New-York: Routledge, 2016); Oliver Hochadel and Agustí Nieto-Galan (eds.), *Urban Histories of Science. Making Knowledge in the City, 1820–1940* (New York: Routledge, 2018).

<sup>16</sup> Sastre-Juan, "Science in Action" (this issue).

that science and technology inhabit.<sup>17</sup> Conversely, such an approach anchors the analysis of broad political and cultural transformations involving science and technology in the concreteness of particular cases and practices, not only discourses. A wonderful example is provided here by Pedro Raposo's analysis of the visually jarring but ideologically coherent juxtaposition, just outside Lisbon, of the Manuelino-style Jerónimos Monastery housing the Portuguese Maritime Museum with the mid-1950s modernist building of the Calouste Gulbenkian Planetarium, two institutions charged by the Salazar regime with extolling Portugal's glorious maritime history.<sup>18</sup> Yet, as the authors here are keen to remind us, material devices, from the push-button interactive display and standardized typographic symbol to stone-heavy buildings, however immutable they might seem, can be invested with many different, even contradictory, meanings and purposes.

### Exhibiting science and technology in the twentieth century

In the nineteenth century, displays of science and technology showcased progress while often serving concomitantly as tools for maintaining social order or fostering social reform. Exhibitions and museums were in part employed as "means of social adjustment" to help keep in check potential unrest in the wake of the rapid growth of urban populations and changes brought about by industrialization and colonization. They were designed to help populations make sense of, and accept, the massive contemporary transformations of labor and social relations.<sup>19</sup>

The display of science and technology in dedicated spaces continued to be dominated in the twentieth century by narratives of progress, both material and social, but with marked shifts in form, context and function. It is this relatively less studied period that this collection of essays examines. This was a period of economic and political upheaval, with two World Wars and the Great Depression and later the rise of consumerism and leisure societies, but also a transformative one in the cultural realm with, in particular, the modernist movement in the arts and architecture.

The contributions brought together in this special issue focus on the middle decades of the twentieth century in a variety of (regrettably only) Western contexts, from New York, Brussels, Vienna, and Chicago in the 1920s to 1940s to Lisbon and Milan in the 1940s to mid-1960s.<sup>20</sup> Three distinct projects are examined, that all

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<sup>17</sup> See Jon Agar and Crosbie Smith (eds.), *Making Space for Science. Territorial Themes in the Shaping of Knowledge* (London: Palgrave Macmillan, 1998); Christian Jacob, *Qu'est-ce qu'un Lieu de Savoir?* (Marseille: OpenEdition Press, 2014) <https://books.openedition.org/oep/423?lang=en>.

<sup>18</sup> Pedro Raposo, "The Sphere and the Dome: The Calouste Gulbenkian Planetarium in Lisbon and the imperial Myth of the Estado Novo," *History of Science* (this issue).

<sup>19</sup> Simon J. Knell, "Museums, Reality and the Material World," in Simon J. Knell (ed.) *Museums in the Material World* (London and New York: Routledge, 2007), pp.1–28, 4; Miriam Levin, Sophie Forgan, Martina Hessler, Robert Kargon and Morris Low, *Urban Modernity. Cultural Innovation in the Second Industrial Revolution* (Cambridge, Mass.: The MIT Press, 2010); Robert H. Kargon, Karen Fiss, Morris Low, and Arthur P. Molella, *World's Fairs on the Eve of War: Science, Technology, and Modernity, 1937–1942* (Pittsburgh: University of Pittsburgh Press, 2015) pp.1–6; Elena Canadelli, Marco Beretta and Laura Ronzon (eds.), *Behind the Exhibit: Displaying Science and Technology at the World's Fairs and Museums in the Twentieth Century* (Washington D.C.: Smithsonian Institution Scholarly Press, 2019).

<sup>20</sup> More work needs to be done beyond this geographical remit, as for instance has begun for Japan with the work of Morris Low and Sophie Houdart. Morris Low, "Atoms for Peace in Brussels and Osaka: World's Fairs

engaged with these transformations: Loïc Charles and Yann Giraud study Otto Neurath and Paul Otlet's plans for various museums of the future, Jaume Sastre-Juan analyzes the successive lives of the New York Museum of Science and Industry, while Pedro Raposo examines the *mises en scène* of astronomical and maritime history by the Estado Novo regime in Portugal. The issue closes with Martha Fleming's historiographical and methodological meditation about researching and writing about twentieth-century exhibitions of science and technology.

The articles in this collection support the scholarship suggesting that by the early twentieth century, most museums conceived their primary functions to be less collecting and knowledge production than exhibiting, spectacle and procuring pleasure as well as education to its visitors, culminating with the collectionless museum that is the Science Center.<sup>21</sup> At the same time, museums and exhibitions continued to belong to a set of "cultural innovations" that fed and put on display a "culture of change" oriented towards the future, considered as a characteristic of modernity, that they often sought to make palatable to populations.<sup>22</sup> But the great exhibitions of the mid-twentieth century departed markedly from earlier ones in that they promoted ideologies rather than technologies, a form of "propaganda warfare" that preceded or substituted for actual warfare between increasingly polarized models of society, as demonstrated by the Estado Novo efforts in Portugal or the fascist E42 exhibition project for Rome.<sup>23</sup> In the twentieth century, exhibitions of science and technology partook in the great political and cultural battles of the age, they embodied different ideas about the place of science and technology in society while seeking to shape a new kind of citizen, e.g. Neurath's social museum idea first realized in the red Vienna of the 1920s, or the consumerist citizen promoted by the later installment of the New York museum as well as the 1939 universal exhibition in the same city.<sup>24</sup>

### Searching for the museum of the future

The evolving political, geopolitical and economic contexts, the rise of late capitalist consumer cultures, leisure and mass media gave a distinct flavor to museums' modernity in the course of the twentieth century. Regardless of the narratives proposed, they all embodied and promoted visions of modernity that always intertwined knowledge, materiality and societies. Thereby they all in one way or another engaged with the future. The different incarnations of the New York Museum of Science and Technology, like Neurath's and Otlet's

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and the Shaping of Japanese attitudes to Nuclear Power," in Arthur Molella and Scott Gabriel Knowles (eds.), *World's Fairs in the Cold War: Science, Technology and the Culture of Progress* (Pittsburg: University of Pittsburgh Press, 2019), pp. 46–54; Sophie Houdart, *L'Universel à Vue d'Oeil: anthropologie de l'Exposition Internationale Japonaise Aichi* (Paris: Pétra, 2013).

<sup>21</sup> See Sharon MacDonald, "Exhibitions of Power and Powers of Exhibitions. An Introduction to the Politics of Display", in Ibid. (ed.), *The Politics of Display. Museums, Science, Culture* (New York: Routledge, 1997); Anke te Heesen, *Theorien des Museums zur Einführung* (Hamburg: Junius Verlag, 2012); Karen Rader and Victoria Cain, *Life on Display. Revolutionizing U.S. Museums of Science and and Natural History in the Twentieth Century* (Chicago: University of Chicago Press, 2014).

<sup>22</sup> Levin et al., *Urban Modernity* (note 19).

<sup>23</sup> Kargon et al., *World's fairs*, p.6 and pp.57-82 (note19); see also Geert Somsen, "Science, Fascism, and Foreign Policy: The Exhibition 'Scienza Universale' at the 1942 Rome World's Fair," *Isis* 108:4 (2017): 769-791.

<sup>24</sup> Charles and Giraud, "Seeking the 'Museum of the Future'" (this issue); Sastre-Juan, "'Science in Action'" (this issue).

projects, were explorations both of the future of science, technology and society, and of the future of the museum.<sup>25</sup> The twentieth century ushered the age of the "museum of the future", as elaborated by a long series of manifestoes starting with G. Brown Goode's "Museums of the Future" text of 1901 (of course, the museum of the future is also a museum, currently under construction in Dubai).<sup>26</sup>

While the recurrent and by now clichéd association of the future with science and technology, as put on show in an exhibition, or better still a Science Center, might seem to speak of a fairly consensual idea about the future and about museums, they can in fact be seen to be responses to ambivalent attitudes in society. For many, the hope placed in science and technology was tarnished in the wake of the first and second World Wars, and later still with the awareness of environmental damage, making it increasingly difficult to sustain simple progressive narratives.<sup>27</sup> "Cultural innovation" could also mark an exploratory attitude towards what could and should be said about science and technology and by what means, as Neurath and Otlet's eminently experimental enterprises demonstrate.<sup>28</sup> Museums of the future were crucial as omnipresent horizons for many actors, whether they eventually materialized or not. To this day, museums enrolling and showcasing science and technology speak both to and of the future. The vast literature written to this day by museum professionals about the future of the museum, often in the form of manifestoes, continues to promote competing visions of the modern citizen, society and the museum in an age that always remains to be realized.<sup>29</sup>

This also was a period of soul searching by professionals about the forms and functions of science and technology exhibits, as they were confronted, as cultural forms of expression, with the rise of new ways of medializing science and technology, with the mass media of radio, cinema and later television. From advertising techniques in the New York museum to Neurath's interest in visual forms of education using design for members of the public used to watching films, and to Otlet's reflection about the modularity and standardization of exhibition components, technologies of communication were crucial as alternatives or as potential instruments for twentieth-century exhibitions of science and technology.<sup>30</sup> This warrants a revision of the simple narrative of the rise of the Science Center and interactivity in the twentieth century, which as Jaime Sastre-Juan persuasively

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<sup>25</sup> Charles and Giraud, "Seeking the 'Museum of the Future'" (this issue); Sastre-Juan, "'Science in Action'" (this issue).

<sup>26</sup> G. Brown Goode, "Museums of the Future," *Annual Report of the Regents of the Smithsonian Institution: Report of the U.S. National Museum*, Pt. 2 (Washington DC: Government Printing Office, 1901). On the new museum movements see for instance Rader and Cain, *Life on Display*, chapter 1 or François Mairesse, "La belle histoire – aux origines de la nouvelle muséologie," *Publics & Musées* 17-18 (2000): 33–56.

<sup>27</sup> On science, technology and futures, see, e.g., John Krige and Jessica Wang (eds.), *Nation, Knowledge, and Imagined Futures: Science, Technology, and Nation-Building, Post-1945*, special issue of *History and Technology* 31:3 (2015); Michael Gordin, Helen Tilley, and Gyan Prakash, *Utopia/Dystopia. Conditions of Historical Possibility* (Princeton and Oxford: Princeton University Press, 2010); Sheila Jasanoff and Sang-Hyun Kim (eds.), *Dreamscapes of Modernity. Sociotechnical Imaginaries and the Fabrication of Power* (Chicago: University of Chicago Press, 2015); Amanda Rees and Iwan Rhys Morus, *Presenting Futures Past. Science Fiction and the History of Science*, *Osiris* 34:1 (2019).

<sup>28</sup> Charles and Giraud, "Seeking the 'Museum of the Future'" (this issue).

<sup>29</sup> On historical vs. professional discourses on modern museums, see Sally Gregory Kohlstedt, "Thoughts in things. Modernity, History, and American History," *Isis* 96 (2005): 586-601.

<sup>30</sup> Charles and Giraud, "Seeking the 'Museum of the Future'" (this issue); Sastre-Juan, "'Science in Action'" (this issue).



argues here, is at best reductive.<sup>31</sup> "Interactive" devices could be of many kinds and serve very different purposes, but they all engaged with the future through the modern media of their times.

Chris Marker's *La Jetée* used the medium of the photo-novel to interrogate how both in museums and in films intricate webs of history, memory and anticipation were woven. In his last works, Marker chose to invest digital spaces, while continuing to engage with the museum world that had been his childhood passion. In 1997 he dedicated one of the seven zones of the interactive multimedia installation *Immemory* to a personal and imaginary museum that visitors could freely roam through.<sup>32</sup> In 2008, commissioned by the Zurich Museum für Gestaltung (design museum), he created the *Ouvroir* with the help of artist Max Moswitzer within the *Second life* metaverse, convinced that cyberspace was the ideal space for memory in the digital era. Should we see here the realization of "Neurath's and Otlet's dream of a flexible, boundaryless and reproducible museum"?<sup>33</sup> In any case, Marker here again questioned in a premonitory way the future of the museum in its material form and as a cultural technique. When the crisis brought about by COVID-19 forced the temporary closure in 2020 of cultural institutions, the move to occupy online space accelerated. The International Council of Museums (ICOM) recommended following the advice of the Triennale's artistic director Lorenza Baroncelli to seize the crisis as "an opportunity to experiment with expressive languages that in a regime of normality we would never have had the courage to experiment" with.<sup>34</sup> ICOM produced a real-time online repository of initiatives born during the confinement, advocating putting collections online, the organization of virtual tours, a stronger presence on social media, the organization of Pinterest-curated exhibitions or increasing audience through the organization of social media competitions. Will the museum of the (not so far) future see these institutions that are, after all, repositories of our material culture undergo a paradoxical dematerialization of its spaces through modern technologies? Or perhaps rather, more accurately, should this process been grasped as yet another re-mediation of the cultural technique of exhibiting science and technology using the modern the tools and spaces of the age?<sup>35</sup>

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The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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<sup>31</sup> Sastre-Juan, "Science in Action" (this issue).

<sup>32</sup> The original installation is now part of the Georges Pompidou National Museum of Modern Art collections (inventory n° AM 1997-253 (232)). A Flash version of *Immemory* is available on the Gorgomancy website: Chris Marker, "Immemory" Gorgomancy, <<http://www.gorgomancy.net/ImmemoryEnglish/index.html>> (26 October 2020).

<sup>33</sup> Charles and Giraud, "Seeking the 'Museum of the Future'" (this issue).

<sup>34</sup> ICOM, "How to reach your public remotely" <<https://icom.museum/en/covid-19/resources/how-to-reach-your-public-remotely/>> (26 October 2020).

<sup>35</sup> On remediation, see the classic Jay Bolter and David Grusin, *Remediation. Understanding New Media* (Cambridge, Mass.: The MIT Press, 1998).