



The permanent Telecommunications gallery at MUST. © Museo Nazionale Scienza e Tecnologia Leonardo da Vinci, 2024

Introduction

Notes on Memory and Museums of Science and Technology

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In 2024, the 150th anniversary of the birth of Guglielmo Marconi (1874-1937) prompted a necessary reflection on the Italian cultural heritage related to this inventor, entrepreneur, and scientist. Drawing on the history and collections of the Museo Nazionale Scienza e Tecnologia Leonardo da Vinci di Milano (MUST for brevity), this volume brings together the results of this collective effort. Marconi's biography and the history of his contribution to the development of wireless telecommunications have been explored in detail through countless analysis and accounts, featured in books, magazines, television programmes, documentaries, and exhibitions.¹ Within the framework of MUST, Marconi's history has been represented through its collections and a variety of interpretative tools.² By inquiring into how these representations were historically constructed and how narratives around Marconi collections can be reinterpreted, this volume addresses the broader question of how we remember and narrate the past of technoscience.

This text was translated from the Italian original version and then it was partially elaborated for the benefit of international readers. As a consequence, some concepts and literature references are different from the Italian version of the introduction.

1 A huge number of biographies on Marconi have been published since he was in his twenties: the Biblioteca Museo Nazionale Scienza e Tecnologia Leonardo da Vinci holds many of them. Here, I will only mention the well-documented works by Raboy 2016, about Marconi's personal life, and by Hong 2001, about the inventor's actual contribution to physics and to the development of wireless technologies.

2 The telecommunications permanent gallery was revised multiple times between 1956 and 2010. The principal curator was Franco Soresini, joined in the 2000s by Massimo Temporelli, with later contributions from Luca Reduzzi and myself. In 2024, it was decided to experiment with a form of a 'sound exhibition' by producing a six-episode podcast (see *infra*).

The relationship with the past, with its material and symbolic layers, is a daily dimension for museums focusing on history, archaeology, anthropology, and art. But science and technology are typically focused on current technoscience, with its demands for expertise, timeliness and, sometimes, urgency. In these institutions, the dimension of collective memory – taken for granted in other types of museums – is often underestimated. These museums – which I will briefly name ‘technoscientific museums’ – constantly work to fulfil their mission of engaging citizens in contemporary technoscientific processes or, conversely, advocating for citizens’ concerns within the expert community, thus present and future concerns are at the centre of their work. However, these museums are also characterised by an institutional mandate to hold and preserve material culture, archival documentation, and library collections related to the historical evolution of technoscience.³

Compared to other memory institutions, collective memory here is a matter that is hidden in the deepest layer of the cultural mission. Anniversaries and commemorations have the power to bring it to the surface and to stimulate questions about its nature.

Evelina Christillin and Christian Greco (respectively the president and the director of the famed Museo Egizio in Turin) argued that the culture of memory arises from

the practices of remembering the deceased, which unfold in two dimensions: the ‘retrospective’, characterised by the *pietas*, a personal effort to ensure that certain figures are not forgotten, and the ‘prospective’, involving glorification and the construction of their fame (Christillin, Greco 2021, 4).

Which specific manifestations of *pietas* and glorification can technical-scientific museums elicit with respect to Marconi and other historical personalities? Which kind of material heritage – artefacts and documents – has been collected in Marconi’s name and entrusted to transcend his own time, perpetuating the tale of his achievements? Why these specific elements? How do we understand the complex history of wireless innovation by drawing on these collections? And which kind of collective imagination of technoscience emerges from this act of ‘remembering together’ an illustrious, deceased inventor (as the etymology of *commemorate* suggests)?

Starting from these questions, the volume first aims to bring the reflection to a museological and meta-thematic level, exploring how over the years MUST has kept the story of the ‘father of radio’ (as many still call Marconi, at least in Italy) relevant. The authors were invited to revisit episodes in the history of wireless communication by focusing their investigations on the traces of Marconi’s earthly passage preserved at MUST, as well

³ The category of museums of science and technology is historically fluid and loosely formalised, as highlighted by Canadelli, Di Lieto 2024 and Spada 2024. I will use ‘technoscience’ instead of ‘science and technology’ when I speak of the general cultural domain in which those museums intervene. The term has been used in science and technology studies (STS) for almost four decades, since it was proposed by the philosopher Bruno Latour to underline the interplay of the production of specialised knowledge and the technological development (1987, 29). I use ‘technoscientific museums’ in order to stress that I am referring specifically to those museums dealing with technological artefacts as the material heritage of scientific practices and artisanal/industrial historical processes. I refer to institutions that, in the early twentieth century, positioned themselves as heirs to the grand universal exhibitions, representing ‘progress’ and ‘modernity’ through the display of artefacts symbolising the latest scientific, technological, and industrial achievements, alongside the milestones that preceded them (Canadelli, Beretta, Ronzon 2019). Examples other than MUST include the Science Museum in London, the Technisches Museum in Vienna, the Deutsches Museum in Munich, the Griffin Museum of Science and Industry in Chicago. These institutions are distinct from science centres, with which they are often associated, by virtue of their scope. Science centres, typically, do not hold historical collections; or, if they do, they attribute a different significance to them (Paoloni, *infra*). Moreover, the use of ‘technoscience’ emphasizes the new conceptual approach of MUST. Traditionally, the approach has been encyclopaedic, offering a taxonomic representation of various technical and scientific branches (as many other museums did in the past). The new general museological guidelines seek to explore these areas of human activity according to a systemic approach (Tasselli 2017).

as in other museums and archives. Unlike the man, these non-human witnesses have the advantage of not having disappeared and, somehow, being able to 'talk' if properly interrogated.⁴ These artefacts are the focal point of museological and historiographical investigations that highlight a historical legacy of telecommunications beyond the usual biography of the inventor as the 'lonely hero' of technoscience.⁵

A key outcome of the anniversary was thus that the Italian national science and technology museums developed new historiographical criteria for examining the Marconi collections in depth. In past decades, the artefacts associated with Marconi have mostly been treated as frozen icons of a canonical narrative, largely unchanged since the simplified version that was established in the 1930s. Now a comprehensive philological investigation of these artefacts has been initiated, similar to what happened to other collections, such as those dedicated to Leonardo da Vinci (Giorgione 2009; 2019a; Beretta, Canadelli, Giorgione 2019).

At MUST, the study of collections related to communication history generally lacked engagement with the extensive research and critical reflections that have

emerged in the last decades on its material and technoscientific sides, both in the fields of media studies and STS.⁶ From the intersections of these two academic fields, this book derived two basic assumptions. The first is that museums are compelled to question the linear and deterministic view of technological developments that characterise traditional narratives of media development. The second point concerns the dialogue between different disciplines, which is essential to understanding the complex phenomena that we call 'media' as they are narrated and presented throughout the museum. In approaching the Marconi collections, we have deliberately sought to juxtapose diverse perspectives that suited our special object of inquiry, following the practical suggestion of the historian Massimo Mazzotti that it is useful to organise the research "around problem-oriented clusters rather than disciplines and fields" to effectively understand the history of technoscience (2010, 12).

It is no coincidence that a reflection on commemoration and collective memory within this special context starts with Marconi, as he played a significant historical role in this regard. In this introductory essay, first I will briefly review the cultural and historical context in

⁴ In our field, historical research that engages actively with technological artefacts is one of a curator's professional skills (Alberti 2022, 137), as was advocated also by Lucien Febvre, founder of the *Les Annales*: "the most fascinating probably for historians, consist of a *constant endeavour to make mute things talk*, to make them say things about men, which of themselves they do not say, or about the societies which produced them, in order finally to build up between them that vast network of mutually supporting relationships" (Febvre 1973, 34, emphasis added). According to Febvre, historians of technique should equally study humans and non-humans as historical actors (Deshusses 2024, 188).

⁵ The issue of heroic narratives is a now long-lasting theme for historians and curators of science and technology worldwide. See, for instance, McLeod 2007; Jordanova 2014; Ortoleva 2019; Liu 2024, not to speak of the specific case of the invention of telegraphy analysed by Kubot 2019. The exaltation of individuality was a practice of self-representation that scientists had used since the early modern age (Beretta 2020, 11).

⁶ In the past the museum has published several overviews of its communications technology collections (Museo Nazionale della Scienza e della Tecnica 1955; 1957; Curti 1971; 1978; Soresini 1995; Sutura, Ronzon 2005); but the detailed development of research integrating perspectives from media studies and STS with those of the museum remains a future endeavour. Media studies have often regarded the museum institution as part of the broader media landscape (e.g., Silverstone 1998; Capaldi 2018; Drotner et al. 2020). Within approaches labelled as 'media archaeology', some scholars have begun to focus specifically on the collections and mission of technical and scientific museums (Parikka 2012). Inside the field of STS, the interest in media technologies is relatively recent compared to other topics (Gillespie et al. 2014; Magaudda, Balbi 2024). The combined perspective from media studies and STS allows us to interpret the MUST collections putting communication, information, and representation practices in relation to the social construction of technoscience that shapes their material foundations. Only recently, through a doctoral research project co-funded by MUST and the Politecnico di Milano, has this approach been actively pursued (Spada 2024).

which Marconi was personally involved in the creation of MUST, an institution that later celebrated him as part of a national scientific Pantheon. I will focus on the type of 'legendary' and mythical narrative constructed around the inventor's biography, which was then translated into an exhibition narrative in the museum through 'his' artefacts.

Musealising Marconi

Guglielmo Marconi directly intervened in shaping the cultural heritage of Italian technoscience. In Italy, during the 1930s, he held institutional roles that led him to actively take part in this field (Paoloni, Reali, Ronzon 2018). Starting from 1896, the international scene and namely Great Britain had been Marconi's preferred context for conducting business, research, and industrial development of his inventions for almost two decades.⁷ But between the two world wars he progressively turned his attention to Italy, drawing closer to the Italian government and public institutions. He could count on a unique relationship with the Italian state, by embodying symbolic functions both as a representative of his native country and as a member of the international scientific community. He was appointed senator in 1914 and participated in the Paris Peace Conference negotiations in 1919 supporting Prime Minister Vittorio E. Orlando. Mussolini's government appointed Marconi president of the Consiglio Nazionale delle Ricerche (National Research Council, CNR) in 1927 and president of the Reale Accademia d'Italia (Royal Academy of Italy) in 1930. By virtue of the latter position, he also became a member of the Gran Consiglio del Fascismo (Grand Council of Fascism, Raboy 2016, 424, 554, 571-2). In 1928, Mussolini spoke

Then I will outline some fundamental issues and conceptual challenges that emerge in curating objects connected to the history of technoscience, and especially to the field of media technology, related to dealing with concepts like past, memory and history within a cultural context mainly oriented by the concepts of innovation and the future.

to Marconi of the need to provide the country with 'living museums' that would showcase the progress of Italian technoscience (Canadelli 2019, 138). The CNR, chaired by Marconi, subsequently undertook a series of actions aimed at creating national collections of historical relics, starting by promoting their exhibition as icons of Italian primacy (*primati italiani*) at the Hall of Science of the *Century of Progress World's Fair* held in Chicago in 1933. This exhibition was intended to become a permanent collection at the Museum of Science and Industry in Chicago, which had initially requested it. The creation of multiple copies of this 'documentation' also became a significant source for the early collection nucleus of MUST (Giorgione 2019b).

In addition to promoting Italian science abroad, Marconi personally supported the establishment of the national museum institution envisioned for Milan by Guido Ucelli (1885-1964), founder and first president of the Museo Nazionale della Scienza e della Tecnica Leonardo da Vinci, as it was named in 1953 on its opening (Redemagni 2011).⁸ The historian Giovanni Paoloni has highlighted the derivation of the celebratory framework of MUST from the nationalist and identity-driven culture of fascism. In 1932, the year

⁷ Relations with Italy in the early years of Marconi's companies were often business-like, with a certain amount of ambiguity, see Balbi, *infra*.

⁸ The attribute 'della tecnica' (of technique) was changed to 'della tecnologia' (of technology) in 2000, when MUST became a private Foundation.

marking the tenth anniversary of the March on Rome, the Direzione Generale degli Italiani all'Estero (Directorate-General of Italians Abroad) published the volume *Da Leonardo a Marconi* (From Leonardo to Marconi). MUST holds a copy with the *ex-libris* of its author: Francesco Savorgnan di Brazzà, a journalist and science populariser specialised in advocating for Italian scientific achievements. The project of a 'national' science museum took shape in this context. Marconi therefore represented the other pole of a historiographical arc seen as significant for the nation's history, spanning from the Italian Renaissance genius to the scientist-inventor-entrepreneur, emblematic of the fascist era (Paoloni 2018, 13). His figure, already renowned worldwide, appeared shrouded

in the same avant-garde and unconventional aura of the 'mythical' Leonardo da Vinci (Beretta, Canadelli, Giorgione 2019, 41).⁹

Marconi's direct involvement in the operation that eventually led to the musealisation of artefacts representing his enterprises is a fundamental aspect of this process. Although contemporary, in the 1930s Marconi's cultural heritage corroborated the claim for an Italian protagonism in the historical development of science and technology. The musealisation of Marconi did not end with his death, but it was actively continued in the early years of MUST by a series of successors, as recounted in various chapters of this volume. The process was characterized by a particular emphasis on the narrative of the inventor's biography.

Dots, Dashes and Other Codes

The biographical literature on Marconi from the early twentieth century, particularly during the fascist era, "presents itself [...] as a chain of texts that fed into one another and adapted to different communicative and cultural contexts: a sort of *traditio*, not oral in this case, but written", observed the communication historian Peppino Ortoleva (1996, 12). The circulation of these accounts was largely the result of Marconi's own self-promotional activism, as he was highly skilled at narrating his historical role as a "great man" of science (Ellis 2016). As his most thorough biographer put it, "Marconi's greatest invention was himself" (Raboy 2016, 8).

The fascist era consolidated an intriguing but reductive vision of the historical significance of Marconi's enterprises by insisting on the invention of radio broadcasting. This was presented by fascist ideology as *the* new communication medium, emblematic

of the avant-garde and propagandistic image the regime sought to project, even if in Italy it was still a niche medium in terms of users and diffusion (Paoloni 2019, 17). As we know, the communication industry based on electromagnetic waves established by Marconi was oriented toward entirely different developmental scenarios, which were much more significant in economic and geopolitical terms. Through the Marconi's Wireless Telegraph Company (MWTC), founded in 1897 in London and later expanded into a global constellation of firms,¹⁰ the new technology offered an alternative telegraphy system – claimed to be more economical and flexible than the established but costly cable network. The MWTC operated in the profitable field of transcontinental telecommunications. With wireless systems, long-distance communication became possible even in mobility – on the sea and in the air – alongside vehicle

⁹ Giorgione, *infra*, explores the post-mortem iconography of Marconi.

¹⁰ Originally founded as the Wireless Telegraph and Signal Company. The name was changed in 1900 (Raboy 2016, 126).

tracking, enhancing navigation safety. For a long time, Marconi and his technicians considered the possibility offered by wireless systems to communicate to many from one point a default to correct, since their aim was to guarantee privacy and precision in telegraphic point to point communication. Marconi himself showed little interest in the initial developments of radio broadcasting, which only took off around the 1920s thanks to the contributions of ideas and individuals from other fields (Balbi 2017).

This complex historical scenario has rarely surfaced in public discourse and popular context in Italy in the second half of the twentieth century. Regarding Marconi the narrative has always matched a fixed 'legend of the inventor' well summarized by the prominent Italian historian of communication Peppino Ortoleva:

The representation of genius as a precocious and stubborn child, fundamentally self-taught; the dramatized narrative of decisive experiments, particularly the first transmission experiment accompanied by the farmer's gunshot [...]; the emphasis on the difficulties encountered, especially contemporaries' scepticism; the portrait of the inventor as a wizard, out of reach in his floating laboratory, the *Eletra* [...]; the insistence, especially from the Italian side, on his superiority over inventors and scientists from other nations. In general, biographers have constructed their anecdotal narratives from authentic and demonstrable episodes in Marconi's life. However, the narrative form, the dramatization style, and the analogies with similar episodes from the

lives of other inventors aimed at a precise goal: attributing an exemplary meaning to the life of the radio inventor. (Ortoleva 1996, 21, transl. by the author)

MUST had rearranged and modified the permanent exhibition on Marconi several times since 1956 - when the museum first succeeded in gathering and exhibiting a significant number of 'Marconi relics' - but proposed an equally fixed narrative. At the museum, the stages of the inventor's legend took the form of a succession of evolutionary stages of technology, leading from 'primitive' wireless telegraphy to a 'noble' application: the radio itself.¹¹

The guidebook created in 1995 to mark the anniversary of the first "wireless transmission experiments", opened with this statement: "The first radio messages were not words or musical pieces but rhythmic series of dots and dashes in telegraphic transmissions" (Soresini 1995, 16, transl. by the author). Although the statement is not incorrect, it is worthy to note the emphasis given to the linear progression from a less evolved communication medium - now obsolete, like the telegraph with its primitive 'dots and dashes' - to a more evolved one, known to contemporaries as 'radio', with articulated words and music. In other words, the mythical narrative of the inventor's biography translates into an equivalent legendary interpretation of a biography of the radio as a medium. As argued by Simone Natale (2016), such narratives about the birth and development of media help shape a particular way of understanding technology and its relationship with society. This approach has shaped the MUST exhibition until today.

¹¹ In 1956 the Sala Marconi was put in the Physics Gallery, but an important milestone at MUST was the inauguration of a permanent gallery dedicated explicitly to Telecommunications in 1975. In 1995 an exhibition was set up dedicated to the centenary of the transmission experiment of 1895. The current display of the Marconi collection dates from 2007.

Venerated Radio: A Mythical Narrative Through Historical Objects

The current display dedicated to the history of radio is part of the permanent Telecommunications gallery. A special introduction welcomes visitors: a glass case stands in the middle of the hall entrance, exhibiting a simplified reconstruction of the devices used by Marconi in 1895, at the age of twenty-one, at Villa Griffone, his family home, for his first experiment of wireless transmission over the hill nearby. This display sends us back to the Bolognese countryside and to the crucial moment of the famous gunshot fired by a farmer, signalling to the young Guglielmo the success of his early intuition.

To the right of the entrance, a long window case spans the entire wall of the room. At its beginning, it showcases a selection of Marconi's early twentieth-century experimental and industrial devices, representing the beginnings of wireless communication. Here, through the artefacts, three celebrated milestones of Marconi's journey are depicted: the prototype of the circuit patented with the number 7777 that gave rise to the development of tuning devices (1900); three samples of the magnetic detector, including two prototypes (1902); and an early naval wireless station that provides an excuse to mention the famous heroic episode of the sinking of the *Titanic* (1912).

Replicas and originals coexist throughout the exhibition. Criteria like the need to explain wireless functioning principles and the availability of space overcome historical authenticity. As the long display case progresses, the exhibition of Marconi's esoteric devices seamlessly becomes a comforting array of radio receivers from various brands, increasingly familiar to contemporary visitors – from the early vacuum tube models of the 1920s to modern digital devices. This compelling visual narrative

can be embraced at a glance, and it conveys a powerful spatial metaphor asserting that “Marconi invented the radio”, inevitably presenting him as the progenitor of everything that followed. Through the exhibition technique of multiplication, the radio technology becomes identified with our familiar household receiver – be it a stylish vintage cabinet or a smartphone app – which, with a simple gesture, keeps us company at home or on the go.

As the historian of technology Anna Guagnini has observed, many museum exhibits on the history of Marconi (not only at MUST) do not present artefacts and documents accounting for the productive, organisational, and large-scale infrastructural aspects of wireless technologies – such as the massive transmitting stations, with their powerful electrical equipment and gigantic antenna structures. For Marconi and his companies, these were the truly significant domains in scientific, industrial, economic, and political terms. Not only are these material aspects underrepresented, but the collective dimension of technological enterprise, which in Marconi's case, involved huge teams of professionals, is also overlooked.¹²

However, the layout and aesthetics of the exhibition convey to the collective imagination a particular 'truth' on how new technology develops and is widely adopted: an exceptional individual has a brilliant insight that anticipates the future and as a consequence of this, the way we live our daily lives changes forever. In the media domain, solitary inventors grant us 'domesticated' devices that inform us, keep us company, and enable (or compel) us to engage in society. The networked and infrastructural dimension that deeply characterises media technologies remains physically and conceptually separate from both the aspects of invention and usage, as almost nothing separates

¹² I am very grateful to Anna Guagnini for our conversations on these topics. On Marconi's technicians, see Guagnini, *infra*.

us from the inventor's first moment of ingenuity. This approach is mirrored by a common thinking in our society of massive media consumption. Issues like industrial scale, maintenance, organisation, and the materiality of installations that enable such consumption are often treated as a separate, specialistic matter and often rendered invisible (Parks, Starosielski 2015, 6).¹³ Thus, in the exhibition history of museums, an object of affection like the radio

receiver, akin to a famous Renaissance painting, becomes a sort of technological Venus, whose beauty magically arises from a divine Marconian breath upon the sea foam left by the *Titanic*.¹⁴ Paradoxically, this myth of sudden and linear genesis ends up overshadowing even the primary historical witnesses to this origin that have survived to the present day: the cultural artefacts known as 'Marconi relics' (*Cimeli marconiani*).

Marconi and His Relics

Since the 1950s, the term 'Marconi relics' at MUST has indicated a heterogeneous collection of objects differing in fabrication, geographical origin, function and authenticity. They shared only one main feature, taken for granted at the time: they were all illustrations of the inventor's ingenuity and homage to the milestones in his biography. If we search for the keyword 'Marconi' in the digital collection system that helps to manage the over 21,000 artefacts at MUST, a constellation of elements emerges, gathered over time from Italian companies of the MWTC network, state organisations like the CNR, and private citizens. These artefacts are not limited to radio equipment; they include scientific instruments, naval and aeronautical relics, medical devices, television equipment, portraits, medals, and busts. Broadly speaking, they can be categorized into three groups: components of experimental apparatus for radiotelegraphy from Marconi's early career; industrial products bearing trademarks traceable to the constellation of Marconi companies in Britain or Italy (a group extending beyond Marconi's death); and artistic and celebratory objects.

A standard question in studying collections is usually who collected what, and why. In this case, it is not possible

to attribute one particular choice in collecting to a single collecting subject. Moreover, within the same category, original objects coexist with probable, or certain replicas.

If we inquire more deeply into their qualities as historical documents, these artefacts not only recount Marconi's life and achievements but also, indirectly, the cultural processes that gave them a role as civic relics honouring his memory. The 1950s inherited from past centuries a well-established tradition of collecting relics of 'saints' of science, following the model of Christian beatification, where scientists referenced a supernatural, otherworldly dimension (Conforti 2015, ix). It is interesting to note that in the late nineteenth and early twentieth centuries, the term 'relics' was used for artefacts embodying the national memories of a young Italy. These were the secular relics of Risorgimento martyrs – arms and symbols of the battles that united the country – which, in the last quarter of the nineteenth century, were gathered and displayed in high-profile events like the Temple of the Risorgimento at the Turin Exhibition of 1884. These temporary events gave rise to historical museums in various Italian cities (Cavicchioli 2022). It is likely that such events indirectly

¹³ MUST Telecommunications gallery proposes a very quick glimpse on infrastructure in a dedicated hall.

¹⁴ The *Titanic* 'myth within the myth' stands for the hundreds of ships – often anonymous trawlers – served for decades by the branch of the Marconi International Maritime Company, founded in Brussels in 1900, an enormous business (Raboy 2016, 145).

inspired a new type of museum meant to represent Italy in its dimension of technoscientific progress. Here, too, as in political history, an “arsenal of symbols” (Baioni 2020, 18) was necessary, simultaneously referring to the nation and technoscience.

However, the mass educational mission that the technical-scientific museum sought to achieve through the exhibition of relics differed from that of Risorgimento museums, which were oriented toward the symbolic construction of citizens' belonging to the new nation-state. Being Italian citizens was a new but permanent and long sought after condition, and national unity was a historical endpoint.

The History of Science and Its Educational Dilemmas

Since the late 1960s, the science centre model - with its hands-on exhibits and workshops encouraging a direct engagement with scientific phenomena without necessarily relying on the display of historical artefacts - has been proposed as an evolutionary stage of the traditional museum, with its precious showcases and strict 'do not touch' rules (Schiele 2014). Since then, the presence of collections in the context of technoscientific culture has placed two fundamental aspects of the museum mission in a dialectical relationship: the educational role in STEM disciplines (Science, Technology, Engineering, and Mathematics) and the task of historicising technoscience.

In her seminal ethnography of the Science Museum backstage, Sharon Macdonald observed that the new visitor-centric approach adopted by the museum along with the desire to compete for public attention in the general entertainment arena - two very well-intentioned aims - entailed a marginalisation of the museum's historical objects. Those objects were recognised as the museum's 'USP - Unique Selling Point': they were “what was distinctive about the Museum [...] and made it different from other leisure or educational pursuits and

The task of the national technoscientific museum, on the other hand, was to promote patriotic pride through admiration for technological progress - already perceived as advancing at a fast pace - and, on this basis, foster scientific literacy (Ucelli 1958). The origins of technoscientific museums worldwide are rooted in this widely shared programme. Since the second half of the twentieth century, this began to be perceived as increasingly problematic, because of both the obsolescence concepts and theories in scientific disciplines represented by the historical objects and the mythical history they were intended to convey (Bud 2017; Canadelli, Beretta, Ronzon 2019).

from science centres” (Macdonald 2002, 247-8). But, at the same time, the key to modernising popular scientific institutions was turning away from the artefacts' centrality in the museum discourse. According to a prominent curator and historian such as Jim Bennet, the creation of the new science centre model risked indeed proposing, again, a 'pure' model of science, “a reinstatement of the unambiguous and objective” (Bennet 2005, 606). These were the same ideas that 'old' science museums promoted originally with their collections of scientific icons, but the difference was that in contemporary times objects could no longer be part of this representation, because they now

seemed ambiguous and contingent. Insufficiently malleable to the new mission, they retained too much of their own agenda, derived in large part from their preexisting 'biographies'. Galleries full of them seemed to raise too many questions where what was wanted were answers. (Bennet 2005, 608)

Historical objects documenting earlier stages of technoscience represented outdated concepts. Moreover, they often

provided links to problematic historical phenomena – such as the excesses of industrialisation and war – which disrupted the positivist idyll between technoscience and social development (Molella 1999; Pestre 2017). The proceedings of a 1980 conference in Rome on the relationship between scientific education and the history of science give us a glimpse as to how this international debate was received in the Italian context and, specifically, at MUST.¹⁵ On that occasion, the German pedagogist Walter Jung¹⁶ observed that for many physics teachers – a subject “oriented toward objective and general knowledge, independent of the randomness of its actual development” – the ‘real’ history, with its contingencies and accidents, was even considered “disturbing” to their work (Jung 1980, 15, transl. by the author). A non-historical, orderly model of physics’ diachronic development allowed them to retrospectively systematize the process and enabled students to organise their thinking. While a realistic history of physics was acknowledged as an important antidogmatic corrective, for the practical purposes of learning the subject, approaches like “pseudo-history” or “quasi-history” based on rationalized sequences of events, were ultimately more functional (16, 22).¹⁷ These discourses were echoed by Orazio Curti, a MUST manager who reported on the museum’s exhibition best practices. Curti argued that scientific heritage had only recently become part of the humanistic museum world as “an indispensable complement to written testimony”. He argued that museum professionals’ task was to develop effective ways of “appropriately illustrating a discipline”:

In interdisciplinary museums such as technoscientific museums, each subject gives life to a gallery [...]. The museologist must consider the necessity of presenting past, present, and possible future developments of science and technology. The display should present a logical succession of interdependent discoveries, highlighting the evolution and progress based on the refinement of scientific and technological achievements over the centuries. The display [...] should transcend the *special meaning of individual objects* in the name of the superior value of a general order, given to collections of real objects, documents, and reconstructions. (Curti 1980, 210-11, transl. and emphasis added by the author)

Historical objects were subordinated to science school programmes proposed by schoolbooks – as a complement to written science – and explicitly not considered in their individual and contingent nature. By abandoning their situatedness, material testimonies could be a narrative device integrated into the construction of a school-compliant history of science. This approach to museum collection was not new. George B. Goode, the first historian of science responsible for collections at the Smithsonian Institution in Washington, D.C., had proposed that “curators must learn to synthesize the study of objects with generalizations about history” (Henson 1999, 254). Consistently, in 1953, Franco Soresini (1920-2012), a scientific collaborator at MUST who curated all the editions of the telecommunication galleries (including

¹⁵ In reporting the Italian debate of the 1980s I will deliberately refer only to ‘science’: this field was analytically separated from technology and considered the primary field of education.

¹⁶ Jung, a pupil of H.G. Gadamer and T.W. Adorno, was director of the Institutes für Lehrerfortbildung in Frankfurt from 1961 (Wiesner et al. 2011).

¹⁷ “Quasi-history” was a label created the year before the Rome conference, by the physicists M.A.B. Whitaker, advocating a more socially aware history of science: “the quasi-history ignores the processes which needed so much time and effort, the detailed examination of the evidence, the comparing and contrasting of different lines of thought, and the construction and testing of hypothesis after hypothesis, all of which led up to the creative act” (Whitaker 1979, 240).

the current one, shortly before his death) used to define himself a museum 'organiser'¹⁸ rather than a 'curator'.

Nowadays, educational approaches in science museums have obviously evolved well beyond the subsidiary roles to textbooks described by Jung and Curti in 1980. Yet, maybe as a consequence of those old approaches, many experts in public science communication and museum education tend to understate the presence of objects as historical entities, often deeming the 'museum model' of communicating science definitely outdated by the 'science centre model' (Spada 2022). In response to this long trend, science historians have proposed different ways to keep science history and science education in the same frame. Solutions span from incorporating historiographical investigative methods directly into the scientific research process (Maienschein, Laubichler, Loettgers 2008), to including the study of real historical processes in science education, pursuing a broader but more complex and time-consuming approach (Bernardini 1980; Heering 2017), or using historiographical literacy to enhance science communicators' skills

(Liu 2024). In some measure, scepticism on the collection and exhibition of historical objects as a way to foster the popular understanding of science has never been entirely abandoned, even among historians of science themselves. Notwithstanding the discipline's 'material turn', the enormous availability of museum objects has rarely been considered as an effective starting point for enquiries into the history of science (Lüthy 2015; Alberti et al. 2024).¹⁹

Thus, when MUST approached a critical review of Marconi relics in 2024, the cultural scenario outlined above was suggesting that those old artefacts – like many other musealised objects of national science – risked getting caught in an impasse. On the one hand, if they looked like icons of some historical achievement, they seemed trapped in a sort of positivist nineteenth-century Arcadia, comforting and devoid of present-day tensions but self-referential and directed only at nostalgic enthusiasts. On the other hand, if they were to be read as educational examples of science, they seemed deprived of meaningful connections to the contemporary landscape.

Once Upon a Time in Technoscience: Between History and Memory

The debate on the use of technoscientific artefacts in education and academic historical research is usually not much concerned with a trivial but fundamental consideration. Although the two positions often coincide, being an object of the past and being a museum object are not the same thing. This is a meaningful difference when we seek

to produce narrations of the past out of some generic artefact, compared to making the same operation out of the 'chosen' museum object. Beyond education, popularisation or academic history, museum objects also transport us into the territory of commemoration, which is at the core of this collective reflection. The enigmatic Marconian

¹⁸ 'Ordinatore' in Italian. ASMUST, Corrispondenza, Corrispondenza II Serie, F. Soresini, "Pensieri sul museo", letter from F. Soresini to G. Ucelli, 30/12/1953.

¹⁹ In Italy the authoritative voice of the historian Marco Beretta stated: "The fading of the now anachronistic ideological motivations that gave birth to the science museums has in some ways limited their purpose [...] Contemporary science no longer seems to need these ancient institutions. Science museums are becoming increasingly more and more expensive and inadequate compared to the speed of scientific progress" (Beretta 2022, 141, transl. by the author).

relics may be almost pointless to contemporary science communicators and difficult to interpret for those who are not historians specialized in 1900s electromagnetic devices (What exactly are those brown things? How do they work?). But it is clear - especially by their epithet 'relics' - that they take on some kind of symbolic value that is not easy to frame in the common understanding of the educational vocation and cultural mission of technoscientific museums.

Nowadays the largest national museum institutions share the assumption that they no longer should be 'just' cultural authorities displaying national treasures to the public but open and dynamic organisations hybridised with external worlds. Museums put their social mission at their core (Brown, Mairesse 2018). Italian museology shares this view: as Christillin and Greco argued, all museums today are required to satisfy the oxymoron of fulfilling their role of preserving the past while, simultaneously, innovating (2021, 27).

For science museums, however, the tension between past and innovation does not only concern the institution's mission but is deeply embedded in their own historical heritage. Collections are composed of material memories of innovation processes. An intrinsic and unique reference to the future characterises the collections of artefacts of the past technoscience: newness, innovation and discovery are central concepts for those who work in this field, but in museums, the passage of time and the institutional mandate of preservation unavoidably lead to the obsolescence of collections in their representativeness of these concepts. For the heritage bearers, namely the communities expressing and supporting the preservation of scientific cultural heritage (such as scientists, industrialists, technicians, and technoscience professionals) this can be problematic since good science, after all, 'forgets' outdated concepts and theories and moves forward (Boudia, Soubiran 2013). Only nostalgia as an emotional engagement seems to justify the use of historical artefacts

in science dissemination contexts (Davies, Horst 2016, 174). The ratio of keeping those artefacts, therefore, is not obvious, and their very existence as 'heritage' is a matter of debate (Cotte 2023).

Musealisation places technoscience artefacts within a cultural framework that transcends its specific domain and aims at larger cultural frames. As museum artefacts, even technoscientific collections share the destiny of *any other* musealised thing. This consideration, trivial as it may sound, is quite new in Italy, where technoscientific heritage has only in recent time been officially acknowledged by the State (Canadelli, Di Lieto 2024; Morisetti, Ronzon 2024). Being 'cultural assets' for technoscientific artefacts entails the adoption of perspectives and tools from other fields in the humanities and social sciences (e.g., historiographies of other sectors, anthropology, economics, sociology). In consequence of this, these artefacts now represent something 'more' than technoscientific achievements. This leads to a decentralisation of the narratives involving them, giving space to a wider range of public discourses on technoscience, hybridised with the perspectives brought in by lay people or other kinds of experts. This long-awaited cultural acknowledgment for technoscientific collections paradoxically happens when contemporary museology heavily questions values such as 'nation', 'universality' and 'progress', i.e. the key concept that historically produced those collections (Basu 2023). This opens up further contradictions for technoscientific museums.

Thus, it is useful to reflect on anniversaries as moments permeated by all those fruitful and revealing tensions. Anniversaries not only push technoscientific museums to think beyond the dichotomy between education and history as disciplined domains, but also address the collective sense of time, which in museums is established by a specific group in favour of a larger community. Anywhere and in any kind of memory institution, this aspect prompts questions about the modes and subjectivities of who is

“reclaiming interpretive rights to their heritage” in terms of a supposed collective memory (Murphy 2005, 76). Despite their special ‘presentist’ attitude, museums of technoscience should not be considered immune to this larger cultural frame.

At the end of the twentieth century, the issue of collective memory was largely debated with reference to a dialectic (and conflictual) relationship between history and memory drawing on the writings of the historian Pierre Nora, who conceptualized museums and other monumental sites as *lieux de mémoire*. But technoscientific museums have not been particularly considered within this perspective. Marconi relics are a good example: they have always been treated as a positivistic account of Marconi’s technoscientific production until today, without considering any of their symbolic and metaphoric values (Spada, *infra*).

In light of this, I consider it interesting to go straight back to Nora’s classical argumentation as a reflective exercise and to apply it to this specific context. For the French historian, the label *lieux de mémoire* was broad enough to include both material elements and institutions (such as monuments, archives, museums, and their collections) and ritualistic and intellectual elements (such as ceremonies, speeches, and history books themselves), where material, symbolic, and functional aspects coexist. He identified as *lieux de mémoire* all entities that simultaneously embody the explicit intention to remember a past episode in an identity-driven way, by actors promoting this memory and defining themselves according to it. At the same time, those entities aim to stop time and bring that past episode into the present, resurrecting it, and attributing to it renewed meanings. In those ‘places’, the very same material traces are both a source of memory and history, but the latter goes in an opposite direction.

History critically intervenes to distance the past, producing a ‘scientific’ representation that, although being aware of its relativity, aims to avoid the subjective dimension inherent in memory. Historical narrative tends to conquer spaces and uproot the spontaneous, ritualistic, and affective processes of memory. In return, through *lieux de mémoire*, the memory of individuals and groups has become a primary object of historical investigation. History and memory define each other in a dialectical tension (Nora 1989).

From the perspective of those working with historical heritage, in curation, archiving, conservation, and restoration, it is easy to recognise the tensions between ‘memorising’ and ‘historicising’ processes at play around technoscientific collections, even if those dynamics are not made explicit in the public face of the museum. From the anecdotal accounts and empirical evidence of many fieldwork experiences shared with colleagues in Italy and abroad, we can say that memory plays a great role in the inner life of the technoscientific museum, defining it as a “time machine” (Murphy 2005, 71) rather than a sole repository of material samples of scientific principles.²⁰ Memory provides a framework in which many people, both lay and expert, give musealised objects a particular meaning which goes beyond both academic history and STEM education. It is in the name of memory, in a quest for a sense of the past which involves affective and identity dynamics from the present, that new objects are donated to expand the museum collections, or existing collections are rediscovered and appreciated. We are speaking of artefacts of all kinds, often not ‘important’, more frequently mundane and for everyday use, since technoscience is everywhere: they become ways to keep alive, in the present, traces of past affective relationships, work practices, and identity values for individuals

²⁰ Eloquent examples are presented in Boon et al. 2014; Geoghegan, Hess 2015; Geindreau et al. 2016; Haines, Woodham 2019; Casonato 2024. The doctoral thesis by Spada 2024 provides an ethnographical inquiry of these cultural dynamics at MUST with reference to the radio collections.

and communities, be they artisans, research groups, entrepreneurs, industrial employees, families, and so on. The celebration of technoscience anniversaries, blending the commemoration of individuals with material and immaterial objects - including their methods, discoveries, tools, and products - is a highly eloquent example of this dynamic (Abir-Am 1999), which in this book we actively explore in the journey that led to the collection of 'Marconi relics'.

At the very same time, the material traces of technoscience represented by musealised artefacts of any kind are increasingly part of an institutionalised system of public resources, methodically organised according to cataloguing, archival, library science, and conservation disciplines, to be accessible to anyone who wishes to use them (see Ronzon, *infra*). They are thus equated with other elements of national heritage: assets to be studied philologically and preserved professionally, aiming to advance ways to scientifically understand the past according to academic and professional historiography. This form of producing knowledge out of technoscientific artefacts is, of course, rather different from the

knowledge produced in disciplinary domains of groups and individuals who sustain a shared memory of the technoscience past and often actively kept or produced artefacts to musealise them. These specific "mnemonic communities" (Zerubavel 2003, 8) are traditionally linked to the context of the technoscience museums but with a different expertise on those traces and may have different ideas about how the relationship between the traces and the past should be examined. But throughout the museum officiality, eventually, collections of technical-scientific artefacts are increasingly recognised by states and most citizens as cultural heritage *per se*, assuming a larger historical value for everyone.

This happens precisely because those thematic museums fulfil their role as *lieux de mémoire*, beyond and alongside their focus on 'communicating' current technoscience. Objects like artefacts connected to Marconi can thus be understood, broadly, as "material products of human activity that acquire high symbolic value by encapsulating some crucial representations of the community's past" (Fabiotti, Matera 2018, 63, transl. by the author), regardless of which specific perspective is applied to this past.

Curating Stories: From Artefacts to Historical Sources, and Back Again

Once we reflect on the multiplicity of the relationships with the past carried on by musealised technoscientific artefacts, the question arises of interpretation and presentation to the public from the curatorial point of view. Curatorial practice is the research posture that shapes this volume: what should it be, beyond the role

of 'organiser'? The scientific dimension of curatorial work is not placed within the specialist field of academia but within the public arena of museums. It relates to a plurality of stakeholders, requiring a continuous redefinition of the conceptual toolbox. In the last decades, in the ever-evolving world of museums, the term 'curator' has

acquired a certain semantic indeterminacy.²¹ According to museologist Noémi Drouguet, this happens because the museum today has become “undisciplined” in two ways: on the one hand, it is called upon to engage in a creative exercise of continuous self-criticism, leading to a post-modern practice that is free and contaminated; on the other hand, it has lost its rigid alignment with the epistemological frameworks that once governed the adherence of museums to a broad range of academic disciplines, whose research they were an integral part of. Curatorship is still expected to involve deep knowledge of the museum’s themes embodied in its collections, but also the challenge of considering how to present them to the public through increasingly sophisticated means that involve a wide range of expertise (Drouguet 2016). In the already interdisciplinary context of technical-scientific museums, curatorship thus finds itself caught between the risk of rigidly holding onto positions considered outdated and its dilution into less specific professional dimensions.

Sam Alberti, a prominent expert in the field, has highlighted an important dimension from which to reconsider curatorial methodologies in technoscientific museums: narration. “Ultimately, stories are our job”, he wrote (Alberti 2022, 30). Seen through field experience, this statement appears less simple and obvious than it might seem. The mythical stories of great inventors, from Leonardo to Marconi, sound fascinating despite being not very accountable in historical terms – in fact,

paradoxically, sometimes because they are so. One sign of their social relevance is that for museums, either entirely disregarding or rectifying these tales is often just as problematic as celebrating them uncritically as immutable mantras (Jordanova 2014). For museum curators, dealing with stories is not simply about cultivating storytelling skills, which are not exclusive to them.

The interpretive work of curation relates to a deeper narrative dimension that concerns the public representation of time. All linked to museum objects, any popular legend, personal memory, or academic historiographical reconstruction that comes to life shares the condition of being narrated. Stories prompt a view on how past, present, and future bond together.²²

Museums are a fundamental source of stories, and this should be considered a crucial feature of their social mission, all but trivial. Thus, it is interesting to reflect on the specific place assigned to technoscientific artefacts as actors in the representations of the past activated by the mnemonic communities connected with museums. These stories aimed at being collectively relevant dialogue with both history and memory in Nora’s terms.

Sociologist Eviatar Zerubavel proposed the concept of ‘temporal maps’ to analyse the social construction of history organisation in our individual minds. Museums are highly effective tools for the social and individual *mapping* of time. As in the nineteenth century natural history museums became a privileged site to realise and

21 A tautological definition like “someone who carries curatorial responsibilities” was suggested for the English dictionary (Horie 1986, 267). In Italy, some museum colleagues pointed out at least four meanings of ‘curator’, with a little irony: curators may be seen as the “backbone of the scientific staff of the museum” studying collections; “interpreter of a museum narrative” or “scholar of a period or theme” when we think of exhibition; but there are also many ‘handyperson’ curators, that often stand at the cash desk, guide visitors and, if necessary, sweep museum floors. The “independent curator of contemporary art”, the only “true cultural guru” stands apart from all those categories (Negri, Marini 2020, 59-60, transl. by the author).

22 As narratologists observe, stories are crucial for human beings, and they are often underestimated because of their aura of innocence and lightness. There is a profound and constitutive relationship between the human condition and being caught in “webs of stories” (Schapp 2017; Gottschall 2022). Stories have been studied as fundamental phenomena that linked the cultural and biological evolution of humanity since the Neolithic (Cometa 2017).

scientifically measure the passing of time, thanks to the overall glimpse they offered on 'evolution' during ages (Bennet 2004, 21), technoscientific museums seem to offer the same possibility but with a view to 'progress'. Here galleries can spatially represent time by defining sequences of historical artefacts that create the illusion of walking through eras. Through cataloguing and dating artefacts, technoscientific museums establish chronologies and anchor points that become shared ways of reading eras. If we reconsider the narrative logic of the history of radio proposed by MUST and analysed above, we see that it corresponds to a specific type of linear mapping forward, communicating the idea that the course of history is a progressive ascent to higher stages of civilisation, linked to superior technology.²³ The mythological simplification that portrays Marconi as the inventor of radio continues to persist and in popular accounts it has often been updated to mobile phones and smartphones. This relation with the past, used to explain and justify the present state of affairs of telecommunications dominant actors, was established precisely by emerging industrial actors in this field, such as Samuel Morse, Alexander G. Bell, and Marconi himself. These entrepreneurs were devoted to a 'usable' notion of past for self-promotion and fostered the habit of identifying historical periods with specific technical artefacts: the era of the telegraph, of radio, and so on (John 2023, 320). Throughout the twentieth century big industrial players in the ICT, such as IBM (or Olivetti, if we consider Italy) were active in donating historical artefacts to museums or even building them for that purpose (Hénin, Casonato 2020; Casonato 2025). This practice has been carried on in our age, when large tech companies resort to a "corporational determinism" attitude, being active in proposing a linear view of the

past that provide justification to their dominance, as the result of an inevitable historical process (Natale, Bory, Balbi 2019).

The chronological display of the dozens of radio receivers aligned the MUST telecommunication gallery, matching decades with technological advancements (crystals, valves, transistors, chips), and carries the latent message that the historical testimony value of those artefacts lies in their ability to speak about the 'duty' of technoscience to guide humanity from a less evolved past to a better future. This approach reinforces an idea of technology that is reified as a monolithic, homogeneous historical agent (Marx 2010, 982). Each receiver here does not testify its situated historical vicissitudes, but is rather a representative of a larger, almost Platonic, entity: *the* radio, or even more broadly, *telecommunications*. Visitors are not introduced to that particular artefact, but to the larger entity that it iconises. This is what is offered to visitors' temporal mapping processes. Symbolically, each receiver belonging to this taxonomy is virtually interchangeable with another of the same 'family'.

This linear conception of a progressive 'mediatisation' or technologisation of the communication has been long debated by historians in this field. Of course, contemporary historians of media pointed out the fallacies of deterministic views of media development. On the one hand, the habit of describing recent phenomena in relation to what preceded them, rather than following their own documented developments (as in the case of wireless telegraphy seen as the obvious predecessor of radio) leads to anachronism and risks pushing historians to a continuous updating of their theories to the latest innovation. On the other hand, there is the risk of overlooking how the history of communicative practices was not always directly related to the progressive expansion and

²³ Despite being widespread, linearity is just one of the ways that humans have of mapping time, as a cultural legacy of the Enlightenment (Zerubavel 2003).

availability of media technologies throughout ages (see, for instance, John 2023; Bourdon, Balbi 2021).

If each object of the gallery is approached according to the philological attention that professional historians should devote to documents, its narrative role as museum artefact assumes a different meaning. Museums indeed preserve *literally* unique objects, indicated by the inventory numbers, that have been deliberately constructed as collection artefacts. This is true even for samples of nature, like stones, although they are perceived as raw and spontaneous when exhibited.²⁴ As well, in technoscientific museums the process of extrapolating artefacts from their original context for exhibition purposes, for example a laboratory instrument, involves choices of representation that 'freeze' functioning artefacts and may recall taxidermy practices used in natural history (Casonato 2024, 174). Museum objects of any kind are the result of a historically situated process that involves extracting a material sample from the broader fabric of reality, recontextualizing it within the museum apparatus and using it to produce what we name 'culture' and 'knowledge' (Pearce 2012).²⁵

Considering objects as individual material entities with their own identity opens up a field of diversified stories that have the chance to disentangle the knot of reified technology. The well-known biographical approach to the study of things (Kopytoff 1986) is especially effective if we consider the openness to different interpretations that the special position of museum object entails (Silverstone 1992, 35; Alberti 2005).

In sum, narrations around objects can be generated by scientific historiography or inspired by symbolic values. Often, they are both. Material traces have always had a

special affective role inside the scientific communities: neither science nor rationalism have managed to overcome the veneration with which the 'saints of science' have been commemorated through their relics (Conforti 2015, vii). The technoscientific museum's linear and deterministic mapping of time related to media history spreads out of the instances of a specific mnemonic community, and it becomes prone to be revised according to professional historians' terms. The nexus between museum artefacts and representation of time then is the result of different influence fields: teleological industrial narratives, mythological veneration for a pantheon of technoscientific heroes driven by collective memory impulses, and a law-compliant philological approach to heritage, informed by contemporary humanities.

Collections thus enable a constant back-and-forth dialogue between mythical construction and historiographical reconstruction, which has its own cultural dignity. It is revealed in the form of narrations that take different shapes: visual displays as well as collection nuclei, or even single artefacts (see Spada, *infra*). This is a particularly interesting area of investigation for curatorship in technoscientific museums, and for formal and informal knowledge and disciplines that cross-participate in them. Contemporary curatorial research is indeed continuously called to draw the coordinates of this dialogue and to critically discuss it.

As we will see in the following chapters, this approach especially fits in with Marconi relics. Their status as testimonies to a mythical vision of technoscience which initially motivated their musealisation does not preclude them from later becoming sources for critical and detached historical investigation, and vice versa. Indeed, the historical

²⁴ Their existence as collection samples depends on interactions between scientific theories, organisational choices, research opportunities and even the availability of a natural site to be collected and transformed into samples (Chalk 2012).

²⁵ I am grateful to my colleagues Francesca Olivini and Laura Ronzon for their reflections on this point. See also Chard-Cooper, *infra*, on the status of truth and unicity of objects in technical-scientific museums.

artefacts presented in this book are implicated in diverse, legitimate, and coexisting representations of the past that while they help sustain the memory of the inventor call upon for further historiographical explorations. The museum can be read as a platform that allows all these operations.

Ultimately, this book focuses on 'past stories about the past of wireless and its imagined future' that we can explore thanks to musealised artefacts. This may sound like a departure from the primary mission of technoscientific

museums. But from field work experience we witness that fascination and care for mnemonic elements embodied in special objects of past technoscience, unexpected encounters with them, efforts to understand them as cultural traces of other eras, developing and reinterpreting stories based on them, all those activities deeply stimulate curiosity and a critical approach to the world: essential ingredients to foster a scientific mindset, in harmony with the contemporary mission of these institutions.



Francesco Savorgnan di Brazzà, *Da Leonardo a Marconi*.
Popular science volume on the achievements of Italian science,
published by Direzione generale degli italiani all'estero. 1932.
Biblioteca Museo Nazionale Scienza e Tecnologia Leonardo da Vinci

The Contents of the Volume

The book was written by scholars with a humanistic background, who have particular familiarity with the traces of the past of technoscience, albeit according to different perspectives: history, curatorship, archives, and conservation. At the centre of their interests are science, technology and industry, intertwining this horizon with those of the media, art, society and cultural heritage.²⁶

The common theme of the essays is to explore which examples of research, and which questions can arise from taking the musealised material traces of Guglielmo Marconi's story as starting point. Different perspectives emerge, collateral stories often overshadowed by the monumental projection of the statuesque figure of the technoscientific hero and by the need, often taken for granted, to recount his individual deeds as a form of commemoration. This operation brings Marconi's biography to the forefront again, in other ways, but this time in relation to those 'technological remains'.

In the first chapter, Simona Casonato and Roberta Spada present the perspective of curatorship and STS in reconstructing the formation of the nucleus of the 'Marconi relics' of MUST between the 1920s and the 1950s. Here emerge the negotiations of meanings and the interweaving of relationships between different mnemonic communities that elect themselves as bearers of the inventor's cultural heritage. The chapter is also an opportunity to reflect on curators' professional tools, such as catalogues and captions, and on their epistemic value.

Roberta Spada continues the analysis by delving into the biography of a museum highlight, which has always been considered the most important and significant of the

Marconi relics at MUST: the magnetic detector built in a cigar box. Replicated in several copies, a true monument that Marconi erected to himself, it is to be found in various Italian exhibitions and collections. This artefact, taken into consideration in its material dimension, turns out to be the most representative in the mythical (self) construction of a legend of the inventor.

Anna Guagnini shows how, starting from the precise observation of the material characteristics of actual Marconian fragments, the history of electromagnetism and wireless technologies can expand into the examination of a variety of protagonists and themes that do not emerge spontaneously from a narrative exclusively focused on Marconi's biography. The examination of jiggers, components of the first radiotelegraphic circuits, brings to light the role played by Marconi's collaborators in the experimental activity that led to the development of wireless telegraphy. This raises important questions such as the role of tacit and embodied knowledge, and the joint contribution of formal and informal skills in technoscientific development.

Gabriele Balbi's essay is linked to another form of museum heritage: a document preserved in the Biblioteca Museo Nazionale Scienza e Tecnologia Leonardo da Vinci. It is the starting point that allows us to think of the influence of relationships between companies and governments in media history. The chapter is an expansion of a previous study based on the MTWC papers preserved at the Bodleian Libraries in Oxford. Balbi explores the relationship of power that Marconi exercised on the Italian government and the special position that Italy

²⁶ The authors' institutional context shows some diversity as well. Four of the authors are academic researchers: Gabriele Balbi, Anna Guagnini and Giovanni Paoloni have benefited from the Byrne Bussey Marconi Fellowships awarded by the Bodleian Libraries, Oxford, respectively in 2012, 2015 and 2019; Roberta Spada has been awarded in 2025 the same fellowship. The other authors Claudio Giorgione, Giovanni Pietrangeli, Laura Ronzon, Sarah Chard-Cooper, and the volume editor Simona Casonato, are museum-based researchers.

occupied in the international scene of the early regulation of telecommunications, observing the theme of the national scientific hero in a different light.

Giovanni Pietrangeli highlights how the archival heritage of MUST, often the residual fruit of the relationship between the museum and dominant subjects in the technoscientific field, is a precious trace for investigating the history of industry. The author briefly returns to the story of the Marconi relics to observe how the negotiation around the collection of artefacts at MUST has left in the museum archives elements relevant to reconstructing the industrial history, paradoxically neglected until now, of the Italian subsidiaries of the Marconi companies and affiliated entities: Marconi Italiana, Società Italiana Radio Marittima, Officine Radiotelegrafiche Marconi.

Finally, Claudio Giorgione takes the path of art curation in the context of the technical-scientific museum. Starting from the copy of the bust of Marconi made by the sculptor Vincenzo Jerace, which completed the first exhibition of Marconi memorabilia at MUST, he ventures into the exploration of the iconography of the inventor and shows the synergic role of the figurative arts in the construction of the legend of the inventor and the imaginary of the origins of radio and telecommunications in Italy.

These essays are followed by an appendix with three methodological contributions that allow us to refine the toolbox available to historians and curators. Giovanni Paoloni, moving between the history of science and cultural heritage disciplines, outlines the conceptual and legal contours that circumscribe the idea of technoscientific cultural heritage in Italy. The inseparability of the different types of heritage that he highlights (such as objects, documents, books, monuments, landscapes) is made tangible by the focus on the Marconi collections.

Laura Ronzon emphasises the need for updated historiographical research on the Museum and its collections that

moves from the forms of documentation built and stratified over time (such as inventories and catalogues). Retracing the main stages of the definition of these practices in the specific context of scientific and technological heritage, she raises the question of the epistemological value of the catalogue, called on the one hand, to share the state of the art in terms of knowledge on a certain artefact and, on the other, to constantly update itself.

Finally, Sarah Chard-Cooper completes the appendix with a reflection that takes us into the field, sharing with readers the 'daily bread' of the intellectual and practical work of museum people: the question of the status of 'truth' of the artefacts we handle. The author proposes a reasoned succession of doubts, questions and queries on the nature of what, in effect, we are contemplating every time we come into contact with collections. The search for answers is a never-ending job, which constitutes the essence of the cultural and scientific production of these institutions.

The investigation into the technological history of media through the philological and precise exploration of the MUST collections is configured as a new research field, in which there is still much to explore. This volume aspires to provide a first, partial starting point. Obviously this is not the case of the authoritative work of the authors involved, to whom, indeed, I owe, in addition to gratitude, much of the material on which the reflections of the introduction are elaborated. I am rather referring to the general framework that aggregates and puts their works into dialogue, which is my responsibility as the curator. To put this approach to the test of further developments, two iconographic inserts are inserted in the volume. They present artefacts and documents of MUST whose biographies are still largely to be discovered and which we hope can be the object of interest and curiosity of the many interlocutors with whom the museum sets daily dialogues.

Bibliography

- Abir-Am, P.G. (1999). "Introduction. Commemorative Practices in Science: Historical Perspectives on the Politics of Collective Memory". *Osiris*, 14, 1-33.
- Alberti, S.M.J.J. (2005). "Object and the museum". *Isis*, 96(4), 559-71.
- Alberti, S.M.J.J. (2022). *Curious Devices and Mighty Machines: Exploring Science Museums*. London: Reaction Books.
- Alberti, S.M.J.J.; Boyle, A.; Inglis, J.; Volkmer, L. (2024). "The Immaterial Turn? How Historians of Science and Technology Use Material Culture". Boon et al. 2024, 210-26.
- Baioni, M. (2020). *Vedere per credere. Il racconto museale dell'Italia unita*. Roma: Viella.
- Balbi, G. (2017). "Wireless's 'Critical Flaw': The Marconi Company, Corporation Mentalities, and the Broadcasting Option". *Journalism & Mass Communication Quarterly*, 94(4), 1239-60.
- Basu, P. (2023). "Pour un musée pluriversel : de la violence épistémique aux écologies de savoirs". *Culture et Musées*, 41, 63-91.
<https://doi.org/10.4000/culturemusees.9793>
- Bennet, T. (2004). *Pasts Beyond Memory. Evolution, Museums, Colonialism*. London; New York: Routledge.
- Bennet, J. (2005). "Museums and the History of Science. Practitioner's Postscript". *Isis*, 96, 602-8.
- Beretta, M. (a cura di) (2020). *Icone di scienza. Autobiografie e ritratti di naturalisti bolognesi della prima età moderna = Catalogo della mostra* (Bologna, Museo di Palazzo Poggi-Sistema Museale di Ateneo, 25 luglio-30 settembre 2020). Bologna: Bononia University Press.
- Beretta, M. (2022). *Storia materiale della scienza*. Roma: Carocci.
- Beretta, M.; Canadelli, E.; Giorgione, C. (2019). *Leonardo 1939. La costruzione del Mito*. Milano: Editrice Bibliografica.
- Bernardini, C. (1980). "Rapporto tra educazione scientifica e educazione umanistica". D'Agostino, Ianniello 1980, 54-8.
- Boon, T.; Haines, E.; Dubois, A.; Staubermann, K. (eds) (2024). *Understanding Use. Objects in Museums of Science and Technology*. Washington, D.C.: Smithsonian Institution Scholarly Press.
<https://doi.org/10.5479/si.25444927>
- Boon, T.; van der Vaart, M.; Price, K. (2014). "Oramics to Electronica: Investigating Lay Understandings of the History of Technology Through a Participatory Project". *Science Museum Group Journal*, 2.
<https://dx.doi.org/10.15180/140206/001>
- Boudia, S.; Soubiran, S. (2013). "Scientists and their Cultural Heritage: Knowledge, Politics and Ambivalent Relationships". *Studies in History and Philosophy of Science*, 44, 643-51.
<https://doi.org/10.1016/j.shpsa.2013.07.002>
- Bourdon, J.; Balbi, G. (2021). "Questioning (Deep) Mediatization: A Historical and Anthropological Critique". *International Journal of Communication*, 15, 2807-26.
- Brown, K.; François, M. (2018). "The Definition of the Museum Through Its Social Role". *Curator. The Museum Journal*, 61(4), 525-39.
<https://doi.org/10.1111/cura.12276>
- Bud, R. (2017). "Adventures in Museology: Category Building over a Century, and the Context for Experiments in Reinvigorating the Science Museum at the Turn of the Twenty-First Century". *Science Museum Group Journal*, 8.
<https://dx.doi.org/10.15180/170809/001>
- Canadelli, E. (2018). "Primati scientifici e divenire del mondo. Il museo di Guido Ucelli e il CNR prima e dopo la guerra". Paoloni, Reali, Ronzon 2018, 66-80.
- Canadelli, E. (2019). "Science Versus Technology. The Exhibition of Universal Science in E42 Rome and the Museum of Science and Technology in Milan". Canadelli, Beretta, Ronzon 2019, 132-56
- Canadelli, E.; Beretta, M.; Ronzon, L. (eds) (2019). *Behind the Exhibits*. Washington, D.C.: Smithsonian Institution Scholarly Press.
<https://doi.org/10.5479/si.9781944466237>
- Canadelli, E.; Di Lieto, P. (a cura di) (2024). *Da cimeli a beni culturali. Fonti per una storia del patrimonio scientifico italiano*. Milano: Editrice Bibliografica.
- Capaldi, D. (2018). *Il museo elettronico. Un seminario con Marshall McLuhan*. Milano: Meltemi.
- Casonato, S. (2024). "Intangible Heritage, Science, and Identity: National Narratives and the Documentation of Science in Practice". Boon et al. 2024, 166-87.

- Casonato S. (2025). "Lives on Shelves. Constructing Histories of Computer in the Museum Store". Natale, S.; Parry R.; Foti, P. (eds), *Museums and the History of Computing*. London; New York: Routledge, 24-34.
- Cavicchioni, S. (2022). *I cimeli della patria. Politica della memoria nel lungo Ottocento*. Roma: Carocci.
- Chalk, H. (2012). "Romancing The Stones. Earth Science Objects as Material Culture". Dudley, S. (ed.), *The Thing about Museums*. London; New York: Routledge, 18-30.
- Christillin, E.; Greco, C. (2021). *Le memorie del futuro*. Torino: Einaudi.
- Cometa, M. (2017). *Perché le storie ci aiutano a vivere. La letteratura necessaria*. Milano: Raffaello Cortina Editore.
- Cotte, M. (2023). *Le Patrimoine Scientifique et Technique Mondial Existe-T-Il?*. Paris: Editions L'Harmattan.
- Curti, O. (a cura di) (1971). *Museoscienza*. Milano: Associazione Amici del Museo.
- Curti, O. (1980). "Museologia dei musei della scienza e della tecnica". D'Agostino, Ianniello 1980, 210-24.
- D'Agostino, S.; Ianniello, M.G. (1980). *Storia della Scienza e della tecnica. Problemi di ricerca storica e didattica nella scuola e nei musei scientifici*, Roma: Marves.
- Davies, S.R.; Horst, M. (2016). *Science Communication: Culture, Identity and Citizenship*. New York: Palgrave Macmillan.
- Deshusses, F. (2024). "Lo spettro delle "Annales". Una lettura politica di "Technology & Culture"". Avellino, L.: Deshusses, F.; Mignini, A. (a cura di), *Rage against the machine. Automazione, lavoro, resistenze*. Milano: Mimesis, 183-92.
- Drouguet, N. (2016). "The Curator's Malaise with the Undisciplined Museum: Exhibition Making in the musée the société". *THEMA. La revue des Musées de la civilisation*, 4, 23-34.
- Drotner, K.; Dziekan, V.; Parry, R.; Schröder, K.C. (eds) (2020). *The Routledge Handbook of Museums, Media and Communication*. London; New York: Routledge; Taylor & Francis Group.
- Ellis, H. (2016). "Marconi, Masculinity and the Heroic Age of Science: Wireless Telegraphy at the British Association Meeting at Dover in 1899". *History and Technology*, 32(2), 120-36.
<https://doi.org/10.1080/07341512.2016.1218955>
- Fabietti, U.; Matera, V. (2018). *Memorie e identità. Simboli e strategie del ricordo*. Milano: Meltemi.
- Febvre, L. (1973). *A New Kind of History: From the Writings of Febvre*. New York: Harper & Row.
- Geindreau, R.; Derolez, S.; Martin, J. (2016). "Enquête sur l'environnement socio-technique d'un générateur Cockcroft-Walton en vue de sa restauration et de sa conservation". *In Situ – Revue des patrimoines*, 29.
<https://doi.org/10.4000/insitu.12935>
- Geoghegan, H.; Hess, A. (2015). "Object-Love at the Science Museum: Cultural Geographies of Museum Storerooms". *Cultural Geographies*, 22(3), 445-65.
<https://doi.org/10.1177/1474474014539247>
- Gillespie, T.; Boczkowski, P.J.; Foot, K.A. (eds) (2014). *Media Technologies: Essays on Communication, Materiality, and Society*. Cambridge, MA: MIT Press.
- Giorgione, C. (2009). *La collezione di modelli del Museo*. Milano: Fondazione Museo Nazionale Scienza e Tecnologia Leonardo da Vinci.
- Giorgione, C. (2018). "Ricostruire la storia della collezione CNR". Paoloni, Reali, Ronzon 2018, 46-65.
- Giorgione, C. (2019). "History of the CNR Artifacts Collection from the Century of Progress Exposition in Chicago to the Museum of Science and Technology in Milan". Canadelli, Beretta, Ronzon 2019, 69-131.
- Gottschall, J. (2022). *The Story Paradox: How Our Love of Storytelling Builds Societies and Tears Them Down*. New York: Basic Books.
- Guagnini, A. (2006). "Dall'invenzione all'impresa. Marconi e la Wireless Telegraph & Signal Company". Govoni 2006, 175-212.
- Govoni, P. (2006). *Storia, scienza e società*. Bologna: CIS, Dipartimento di Filosofia, Università di Bologna.
- Haines, E.; Woodham, A. (2019). "Mobilising the Energy in Store". *Science Museum Group Journal*, 12.
<https://dx.doi.org/10.15180/191207/001>
- Heering, P. (2017). "Science Museums and Science Education". *Isis*, 108, 399-406.
<http://dx.doi.org/10.1086/692689>
- Henson, P. (1999). "“Objects of Curious Research”: The History of Science and Technology at the Smithsonian". *Isis*, 90, 249-69.
- Horie, C.V. (1986). "Who is a Curator?". *Museum Management and Curatorship*, 5(3), 267-72.
[https://doi.org/10.1016/0260-4779\(86\)90034-8](https://doi.org/10.1016/0260-4779(86)90034-8)
- Hong, S. (2001). *Wireless: From Marconi's Black-Box to the Audion*. Cambridge, MA: MIT Press.

- John, R.R. (2023). "Debating New Media: Rewriting Communications History". *Technology and Culture*, 64(2), 308-58.
<https://doi.org/10.1353/tech.2023.0055>
- Jordanova, L. (2014). "On Heroism". *Science Museum Group Journal*, 1.
<https://dx.doi.org/10.15180/140107/010>
- Jung, W. (1980). "Storia della scienza nell'insegnamento scientifico: pro e contro". D'Agostino, Ianniello 1980, 12-29.
- Kubot, T. (2019). "Telegraphs and National Heroes. A Case Study of Telegraphy as a Mirror of National Branding". Canadelli, Beretta, Ronzon, 2019, 15-30.
- Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge (MA): Harvard University Press.
- Liu, B. (2024). "The Significance and Value of the Historiography of Science in Science Communication". *Cultures of Science*, 7(4), 229-35.
<https://doi.org/10.1177/20966083241300720>
- Lüthy, C. (2015). "Museum Spaces and Spaces of Science. Reflections on the Explanatory Possibilities of History of Science Collections". *Nuncius*, 20(2), 415-29.
<http://dx.doi.org/10.1163/182539105X00051>
- Maienschein, S.J.; Laubichler, M.; Loettgers, A. (2008). "How Can History of science Matter to Scientists?". *Isis*, 99, 341-9.
- Macdonald, S. (2002). *Behind the Scenes at the Science Museum*. Oxford; New York: Berg.
- Magaudda, P.; Balbi, G. (2024). "Theorizing Failure in Digital Media. Four Eclectic Theses". *Annals of the International Communication Association*, 48(3), 205-18.
<https://doi.org/10.1080/23808985.2024.2326056>
- Marx, L. (2010). "Technology: The Emergence of a Hazardous Concept". *Technology and Culture*, 51(3), 561-77.
<http://dx.doi.org/10.1353/tech.2010.0009>
- Mazzotti, M. (2010). "Introduction". Mazzotti, M; Pancaldi, G. (eds), *Impure Cultures. Interfacing Science, Technology, and Humanities*. Bologna: CIS, Dipartimento di Filosofia, Università di Bologna, 1-18.
- Molella, A. (1999). "Science in American Life, National Identity, and the Science Wars: A Curators View". *Curator: The Museum Journal*, 42(2), 108-16.
<https://doi.org/10.1111/j.2151-6952.1999.tb01134.x>
- Morisetti, I.; Ronzon, L.. (2024). "Da gabinetti scientifici a musei scolastici: il patrimonio dei licei scientifici per co-costruire nuove competenze e relazioni". *Scientia*, 2(1).
<https://www.doi.org/10.61010/2974-9433-202401-015>
- Murphy, B. (2005). "Memory, History and Museums". *Museum International*, 277(57), 70-7.
- Museo Nazionale della Scienza e della Tecnica Leonardo da Vinci (1956). *La sala Marconi, le sezioni radio e telecomunicazioni*. Milano: Museo Nazionale della Scienza e della Tecnica Leonardo da Vinci.
- Natale, S.; Bory, P.; Balbi, G. (2019). "The Rise of Corporational Determinism: Digital Media Corporations and Narratives of Media Change". *Critical Studies in Media Communication*, 36, 1-16.
<http://dx.doi.org/10.1080/15295036.2019.1632469>
- Negri, M.; Marini, G. (2020). *Le 100 parole dei musei*. Venezia: Marsilio.
- Nieto-Galan, A (2016). *Science in the Public Sphere. A History of Lay Knowledge and Expertise*. London: Routledge.
- Nora, P. (1989). "Between Memory and History: Les Lieux de Mémoire". *Representations*, 26, 7-24.
<https://doi.org/10.2307/2928520>
- Ortoleva, P. (1996). *Guglielmo Marconi. La leggenda dell'inventore*. Venezia: Marsilio.
- Ortoleva, P. (2019). *Miti a bassa intensità. Racconti, media, vita quotidiana*. Torino: Einaudi.
- Paoloni, G. (2018). "Scienza in pubblico: l'Italia tra le due guerre". Paoloni, Reali, Ronzon 2018, 9-22.
- Paoloni, G.; Reali, R.; Ronzon, L. (a cura di) (2018). *I 'primati' della scienza. Documentare ed esporre scienza e tecnica tra fascismo e dopoguerra*. Milano: Hoepli.
- Parks, L.; Starosielski, N. (2015). *Signal Traffic: Critical Studies of Media Infrastructures*. Chicago: University of Illinois Press.
- Parikka, J. (2012). *What is Media Archaeology?* Cambridge: Polity Press.
- Pestre, D. (2017). "The Sciences Between Technical Demiurgy, Economic Matters of Fact, and Political Regulations. Historical Overview, Current Situation, and Normative Principles". Boyle, A.; Hagmann, J. (eds), *Challenging Collections. Approaches to the Heritage of Recent Science and Technology*, vol. 11. Washington, D.C.: Smithsonian Institution Scholarly Press, 2-22.

- Raboy, M. (2016). *Marconi: The Man Who Networked the World*. New York; Oxford: Oxford University Press.
- Redemagni, P. (2011). "La nascita del museo". *Guido Ucelli di Nemi: Industriale, umanista, innovatore – 1885-1964*. Milano: Ulrico Hoepli Editore, 125-60.
- Schapp, W. (2017). *Reti di storie. L'essere dell'uomo e della cosa*. Milano; Udine: Mimesis.
- Schiele, B. (2014). "Science Museums and Centres. Evolution and Contemporary Trends", Bucchi, M.; Trench, B. (eds), *Routledge Handbook of Public Communication of Science and Technology*. 2nd ed. London; New York: Routledge; Taylor & Francis Group, 40-57.
- Soresini, F. (1995). *Marconi: una comunicazione lunga un secolo = Catalogo della mostra* (Milano, 11 dicembre-30 giugno 1996). Milano: Museo Nazionale della Scienza e della Tecnica Leonardo da Vinci.
- Silverstone, R. (1992). "The Medium is the Museum: On Objects and Logics in Times and Spaces". Durant, J. (ed.), *Museums and the Public Understanding of Science*. London: The Science Museum, 34-42.
- Spada, R. (2022). "Science and Technology Museums Meet STS. Going Beyond the Galleries and Into the Practices". *TECNOSCENZA: Italian Journal of Science & Technology Studies*, 13(1), 129-46.
<https://doi.org/10.92/issn.2038-3460/17568>
- Spada, R. (2024). *Museum Artefacts of Technoscience: Media History, Curation, and Narratives About 1930s Radio Objects in the Italian National Science and Technology Museum* [Tesi di dottorato]. Milano: Politecnico di Milano.
- Sutera, S.; Ronzon, L. (a cura di) (2005). *Telecomunicazioni: conservare ed esporre*. Milano: Museo Nazionale Scienza e Tecnologia Leonardo da Vinci.
- Tasselli, L. (2017). "Verso un Progetto Museologico generale, documento interno". Milano: Museo Nazionale Scienza e Tecnologia Leonardo da Vinci.
- Ucelli, G. (1958). *Cinque anni del Museo*. Milano: Alfieri e Lacroix.
- Whitaker, M.A.B. (1979). "History and Quasi-History in Physics Education: Part 2". *Physics Education*, 14(2), 239-42.
- Wiesner, H.; Schwedes, H.; Wodsinski, R. (2011). "Nachruf auf Walter Jung". *Physik Journal*, 10(8-9), 95.
- Zerubavel, E. (2003). *Time Maps. Collective memory and the Social Shape of the Past*, Chicago; London: The University of Chicago Press.