Studies 12

Artemis Yagou (ed.)

Technology, Novelty, and Luxury

Deutsches Museum

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Deutsches Museum Studies

Edited by Eva Bunge, Frank Dittmann, Ulf Hashagen, Marisa Pamplona Bartsch, Matthias Röschner, Helmuth Trischler

Volume 12

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Introduction

Artemis Yagou

Luxury is an ancient concept that persists. Its beginnings may be traced back to the idea of the original sin, when Adam and Eve opted for the non-necessary but exciting.[1] Luxury has existed in a variety of forms throughout history, whenever individuals could have access to items beyond the limits of necessity, in other words the 'extraordinary, non-essential and exclusive':[2] fine food and wine, magnificent residencies, sumptuous furniture, lavish fabrics, precious jewellery, expensive watches, complex instruments or gadgets, extravagant cars and yachts, valuable works of art. Nowadays, artefacts of luxury are kept in museums and collections all over the world, attracting and enchanting the public. Over the years, many volumes have been dedicated to tracing the slippery meaning of the concept of luxury and especially its entanglement with questions of identity, morality and power.[3] The differentiation itself between 'necessity' and 'luxury' is considered highly ambiguous, socially constructed and evolving over time. An anthropological approach argues against economic analyses separating human needs into physical ones, which have 'the dignity of a necessity', and those other needs considered 'artificial wants, false, luxurious, even immoral'.[4] The distinction between consumption fulfilling basic versus superfluous needs is strongly challenged, given that 'consumption is always a social act'.[5] Utility, sociability, and a whole range of aesthetic and symbolic considerations are intertwined in the act of consumption.[6] Indeed, through the goods they own, individuals 'make physical, visible statements about the hierarchy of values' to which they subscribe.[7] At the same time, nowadays one often talks of luxuries that are immaterial and intangible, such as privacy, attention or time, thus further complicating the debate.

Typically, the history of luxury has been connected with monarchs and leaders, dominant social classes, and various elites who were entitled or allowed to indulge in luxurious practices. Sumptuary laws, imposed for extended historical periods in different geographical regions, prohibited non-elite groups from engaging in the acquisition and use

1 Sekora, *Luxury*, 23.

2 *What is Luxury*? exhibition, Victoria & Albert Museum, London, 25 April to 27 September 2015.

3 Indicative titles on luxury across ages and cultures: Sekora, *Luxury*; Berry, *The Idea of Luxury*; Berg and Eger, *Luxury in the Eighteenth Century*; Berg and Clifford, *Consumers and Luxury*; Grewe and Hofmeester, *Luxury in Global Perspective*; McNeil and Riello, *Luxury: A Rich History*; Schuldenfrei, *Luxury and Modernism*.

4 Douglas and Isherwood, *The World of Goods*, 4.

5 A statement by Renata Ago inspired by the work of Mary Douglas and Baron Isherwood, quoted in Ciriacono, *Luxury Production*, 204. See also: Ago, *Gusto for Things*.

6 The historical study of consumption, this fundamental aspect of modern life, has been rather neglected academically until quite recently. These groundbreaking volumes are notable exceptions: McKendrick, Brewer and Plumb, *The Birth of a Consumer Society*, and Brewer and Porter, *Consumption and the World of Goods*.

7 Douglas and Isherwood, *The World of Goods*, ix.

of luxury goods. Disobeying such laws and thus attempting to rise above one's social position entailed serious punishment for transgression. At the same time, studies of the economic growth of the seventeenth and eighteenth centuries, especially in Western Europe, have shown that the concept of luxury is not monolithic. It includes certain aspects that have been systematically examined only relatively recently, in particular the emergence of 'middling' society, middle-class social groups that gradually acquired broader access to consumer goods. In this context, a more specific concept, which pervades this volume, is that of 'popular luxury' or 'populuxe' goods, originally defined as 'cheap copies of aristocratic luxury items'.[8] The concept was subsequently elaborated upon by various scholars who brought to the fore the complexity of the phenomenon in its various guises.[9] Generally speaking, the concept of 'popular luxury' refers to the development and diffusion of desirable products that were not precious in absolute terms, but were highly sought after for affording variety, personal choice and pleasurable use.[10] Such more accessible items, often bordering on the mundane, subverted established perceptions of value and thus challenged the very notion of luxury. The tendency towards the democratisation of luxury was further enhanced in the nineteenth century and beyond, through the development of fully fledged consumer societies. Individual empowerment through consumer choices redefined mentalities and tested power relations. It comes as no surprise, then, that the expansion of luxury practices was typically criticised as dangerous; social commentators were fearful of the threat it posed to the status quo and of its potential to challenge established hierarchies and bring about moral degeneration.[11]

Throughout history, many of the manifestations of luxury, for example new materials or types of objects, have been connected to novelty, or otherwise innovation.[12] Innovation is defined as 'change that is human-made and deliberate, as contrasted to that made by God, nature or chance'.[13] Like luxury, innovation too had a pejorative meaning in the past: it was considered deviant behaviour subverting the order established by organised religion, craft guilds and other authorities. Innovation was linked to transgression of predefined limits and described as 'the secularized term for heresy'.[14] Similarly to luxury, innovation is a political concept: it has been regulated, forbidden and punished, although rulers and kings could innovate constantly.[15] Negative views of the concept dominated until the eighteenth century, but after the French Revolution the meaning of innovation gradually shifted to the positive. An expression of freedom and choice, it

8 Fairchilds, 'The Production and Marketing', 228.

9 See for example: Berg, 'New Commodities'; Riello, 'Strategies and Boundaries'; Blondé et al., *Fashioning Old and New.*

10 De Vries, *The Industrious Revolution.*

11 Berg and Eger, *Luxury in the Eighteenth Century,* 1–2.

12 In our analysis, novelty and innovation are treated as more or less synonymous and interchangeable.

13 Godin, *Innovation Contested,* 2.

14 Ibid., 6.

15 Ibid., 5.

became liberated from its negative conceptual baggage and was oriented towards the future. A rehabilitation of innovation was fully realised over the course of the nineteenth century, when it became closely associated with progress and utility; it acquired new connotations linked to creativity, originality and reform. Subsequently, the twentieth century witnessed the triumph of innovation, in the sense that the latter became an all-pervasive catchphrase, force and process, whose positive essence was taken for granted.[16]

Neither luxury nor innovation are static phenomena; they are dynamic categories evolving over time in conjunction with socioeconomic factors and changing mentalities in different places and cultures. Additionally, both of them are inextricably linked to technology: new materials and manufacturing processes, specialist technical skills, novel product typologies, and other technology-related factors have enabled humans to shape luxury and innovation in their various forms. However, although technology and innovation have been systematically linked and studied together, to the point that they have become almost synonymous,[17] the links between technology and luxury have remained relatively uncharted. There are of course exceptions.[18] It has been argued, for example, that early-twentieth-century modernism's manifestations of luxury depended a lot on technology, especially electricity.[19] The same period witnessed the rise of ersatz luxuries, such as artificial gems and artificial silk, resulting from technical progress.[20] Like the examples of gemstones, silk and electricity, the majority of luxuries originally emanate from nature, namely from natural resources that are rare, hard to produce and difficult to harness. Nevertheless, eventually most luxuries are not unprocessed natural materials but the outcomes of complex technical processes.

The close connection between technology and luxury is the main premise of this volume; in other words, the argument that technology provides a fundamental material backdrop for creating luxury. Values, beliefs and mentalities interact with technology to complete the picture of what luxury is within a given society. Furthermore, the interplay of technology and luxury, like all human accomplishments, develops and unfolds in a myriad of ways. Technological developments over time contribute to shifting meanings of luxury, and vice versa: technology shapes luxury and luxury stimulates technology. There is clearly a good degree of ambiguity, ambivalence and tension as far as the concepts examined are concerned. Today innovation is practically considered synonymous to technology, and novelty is often confounded with luxury. We argue that the examination of these phenomena through detailed case studies will enable us to unravel their complex entanglements and enrich our understanding of their interactions.

In the four essays included in this eclectic compilation, the authors set out to explore the links between technology, novelty and luxury. Although novelty is often ac-

16 Godin, *Innovation Contested*, 'Introduction'; Godin, 'Technological Innovation'.
17 Godin, *Innovation Contested*, 12.
18 For the early modern period see Ciriacono, *Luxury Production*.
19 Schuldenfrei, *Luxury and Modernism*, 27.
20 Ibid., 57; Nassau, *Gems Made by Man*.

knowledged as an important element of luxury manifestations, their technical background remains inconspicuous. The range and nature of interconnections between the three key themes of technology, novelty and luxury constitute the essence of this volume. The four essays deal with specific product categories: musical instruments, educational toys and pocket watches of the late eighteenth and early nineteenth centuries, and late-nineteenth-century furniture. The authors employ the findings of original research to demonstrate the close-knit relationship between technology, novelty and luxury in different time-periods and geographical contexts. The highly diverse chapters illuminate various so far inadequately explored manifestations of these interactions. The idea for this volume emerged after two successful sessions on technology and luxury organised by the author of this introduction at the Annual Meeting of The Society for the History of Technology (SHOT) that took place in Milan between 24 and 27 October 2019. The reception of those sessions by the audience was very encouraging, prompted fascinating discussions and eventually led to this publishing initiative. The blend of product categories dealt with in the volume reflects the varying interests of the contributors, but also reveals the breadth and complexity of the subject matter. Illuminating a sufficiently broad spectrum of manufactured products enables us to approach many different parameters of the issue under consideration.

In his contribution to the volume, Panagiotis Poulopoulos introduces in a sweeping manner all the issues this volume is meant to explore. He employs musical instruments from the late eighteenth and early nineteenth centuries as original sources for his investigation and states the surprising fact that these artefacts have seldom been examined from the point of view of luxury, despite their considerable monetary and symbolic value. His study focuses on artefacts from Britain, France and Germany, and is organised along four axes. The first is substitution, in other words the employment of new materials and techniques for the creation of affordable luxury. The second and third themes, miniaturisation and portability, are closely intertwined. A variety of inventions and improvements enabled the making of musical instruments that were smaller and easier to carry, thus being in line with the desire for and reality of increased mobility from the eighteenth century onwards. Poulopoulos' fourth theme, mechanisation, foregrounds specific technical improvements that facilitated the popularisation of musical instruments among a wide range of users.

The contribution by Joseph Wachelder offers a counterpoint to the previous essay by placing special emphasis on matters of consumption in the same time-period. Three examples from the domain of educational toys, namely geographical dissections (puzzles), rational toys and the kaleidoscope, illustrate the development of a market for instructive toys. Technology and science underpin the selected examples: geographical dissections depended on the skillful handling of materials, rational toys were founded on mechanical and scientific experiments, while the fad of the kaleidoscope resulted from a patented invention turned into a toy. Placing less attention on the material specifications and technical properties of these toys, Wachelder chooses to emphasise the ways in which such playthings were used to articulate new consumption patterns that encompassed

both instruction and pleasure. These two aspects of educational toys were present in variable degrees in products from different countries, as evidence from Britain, Germany and France shows. At the same time, these educational toys informed the ongoing debate about luxury, and the fine distinctions between exclusive luxury and the more inclusive categories of fashionable, populuxe and semi-luxury goods.

In my essay, I direct my attention to another product type and geographical space, more specifically pocket watches exported from Britain and the European continent to the markets of the Ottoman Empire during the long eighteenth century. One specific item, a pocket watch with Ottoman-era numerals currently in the collection of the Deutsches Museum, is the starting point from which I move outwards, to reveal associated layers of meaning. The item under consideration is a low-profile object of medium value that may not be described as luxurious, but which definitely belongs to the 'popular luxury' category. Indeed, it was precious for those who bought it and owned it, as it enabled them to participate in technological modernity and self-fashion themselves in ways that were novel and enjoyable at the same time. For most users, this watch would be a fashionable accessory and a state-of-the-art item, possibly the most technically advanced product they would ever own or use. This kind of affordable 'popular luxury' existed in parallel to a high-end, luxury market that would be totally inaccessible to the many.

On the other hand, the case study presented in the next essay describes a more antagonistic situation between two distinct, technology-dependent forms of luxury. Camille Mestdagh propels us temporally into the second half of the nineteenth century, discussing the conflicts that emerged in the French furniture industry. The battle was between the high-quality, high-priced, handcrafted furniture of established manufactures and the cheaper output of emerging, technology-based, mass-production processes. The technologies employed, the role of individuals involved and the related mentalities and issues of power lie in the heart of this polarity. Mestdagh exposes the socioeconomic issues at stake within the gap created between artistic handicraft and industrialised production. Through an analysis of French furniture, she highlights the social tensions engendered by the use of new technologies and questions the compatibility between luxury and democratisation. The changing meanings of luxury resulting from the application of new technologies generated intense frictions and threatened the destruction of entire industries. Their survival required skillful negotiation and re-contextualisation of technological changes.

As all four essays show, technology is pivotal to the creation of wealth and the stratification of society; it is a domain in which relations of power are contested. Access to technology enables the generation and increase of wealth, thus impacting directly the acquisition and distribution of power among social groups. The chapters of this volume analyse many aspects of the interaction between technology, novelty and luxury, and illuminate relevant phenomena in selected product types; nevertheless, the topic is by no means exhausted. The case studies suggest that technology has been central to the creation and elaboration of luxurious items, but also crucial in contributing to the shifting meanings of luxury. There is clearly a dynamic interaction between technological change

and the creation of luxury. Indeed, 'technology is a cause as well as a consequence of the values and norms of the society in which it flourishes – technology is both a social force and a social product'.[21] The essays presented in this volume lead to the acknowledgement of increased complexity: the deeper one probes into material culture, the more complicated it becomes to come up with simple answers. Furthermore, the multifarious ways in which technology and luxury have interacted historically provide us with informed and timely insights for the present. On a very general as well as practical level, the insights gained can be very useful in our attempts to grasp the complexities of our day-to-day existence and deal with them. On an academic level, this volume enriches the current debates in a number of fields: the history of design and technology, cultural history, the history of consumption and the history of mentalities, to name but a few.

To sum up, if luxury was the 'keynote debate of the Enlightenment',[22] it remains a very powerful as well as controversial concept well into the twenty-first century.[23] Even though there is currently an increasing awareness of intangible forms of luxury, such as time availability, the materiality of the phenomenon does not cease to attract interest. The essays in this volume shed light on various material and technical manifestations of luxury in an original way. The content of the essays is not defined by strict adherence to a specific agenda, but attempts to be sufficiently open to different approaches illuminating the subject from various viewpoints. The authors examine concrete practices through which the idea of luxury is negotiated and developed within broad sociocultural contexts. They aim to show relationships and interactions that have so far remained relatively unexplored, hiding in the fuzzy and dim territories of disciplinary borders. The intention was to cross such boundaries, make new connections, and generate new research directions. It is expected that this volume will trigger fruitful cross-disciplinary and cross-cultural investigations.[24]

21 Mayr, *Authority, Liberty & Automatic Machinery,* xviii.

22 Berg and Eger, *Luxury in the Eighteenth Century,* 5.

23 *What is Luxury?* exhibition.

24 I would like to thank Paul Kilbey for his meticulous editing of this volume.

Bibliography

Ago, Renata. *Gusto for Things: A History of Objects in Seventeenth-Century Rome*. Chicago: University of Chicago Press, 2013.

Berg, Maxine. 'New Commodities, Luxuries and their Consumers in Eighteenth-century England'. In *Consumers and Luxury: Consumer Culture in Europe 1650–1850*, ed. by Maxine Berg and Helen Clifford, 63-85. Manchester: Manchester University Press, 1999.

Berg, Maxine and Helen Clifford, eds. *Consumers and Luxury: Consumer Culture in Europe 1650–1850*. Manchester: Manchester University Press, 1999.

Berg, Maxine and Elizabeth Eger, eds. *Luxury in the Eighteenth Century, Debates, Desires and Delectable Goods*. Basingstoke and New York: Palgrave Macmillan, 2002.

Berry, Christopher J. *The Idea of Luxury: A Conceptual and Historical Investigation*. Cambridge: Cambridge University Press, 1994.

Blondé, Bruno, Natacha Coquery, Jon Stobart and Ilja Van Damme, eds. *Fashioning Old and New: Changing Consumer Patterns in Western Europe (1650–1900)*. Turnhout: Brepols, 2009.

Brewer, John and Roy Porter, eds. *Consumption and the World of Goods*. London: Routledge, 1993.

Ciriacono, Salvatore. *Luxury Production, Technological Transfer and International Competition in Early Modern Europe*. Leipzig: Leipziger Universitätsverlag, 2017.

De Vries, Jan. *The Industrious Revolution: Consumer Behaviour and the Household Economy, 1650 to the Present*. Cambridge: Cambridge University Press, 2008.

Douglas, Mary and Baron Isherwood. *The World of Goods: Towards an Anthropology of Consumption*. London and New York: Routledge, 1996.

Fairchilds, Cissie. 'The Production and Marketing of Populuxe Goods in Eighteenth-Century Paris'. In *Consumption and the World of Goods*, ed. by John Brewer and Roy Porter, 228–248. London: Routledge, 1993.

Godin, Benoît. *Innovation Contested: The Idea of Innovation over the Centuries*. New York and London: Routledge, 2015.

Godin, Benoît. 'Technological Innovation: On the Origins and Development of an Inclusive Concept'. *Technology and Culture* 57, no. 3 (July 2016): 527–556.

Grewe, Bernd-Stefan and Karin Hofmeester, eds. *Luxury in Global Perspective: Objects and Practices, 1600–2000*. Cambridge: Cambridge University Press, 2016.

Mayr, Otto. Authority, *Liberty & Automatic Machinery in Early Modern Europe*. Baltimore: Johns Hopkins University Press, 1986.

McKendrick, Neil, John Brewer and J. H. Plumb, *The Birth of a Consumer Society: The Commercialization of Eighteenth-century England*. London: Europa, 1982.

McNeil, Peter and Giorgio Riello. *Luxury: A Rich History*. Oxford: Oxford University Press, 2016.

Nassau, Kurt. *Gems Made by Man*. Radnor PA: Chilton Book Company, 1980.

Riello, Giorgio. 'Strategies and Boundaries: Subcontracting and the London Trades in the Long Eighteenth Century'. *Enterprise and Society* 9, no. 2 (June 2008): 243–280.

Schuldenfrei, Robin. *Luxury and Modernism: Architecture and the Object in Germany 1900-1933*. Princeton: Princeton University Press, 2018.

Sekora, John. *Luxury: The Concept in Western Thought, Eden to Smollett*. Baltimore: Johns Hopkins University Press, 1977.

Aspects of Technology in Populuxe Musical Instruments of the Late Eighteenth and Early Nineteenth Centuries

Panagiotis Poulopoulos

Abstract

The possession of musical instruments in diverse cultures usually indicates wealth, prestige and social standing. Yet musical instruments have seldom been examined within the context of luxury in scholarly studies, despite their often great monetary and symbolic value. One of the most interesting periods for further research on this topic spans the late eighteenth and early nineteenth centuries. During this time, numerous 'populuxe' musical instruments appeared as part of the so-called 'Consumer Revolution', which instigated and sustained a market for affordable, semi-luxury products built with innovative approaches and traded at an international level. Apart from their pioneering musical, functional and aesthetic features, many of these novel, fashionable musical instruments, ranging from pedal harps to mini pianos and from walking-stick recorders to keyed guitars, exemplified above all the implementation of new ideas and new technologies in the musical instrument-making industry. Using various case studies of plucked stringed, keyboard and wind instruments, this article will discuss diverse aspects of technology, such as substitution, innovation, miniaturisation, portability and mechanisation, and examine how they shaped the production and consumption of populuxe musical instruments during a groundbreaking period in European history.

Keywords Musical Instruments, Technology, Industrialisation, Consumer Revolution, Serial Production, Design, Decoration, Branding, Fashion, Novelty, Luxury

Introduction

Luxury is loud. As a display of affluence, comfort and extravagance that seeks to impress, luxury usually creates noise. But what does luxury sound like? One way to examine the sound of luxury is to investigate the history and development of musical instruments as luxury objects.[1] From this perspective, one of the most interesting periods for further research spans the late eighteenth and early nineteenth centuries. During this time, numerous 'populuxe' artefacts, including musical instruments, appeared as part of the so-

1 The preliminary research findings that formed the basis of this article have been analysed in my paper 'Technological substitution and innovation in the production of musical instruments at the turn of the nineteenth century', presented at the panel session 'Technology and Luxury' during the Annual Meeting of the Society for the History of Technology (SHOT), Milan, 24–27 October 2019. I am grateful to Artemis Yagou for organising the panel session at SHOT and for initiating further scholarly discussions on the interactions between technology and luxury that resulted in this volume.

called 'Consumer Revolution', which instigated and sustained a market for affordable, semi-luxury products built with innovative approaches and traded at an international level.[2] This was also an important phase in music history, which radically changed the way musical instruments would be made, used and perceived in the years to come. For example, this period saw the rapid expansion of the music business, signified by the rise of public concerts, the abundance of printed scores, teaching methods and music treatises, and the emergence of talented virtuosi and ambitious composers whose oeuvre enriched musical culture and opened new paths for musical expression. At the same time, creative musicians, inventors and instrument makers experimented with new materials, shapes and sounds, and several popular instruments, such as the piano, harp, guitar, flute and clarinet, were further developed and established, adopting many of the forms and features with which we recognise them today.

However, musical instruments have seldom been examined within the context of luxury, despite their monetary and symbolic values, and, as a result, a definition of 'populuxe' or 'popular luxury' concerning musical instruments is currently lacking. In addition, the term 'populuxe' in scholarly studies investigating the concept of luxury in relation to the trade of manufactured goods, surprisingly does not include musical instruments, although their possession usually indicates wealth and prestige.[3] For the purposes of this article 'populuxe' refers mostly to novel, fashionable musical instruments that were serially produced in relatively large numbers and whose manufacture involved the implementation of new ideas and new technologies.[4] Most of these instruments were addressed to a broad and diverse clientele, which included members of the social elite as well as affluent middle-class customers, and were usually played in a secular, urban, and primarily domestic environment. Church organs used in religious services, brass and percussion instruments used by military bands, or folk instruments used in rural regions for communal celebrations or seasonal festivals do not have populuxe attributes and will not be considered here. Using several case studies of plucked stringed, keyboard and wind instruments, the article will discuss various aspects of technology, such as substitution, innovation, miniaturisation, portability and mechanisation, and examine how they shaped the production and consumption of populuxe musical instruments.[5]

2 For more details on new designs, materials and techniques that shaped the luxury market in the long eighteenth century, see Snodin and Styles, *Design & the Decorative Arts*, 133–159.

3 See, for instance, Fairchilds, 'The Production and Marketing of Populuxe Goods', 228–248; Berg, 'From Imitation to Invention', 1–30; or Coquery, 'The Language of Success', 71–89.

4 These features essentially conform with the characteristics of populuxe products as defined in Riello, 'Strategies and Boundaries', 261–265.

5 Unless otherwise stated, all artefacts discussed in this article belong to the collection of the Deutsches Museum. To avoid unnecessary repetitions, only the museum description and inventory number (Inv. No.) of these artefacts are provided in the text.

Substitution and innovation: the transformation of the pedal harp

All that glitters is not gold. Two significant aspects that had a strong impact on the manufacture and marketing of populuxe musical instruments concern technological substitution and innovation, particularly in terms of design and decoration. One should not forget that the looks of instruments were as important as their sound; as has been pointed out, 'Eighteenth-century producers of consumer goods faced markets that were keenly attuned to the visual appearance of their products', with novelty and fashion being 'obsessions at every level in the market.'[6] The quest for new designs often led to the replacement of traditional materials, techniques and styles employed in the construction and ornamentation of instruments with new ones, which were usually cheaper and more consistent, and required less skill in their application, thus allowing the making of fine instruments while decreasing production time and costs. In this respect, musical instrument-making was characterised both by a continuation of former notions of luxury, which emphasised for example the use of expensive materials, and a renewal of the trade with novel approaches that served the purposes of mass production.

This is nowhere else as manifest as in the case of the pedal harp. Invented by Jacob Hochbrucker (1673–1763), a harp maker in Donauwörth, Bavaria, in the early eighteenth century, but popularised in Paris from the 1760s onwards as a fashionable instrument for ladies, the pedal harp became a favourite instrument of the French nobility and aristocracy, who led in terms of taste and were the main consumers of luxury products.[7] The significance of the harp in the education and lifestyle of young women in Western societies is revealed in contemporary conduct manuals as well as in fiction and iconography, where harps were frequently employed as literary or artistic props.[8] Early pedal harps were equipped with single-action mechanisms, which allowed the production of two different notes per string: that of the open string and, when a pedal was pressed, a semitone higher, raising simultaneously the pitch of all the strings of the same note throughout the harp's compass. In terms of construction, single-action harps made in late eighteenth-century France by such makers as Georges Cousineau (1733–1800) and Jean-Henri Naderman (1734–1799) were characterised by a thin soundbox made of staves like a lute, a soundboard with several small soundholes, a mechanical action containing few metal parts mounted directly on the carved wavy wooden neck, a shallow pedalbox resting on spikes that housed the pedals, and a slim column ending on a spiral scroll. Visually these

6 Styles, 'Design for Large-Scale Production', 13–14.

7 For more details on the feminisation of the pedal harp and its approval by polite society, see Adelson and Letzter, '"For a woman when she is young and beautiful"', 314–335.

8 For a concise account on the evolution of the pedal harp in Western Europe and North America, see Rensch, *Harps and Harpists*, 153–245. Regarding the presence of the pedal harp in literature, see Dubois, *Music in the Georgian Novel*, 224–230, while for a thorough analysis of depictions of pedal harps in portraiture, see Cleary, 'The "harpe organisée"', 193–213. On the same topic see also Kolle, 'Feminine Portraits: Lady Harpists'. A virtual gallery including numerous portraits with harps is presented in Elise Kolle, 'Portraits of Lady Harpists: A database for portraits with harps and harpists between 1720–1850', available at https://historicalharpportraits.wordpress.com/ (accessed 22 November 2021).

Fig. 1 Single-action harp, Cousineau père et fils, Paris, c. 1780. Rijksmuseum, Amsterdam (Inv. No.: BK-2016-98-5). The decoration of this harp with gilded wood-carvings on the pedalbox and scrolled column as well as with paintings on the soundboard is characteristic of French harps from the late eighteenth century.

harps were distinguished by their opulent decoration with elaborate woodcarvings, colourful paintings and shiny gildings in Rococo style (Fig. 1).[9] Often referred to as 'Louis XI' harps, these instruments were synonymous with the *Ancien Régime* and its frivolous customs, which became despised after the French Revolution. In order to survive and thrive in a post-revolutionary, liberal world, the pedal harp was in need of a drastic facelift.[10]

Enter Erard. A tireless inventor and prolific manufacturer of musical instruments with branches in Paris and London, Sébastien Erard (1752–1831) is mostly known for his groundbreaking contributions to both the piano and the harp.[11] In the case of the harp, Erard gradually transformed the instrument technically as well as aesthetically. Starting with the harp's construction, Erard changed the soundbox, giving it a semi-conical form and using laminated wood, abandoning forever the earlier staved design. He also strengthened the neck by employing multiple layers of wood glued together, rather than a single wooden piece carved to shape, as on older harps. Moreover, Erard enclosed the entire mechanical action between two brass plates that were screwed on the wooden neck, and added movable components which allowed the adjustment of intonation and the regulation of the mechanical parts. This rendered the mechanism independent of the harp's fragile and temperamental wooden frame and facilitated repairs or replacements without affecting simultaneously the wooden and metal structures. Furthermore, Erard introduced a thicker fluted column ending with a capital, and enlarged the pedalbox and its protruding feet, thus improving the statics of the harp and emphasising its dual role as a musical instrument and a freestanding piece of furniture. Erard additionally devised a new mechanism with forked discs (*fourchettes*) which permanently replaced earlier systems with hooks (*crochets*) or crutches (*béquilles*) that were typically used on pedal harps, eliminating issues of string breakage and misalignment.

At the same time, Erard revamped the decorative elements of the harp. Around 1800 Erard began replacing the painstaking and time-consuming woodcarvings with composition ornaments. A thermoplastic resinous compound comprising several organic and inorganic ingredients, composition was a flexible and reliable material that was commonly used in architectural elements, furniture and picture frames from the third quarter of the eighteenth century onwards. In a warm and damp state, the soft composition could be pressed in reverse-carved wooden or metal moulds and then applied on flat or curved surfaces appropriately prepared with grounding such as gesso. As it dried, composition took a precise shape and became hard and durable, but using hot water steam it could be softened and reworked in new shapes.[12] Composition ornaments were consid-

9 The typical features of French single-action harps have been summarised in Droysen-Reber, *Harfen des Berliner Musikinstrumenten-Museums*, 53–70.

10 Parker, *Child of Pure Harmony*, 10.

11 For more details on Erard's input in the development of the piano and harp, see Adelson et al., *The History of the Erard Piano and Harp*, 1–36.

12 For a historical overview of composition, see Wetherall, 'History and Techniques of Composition', 26–29; and Thornton and Adair, 'Applied Decoration for Historic Interiors', 1–16.

Fig. 2 Double-action harp, Erard, London, 1818, No 2631 (Inv. No.: 16147). A typical example of Erard's Grecian model, this harp is decorated in neoclassical style with gilded composition ornaments on the pedalbox and capital as well as with golden decoupage prints on its black soundboard and soundbox.

erably cheaper, as well as faster and easier to make, in comparison to traditional wood-carvings, and although they were more brittle than wood, they were more practical to handle, repair or replace. Moreover, they could receive a high-quality finishing with painted coatings or gilding, rendering them indistinguishable from more precious materials, such as wood, metal or stone. Composition ornaments became widely used for the decoration of harps in the early nineteenth century.[13]

Equally innovative to the sculptural embellishment was the pictorial adornment of Erard harps, which relied on the use of decoupage prints instead of paintings. Decoupage was a decorative technique involving the cutting and colouring of images printed on paper and their subsequent adhering onto flat surfaces with minimum preparation. The application of multiple layers of transparent varnish over the prints improved the quality of the decoupage by increasing the smoothness and lustre of the surfaces, thus making it difficult to tell apart the pasted prints from real paintings. Benefiting enormously from the refinement of available printing techniques, such as copperplate engraving or etching, and the introduction of new ones, such as lithography, during the late eighteenth century decoupage was all the rage: amateur artists used decoupage prints for the adornment of household objects like boxes, trays or stands, while professional decorators employed them to ornament larger objects ranging from cabinets to coaches.[14] As a substitute for paintings, decoupage offered several advantages. Not only was it less costly and less difficult to execute, but it also combined consistency with flexibility, since although most prints were standardised, mixing them in different arrangements permitted customised designs to be achieved according to the individual needs and tastes of a maker or client. The most eye-catching decoupage consisted of figures and motives printed on gold leaf pasted on paper and placed on a contrasting dark background, a pattern observed on many extant Erard harps.[15]

The aforementioned innovative technical and aesthetic features were encompassed on Erard's single-action 'Empire' harps, which started to be serially produced in the late 1790s, but became more conspicuously displayed on the double-action harp that Erard introduced in 1811 in London. Unanimously considered as the forerunner of the modern concert harp, Erard's double-action harp could produce three notes per string utilising two rows of interlinked forked discs, allowing harpists to play in all keys. The first commercially manufactured double-action harp by Erard became known as the 'Grecian' model because of its distinctive decoration with neoclassical motives inspired by ancient Greece (Fig. 2).[16] As an avid art collector, Erard had certainly encountered samples of original Greek antiquities in contemporary publications, auctions and exhibitions, while

13 Baldwin, 'The Harp in Early Nineteenth-century Britain', 413–416.

14 For a brief historical overview of decoupage see Kisluk-Grosheide, '"Cutting up Berchems, Watteaus, and Audrans"', 81–84; see also Manning, *Manning on Decoupage*, 21–27.

15 For more information about the decoupage on Erard harps see Poulopoulos et al., 'Technological Study of the Decoration on an Erard Harp', 88–97.

16 On the Grecian harp see Poulopoulos and Lee, 'A Synergy of Form, Function and Fashion', 377–384.

he must have also been aware of their modern renditions in the architecture, furniture, sculpture and ornamental pottery created by leading entrepreneurs such as Robert Adam (1728–1792) and Josiah Wedgwood (1730–1795). After all, Neoclassicism may have represented the noble ideals and austere elegance of the classical past, but paradoxically exerted a major influence on the design of various state-of-the-art objects, ranging from timepieces to steam engines, which were often disguised as antique monuments with fluted columns and ornamental reliefs, much like Erard's Grecian harp.

Therefore, by adopting – and adapting – various pioneering materials, techniques and styles already established in other manufacturing sectors, extending from furniture-making to printing, Erard managed to produce harps that looked highly ornate and expensive, yet were made relatively quickly and economically. Between 1811 and 1836, Erard's London branch built about 3,500 Grecian harps, employing industrial practices based on the concepts of specialisation, standardisation and interchangeability, which allowed for large-scale serial production. Contrary to earlier harps, which were usually signed by their makers with obscure inked inscriptions, stamps or paper labels on wood, Erard Grecian harps were branded with noticeable calligraphic engravings on the brass plates housing the mechanism, which rendered them easily recognisable and difficult to fake. In the luxury markets of large urban centres, like London or Paris, where new as well as second-hand items, and originals as well as imitations and forgeries, were commonly circulated though complex trade networks, the branding of products turned out to be indispensable for makers, suppliers, dealers and, of course, customers.[17] Bearing visible inscriptions which highlighted Erard's reputation as a patent holder as well as his connections to the social elite, the engravings on Erard Grecian harps acted both as powerful trademarks and as useful tools for identification, authentication and advertising purposes. Within two decades, spanning from the mid-1790s to the mid-1810s, the Erard harp had become not only an advanced musical instrument but also an iconic symbol of wealth and status.[18] With a price equal to the annual expenses of a gentleman's family or three times the annual wages of a manual labourer, Erard Grecian harps were sold initially in Britain and later at a global scale mainly to fashion-conscious women belonging to rich families from the upper and middle classes.[19] Few of them might have known that under

17 See Styles, 'Product Innovation in Early Modern London', 124–169. See also Berg, 'From Imitation to Invention', 17–26; and Coquery, 'The Language of Success', 81–87.

18 The role of Erard in the transition from the single- to the double-action harp was the focus of my research project 'A Creative Triangle of Mechanics, Acoustics and Aesthetics: The Early Pedal Harp (1780–1830) as a Symbol of Innovative Transformation' (2016–2020). This project, which examined Erard harps from different perspectives using interdisciplinary approaches, was funded by the 'Research in Museums' programme of the VolkswagenStiftung (Volkswagen Foundation) and was hosted at the Research Institute for the History of Science and Technology in the Deutsches Museum. I am grateful to my colleagues Silke Berdux, Ulf Hashagen and Helmuth Trischler for their encouragement and help, as well as to the VolkswagenStiftung for supporting my research financially.

19 Nex, 'The Business of Musical-Instrument Making', 109–116. For more details on the marketing strategies and customer profile of the Erard firm, see Chapter 5 in Poulopoulos, *A Symbol of Innovative Transformation* (forthcoming).

the glamorous, golden surfaces of these harps lied a malleable resinous dough or some thin paper and glue.

Miniaturisation: from the piano to the orphica

Size matters. A remarkable technological aspect that affected the fabrication and diffusion of populuxe musical instruments concerned the reduction of scale. Downsizing was particularly important for large and heavy stringed keyboard instruments, such as harpsichords and grand pianos, which were favoured by professional and amateur musicians alike. Advances in string technology, combined with improvements in construction materials and methods, enabled the production of smaller keyboard instruments like the square piano, which offered a fine and varied sound at a low price. For example, the problem of relatively short string lengths due to the condensed size of the square piano was solved with the adoption of overspun strings for the bass register, while the sound-

Fig. 3 Square piano, Clementi & Co, London, 1805, No 4447 (Inv. No.: 1991-735). By closing its lid, the instrument can be turned into an elegant side table.

board and bracing became progressively thicker to help the instrument withstand the greater string tension.[20]

Thus, although harpsichords and grand pianos were arguably the most expensive and prestigious keyboard instruments, their most common relative during the late eighteenth and early nineteenth centuries was the square piano. Being smaller and cheaper than their grand equivalents, square pianos required less space and were much more affordable. Therefore, they were very attractive for middle-class customers who desired to enjoy music at their homes but did not possess the room and budget needed for a grand piano. With their increased dynamics, expressive qualities and tonal options, square pianos were equally suitable for vocal accompaniment and for solo or ensemble performances in an intimate, domestic setting. In addition, when their lids were closed, these instruments looked like elegant side tables, thus fitting nicely with other pieces of furniture in well-to-do households. Usually built and decorated with imported timbers originating from colonial regions, such as mahogany and satinwood, square pianos demonstrated the same exotic woods found on a variety of luxury products, from snuff boxes to long-case clocks. It is worth noting that mahogany was not traditionally associated with the manufacture of musical instruments. However, as a new wood imported in large quantities through transatlantic shipping[21] it offered many advantages: it was durable and easily workable, it was available in large boards, it had an attractive red-brown colour, and it could take a high polish,[22] thus making it appropriate for pianos that were often purchased both as musical instruments and as pieces of furniture. In this context it is important to mention that Johann Christoph Zumpe (1726–1790), a German immigrant who introduced the square piano in London in the 1760s using mahogany extensively in its construction, was originally trained as a furniture maker.[23]

Thousands of square pianos were produced in the first decades of the nineteenth century in London, Paris, and Vienna, and quite a large number of them have survived in private and public collections. Prominent firms, such as Broadwood, Erard, and Clementi & Co (Fig. 3), sold these instruments not only across Europe, but in places stretching as far away as India or Australia in the East and North America in the West, where colonial settlers were eager to follow the latest European fashions.

20 For a comprehensive overview on the development of the square piano, see Cole, *The Pianoforte in the Classical Era*, 43–113, 272–280.

21 For more details on the selection of mahogany as an alternative freight for ships occupied in the West Indies trade, see Bowett, 'The Commercial Introduction of Mahogany', 48–52.

22 The reasons behind the widespread use of mahogany have been analysed in Snodin and Styles, *Design & the Decorative Arts*, 145.

23 For more details on Zumpe's training and early career see Poulopoulos, 'A Comparison of Two Surviving Guittars by Zumpe', 49–50. The features of square pianos by Zumpe have been discussed in Cole, *The Pianoforte in the Classical Era*, 51–63.

The commercial appeal of square pianos is further reflected by the introduction of even smaller pianos with reduced overall dimensions and a shorter compass, such as travel or sewing-table pianos,[24] and by the invention of plucked instruments equipped with piano-key mechanisms, which appeared from the early 1780s onwards. Patent keyed citterns built in London during the late eighteenth century and often advertised in the press as 'pianoforte guittars', or keyed guitars developed in Germany during the early nineteenth century and labelled as 'Tastengitarren', were novel instruments aiming to rival the piano and mainly addressed to amateur female musicians.[25] In the case of the pianoforte guittar, its technical sophistication was apparently more important than its musical features: the instrument was 'more impressive for the intricacy of its design than for the music that would have been played on it'.[26] Despite their restricted musical abilities and questionable function, such unusual, hybrid instruments, merging features from different instruments types,[27] were highly sought after because they answered the demand for compact,

Fig. 4 Orphica, unsigned, possibly Vienna, around 1810 (Inv. No.: 18651). The instrument has a short compass of three and a half octaves with short and narrow keys, rendering it more suitable for children or women.

24 A typical example of a sewing-table piano is housed in the National Museum of American History, Smithsonian Institution, Washington (Inv. No.: 1992.0192). For more details of this artefact see https://www.si.edu/object/work-table-piano:nmah_607135 (accessed 22 November 2021). Similar specimens are housed in the Residenz München, Munich, and the Musikinstrumenten-Museum, Berlin.

25 For more details on keyed citterns and guitars see Wheeldon, 'Makers of the Pianoforte Guittar', 97–116, 226–227; and Wheeldon, 'Reconstructing German Keyed Guitars' (forthcoming). I am thankful to Daniel Wheeldon for sharing information on keyed citterns and guitars.

26 Wheeldon, 'The Met's German Keyed Guitar', 147.

27 For example, several hybrid instruments combining features of plucked and bowed instruments appeared during the same time. For more details see Poulopoulos, 'The Impact of François Chanot's Experimental Violins', 73–77.

inexpensive and easy to play piano-like instruments that, in contrast to real pianos, did not require a substantial financial investment and learning commitment.

The gradual miniaturisation of keyboard instruments was epitomised by the orphica (Fig. 4). Invented in Vienna in 1795, the orphica was essentially a portable mini piano in the form of a lyre or harp.[28] Its inventor, Carl Leopold Röllig (c.1754–1804), was a composer and virtuoso of the glass harmonica who devised the orphica as a keyed surrogate for plucked instruments. Röllig believed that the orphica had superior features to the lute, cittern or guitar, claiming that he had created an instrument 'whose construction is quite different from that of the theorbo, the lute, the English and Spanish zither (Cithara), and which surpasses all of them in in beauty of tone and variety of modulation.'[29] Apparently under the influence of Neoclassicism, a cultural movement that prevailed in European art, fashion and culture during that time, Röllig named his new instrument after Orpheus, a figure of Greek mythology who was an accomplished poet, singer, and player of the lyre.

Regarding its sound, Röllig claimed that 'the orphica in relation to the choice of tones stands as an intermediate species between the lute and the fortepiano.'[30] Röllig additionally maintained that the orphica could be played 'sitting on the sofa, the chair, or on the grass, on the lap, whereon it can be held firmly with a strap',[31] thus making the instrument ideal for playing music both in the comfortable conditions of a drawing room and in the open air. This is further indicated by the images in a brochure issued by Röllig in 1795 to promote his instrument, as well as in an engraving in the *Journal des Luxus und der Moden*, an influential fashion magazine published in Germany, in which the male and female players of the orphica are portrayed performing outdoors.[32] The convenient, casual character of the orphica is confirmed by the fact that in England the instrument became known as the 'weekend piano'.[33] It is worth noting that the majority of about fifty orphicas that have survived worldwide have different characteristics from those mentioned in Röllig's patent and are unsigned. The prevalence of unauthorised copies indicates that other makers may have imitated Röllig's orphica because they recognised the instrument's profitable potential in a market saturated with larger pianos.

28 For more information on the invention and development of the orphica, see Vogel, 'Orphicas: Genuine, Less Genuine and Fakes', 19–45, 204–205.

29 'Auf solche Weise entstand ein Instrument, das, seinem Baue nach, von der Theorbe, der Laute, der Englischen und Spanischen Zither (Cithara) ganz verschieden ist, und sie alle an Lieblichkeit des Tones und Mannigfaltigkeit der Modulation auch weit übertrifft.' Röllig, *Orphica, ein musikalisches Instrument*, 4.

30 'Die Orphica in Beziehung auf die Wahl ihrer Tonstücke, stehet als Mittelgattung zwischen der Laute und dem Fortepiano.' Röllig, *Orphica, ein musikalisches Instrument*, 17.

31 'auf dem Sopha, dem Stuhle, oder im Grase sitzend, auf den Schooss, worauf sie vemittelst eines Bandes fest gehalten.' Röllig, *Orphica, ein musikalisches Instrument*, 14.

32 See Röllig, *Orphica, ein musikalisches Instrument*, figs. 14 and 16; and Müller, 'Die Orphica, ein neues musikalisches Instrument', 87–98, and table 69.

33 Cited in Vogel, 'Orphicas: Genuine, Less Genuine and Fakes', 24–25.

Nevertheless, downsizing had its shortcomings. In order to keep the size of the orphica small, but also to make a sufficient number of notes available on its keyboard, the keys of the instrument were noticeably shorter and narrower than those of a normal piano. This was criticised in a contemporary dictionary article whose author argued that 'The keyboard is so small that it is only suitable for children, or at most for the hands of a lady.'[34] Furthermore, the orphica's short compass, usually spanning three to four octaves, limited its use to playing simple pieces or accompanying songs; complex music, requiring extended range, volume and dynamics, did not belong to the orphica's typical repertoire. Moreover, despite its compact size, the orphica was not light, as observed in surviving examples: for instance, the unsigned instrument in the Deutsches Museum shown in Fig. 4 weighs 6.6 kilograms, while heavier orphicas have also been reported.[35] The rather heavy weight of the orphica must have prevented its prolonged transportation on foot, not to speak of its carrying around with a shoulder strap, as suggested by Röllig and depicted in the above-mentioned images. Although the orphica never became a great success, this did not preclude composers of the highest calibre from writing music for the instrument, as evidenced by two surviving pieces written for the orphica in 1798 by Ludwig van Beethoven (1770–1827).[36] The case of the orphica proves that small does not necessarily mean insignificant.

Portability: walking stick instruments for music on the road

Could Beethoven 'carry a tune'? Most certainly yes, both metaphorically and literally (despite eventually becoming deaf). The orphica was not the only attempt at reducing the size and maximising the portability of musical instruments in the decades either side of 1800. One should not forget that music then was not as omnipresent as nowadays. In the absence of recorded music that could be instantly reproduced, individuals had to play themselves the music they wanted to listen to – or pay others to do so. Although in urban locations it was relatively easy to make and listen to music, either at home or at the nearest public house and concert hall, this was far more difficult while being on the road or in rural areas, where instruments and musicians might be rare. In order to meet the growing demand for portable music, inventors and makers came up with new condensed designs of existing instruments. Some of them took the concept of portability to the next level by introducing instruments built in the form of a walking stick.

The vogue for walking-stick instruments in the early nineteenth century was driven by a general trend for gadgets 'on the go'.[37] The era which witnessed the first effects of

34 Cited in Kopitz, 'Beethoven as a Composer for the Orphica', 29.

35 A similar unsigned orphica in the Salzburg Museum, Salzburg (Inv. No.: B 15/24) weighs 8.80 kilograms ('8,80 Kilo schwer'), whereas in comparison a contemporary guitar ('Biedermeiergitarre') weighs only about 800 grams ('nur etwa 80 Deka'), as mentioned in Birsak, 'Orphica: Ein handliches Klavier', 3.

36 See Kopitz, 'Beethoven as a Composer for the Orphica', 25–30.

37 For an overview of portable objects developed in the long eighteenth century, see Bernasconi, *Objets portatifs*.

Fig. 5 Walking stick clarinet, unsigned, second quarter of nineteenth century (Inv. No.: 10203). In the right image the top of the handle has been removed to reveal the clarinet's mouthpiece.

industrialisation on humans and the environment they lived in coincided with an increasing tendency among the bourgeoisie to come closer to nature and the consequent popularisation and expansion of outdoor activities and travels. This led to a proliferation of novel, eccentric walking stick objects used mostly by gentlemen as fashionable mobile accessories. Dual-purpose walking canes appeared in a wide variety, typically consisting of a long wooden stick used as a walking aid and various mathematical, navigational, optical or medical instruments usually housed in a secret compartment on the handle or in a cavity inside the stick itself. Extant walking stick specimens in museum collections

are equipped, for instance, with measuring scales,[38] telescopes,[39] hearing devices,[40] or healing equipment.[41] The popularity of multifunctional walking canes continued well into the twentieth century, as illustrated by diverse products ranging from those developed for leisure and travelling, such as canes supplied with smoking implements[42] or

Fig. 6 Csakan, Augustin Rorarius, Vienna, second quarter of nineteenth century (Inv. No.: 25963). By inserting the long spiky part to its hollow bottom end, the instrument can be transformed into a walking stick.

38 Unsigned walking stick with a measuring scale made around 1780–1806 (Inv. No.: 1530); at least three similar walking sticks with measuring scales are housed in the Deutsches Museum (Inv. Nos.: 17965, 32134, and 37916).

39 Walking-stick telescope with a compass on its handle (Inv. No.: 39187). Similar walking-stick telescopes survive in the National Maritime Museum, Greenwich, London (Inv. No.: NAV1611), in the Museo Galileo - Istituto e Museo di Storia della Scienza, Florence (Inv. No.: 2547), and in the Corning Museum of Glass, Corning, NY (Inv. No.: 2016.8.7). For more details and images of these artefacts see https://collections.rmg.co.uk/collections/objects/43823.html; https://catalogue.museogalileo.it/object/WalkingStickTelescope.html; and https://www.cmog.org/artwork/walking-stick-telescope, respectively (accessed 22 November 2021).

40 Ear trumpet and walking stick combined, Science Museum, London (Inv. No.: A31036). For more details of this artefact see https://collection.sciencemuseumgroup.org.uk/objects/co78016/ear-trumpet-and-walking-stick-combined-hearing-trumpet-walking-stick (accessed 22 November 2021).

41 A walking stick with a compartment for storing leeches on its handle survives in the Whipple Museum of the History of Science, University of Cambridge, Cambridge (Inv. No: Wh.5187). For more details of this artefact see Rosanna Evans, 'Walking stick with leech compartment', available at https://www.cam.ac.uk/museums-and-collections/collaborative-projects/my-museum-favourite/walking-stick-with-leech-compartment (accessed 22 November 2021).

42 Walking-stick tobacco pipe (Inv. No.: 8918).

photographic apparatuses,[43] to those designed for sport and military purposes, like trekking, hunting or self-defence, with deadly weapons and tools being hidden inside innocent-looking walking canes.[44]
Musical instruments, especially aerophones whose sound is produced by blown air, were perfect candidates for this trend. Usually made in a long, thin, tube-shaped form with natural materials, such as wood or ivory, and being able to imitate natural sounds from birdsong to the whistling wind, woodwind instruments, such as the recorder, flute, clarinet and oboe, were commonly built as walking sticks with removable components that usually covered the sensitive instrument parts, such as the mouthpiece (Fig. 5).

One representative example is the csakan, a large tenor recorder first mentioned in written sources in 1807.[45] Several models of the csakan possessed a dual functionality as a walking stick and a musical instrument, having extensions that could be added or removed at pleasure to serve each purpose, as illustrated in a csakan built by Augustin Rorarius (1788–1848), a Viennese maker of woodwind instruments (Fig. 6).[46] This made the csakan the perfect contraption for the Sunday excursions of cultivated city dwellers.

Fig. 7 Walking-stick violin, unsigned, Germany, second half of the nineteenth century (Inv. No.: 5516). The violin bow can be hidden in the hollow middle part of the stick, which also covers the violin strings and tailpiece, while the two metal rings and T-shaped handle are used to keep the pieces together.

43 Cane handle camera 'Ben Akiba', A. Lehmann, Berlin, c. 1903 (Inv. No.: 63206) and walking-stick tripod stand (Inv. No.: 1985-444).
44 Walking-stick gun (Inv. No.: 8917).
45 For the development of csakan and its repertoire see Betz, *Der Csakan und seine Musik*.
46 For more details of this instrument see Seifers, *Die Blasinstrumente im Deutschen Museum*, 26.

From a musical viewpoint, one advantage of the csakan was that due to its tonality and mellow sound it could be played alone, but also together with other portable and soft-sounding instruments like the guitar, as evidenced by duets for csakan and guitar that were published from 1810 onwards.[47] Music scores and lessons for csakan were offered in the larger cities of the Austro-Hungarian Empire, such as Vienna, Ofen (Pest), and Pressburg (Bratislava), as well as in other German-speaking regions, where the instrument was often included in concerts by touring virtuosi. Even Beethoven reportedly used the csakan as a walking accessory and it is tempting to assume that he played the instrument while on the move.[48]

Novelty, as expressed in such uncommon objects as walking-stick instruments, was an essential component of luxurious lifestyle that prevailed at the beginning of the nineteenth century. Other experimental walking-stick instruments, from trumpets to violins (Fig. 7), that were conceived in the course of the nineteenth century, provide further testimony of the wishes and efforts for music entertainment 'on the go' long before the arrival of the Walkman and iPod. The garden, the park and the forest thus became new venues for music enthusiasts, who could now happily carry their tunes – and fancy instruments – wherever they desired.

Mechanisation: horology, lutherie, and the tuning of citterns and guitars

Welcome to the machine age. A noteworthy technological trait of populuxe instruments in the early industrial era concerns their intense mechanisation. The radical change of the manufacturing sector due to industrialisation was combined with an interest and motivation among contemporary scientists, engineers and manufacturers to build mechanical contrivances for the upgrading and refinement of products as different as pocket watches, cooking ovens, wheelchairs, automata, and musical instruments. One person who produced all the above objects (and several others) is John Joseph Merlin (1735–1803), a Belgian inventor trained in Paris and working in London from 1760 onwards.[49] Arguably the most remarkable among the various uncommon stringed and keyboard instruments by Merlin is a combined harpsichord-pianoforte equipped with a musical notation device, surviving in the collection of the Deutsches Museum.[50] Merlin's interest in unusual

47 See Poulopoulos, 'Musik im Freien', 57–59; and Poulopoulos, 'The Guitar as an "Open-air" Instrument', 9–10.

48 For more details on Beethoven's connection to the csakan, see Tarasov, 'Neues von Beethoven, 1', 6–10; and Tarasov, 'Neues von Beethoven, 2', 6–9.

49 For Merlin's biography and output see French et al., *John Joseph Merlin*, 11–111; and Debenham, 'Joseph Merlin in London', 130–163.

50 Combined harpsichord-pianoforte equipped with a musical notation device (Inv. No.: 43872). For more details of this instrument see Henkel, *Besaitete Tasteninstrumente*, 98-102; and Latcham, 'The Apotheosis of Merlin', 271–298.

instruments is further confirmed by his purchase in 1785 of four pianoforte guittars from Christian Clauss (active 1783–1799), a well-known maker of these instruments.[51]

This fascination – if not obsession – with sophisticated machinery affected not only highly mechanised instruments, such as the combined harpsichord-pianoforte by Merlin or the pedal harps and pianos mentioned earlier, whose function relied on numerous mechanical components, but also their less technology-driven equivalents, such as citterns and guitars. Apart from the already mentioned piano-key mechanisms devised for these instruments in order to provide them with new performance options, citterns and guitars also became equipped with advanced mechanical apparatuses aiming to enhance their functionality and reliability. An example worth discussing regards the various tuning devices that were developed for plucked and bowed stringed instruments in order to improve their tuning stability and intonation. These devices were greatly influenced by the development and widespread use of precision metal screws during the late eighteenth and early nineteenth centuries. Owing to the work of leading mechanical engineers, such as Henry Maudslay (1771–1831), who build screw-cutting lathes and other precision machine tools, screws were transformed from irregular, hand-made objects to standardised, mass-produced items.[52] Allowing 'structures to be held together, and to be dismantled again', and enabling repairs, replacements and adjustments, the humble screw can be considered as 'a building block of the modern industrial world, and one that is easy to take for granted.'[53]

One of the earliest tuning systems for musical instruments utilising screw threads is the watch-key machine. Made of cast brass and fixed with a screw on the headstock of an instrument, the watch-key machine typically consisted of a rectangular frame enclosing long vertical screw threads which allowed the tension of strings, and thus their pitch, to be increased or lowered with accuracy. Watch-key machines were commonly used on the guittar, a type of cittern usually referred to as the 'English guitar'. From the mid-1750s, when it first appeared in London, to the early 1800s, when it started to become superseded by similar plucked instruments, the guittar enjoyed a great popularity across in the British Isles.[54] Being cheap, portable, and relatively easy to play, the guittar appealed mainly to amateur performers of polite society, especially young girls. With only few instructions, beginners could quickly learn to play simple airs or songs, which helped them to demonstrate their artistic cultivation and skills and thus to improve their chances for upwards social mobility.[55] Having a dominant presence in drama, literature, and portraiture, the guittar played a significant role in the lifestyle and culture of Georgian

51 See Nex, 'The Business of Musical-Instrument Making', 386. For more detail on Clauss see Poulopoulos, 'Claus, Christian', 582.

52 For the contributions of Maudslay in mechanical engineering, see Cantrell, 'Henry Maudslay', 18–38.

53 Waller, *Iron Men*, 28.

54 For a comprehensive history of the guittar, see Poulopoulos, 'The Guittar in the British Isles'.

55 See Page, *The Guitar in Georgian England*, 38–62.

Fig. 8 Guittar, Michael Rauche, London, 1761 (Inv. No.: 2019-0027). A brass watch-key machine of a later date bearing the engraving 'PRESTON*INVENTOR' has been mounted on the sickle-shaped headstock of the instrument, while four holes have been drilled on the neck and fingerboard for the attachment of a capotasto with a screw.

Fig. 9 Cistre, unsigned, France, last third of the eighteenth century (Inv. No.: 10205). This instrument bears a watch-key machine with protruding spindles, while four holes for a capotasto are evident on the second third, fifth and seventh frets.

Britain.[56] The craze for the guittar quickly attracted the interest of inventors and makers, leading to the development of several innovative features, one of which was the aforementioned watch-key machine. Keeping the tuning of the guittar's wire strings stable and accurate with minimum effort, the watch-key machine eventually replaced the wooden pegs used previously on guittars, which were less reliable and more prone to damage. Except for the watch-key machine, another pioneering device utilising screws that was introduced on the guittar was the capotasto. This was a movable bar fitted with a screw in holes drilled on the guittar's fingerboard, which enabled musicians to transpose in higher keys without having to change their fingerings.

Both the watch-key machine and the holes for the capotasto can be observed on a guittar by Michael Rauche (c. 1710–1784), built in London and dated 1761 (Fig. 8). Having immigrated to London from Germany, Rauche was one of the earliest and most prolific makers of the guittar in the British capital, and also published music for it.[57] Like other early guittars, this instrument was modified to be equipped with a watch-key machine, a process that involved removing part of the original neck and headstock and adding a new neck part and a sickle-shaped headstock on which the watch-key machine was mounted.[58]

The engraving 'PRESTON*INVENTOR' on the watch-key machine is a noteworthy feature. The watch-key machine had been introduced in the mid-1750s; the earliest known surviving guittar with a watch-key machine is an instrument dated 1756 and signed by Reinerus Liessem (before 1743–1760), a maker of German or Austrian origin.[59] The watch-key machine was further improved and standardised in the 1760s by the British guittar manufacturer John Preston (1727–1798), who claimed to be 'the original Inventor for tuning the guitar with a watch key'.[60] Interestingly, early watch-key machines attached on guittars and similar instruments had protruding spindles, as shown on an unsigned French guittar (usually referred to as cistre, the counterpart of the guittar in France), which dates from the last third of the eighteenth century (Fig. 9).[61] This suggests that Preston was not the original inventor of the machine, but most likely improved the initial design by introducing a machine with recessed screw threads, which made it more compact and less fragile.

Most importantly, the metal parts and screws used in watch-key machines and other tuning devices were presumably built not by luthiers, but by professionals in other trades involving precision work, such as clock- and watchmakers or makers of scientific instru-

56 Poulopoulos, '"A complete Accompanyment to the Female Voice"', 97–120.

57 For more information on the biography and professional activities of Rauche, see Poulopoulos, '"Wha sweetly tune the Scottish lyre"', 152–158.

58 See Poulopoulos, *New Voices in Old Bodies*, 77–82.

59 See Poulopoulos and Durkin, '"A very mistaken identification"', 318. For more details on Liessem, see Poulopoulos, 'Liessem, Reinerus', 284.

60 For more details on Preston see Poulopoulos, 'Preston, John', 164.

61 For more details of this instrument see Wackernagel, *Europäische Zupf- und Streichinstrumente*, 62.

Fig. 10 Lyre guitar, Johann Gottlob Thielemann, Berlin, 1811, No 17 (Inv. No.: 64021). The instrument is equipped with a watch-key machine for six strings.

ments. Several instances reveal the close connections between guittar manufacturers and makers of watches and clocks. For example, in 1763 Liessem's son Reinerus began an apprenticeship with John Basire (1734–1803), a clock-maker in London. Since apprentices were usually trained under eminent craftsmen with whom their parents had personal or professional relationships, it is possible that Basire may have built the watch-key machines used on guittars by Liessem.[62]

Likewise, in 1764 John Hawthorn (before 1755–1779), a watchmaker in Newcastle, announced the sale of various guittars 'all made by Mr FREDERICK HINTZ, GUITAR-MAKER to her Majesty and the Rest of the Royal Family'.[63] A compatriot and competitor of Rauche and Liessem, the guittar and viol maker John Frederick Hintz (1711–1772) was, according to written accounts and advertisements, the originator of the guittar as well as a successful inventor and manufacturer of uncommon instruments in London, having many customers among the royalty and nobility.[64] That Hintz supplied Hawthorn with guittars and other novel, unconventional instruments should come as no surprise, since when Hawthorn died, his wife continued his business, which included the retailing of various populuxe items, such as 'Jewelry, Trinkets, Watches, Music and Musical Instruments'.[65]

On the other side of the Channel, a notable example regards the watchmaker Pierre Joseph Peerens (1738–1819), who in 1767 became son-in-law of Gérard Joseph Deleplanque (1723–1784), a maker of plucked and bowed instruments in Lille. Peerens is referred to as a 'watchmaker' in various records and it is interesting that the earliest guittar by Deleplanque with a watch-key machine is dated 1769, two years after Peerens joined the Deleplanque family by marrying the instrument maker's eldest daughter. The fact that almost all guittars made by Deleplanque after this date are equipped with watch-key machines indicates that Peerens may have been involved in their manufacture and maintenance, considering his watchmaking background and skills.[66]

Although the watch-key mechanism worked well with wire-strung instruments like the guittar, it was not as successful with gut-strung instruments like the Spanish guitar, because as a softer and more tensile material gut required more leeway for its tuning to the appropriate pitch than wire. However, the watch-key machine was not instantly abandoned when gut-strung Spanish guitars and other plucked instruments, such as harp lutes or lyre guitars, became popular in Europe around 1800 especially among female musi-

62 See Poulopoulos and Durkin, '"A very mistaken identification"', 317–319.

63 *Newcastle Courant* (Newcastle), 7 January 1764. Hawthorn is mentioned as a watchmaker in a list of subscribers contained in Whitehead and Jameson, *An explanation of the arms*, viii.

64 For more details on Hintz as a maker of uncommon instruments in Georgian London see Poulopoulos, '"A Guittar to be played with a Bow"', 102–108. On the impact of makers of German origin, such as Hintz, Liessem and Rauche, in the development of the guittar, see Poulopoulos, 'The Influence of Germans', 62–75.

65 Quoted in Pinchbeck, *Women Workers and the Industrial Revolution*, 285.

66 See Hemmy et al., 'New insights', 9–14, 18–19.

cians.[67] One representative example among several extant specimens is a lyre guitar by Johann Gottlob Thielemann (c.1765–1821) built as late as 1811, which is equipped with a watch-key machine similar to those typically used on earlier guittars (Fig. 10).[68]

The use of a sophisticated watch-key machine on an antique-looking instrument like the lyre guitar is not a coincidence. A characteristic byproduct of Neoclassicism, lyre guitars were built in various forms evoking ancient Greek lyres, but usually had a modern guitar fingerboard to appeal to players of fretted plucked instruments as well as a pedestal that allowed them to stand as tasteful furniture pieces. Being extremely fashionable in the first decades of the nineteenth century, lyre guitars are important in guitar history because they exemplified experimentation not only on an aesthetic level, but also on a technical one. For example, due to the large cavities of the instrument's body, the sound of lyre guitars was deeper and louder than that of common guitars, even though it did not project efficiently, making these instruments more appropriate for intimate solo music at home, rather than at a concert hall.[69] Apart from their rather muffled sound, lyre guitars were often criticised by contemporary writers for their poor ergonomics and playability due to their awkward shape, and are nowadays a forgotten curiosity; yet, it should be pointed out that various pioneering concepts that were later applied to common guitars were first tested on lyre guitars. These include, for instance, the stringing with six single strings, the adoption of a large body and multiple soundholes to enhance bass frequencies and resonance, and the application of adjustable necks with screws to facilitate regulation and repair.[70]

The presence of a watch-key machine on the lyre guitar by Thielemann is worth further analysis from the perspective of cross-fertilisation between different crafts. Thielemann was a furniture manufacturer who, mainly for financial reasons, started making guitars from c. 1805/1806.[71] Until his death in 1821 Thielemann produced about one thousand guitars on which he adopted various production and marketing methods applied in the making of furniture and other luxury objects. Rather than entirely switching careers, Thielemann continued to make furniture, employing other artisans to build guitars in his premises, while he was mainly supervising their work. This is evidenced by the fact that Thielemann's guitars bear hidden signatures and serial numbers written in ink inside the body, indicating division of labour, whereas oval printed paper labels with Thielemann's name, resembling those used by other furniture manufacturers in Berlin, are placed on visible areas. As someone involved in the furniture-making business, Thielemann must have had contacts with specialists in metalwork, who could provide

67 For more details on the development of guitar hybrids, such as harp lutes and lyre guitars, in the early nineteenth century, see Sugimoto, 'Harp Lutes in Britain', and Bonner, *The Classic Image*, respectively.

68 For more details of this instrument see Wackernagel, Europäische Zupf- und Streichinstrumente, 96–97.

69 Wedemeier, *Gitarre-Zister-Laute*, 24–27. On the musical features of the lyre guitar see also Ophee, 'The Story of the Lyre-Guitar', 235–243.

70 On the last feature see Bieber, 'Removable and Adjustable Necks', 39, 44–45.

71 For more details on Thielemann as guitar manufacturer see Hurttig, 'Johann Gottlob Thielemann', 19–36.

him both with metal parts for furniture and with watch-key machines. Notably, lyre guitars with watch-key machines were among the most expensive guitars in Thielemann's catalogue, demonstrating the marketing potential of mechanical gadgets for contemporary audiences.[72]

The watch-key tuning machine constitutes a remarkable example of the intersections between horology and lutherie in the production of populuxe musical instruments. As indicated by the cases of Liessem or Deleplanque mentioned earlier, we can assume that manufacturers such as Rauche or Thielemann most likely did not make watch-key machines in their workshops, but were supplied with such devices by clock- and watchmakers. In this context, another case worth mentioning is that of Heinrich Johannes Kessels (1781–1849), a prominent maker of chronometers and observatory regulators, who had professional connections with the Erard firm from about 1814 to 1822. For instance, Kessels is mentioned in 1814 as the 'young watchmaker' who helped Sébastien Erard with his experiments on wind instruments, while a letter from 1822 reveals that Kessels may have also been involved in the development of pedal harps.[73] These examples vividly illustrate the collaboration between various crafts upon which the trade of fashionable musical instruments relied in the age of extensive mechanisation and industrialisation.

Conclusion

The fruitful and manifold interactions between technology and luxury in the decades around 1800 are echoed in a wide variety of novel populuxe musical instruments that appeared during this time. The growth of a new class of enlightened citizens, who could spend more money and time for their musical amusement, opened up new possibilities as well as challenges for those involved in the manufacture and trade of musical instruments. From sewing-table pianos to orphicas, and from walking-stick violins to keyed or 'mechanised' guittars, inventors and makers strove to create new, fashionable instruments that were elegant, affordable, portable and relatively easy to play. Many of these instruments fulfilled the musical aspirations of middle-class customers who were keen to imitate their social and financial superiors by consuming semi-luxury instruments. Although some of these populuxe instruments were experimental hybrids doomed to become obsolete, they introduced ideas and features that had a lasting presence in the manufacture of musical instruments, and thus deserve more attention by scholars. Moreover, apart from their obvious use as sounding devices, populuxe musical instruments such as the square piano, pedal harp, lyre guitar or csakan were consumer goods with a highly decorative or symbolic character, and were often displayed as stylish pieces of furniture in affluent homes or as practical musical accessories for outdoor activities. The

72 On Thielemann's lyre guitars, see Hurttig, 'Johann Gottlob Thielemann', 21–25.

73 See Adelson et al., *The History of the Erard Piano and Harp*, 562–563 and 788. For a thorough account of Kessels' biography and work, see Oestmann, *Heinrich Johann Kessels*.

key word connecting these diverse artefacts was novelty, a factor that determined the commercial success of new products incorporating innovative concepts and technologies. Above all, this article has shown that apart from their undeniable value as witnesses of music history, musical instruments are multifaceted objects that can be studied from various perspectives, enhancing our understanding and appreciation of the past.

Bibliography

Adelson, Robert and Jacqueline Letzter. '"For a woman when she is young and beautiful": The Harp in Eighteenth-Century France'. In *History/Herstory: Alternative Musikgeschichten*, ed. by Annette Kreutziger-Herr and Katrin Losleben, 314–335. Cologne, Weimar, Vienna: Böhlau, 2009.

Adelson, Robert, Alain Roudier, Jenny Nex, Laure Barthel, and Michel Foussard. *The History of the Erard Piano and Harp in Letters and Documents*, 1785–1959. Cambridge: Cambridge University Press, 2015.

Baldwin, Mike. 'The Harp in Early Nineteenth-century Britain: Innovation, Business, and Making in Jacob Erat's Manufactory'. PhD diss., London Metropolitan University, 2017.

Berg, Maxine. 'From Imitation to Invention: Creating Commodities in Eighteenth-Century Britain'. *The Economic History Review 55*, no. 1 (2002): 1–30.

Bernasconi, Gianenrico. *Objets portatifs au Siècle des lumières*. Paris: CTHS, 2015.

Betz, Marianne. *Der Csakan und seine Musik: Wiener Musikleben im frühen 19. Jahrhundert, dargestellt am Beispiel einer Spazierstockblockflöte*. Tutzing: Schneider, 1992.

Bieber, Alain. 'Removable and Adjustable Necks for Classical Guitars'. *American Lutherie* 80 (2004): 38–45.

Birsak, Kurt. 'Orphica: Ein handliches Klavier für Orpheus und die Damenwelt'. *Das Kunstwerk des Monats, Salzburger Museum Carolino Augusteum für Kunst und Kulturgeschichte der Stadt und des Landes Salzburg* 17, no. 190 (2004): 1–3.

Bonner, Stephen. *The Classic Image: European History and Manufacture of the Lyre Guitar, 850–1840*. Harlow: Bois de Boulogne, 1972.

Bowett, Adam. 'The Commercial Introduction of Mahogany and the Naval Stores Act of 1721'. *Furniture History* 30 (1994): 43–56.

Cantrell, John. 'Henry Maudslay'. In *Henry Maudslay and the Pioneers of the Machine Age*, ed. by John Cantrell and Gillian Cookson, 18–38. Stroud: Tempus, 2002.

Cleary, Maria Christina. 'The "harpe organisée", 1720-1840: Rediscovering the lost pedal techniques on harps with a single-action pedal mechanism'. PhD diss., Leiden University, 2016.

Cole, Michael. *The Pianoforte in the Classical Era*. Oxford: Clarendon Press, 1998.

Coquery, Natacha. 'The Language of Success: Marketing and Distributing Semi-Luxury Goods in Eighteenth-Century Paris'. *Journal of Design History* 17, no. 1 (2004): 71–89.

Debenham, Margaret. 'Joseph Merlin in London, 1760–1803: The Man behind the Mask. New Documentary Sources'. *Royal Musical Association Research Chronicle* 45, no. 1 (2014): 130–163.

Droysen-Reber, Dagmar. *Harfen des Berliner Musikinstrumenten-Museums*. Berlin: Staatliches Institut für Musikforschung Preußischer Kulturbesitz, 1999.

Dubois, Pierre. *Music in the Georgian Novel*. Cambridge: Cambridge University Press, 2015.

Fairchilds, Cissie. 'The Production and Marketing of Populuxe Goods in Eighteenth-Century Paris'. In *Consumption and the World of Goods*, ed. by John Brewer and Roy Porter, 228–248. London and New York: Routledge, 1993.

French, Anne, Michael Wright, and Frances Palmer. *John Joseph Merlin: The Ingenious Mechanick*. London: Greater London Council, 1985.

Hemmy, Christine, Philippe Bruguière, and Jean-Philippe Echard. 'New insights into the life and instruments of Gérard Joseph Deleplanque, maker in eighteenth-century Lille'. *The Galpin Society Journal* 71 (2018): 5–34.

Henkel, Hubert. *Besaitete Tasteninstrumente. Deutsches Museum. Kataloge der Sammlungen. Musikinstrumenten-Sammlung*. Frankfurt am Main: Bochinsky, 1994.

Hurttig, Martin. 'Johann Gottlob Thielemann und der Berliner Gitarrenbau um 1800'. Diplomarbeit, Westsächsische Hochschule Zwickau, 2008.

Kisluk-Grosheide, Daniëlle. '"Cutting up Berchems, Watteaus, and Audrans": A *Lacca Povera* Secretary at The Metropolitan Museum of Art'. *Metropolitan Museum Journal* 31 (1996): 81–97.

Kolle, Elise. 'Feminine Portraits: Lady Harpists and Their Music in the Age of Enlightenment'. Masters diss., University of Glasgow, 2020.

Kopitz, Klaus Martin. 'Beethoven as a Composer for the Orphica: A New Source for WoO 51'. *The Beethoven Journal* 22, no. 1 (2007): 25–30.

Lacham, Michael. 'The Apotheosis of Merlin'. In *Music of the Past – Instruments and Imagination. Proceedings of the Harmoniques International Congress, Lausanne 2004,* ed. by Michael Latcham, 271–298. Bern: Peter Lang, 2006.

Manning, Hiram. *Manning on Decoupage.* 2nd edition; New York: Dover Publications, 1980.

Müller, Johann Christian Ernst. 'Die Orphica, ein neues musikalisches Instrument, erfunden von Hr. C. L. Röllig zu Wien'. *Journal des Luxus und der Moden* 11 (1796): 87–98.

Nex, Jennifer Susan. 'The Business of Musical-Instrument Making in Early Industrial London'. PhD diss., Goldsmiths College London, 2013.

Oestmann, Günther. *Heinrich Johann Kessels: Ein bedeutender Verfertiger von Chronometern und Präzisionspendeluhren. Biographische Skizze und Werkverzeichnis.* Acta Historicae Astronomomiae 44. Frankfurt am Main: Harri Deutsch, 2011.

Ophee, Matanya. 'The Story of the Lyre-Guitar'. *Soundboard: Quarterly Magazine of the Guitar Foundation of America* 14, no. 4 (1987/8): 235–243.

Page, Christopher. *The Guitar in Georgian England: A Social and Musical History.* New Haven and London: Yale University Press, 2020.

Parker, Michael. Child of Pure Harmony: *A Source Book for the Single-Action Harp.* London: Parker, 2005.

Pinchbeck, Ivy. *Women Workers and the Industrial Revolution,* 1750–1850. London: Routledge, 1930.

Poulopoulos, Panagiotis. 'The Guittar in the British Isles, 1750–1810'. PhD diss., University of Edinburgh, 2011.

Poulopoulos, Panagiotis. 'A Comparison of Two Surviving Guittars by Zumpe and New Details Concerning the Involvement of Square Piano Makers in the Guittar Trade'. *The Galpin Society Journal* 64 (2011): 49–59, 180–183.

Poulopoulos, Panagiotis. '"A complete Accompanyment to the Female Voice": The Guittar and its Role in the Culture of Georgian England'. *Phoibos: Zeitschrift für Zupfmusik 5,* no. 1 [Issue 'Gender'] (2012): 97–120.

Poulopoulos, Panagiotis. 'The Influence of Germans in the Development of "this favourite Instrument the Guittar" in England'. *Soundboard: Quarterly Magazine of the Guitar Foundation of America* 38, no. 4 (2012): 62–75.

Poulopoulos, Panagiotis. '"Wha sweetly tune the Scottish lyre": A Guittar by Rauche & Hoffmann and its Connection to Robert Burns'. *The Galpin Society Journal* 67 (2014): 40–44, 143–170.

Poulopoulos, Panagiotis. 'Claus, Christian'. In *The Grove Dictionary of Musical Instruments,* ed. by Laurence Libin, Vol. 1, 582. 2nd edition. New York: Oxford University Press, 2014.

Poulopoulos, Panagiotis, 'Liessem, Reinerus'. In *The Grove Dictionary of Musical Instruments,* ed. by Laurence Libin, Vol. 3, 284. 2nd edition. New York: Oxford University Press, 2014.

Poulopoulos, Panagiotis. 'Preston, John'. In *The Grove Dictionary of Musical Instruments,* ed. by Laurence Libin, Vol. 4, 164. 2nd edition. New York: Oxford University Press, 2014.

Poulopoulos, Panagiotis. 'Musik im Freien in der Zeit des Biedermeier: Die Beispiele der Orphica, der Gitarre und des Csakans'. *Phoibos: Zeitschrift für Zupfmusik* 8, no. 1 [Issue 'Historische Aufführungspraxis II'] (2015): 43–68.

Poulopoulos, Panagiotis. 'The Guitar as an "Open-air" Instrument in the Early Romantic Era'. *Soundboard Scholar: Journal of the Guitar Foundation of America* 1 (2015): 4–15.

Poulopoulos, Panagiotis. *New Voices in Old Bodies: A Study of 'Recycled' Musical Instruments with a Focus on the Hahn Collection in the Deutsches Museum.* Deutsches Museum Studies 2. Munich: Deutsches Museum Verlag, 2016.

Poulopoulos, Panagiotis. 'The Impact of François Chanot's Experimental Violins on the Development of the Earliest Guitar with an Arched Soundboard by Francesco Molino in the 1820s'. *Early Music* 46, no. 1 (2018): 67–86.

Poulopoulos, Panagiotis. '"A Guittar to be played with a Bow, as well as with the Fingers": Reconsidering a Puzzling Hybrid by Frederick Hintz'. *Journal of the American Musical Instrument Society* 44 (2018): 88–122.

Poulopoulos, Panagiotis. *A Symbol of Innovative Transformation: The Production and Consumption of the Erard Grecian Harp in Regency England* (forthcoming).

Poulopoulos, Panagiotis, and Rachael Durkin. '"A very mistaken identification": The "Sultana" or "Cither viol", and its Links to the Bowed Psaltery, Viola d'Amore and Guittar'. *Early Music* 44, no. 2 (2016): 307–333.

Poulopoulos, Panagiotis and Julin Lee. 'A Synergy of Form, Function and Fashion in the Manufacture of the Erard Harp'. In *Wooden Musical Instruments: Different Forms of Knowledge*, ed. by Marco A. Pérez and Emanuele Marconi, 367–398. Paris: Cité de la Musique - Philharmonie de Paris, 2018.

Poulopoulos, Panagiotis, Marisa Pamplona, Luise Richter, and Elke Cwiertnia. 'Technological Study of the Decoration on an Erard Harp from 1818'. *Studies in Conservation* 65, no. 2 (2020): 86–102.

Rensch, Roslyn. *Harps and Harpists*. Indiana: Indiana University Press, 1989.

Riello, Giorgio. 'Strategies and Boundaries: Subcontracting and the London Trades in the Long Eighteenth Century'. *Enterprise & Society* 9, no. 2 (2008): 243–280.

Röllig, Carl Leopold. *Orphica, ein musikalisches Instrument. Erfunden von C. L. Röllig*. Vienna: Blumauer, 1795.

Seifers, Heinrich. *Die Blasinstrumente im Deutschen Museum: Beschreibender Katalog*. Munich: Oldenbourg, 1976; revised edition 1980.

Snodin, Michael, and John Styles. *Design & the Decorative Arts. Georgian Britain 1714–1837*. London: V&A Publications, 2004.

Styles, John. 'Design for Large-Scale Production in Eighteenth-Century Britain'. *Oxford Art Journal* 11 (1988), 10–16.

Styles, John. 'Product Innovation in Early Modern London'. *Past & Present* 168 (2000), 124–169.

Sugimoto, Hayato. 'Harp Lutes in Britain, 1800-1830. Study of the Inventor, Edward Light and His Instruments'. PhD diss., University of Edinburgh, 2015.

Tarasov, Nik. 'Neues von Beethoven, 2. Teil: Csakan-Recherchen beim großen Wiener Klassiker'. *Windkanal* 4, no. 2000 (2000): 6–9.

Tarasov, Nik. 'Neues von Beethoven, 1. Teil: Csakan-Recherchen in Beethovens Konversationsheften'. *Windkanal* 3, no. 2000 (2000): 6–10.

Thornton, Jonathan, and William Adair. 'Applied Decoration for Historic Interiors: Preserving Composition Ornament'. *Preservation Briefs* 34 (1994): 1–16.

Wackernagel, Bettina. *Europäische Zupf- und Streichinstrumente, Hackbretter und Äolsharfen. Deutsches Museum München. Musikinstrumentensammlung Katalog*. Frankfurt am Main: Bochinsky, 1997.

Waller, David. *Iron Men: How One London Factory Powered the Industrial Revolution and Shaped the Modern World*. London and New York: Anthem Press, 2016.

Wetherall, Judith. 'History and Techniques of Composition'. In *Gilding and Surface Decoration*, ed. by Sophie Budden, 26–29. London: United Kingdom Institute for Conservation, 1991.

Wedemeier, Ulrich. *Gitarre-Zister-Laute: Sammlung Historischer Zupfinstrumente*. Hannover: Wedemeier & Brinkmann, 2012.

Wheeldon, Daniel. 'Makers of the Pianoforte Guittar in London, 1780–1789'. *The Galpin Society Journal* 70 (2017): 97–116, 226–227.

Wheeldon, Daniel. 'The Met's German Keyed Guitar'. *Metropolitan Museum Journal* 55 (2020): 145–155.

Wheeldon, Daniel. 'Reconstructing German Keyed Guitars from the Romantic Period'. PhD diss., University of Edinburgh (forthcoming).

Whitehead, William and Jameson, Thomas. *An explanation of the arms of the several incorporated companies in the town and county of Newcastle upon Tyne*. Newcastle: Angus, Robson & Company, 1776.

Vogel, Benjamin. 'Orphicas: Genuine, Less Genuine and Fakes'. *The Galpin Society Journal* 57 (2004): 19–45, 204–205.

Instructive toys: Populuxe and Semi-Luxury Goods in Britain, Germany and France (1760–1818)

Joseph Wachelder

Abstract

This paper considers the advancement of educational toys, around 1800, in the context of an ongoing Consumer Revolution, to explain differences in the development of play and playthings in Britain, Germany and France. Populuxe playthings, such as the 'bilboquet' (cup and ball), the 'joujou de Normandie' (yoyo) and the diabolo, became a craze across Europe, notably in Britain and France. The argument concentrates on geographical dissections, rational toys and the kaleidoscope as case studies, also by focusing on interdependencies between their educational function, the sensorial aspects of play and patterns of consumption. Geographical dissections, as used in the upbringing of British royal offspring in the 1760s, were clearly luxury goods. Rational toys, as promoted by Beddoes and the Edgeworths, fit Berg's category of semi-luxury goods, offering a new functionality, affording bodily pleasures. The promoters of rational toys advanced 'amusement and instruction', highlighting the sense of touch. In contrast, German pedagogues stressed improvements in school instruction rather than play, while also foregrounding the sense of sight. The interdependencies between changing consumption patterns, educational innovations and science as popular culture are corroborated by the German debate about the alleged novelty of the kaleidoscope.

Keywords Educational Toys, Touch, Sight, Playthings, Populuxe, Semi-luxury, Geographical Dissections, Rational Toys, Kaleidoscope, Joujou de Normandie, Diabolo

Introduction

The concept of 'educational toys' is often used rather casually, appealing to common-sense ideas about both 'education' and 'toys', without specifying addressees, contents, aims and contexts of use. Such specifications are necessary, however, to grasp historical developments in the application of play and playthings for education or instruction. The upsurge of toys and playthings for education and instruction in the years between 1760 and 1818, I argue, was part of a Consumer Revolution in that period. Briefly put, this revolution implied a radical change in patterns of consumption in Western Europe, pertaining to who in fact consume, what they consume and why they do so. If there has been little scholarly debate about the relative importance of France and Great Britain as drivers of consumption in its modern sense, there is much agreement about its distinctive characteristics or underlying motivations: pleasure, fashionableness and an ongoing pursuit of novelty or 'newness'. Indeed, play and playthings increasingly grew

fashionable during this era as well. But differences in the advancement of rational toys and – later on – philosophical toys gave rise to different developments in Britain, France and Germany, and this is related in part to differing consumption patterns.

In the period under study, 1760 until 1818, playthings aimed at being instructive gradually developed from exclusively luxury goods into fashionable, populuxe and mostly semi-luxury goods. It is common to explain the increased popularity of toys by referring to Enlightenment ideas about education, which are traced back to John Locke (1632–1704) and Jean-Jacques Rousseau (1712–1778).[1] Without downplaying their relevance, in this contribution I argue that the insights gained and the concepts developed to explain the Consumer Revolution also help to elucidate the dynamics and spread of educational toys, with particular attention for interactions between Britain, Germany and, to a lesser extent, France. I develop this argument by looking at three cases. The first case involves the introduction of geographical dissections in France and Great Britain as of 1760, as well as Germany, for which the oldest references date from 1785[2] and 1790.[3] My discussion of this case relies on secondary literature, in particular studies on jigsaws by Linda Hannas and geographical dissections by Jill Shefrin. A second case pertains to the introduction of rational toys in Great Britain, around 1790, in which Thomas Beddoes (1760–1808) played an important role. My discussion here is based on research developed together with Hugh Torrens.[5] The third case study centres on the attention to fashionable play and playing in the German periodicals *Journal des Luxus und der Moden* and *London und Paris*. This prepares the ground for a discussion of the well-known craze for the kaleidoscope, around 1817, and its differing reception in Germany, for which Thomas Stauss' *Frühe Spielwelten* provided interesting materials. A careful look at these three cases will reveal important differences in the development of play and playthings in these three countries in relation to their educational function, the sensorial aspects of play and patterns of consumption. Due to this focus on consumption, appearance and handling, the technical requirements for the production and successive innovations will receive less attention.[5]

An emerging consumer culture

The idea of a Consumer Revolution situated somewhere in the seventeenth and eighteenth centuries was born when social and economic historians started to reflect on the cultural dimensions paralleling and affecting economic growth, increased prosperity and a broader spread of wealth. It turns out to be difficult to identify a more specific period

1 Brandow-Faller, 'Introduction', 5, 6.
2 Bekkering, *Spass und Geduld*, 12, 17.
3 Stauss, *Frühe Spielwelten*, 37.
4 Torrens and Wachelder, 'Toys, Models'.
5 I would like to thank Ton Brouwers and Paul Kilbey for their excellent editing.

for the so-called Consumer Revolution because of differences concerning not only the specifics of the countries and goods involved, but also the characteristics of and assumed mechanisms behind it. For example, Neil McKendrick, John Brewer and J. H. Plumb situate the breakthrough of this revolution in Great Britain in the third quarter of the eighteenth century.[6] In the 1770s, the term 'warehouse' began to appear in provincial towns of England, as an alternative for shops selling low-priced articles.[7] Not much later the word 'repository' got currency as a designation for places retailing fancy goods.[8] Writing on France, Daniel Roche situates the birth of a consumer society in the last quarter of the eighteenth century, when the sartorial *Ancien Régime* – characterised by 'inertia and immobility, (…) a coincidence of costume and social position; [and] a desire for control' – evolved into a consumption society in which fashion became a major driving force.[9] Jan de Vries dates the beginnings of this Consumer Revolution much earlier, in the seventeenth century, emphasising the industriousness of Britain and the Netherlands as a crucial factor. Apparently, the concept of the Consumer Revolution, including its emergence, varies from one country to the next. Why, then, is it a relevant concept for the study of the upsurge of educational toys around 1800?

In his seminal study *Empire of Things*, Frank Trentmann accounts for the difference between the Consumer Revolution of the eighteenth century and the interest in luxury goods in previous times or cultures, such as Renaissance Italy and Ming China. He argues that a basic distinction between Ming China and eighteenth-century Britain and France pertained to the aims of consumption. In Ming China, antiquity was seen as providing true value, while any novelties were suspect.[10] Although Renaissance Italy fostered new ideals of comfort and luxuries, these 'remained part of a civic culture that continued to be oriented towards public display and posterity, not private pleasure or the lure of novelty.'[11] But fashionableness, novelty and newness, as well as individual pleasure and sensibility, became distinguishing characteristics of the eighteenth century's Consumer Revolution. Before elucidating how these characteristics contributed to the advancement of 'instructive toys' in the second part of the eighteenth century, it is useful to introduce some key concepts and findings from the scholarly debate on the Consumer Revolution.

Scholarly exchanges about the respective stakes of France and Britain in the Consumer Revolution have revealed that fashion became prominent in French courtly circles at the start of the eighteenth century.[12] Connections to the court long remained a unique selling point to promote fashionable goods in France.[13] Some of the earliest merchants advertising English goods in France, such as Le Petit Dunkerque, established in 1767,

6 McKendrick, Brewer, and Plumb, *Birth*; Brewer and Porter ed., *Consumption*.
7 Mui and Mui, *Shops and Shopkeeping*, 64.
8 Ibid., 65.
9 Roche, *Culture of Clothing*, 56, 100.
10 Trentmann, *Empire of Things*, 50.
11 Ibid., 32.
12 Jones, *Sexing La Mode*.
13 Coquery, 'French Court Society', 97, 105, 107.

used their royal clientele as recommendation.[14] After the end of the Seven Years' War (1763), the first *magasins anglais*, which offered solely English goods, emerged in France.[15] In the 1780s, British products became increasingly popular in France, even to the extent that contemporaries began to speak about an 'Anglomania'. Shops like Le Porte-Feuille Anglais, the Magasin Anglais or Town of Birmingham testify to that.[16] The Treaty and Peace of Paris (1783), accomplishing the independence of the United States and marking an end to the wars between Britain on one side and France, Spain and the Netherlands on the other, may have created favourable circumstances for British products in France. But Britain had much on offer as well. Maxine Berg refers to an 'anglomanie' in world markets, due to the quality of British semi-luxury ware.[17] The trade in scientific instruments may serve as another example. In this respect Paris was clearly falling behind London, which offered possibilities for tailor-made solutions, not hindered by guild regulations.[18]

Contemporary sources from Germany provide more insight into trends in consumption and exchanges between France and Britain towards the end of the eighteenth century. It is obvious that the different German states failed to catch up with new consumer patterns emerging in France and Britain.[19] Publisher Friedrich Justin Bertuch (1747–1822) seized the opportunity to launch a number of journals, such as the *Journal des Luxus und der Moden* (1786–1827, under different titles) and *Paris und London* (1798–1815, under different titles),[20] to keep Germans abreast of the latest developments in France and Britain, as well as to promote fashionable goods he produced in his Weimar enterprise, the Landes-Industrie Comptoir. Bertuch's journals suggest that at the turn of the century also the German *Bildungsbürgertum* preferred the simpler designs and furniture from Britain over the more refined and decorated French designs, which remained expressions of aristocratic elegance.[21] In 1799, Bertuch depicted German economic dependence on France and England in quite appealing metaphors:[22]

> It cannot be denied that thus far France kept Germany on a slave chain, supplying it with large quantities of luxury items in exchange for cash money (…). However, France is not the only one whose magic wand we have to fear. (…) The tasteful simplicity and solidity which only England managed to afford its manufacturing goods is so exceptionally commanding and attractive for us Germans that the sheer notion of 'English goods' has an irresistible, magic appeal for us.

14 Coquery, 'Language of Success', 76.
15 Sargentson, *Merchants*, 115.
16 Coquery, 'French Court Society', 107–109.
17 Berg, *Luxury and Pleasure*, 20.
18 Turner, *Pleasure and Profit*, 3–6.
19 Purdy, *Tyranny of Elegance*, ix.
20 Kuhles, 'Journal des Luxus', 490.
21 Purdy, *Tyranny of Elegance*, 13, 17.
22 Bertuch, *Wichtigkeit*, 18.

When the *Journal des Luxus und der Moden* raised the question of why the German states failed to follow major foreign capitals, it was argued that these states lacked 'a large population and a lively circulation of money.'[23] Furthermore, there was not a single dominating city in Germany, whereas the countryside was omnipresent.[24] The catalysing role of a lively metropolis for the emergence of a modern consumer culture recurs frequently in the secondary literature. Throughout the eighteenth century, Paris and London were leading. Wischermann describes London in the middle of the eighteenth century as 'the hub of the world economy and Paris its cultural centre.'[25] London was also the fastest growing European city in the eighteenth century.[26] Around 1800 its number of inhabitants approached one million, and it outclassed other capitals also in the quality of its infrastructure.[27] London was renowned for its attractive shopping displays of luxury goods, decorated with glass plates and mirrors.[28] Apart from the available money and the number of inhabitants (and visitors or tourists), a 1806 issue of the periodical *London und Paris* also singled out a capital's relationship to cities in the periphery as a crucial factor.[29] In the case of London this was a highly favourable circumstance.[30] Cities to its west and in the Midlands manufactured plenty of goods for the capital, while their inhabitants were also eager to follow trends originating in London.[31]

Since the pioneering works by Thorstein Veblen[32] and Werner Sombart,[33] a recurring issue of scholarly reflection is to what extent the mechanism of emulation suffices to understand the growth and spread of consumption. Although emulation was an important factor, it was neither the only one nor the most crucial. New goods could gain new meanings when consumed by new groups of consumers, as demonstrated by, for instance, Sidney W. Mintz in his biography of sugar. From serving as a medicine and spice, sugar developed into a luxury food for the well-to-do, to end up, in the nineteenth century, as cheap nourishment for the labouring class.[34] However, becoming more affordable does not necessarily reduce the fashionableness of a consumer good. On the contrary, imitation of luxury products could lead to the invention and use of new materials, which may turn into an attraction in its own right. To account for this, Cissy Fairchilds has proposed the concept of 'populuxe' goods.[35] Fashionableness, however, may well

23 *Journal des Luxus und der Moden* January (1791): 7, translated and quoted in Purdy, *Tyranny of Elegance*, 1.
24 Wurst, *Fabricating Pleasure*, 30.
25 Wischermann, 'Placing Advertising', 3.
26 Brewer, Pleasures, xxv.
27 Prinz, 'Aufbruch', 195–196.
28 Jones, *Sexing La Mode*, 166.
29 'Die Londoner Auctionen', 19.
30 Prinz, 'Aufbruch', 209.
31 Maxted, 'Bertuch und England', 413; cf. Brewster, *Pleasures*, 55.
32 Veblen, *Leisure Class*.
33 Sombart, *Luxus und Kapitalismus*.
34 Mintz, *Sweetness and Power*.
35 Fairchilds, 'Populuxe Goods', 228–248.

become a driver as such. Complementary to Fairchilds' idea of populuxe, Maxine Berg has drawn attention to new goods, which merely due to their newness became fashionable, while also facilitating new needs created by fashionable consumption.

Berg uses the adjective 'semi-luxury' for goods that enable new forms or expressions of enlightened consumption, such as sniff boxes for holding tobacco, or tableware for having tea. Both products afford enjoyment of bodily pleasures. As Berg puts it: 'The British luxuries of the eighteenth century deployed quality, art, and style together with invention, mechanism, imitation, and novelty. Together these provided the attributes of the new luxury – delight, comfort and convenience, utility, the agreeable.'[36] The new products fitted new societal structures: 'They had many similarities to traditional luxury ware, but they were not produced for an elite. (…) They were a new kind of commodity, the special and decorative commodity within the means of the middling classes, and closely attuned to aspirations of quality and individuality.'[37] The observation that changing consumption patterns interact with – reflect, express *and* guide – changing values and go along with evolving societal structures is a basic one, which perhaps for that reason is not easy to analyse. In a seminal paper titled the 'The Great Chain of Buying', Colin Jones has analysed advertisements for medical products in the *Affiches*, French local and regional newspapers. As requisite to bodily pleasures, good health became a core value to promote new goods, or to link up existing products with new meanings. As a tag, 'de santé' began to be used for promoting a wide range of new products.[38] This encouraged the idea of an open market instead of sumptuary laws, and thus, implicitly, made the boundaries between the nobility and the third estate more permeable.[39] Michael Kwass has signalled a similar effect with respect to material goods which highlight individual pleasure rather than status distinctions.[40]

Below, the distinction between luxury, populuxe and semi-luxury goods will be used to analyse the trajectory of some typical playthings, which in the nineteenth century would have an educational connotation. Luxury goods were considered precious, valuable goods for the well-to-do. Fairchilds' concept of populuxe applied foremost to fashionable adornments and trinkets, often produced with new, fairly inexpensive materials, imbued with specific (aesthetic) qualities. Likewise, Berg coined the notion of 'semi-luxury' goods to denote new functional goods, affording bodily pleasures in particular.

36 Berg, *Luxury and Pleasure*, 26.
37 Berg, 'New commodities', 65.
38 Jones, 'Great Chain', 28; Jones and Spang, 'Sans-culottes', 52.
39 Jones, 'Great Chain'. Cf. Roche, *Culture of Clothing*, 464–469.
40 Kwass, 'World of Goods', 88.

Toys and playthings

In the eighteenth and early nineteenth centuries, the word 'toy' had multifarious meanings.[41] It was used to refer to children's playthings, often very cheap ones as found at funfairs, but also to the type of goods Fairchilds denotes as populuxe or Berg calls semi-luxury. In the second part of the eighteenth century, Birmingham was the centre of England's toy production. Edmund Burke (1729–1797) even called Birmingham 'the grand toy-shop of Europe'.[42] In this respect, Jay gives a vivid description of this city's manufacturing activity: 'A thousand small workshops and production lines churned out toys and buckles, cutlery, buttons and snuffboxes, flooding the country, and increasingly the world, with smartly designed trinkets at rock-bottom prices.'[43] Toyware was connected to a sprawling consumption culture, while individual toys were often characterised 'by novelty'.[44]

It is important to challenge the narrow view of toys as baubles, as is argued by Liliane Hilaire-Pérez. Toys could be cheap or dear; they might have stood for a worthless trifle, but could also be expensive luxury goods. Some were playthings for either children or adults.[45] Johnson's elucidation of a 'toyshop' as a shop which sells 'playthings and little nice manufactures' suggests this diversity.[46] Data from the rediscovered bank accounts of Paul Bertrand (c. 1689–1755), who ran a toyshop in Bath between 1730 and 1747, enabled Vannessa Brett to reconstruct the role of toys and toyshops in mid-eighteenth-century resorts such as Bath, Tunbridge Wells and Scarborough. Brett defines an eighteenth-century toy as 'a small and desirable luxury item'. If it had a specific function, 'such as a box to hold snuff, scent or patches', it varied widely in terms of its cost, practicality and materials.[47] Toyshops were as varied as the toys themselves, targeting different (ranks of) clientele and specialising in different types of objects, ranging from practical items, such as canes, to items strictly used as adornments, such as silver miniatures. Bertrand's toyshop targeted a high-end clientele. It catered to the landed gentry and aristocracy whose members seasonally moved from London to the countryside, following almost pre-established scheduled routes and events in both locations, such as field sports and races.[48] Such shops allowed the wealthy to marvel, in good company, at trinkets and procure them. Whereas Birmingham delivered predominantly metal toys, Tunbridge became the eponym for marquetry in wooden boxes. Shopping was a favourite pastime in Bath,[49] as was playing games of chance, for money. When in 1738 the government start-

41 Brown, *British Toy Business*, 26; Wachelder, 'Toys'.
42 Jay, *Atmosphere of Heaven*, 13.
43 Ibid.
44 Fennetaux, 'Toying with Novelty', 17, 21.
45 Hilaire-Pérez, 'Technology', 135–153.
46 Johnson, 'Toyshop'.
47 Brett, *Bertrand's Toyshop*, 16.
48 Ibid., 79–92, 105.
49 Ibid., 121.

ed to combat games by forbidding ace of hearts, faro, basset and hazard outside private courtly circles, new games of chance were introduced and subsequently forbidden: games employing letters instead of numbers (EO, even or odds), dice games and roulette.[50] Gaming was a favourable entertainment among the aristocracy, second only to visiting the warm mineral waters of spas and resorts.[51] Toyshops benefited from this popularity of games. As observed by Brett, a set of dice and a pack of cards provided 'the bread and butter of many a toyshop.'[52] Toyshops proffered tickets for lotteries as well.[53] In the first decades of the nineteenth century, toyshops in London still offered a wide variety of ware and services.[54]

Geographical dissections

By and large, education was still a privilege in the middle of the eighteenth century. The upper classes largely organised basic education at home. For more advanced education, schools were available, in particular for boys. In Britain, boarding schools were rather common, while education for women was underdeveloped.[55] The topics taught reflected the noble and gentle background of the majority of students. As regards geographical knowledge, for instance, London-based publisher John Newbery (1713–1767), who pioneered the promotion of children's books,[56] published an atlas for children in 1758, presenting 'the empires, kingdoms and states of the known world, with historical extracts relative to each'. The Atlas Minimus was promoted as essential 'towards forming the character of the fine gentlemen and agreeable companion'.[57] London-based book and map seller John Spilsbury (1739–1769) was long held to have introduced geographical dissections in Great Britain,[58] but Jill Shefrin recently discovered a French connection.[59] Lady Charlotte Finch (1725–1813), royal governess to the fifteen children of George III, imported geographical dissections from France. The French educationalist Mme Le Prince de Beaumont (1711–1780), who resided in England from 1748 to 1762, served as a go-between. Mme de Beaumont authored numerous moralising stories for children, including dialogues between a wise governess and her pupils, such as *Magasin des enfans*, *Magasin des adolescentes* and *Instructions pour les jeunes dames* (all dating back to approximately 1760).[60] Such a moralising tone was quite common in the emerging market for

50 Brett, Bertrand's Toyshop, 49-50, 136.
51 Ibid., 135.
52 Ibid., 135.
53 Ibid., 137.
54 Wachelder, 'Toys', 24.
55 Goodman, *Becoming a Woman*, 71.
56 Paterson, *The Edgeworths*, 2; Townsend, *Trade*, 1994.
57 Newbery, 1758, quoted in Shefrin, *Neatly Dissected*, 11.
58 Hannas, *English Jigsaw Puzzle*, 15.
59 Shefrin, *Affectionate Care*.
60 Ibid., xiv.

children's literature.[61] Mme de Beaumont frequently criticised educational practices in England during her sojourn, particularly the British aristocratic taste for everything French.[62] The geographical dissections which Lady Charlotte ordered for the royal children are preserved in the Cotsen Children's Library, Princeton. Shefrin's *Such Constant Affectionate Care* provides a meticulous historical study of the remaining geographical dissections. The luxury character of these early dissections – serving as the royal children's playthings – is suggested by the mahogany cabinets holding them, which were valuable goods in their own right (Fig 1).

Fig. 1 Lady Charlotte Finch's puzzle cabinet, upper cabinet with thirteen drawers on lower cabinet with legs, varnished mahogany and brass fittings, English, 1760s. Museum no: B.1:1-2011 (cabinet) and B.1:2-2011 (cabinet stand). The item and its contents are shared between the V&A Museum of Childhood and the Historic Royal Palaces.

Regardless of the role of Mme de Beaumont in bringing the geographical dissections from France to Britain, John Spilsbury was the first book and map seller to market dissected maps in Britain.[63] In 1764 and 1765, Lady Charlotte commissioned additional geographical dissections for the royal offspring. These too were luxury products, mounted on mahogany (Fig. 2). In a pioneering book on jigsaws from 1972, which is well before the concept of the Consumer Revolution originated, Linda Hannas describes a develop-

61 Heywood, *History of Childhood*, 167.
62 Shefrin, *Affectionate Care*, 74.
63 Ibid., 81.

Fig. 2 Europe Divided into its Kingdoms &c., by John Spilbury, London, 1766.

ment that seems to fit Fairchild's concept of populuxe rather well:[64] Up to the early nineteenth century the wood used for mounting was mahogany or cedar. This kind of wood was very expensive, and accounted for Spilsbury selling puzzles 'without the sea' more cheaply because of the saving in wood. When softwood gradually took over from hardwood the puzzles had to be backed by a strong paper in order to equalize the pull of the picture pasted on the other side.

Subsequently, less expensive chip-boxes started to emerge alongside the expensive ones, which came in dovetailed oak or mahogany boxes. Hannas concludes that by around 1820 'the mahogany box had virtually disappeared' and that it 'may have been killed as much by fashion as by economic stringency'.[65] It is noteworthy that she rather

64 Hannas, *English Jigsaw Puzzle*, 57.
65 Ibid., 58.

casually mentions the relevance of fashion, next to economic motives. The use of cheaper materials was in line with populuxe goods, which acquired an aesthetics of their own, according to Fairchilds. Yet changed aesthetics were not the prime characteristic of jigsaws. In the second case study below, which is on rational toys, I argue that educational playthings became exemplary for semi-luxury goods rather than populuxe goods.

Rational toys

In the 1790s, English physician Thomas Beddoes (1760–1808) developed an interest in toys and educational models, highlighting the relevance of the sense of touch.[66] Beddoes even envisaged a 'Rational Toys manufacture', although this never got off the ground. His ideas on education, however, gained prominence through his friendship with Richard Lovell Edgeworth (1744–1817). In 1794 Beddoes married Edgeworth's daughter Anna (1773–1824); four years later her sister Maria (1768–1849), partly inspired by Beddoes, joined forces with her father and her stepmother Honora Sneyd (1751–1780) to write *Practical Education* (Sneyd died before the book's completion).[67] First published in 1798, the book became a landmark in the history of education.[68] *Practical Education* also proved seminal for the advancement of educational toys in the first decades of the nineteenth century in Britain.

Having lived in Lichfield, Richard Lovell Edgeworth was well acquainted with Birmingham's industry. Birmingham was famous for its miniatures, manufactured by skilled craftsmen. These miniatures were purchased by the well-to-do, who would often display them on their living room's mantelpiece. In *Practical Education* Maria and Richard Lovell Edgeworth promoted alternatives to this precious type of toy, highlighting the value of educational toys for youngsters. Maria Edgeworth and her father observed that children needed practical things to do. The first chapter, which was written principally by Maria, was dedicated to toys. In her opinion, children 'require to have things which exercise their senses of their imagination, their imitative and inventive powers.'[69] This exercising of the senses should be taken literally. Pleasing the eyes was insufficient; toys should stimulate children to use and play with them: 'The glaring colours, or the gilding of toys, may catch the eye, and please for a few minutes, but unless some use can be made of them, they will, and ought to be soon discarded.'[70] Because the authors paid much attention to the sense of touch, they advocated nurseries where children were allowed to touch all objects and furniture.[71]

66 See Torrens and Wachelder, 'Toys, Models' for a more elaborate treatment of Beddoes' engagement with rational toys.

67 Edgeworth and Edgeworth, *Practical Education*.

68 Michaels, 'Experiments before Breakfast'.

69 Edgeworth and Edgeworth, *Practical Education*, 2003, 11 [1798, 2].

70 Ibid., 11 [1798, 1].

71 Ibid., 16 [1798, 11].

Maria Edgeworth gave an overview of the stock of a rational toyshop, which should comprise all manner of garden and carpenter's tools and accessories, pencils, cards and pasteboards, as well as 'substantial, but not sharp pointed, scissars [sic]', wire, gum, and wax – and, of course, work-benches. There should also be a wide variety of models which children should be able to take to pieces and which ought to be of gradually increasing complexity and abstraction: furniture, architecture, simple machines, complicated machinery, chemical toys, fossils for their cabinets, inexpensive microscopes, experiments in optics. The manufacture of simple microscopes had become a speciality of the Birmingham and Midlands trade.[72] The fashionableness of the above-mentioned 'rational' toys becomes clear at the end of the first chapter, where Maria Edgeworth expressed the hope to offer a more detailed list of rational toys in the future:[73]

> We intended to have added to this chapter an inventory of the present most fashionable articles in our toy-shops, and a *list of the new assortment*, to speak in the true style of an advertisement; but we are to defer this for the present: upon a future occasion we shall submit it to the judgment of the public.

Well-chosen educational toys could provide both amusement and instruction. Acknowledging the fun factor fitted into the Enlightenment 'sensationalist' context, as Roy Porter has pointed out:[74]

> This 'sensationalist' psychology – man viewed as an ensemble of stimuli and responses, mediated through the senses – sanctioned a new hedonism. 'Pleasure is now, and ought to be your business', Lord Chesterfield instructed his teenage son. The well-tempered pursuit of happiness in the here and now – indeed, the right to happiness – became a leading theme of moral essayists.

The combination of amusement and instruction turned rational toys into semi-luxury items. These toys combined pleasure with individual development, thus expressing core values of the Enlightenment, while becoming fashionable goods.

Richard Lovell Edgeworth continued Beddoes' efforts to produce rational toys. In 1807, in a letter to a friend, he discussed a proposal to open a 'Rational Toyshop' in London.[75] In this letter, Edgeworth highlighted, once again, the relevance of the bodily appropriation of toys, by distinguishing between philosophical apparatus and instructive toys:[76]

72 Morrison-Low, *Making Scientific Instruments*, 201.
73 Edgeworth and Edgeworth, *Practical Education*, 2003, 30 [1798, 35].
74 Porter, 'Enlightenment and Pleasure', 15.
75 Shefrin, *Neatly Dissected*, 22.
76 Edgeworth, Letter to a Friend, December 6, 1807, in the Cotsen Children's Library, Princeton, shelf mark CTSN MSS Q 26758.

> The difference between instructive toys and philosophical apparatus consists in this, the latter are exhibited by masters and carefully preserved from the hands of learners; the former are intended for the rude hands of unpractised children, and should be constructed so as to bear hardship and to excite the attention of those who use them, to the effects of mechanical powers and mechanical resistances, to the means of communicating motion in various manners and in various directions. To fix the attention is then the great object and this can never be done without the toy or instrument necessarily requires the bodily action of the child who uses it.

Somewhat later, Edgeworth wrote to Mr. Tabart (ca. 1767–1833),[77] who ran a Juvenile Library on New Bond Street, about rational toys. It is not clear if at the time a 'rational toyshop' was established in London. Yet from the 1820s onwards, both Beddoes and Maria Edgeworth were celebrated for their pioneering work on toys which combined amusement with instruction.

The wide acclaim of 'rational toys' in Britain did not have a counterpart in Germany. Although German toy production was renowned, in many respects it was also very traditional. Wooden toys for children were commonly produced in a domestic context, by farmers and their families (including extensive use of child labour) in winter.[78] Moreover, these manufacturers competed particularly on price, not on the specific educational or instructive qualities of their products. As mentioned, geographical dissections were introduced fairly late in Germany. They failed to become popular in the first part of the nineteenth century.[79] Unlike in England, the few geographical puzzles produced in Germany did not feature as luxury items, nor did their pieces follow the contours of the countries.[80] In England the shape of the pieces was highlighted to underline the importance of the sense of touch for pedagogical reasons. Finally, due to the focus on costs in Germany, some of the first German puzzles were in fact made of cardboard, almost a century before this material was used to make jigsaw puzzles in France and Britain.[81]

Although the German-speaking world had many pedagogical innovators, such as J.B. Basedow (1724–1790), C.G. Salzmann (1744–1811), E.C. Trapp (1745–1818), J.H. Campe (1746–1818) and the Swiss J.H. Pestalozzi (1746–1827), they all stressed improvements in school instruction rather than play.[82] Further, where in Britain the Edgeworths praised the sense of touch, in Germany the sense of sight was highlighted, by

77 Edgeworth MSS, 1724–1817 in the National Library of Ireland: Reel 16, MS 22471: Correspondence and associated papers of Richard Lovell Edgeworth regarding Education. 58 items. c. 1772–1817. With 4pp typescript listing. (7 folders). c.1809 – 'Rational Toys in a letter to Mr Tabart'.

78 Stäblein, *Altes Holzspielzeug*, 36–37.

79 Bekkering, *Spass und Geduld*, 17–18.

80 Ibid., 18.

81 Ibid., 12, 18.

82 Hohenstein, *Bertuch* (1747–1822), 64.

emphasising reading aids and pictures in children's books, and also illustrated by Bertuch's highly popular multi-volume *Bilderbuch für Kinder* (1790–1830).[83] This publication aimed at 'teaching through eyes'.[84] The *Journal des Luxus und der Moden* refers to Johann Christoph Friedrich Guts Muth (1759–1839), based at the Salzmann Institute in Schnepfenthal, as a major German pedagogical theorist, who proposed a classification of playing.[85] Whereas Beddoes and the Edgeworths employed philosophical arguments to promote the use of various senses for educational aims, Guts Muth proceeded along classificatory lines, distinguishing between different classes, orders and species of play. He considered physical training of prime importance. Playing should serve the aims of 'entertainment' (*Unterhaltung*), and 'recreation' or 'relaxation' (*Erholung*), for both adults and children. Although there is overlap with the British trope 'for amusement and instruction,' there are subtle differences. The German words *Erholung* and *Unterhaltung* entail passive connotations. German sources frequently consider playing as *Zeitvertreib*, a way to spend spare time. In this respect Guts Muth voiced a preference for other terms, because 'we should rather hold on to time than spend it', even though spending leisure time is 'necessary for relaxation, brightening up and merriness'.[86] In the introduction of his 1796 book, however, it is suggested that 'play' (*Spiel*) is born out of 'boredom' (*Langeweile*) and our subsequent 'innate drive to do things'.[87] Friedrich Bertuch followed this same line of reasoning. He considered 'pleasant shortening of time' as common to all games.[88] Such subtle differences between British and German approaches to games are also reflected in puzzles used as toy. As mentioned, geographical dissections were introduced in Germany rather late, and they met with little acclaim. But lithographs (*Bilderbogen*) were much more popular. Some of them were dissected in geometrical patterns, to be reassembled as a puzzle, indicated as 'patience' (*Geduld*), 'combination' or 'retour' games (terms suggesting their French origins).[89] Way into the nineteenth century, as observed by Bekkering, the term Geduldspiel was most frequently used in Germany to denote puzzles[90] (Fig. 3) (Fig. 4).

Fads, fashions and playthings

Two periodicals published by Bertuch, *Journal des Luxus und der Moden* and *London und Paris*, paid much attention to the fads and fashions in play. A systematic examination reveals, however, that games or toys with instructive aims were hardly mentioned. De-

83 Diers, 'Bertuchs Bilderwelt', 438; Koch, ‚Orbis Pictus'; Göbels, 'Nachwort', 172–176.

84 F.J. Bertuch, 'Plan, Ankündigung und Vorbericht [zum Bilderbuch für Kinder]', quoted in Diers, 'Bertuchs Bilderwelt', 441; Hohenstein, *Friedrich Justin Bertuch*, 65.

85 'Guts Muths Spiele für die Jugend', xxiv–xxvi. Note that his name also appears as Gutsmuth and GutsMuth.

86 Ibid., xxv.

87 Guts Muths, *Spiele*, 1.

88 Friedrich Justin Bertuch, 'Joujou de Normandie', 6.

89 Bekkering, *Spass und Geduld*, 12.

90 Ibid., 12–13.

Fig. 3 Lid of the puzzle Ruhig Blut, by Richter, about 1920–1929.

Fig. 4 Box with pieces of the puzzle Ruhig Blut, by Richter, about 1920–1929.

scriptions of Paris highlighted the popularity of public physical sports for men.[91] But fads such as the 'bilboquet' (cup and ball), the 'joujou de Normandie' (yoyo) and the diabolo were particularly popular among women. These fads can be characterised as populuxe goods, while it is also safe to argue that the Consumer Revolution resulted in tighter connections between consumption, leisure and women.[92] If fashionable populuxe goods gave pleasure, they did not serve any other specific function. Luxury versions appeared as well. An ivory bilboquet has remained from Maria Louise, Duchess of Parma (1791–1847), daughter of the Emperor of Austria, who became, in 1810, Napoleon's second wife.[93] As noted by Bertuch, the first yoyo seen in Paris – a present from the Duc d'Orléans (1747–1793) to his lady friend, Madame de Bouffon (1767–1808) – was mounted with diamonds, its estimated costs amounting to 2400 livres.[94] Of course, the yoyo's massive popularity could only be sustained by producing more affordable versions. As commented at one point by Bertuch, the yoyo had been such a fad in Paris that one would see both 'the old and the young holding one in their hand, while in particular girls perform incredible tricks with it to attract attention.'[95]

From Bertuch's journals one can distil how some of these playthings reached Germany. The yoyo was first introduced in England from East India in early 1791.[96] As a gadget it succeeded the bilboquet.[97] In the pages of the *Journal des Luxus und der Moden* it is not possible to trace early German enthusiasm for yoyos. Basically, it was suggested that this toy 'is at least more innocent and less expensive' than gambling.[98] Bertuch deplored not having found out how the yoyo arrived in Germany, but the initial guess was that noble emigres from France were responsible.[99] Several months later, however, he could offer more detailed information to his readers on this toy. He confirmed its East Indian origin, it being called 'bandeliro' in Bengal. After its introduction in England, it got its nickname 'The Prince of W–S' toy. After passing through Normandy, the new toy soon arrived in Flanders and the Netherlands, where it was named after its region of transit, Normandy. In the summer of 1791 young Englishmen introduced yoyos in the German-speaking regions, particularly when visiting spas, such as Aachen, Carlsbad and Pyrmont.[100]

Bertuch voiced his astonishment about the wide acclaim for this 'new fad' all over Europe, where it provided employment to 'turner's shops, gold worker's, jewellers and

91 'Spaziergang', 147.
92 Goodman, *Becoming a Woman*, 13.
93 *Jouets de princes* 1770–1870, 113.
94 Bertuch, 'Joujou de Normandie', 12.
95 Ibid., 12.
96 'Moden-Neuigkeiten. 1. aus England', 678.
97 'Moden-Neuigkeiten. 1. aus Teutschland', 514.
98 Ibid., 514.
99 Ibid., 515.
100 Bertuch, 'Joujou de Normandie', 12

fashion shops'.[101] In a concluding paragraph he added a comment, with unconcealed irony, on the quasi usefulness enthusiasts attributed to the yoyo, suggesting that because of its rapid spread all nations would want to claim having invented it:[102]

> Supreme goddess of the world, thank you for this lovely gift! Please present us annually or even monthly with a new yoyo from your blessed hand and out of your inexhaustible creativity, or make sure – which you would never want – that we do not need one any more!

Fig. 5 'Le Diable, ein neues Modespiel in Paris'.

101 Bertuch, 'Joujou de Normandie', 13.
102 Ibid., 13.

Bertuch seems to have sensed the spirit of the new age very well. In 1812, the *Journal des Luxus und der Moden* reported on a new fashionable plaything, the diabolo, which once again created a fad in Paris.[103] The journal remained sceptical: 'It is bound to fade soon, and will hardly last longer than the onetime yoyo at the start of the [French] Revolution' (Fig. 5).[104]

About 1817, a new craze emerged, this time involving the kaleidoscope, which originated in London but was immediately imitated and fine-tuned in Paris, where it mostly appeared under different names: *lunettes françaises*, *multiplicateur, polyoscope metamorphosiscope* or *transfigurateur.*[105] Germany once again followed, hesitantly and less exuberantly. In 1818, *Annalen der Physik*, a journal on physics, devoted an article to the kaleidoscope. Part four of the article comprises an excerpt from a letter from *Hofrath* Wurzer (1765–1844), dated 8 July 1818, discussing innovations and improvements to the kaleidoscope in Britain and France. The estimated number of kaleidoscopes being produced daily in Paris seemed incredibly high: 'It is said that nowadays 60,000 kaleidoscopes are made in Paris every day.'[106] The enormous popularity of the kaleidoscope in England and France is obvious. As the paper commented on France, where one was made with a value of no less than 20,000 francs:[107]

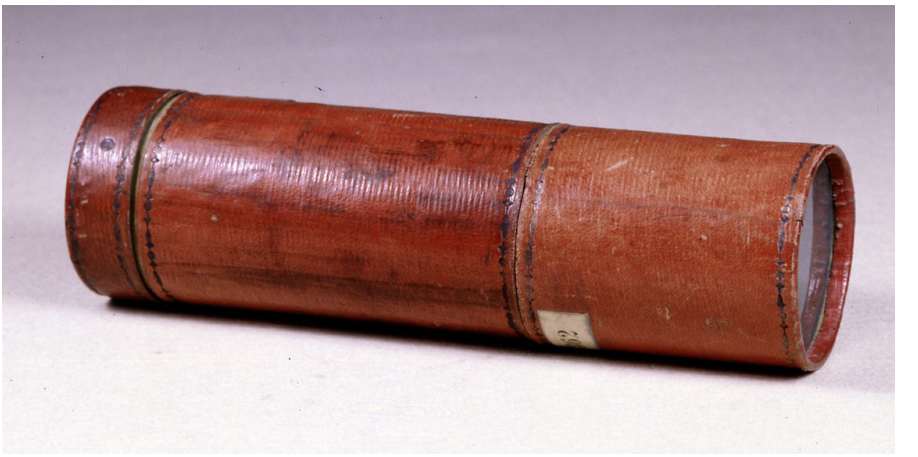

Fig. 6 Brewster type kaleidoscope. Date and manufacturer unknown.

103 See also 'Das Jeu de Diable'.
104 'Ueber das neue Modespiel', 677.
105 Stauss, *Frühe Spielwelten*, 224.
106 'Das Kaleidoskop', 369.
107 Ibid., 372.

Fig. 7 Schubert and the Kaleidoscope, Kupelwieser and the Draisine, 16 July 1818.

> Every family in Paris now has a kaleidoscope, or, as they call it, a transfigurateur. On the boulevards of Paris, they show kaleidoscopes of the size of four-pounders. From Marseille a splendid kaleidoscope (*Schönsehrohr*) was dispatched to the sultan's palace in Turkey.

At first sight one might conclude that the kaleidoscope fits the pattern of fads such as the yoyo, the diabolo or the bilboquet (Fig. 6). Unfortunately, the German perception and reception of the kaleidoscope cannot be studied on the basis of *London und Paris*. Bertuch published this journal from 1798 until 1810, after which it was succeeded in 1811 by *Paris, Wien und London*, in 1812 by *Paris und Wien*, and as of 1814 by *London, Paris und Wien*. In 1815 the title was discontinued definitively.

The inventor of the kaleidoscope, David Brewster (1781–1868), lived in Edinburgh. Peter Mark Roget (1779–1869)[108] provided an eyewitness account of the contrivance's

108 Emblen, *Peter Mark Roget*.

instant acclaim in the British capital. Few months after its initial appearance in 1816, Roget summarised the kaleidoscope's success as follows:[109]

> In the memory of man, no invention, and no work, whether addressed to the imagination or to the understanding ever produced such an effect. A universal mania seized all the classes, from the lowest to the highest … and every person not only felt, but expressed that a new pleasure had been added to their existence.

In a *Treatise on the Kaleidoscope* (1819) Brewster himself mentioned that within three months after the contrivance's presentation, 200,000 specimens had been sold in London and Paris.[110] In 1818, the contrivance also took Vienna by storm[111] (Fig. 7).

Yet the kaleidoscope did not offer him the profits he had hoped for. He had applied for a patent 'for a new Optical Instrument called "the Kaleidoscope" for exhibiting and creating beautiful Forms and Patterns of great use in all the ornamental arts.' The patent was granted on 17 July 1817, but before that date, and after some patent instruments had been shown to London opticians, others also identified the basic principles for making them and soon imitations were found everywhere.

Providing much pleasure, the kaleidoscope was initially proposed as an ingenious, new product with specific aesthetic functionalities, as indicated in the patent. Brewster argued that the fine and useful arts all pursued symmetrical ornaments, except for the landscape painter, who according to the prevailing aesthetic principles of the picturesque was in search of irregular forms. He gave examples of the application of the instrument in architecture, ornamental painting and the designs for carpets.[112] In the patent application for the kaleidoscope Brewster also highlighted another aesthetic function: the device enabled painters or jewellers to judge whether the colours of a design fit well together.[113] Conceptually, the kaleidoscope belongs in the category of semi-luxury goods (as defined by Berg).

The kaleidoscope sparked an international debate as to who should be credited as its inventor. In particular the instrument proposed by Richard Bradley (1688–1732) in *New Improvements in Planting and Gardening both Philosophical and Practical* (1717) to design symmetrical gardens was considered in this respect. The last chapter of Brewster's *A Treatise on the Kaleidoscope* and its appendix with supporting letters provided arguments for the originality of Brewster's invention. In the German debate some German precursors were put forward. For example, Gilbert, in his historical overview in the *Annalen der Physik*, referred to the manifold reflections produced by two mirrors angularly positioned towards each other, as 'an issue long known'.[114] The Nuremberg-based manufacturer of

109 Peter Mark Roget in *Blackwood's Magazine*, as quoted in Kendall, *Man*, 219.
110 Brewster, *Treatise Kaleidoscope*, 7.
111 Steblin, 'Schubert's Pepi', 51.
112 Brewster, *Treatise Kaleidoscope*, 116.
113 'Das Kaleidoskop', 372.
114 Ibid., 341.

mathematical and optical instruments Johann Bernhard Bauer (1752–1839) put forward, in a pamphlet published on 19 June 1818 in the newspaper *Nürnberger Allgemeinen Handlungs-Zeitung*, that the Berlin-based natural philosopher Johann Heinrich Lambert (1728–1777) and the Augsburg instrument maker Georg Friedrich Brander (1713–1783) had constructed similar instruments half a century before. Bauer maintained that he himself had manufactured similar contrivances as of 1798, which were available through the catalogue of Nuremberg wholesaler Georg Hieronimus Bestelmeier (1764–1829).[115]

Thomas Stauss rather casually concludes, after a discussion of German objections against the alleged newness of Brewster's kaleidoscope, that the 'fact of the matter is that the kaleidoscope began to spread all across Europe in such large quantity only after the handy tubular construction by Sir David Brewster.'[116] Stauss thus highlights the distinguishing characteristic of the British instrument turned into a toy. Brewster's handheld

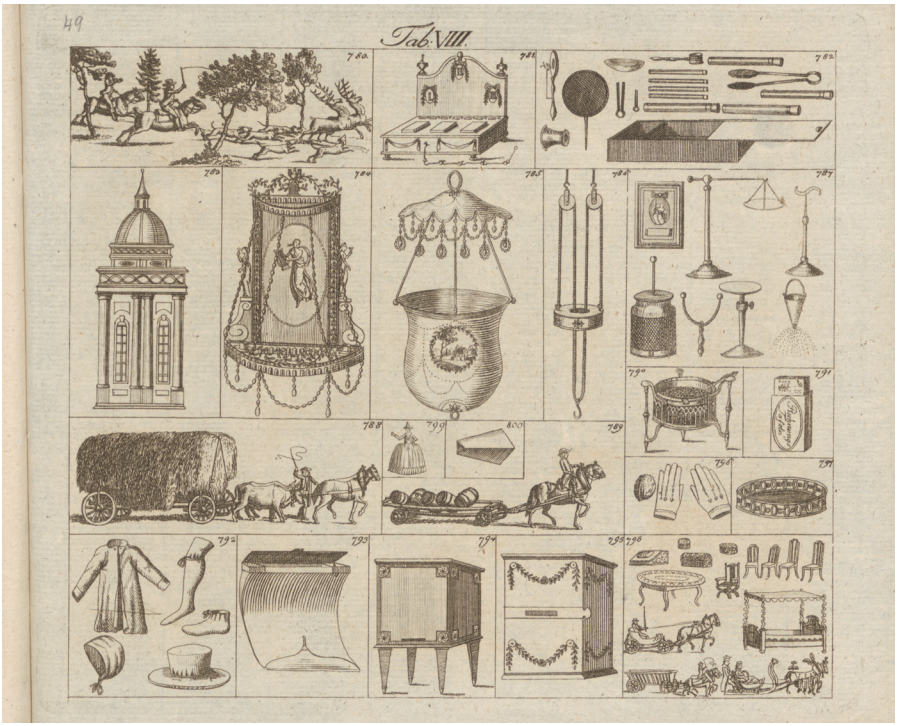

Fig. 8 The piece with number 800 refers to a 'triangular mirror pyramid' (*dreyeckigte Spiegelpyramide*).

115 Stauss, *Frühe Spielwelten*, 227.
116 Ibid., 229.

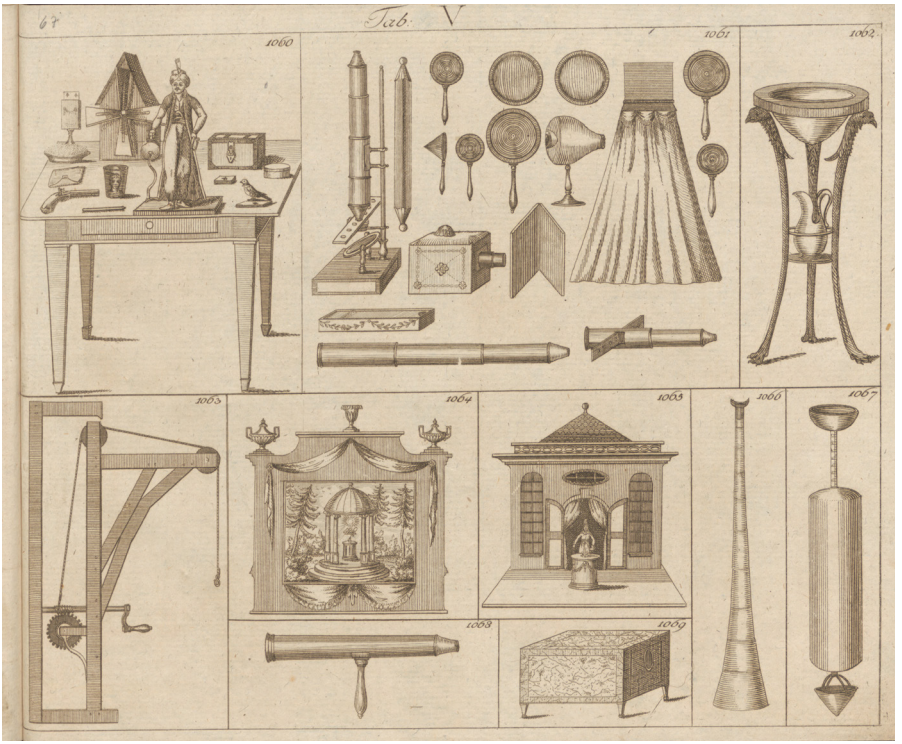

Fig. 9 The piece with number 1069 refers to an 'optical beam box' (optisches *Strahlenkästchen*).

device allows for experimenting with and immediately experiencing phenomena, which caused it to differ from a demonstration device. Edgeworth's distinction between philosophical apparatus and instructive toy is crucial to understand what is at stake, because the claims about prototypes all refer to demonstration devices. Bauer's 'triangular mirror pyramid' and 'optical beam box' simply lack the fashionableness and bodily touch that characterised the new devices from the second decade of the nineteenth century (Fig. 8) (Fig.9).

Gilbert categorises the 'Nuernberger beam box' as one of the 'Nuernberger goods',[117] which can be considered a German equivalent for the broad English definition of toys, which included Tunbridge ware. 'Playthings' (*Spielwaren*) were often subsumed under overarching denominations like 'Nuernberger goods', 'Sonnenberger goods', or 'wooden goods'.[118] From the end of the eighteenth century, however, Britain saw the emergence of specific categories such as 'rational toys'. As a result, every slight innovation in toys

117 'Das Kaleidoskop', 343.
118 Sohl, 'Spielwarenhandel', 422.

was stressed to promote ongoing newness.[119] This 'branding of articles accompanied a shift in marketing from highlighting the reputation of the shop to supporting consumer selection'.[120] In the second part of the 1820s, as argued by Stauss after an analysis of the widely distributed German *Bestelmeier* annual catalogue, there was a sharp decline in advertisements proffering 'physical attractions, which in their entire design were still strongly reminiscent of the eighteenth century'.[121] This heralded a new era for playthings, including instructive toys.

Conclusion

Building on scholarly insights pertaining to the Consumer Revolution in general, and employing the distinction between luxury, populuxe and semi-luxury goods in particular, the argument in this paper focused on the advancement of educational toys in Britain, France and Germany around 1800. At the time, populuxe playthings, such as the bilboquet, the yoyo and the diabolo, became a craze across Europe, particularly in Britain and France. The more limited attention for these new playthings in Germany can be accounted for by the absence of a leading metropolis, as a centre driving innovation, while the country was also less advanced economically. The general trend to embrace novelty and fashionableness stirred the development of new (categories of) playthings. This exemplifies how in the years between 1760 and 1818 the rather broad category of toys diversified. The British promotion of 'rational toys' contributed in another way to the further specification of toys and the articulation of the concept of educational toys.

As revealed by the discussion of the case studies, there were important differences in the development of play and playthings in Britain, France and Germany, notably in relation to their educational function, the sensorial aspects of play and patterns of consumption. Geographical dissections, as used in the upbringing of British royal offspring in the 1760s, clearly featured as luxury goods. The courtly connections and French origins contributed to this status. Rational toys, as promoted by Beddoes and the Edgeworths, fit the category of 'semi-luxury' goods, as coined by Berg to denote new functional goods, affording bodily pleasures in particular. The promoters of rational toys advanced 'amusement and instruction', highlighting the sense of touch. In contrast, German pedagogues put emphasis on improvements in school instruction rather than on play, and they also underscored the significance of the sense of sight in educational and developmental contexts. The interdependencies between changing consumption patterns, educational innovations and science as popular culture are corroborated by the analysis of the German debate about the novelty of the kaleidoscope.

119 Wachelder, 'Toys', 29.
120 Walsh, 'Shop Design', 175.
121 Stauss, *Frühe Spielwelten*, 249.

Bibliography

Bekkering, Geert. *Spass und Geduld: Zur Geschichte des Puzzlespiels in Deutschland.* Husum: Husum Druck- und Verlagsgesellschaft, 2004.

Berg, Maxine. 'New commodities, luxuries and their consumers in eighteenth-century England'. In *Consumers and Luxury: Consumer Culture in Europe 1650–1850,* ed. by Maxine Berg and Helen Clifford, 63–85. Manchester and New York: Manchester U.P., 1999.

Berg, Maxine. *Luxury and Pleasure in Eighteenth-Century Britain.* Oxford: Oxford University Press, 2005.

Bertuch, Friedrich Justin. 'Ueber das Joujou de Normandie, und die Moden des Joujous überhaupt'. *Journal des Luxus und der Moden* 7 (1792): 6–13.

Bertuch, Friedrich Justin. 'Über die Wichtigkeit der Landes-Industrie-Institute für Deutschland [1793]'. In *Dem Andenken an Friedrich Justin Bertuch, Zum 150. Todestag am 3. April 1972,* ed. by Helmut Holtzhauer, 13–20. Weimar: Stadtmuseum Weimar, 1972.

Brandow-Faller, Megan. 'Introduction: Materializing the History of Childhood and Children'. In *Childhood by Design: Toys and the Material Culture of Childhood, 1790 – present,* ed. by Megan Brandow-Faller, 1–27. New York: Bloomsbury, 2018.

Brett, Vanessa. *Bertrand's Toyshop in Bath: Luxury Retailing 1685–1785.* Wetherby U.K.: Oblong, 2014.

Brewer, John. *The Pleasures of the Imagination: English Culture in the Eighteenth Century.* London: HarperCollins Publishers, 1997.

Brewer, John, and Roy Porter, eds. *Consumption and the World of Goods.* London and New York: Routledge, 1993.

Brewster, David. *A Treatise on the Kaleidoscope.* Edinburgh: printed for Archibald Constable & Co. Edinburgh; and Longman, Hurst, Rees, Orme & Brown; and Hurst, Robinson, & co. London, 1819.

Brown, K. D. *The British Toy Business: A History since 1700.* London and Rio Grande: The Hambledon Press, 1996.

Coquery, Natacha. 'French Court Society and Advertising Art: The Reputation of Parisian Merchants at the End of the Eighteenth Century'. In *Advertising and the European City: Historical Perspectives,* ed. by Clemens Wischermann and Elliot Store, 96–112. Aldershot, England/Burlington (Vermont), USA: Ashgate, 2000.

Coquery, Natacha. 'The Language of Success: Marketing and Distributing Semi-Luxury Goods in Eighteenth-Century Paris'. *Journal of Design History* 17, no. 1 (2004): 71–89.

'Das Jeu de Diable'. *Paris und Wien* 4 (1812): 315–318.

'Das Kaleidoskop (Schönheitsrohr, Schönkucker, Multiplicateur, Transfigurateur)'. *Annalen der Physik* 29 (new)/59 (old) (1818): 341–372.

'Die Londoner Auctionen'. *London und Paris* 17 (1806): 19–30.

Diers, Michael. 'Bertuchs Bilderwelt: Zur populären Ikonographie der Aufklärung'. In *Friedrich Justin Bertuch* (1747–1822): *Verleger, Schriftsteller und Unternehmer im Klassischen Weimar,* ed. by Gerard R. Kaiser and Siegfried Seifert, 433–464. Tübingen: Max Niemeyer Verlag, 2000.

Edgeworth, R. L. Letter to a Friend, December 6, 1807, in the Cotsen Children's Library, Princeton, Shelf mark CTSN MSS Q 26758.

Edgeworth, R. L. MSS, 1724-1817 in the National Library of Ireland: Reel 16, MS 22471: Correspondence and associated papers of Richard Lovell Edgeworth regarding Education. 58 items. c. 1772–1817. With 4pp typescript listing. (7 folders). c. 1809 – 'Rational Toys in a letter to Mr Tabart'.

Edgeworth, Maria and Richard Lovell Edgeworth. *Practical Education,* 2 vols. [London: printed for J. Johnson, 1798]. In *The Pickering Masters: The Novels and Selected Works of Maria Edgeworth,* ed. by Susan Manly. London: Pickering & Chatto, 2003.

Emblen, D. L. *Peter Mark Roget: The Word and the Man.* London: Longman, 1970.

Fairchilds, Cissie. 'The Production and Marketing of Populuxe Goods in Eighteenth-Century Paris'. In *Consumption and the World of Goods,* ed. John Brewer and Roy Porter, 228–248. London and New York: Routledge, 1993.

Fennetaux, Ariane. 'Toying with Novelty: Toys, Consumption and Novelty in Eighteenth-Century Britain'. In *Fashioning Old and New: Changing Consumer Patterns in Western Europe (1650–1900). Studies in European Urban History 18 (1100-1800),* ed. by Bruno Blondé, Natacha Coquery, John Stobart, and Ilja van Damme, 17–28. Turnhout, Belgium: Brepols, 2009.

Göbels, Herbert. 'Nachwort'. In *Friedrich Justin Bertuch, Bilderbuch für Kinder: Eine Auswahl,* ed. by Herbert Göbels, 167–89. Dortmund: Harenberg Kommunikation, 1979.

Goodman, Dena. *Becoming a Woman in the Age of Letters.* Ithaca and London: Cornell University Press, 2009.

Guts Muths, Johann Christoph Friedrich. *Spiele zur Uebung und Erhohlung des Körpers und Geistes für die Jugend, ihre Erzieher und alle Freunde unschuldiger Jugendfreunden.* Schnepfenthal: Im Verlage der Buchhandlung der Erziehungsanstalt, 1796.

'Guts Muths Spiele für die Jugend'. *Journal des Luxus und der Moden* 11 (1796): xxiv–xxvi.

Hannas, Linda. *The English Jigsaw Puzzle 1760 to 1890: With a descriptive check-list of Puzzles in the Museums of Great Britain and the Author's Collection.* London: Wayland Publishers, 1972.

Heywood, Colin. *A History of Childhood: Children and Childhood in the West from Medieval to Modern Times.* 2nd edition. Cambridge: Polity Press, 2018.

Hilaire-Pérez, Liliane. 'Technology as a Public Culture in the Eighteenth Century: The Artisans' Legacy'. *History of Science* 45 (2007): 135–153.

Hohenstein, Siglinde. *Friedrich Justin Bertuch (1747–1822) – bewundert, beneidet, umstritten.* Berlin/New York: Walter de Gruyter.

Jay, Mike. *The Atmosphere of Heaven: The Unnatural Experiments of Dr. Beddoes and his Sons of Genius.* London and New Haven: Yale University Press, 2009.

Johnson, Samuel. 'Toyshop'. In *A Dictionary of the English Language: A Digital Edition of the 1755 Classic by Samuel Johnson,* ed. by Brandi Besalke. https://johnsonsdictionaryonline.com/views/search.php?term=toyshop (accessed 22 November 2021).

Jones, Colin. 'The Great Chain of Buying: Medical Advertisements, the Bourgeois Public Sphere, and the Origins of the French Revolution'. *The American Historical Review* 101 (1996): 13–40.

Jones, Colin, and Rebecca Spang. 'Sans-culottes, sans-café, sans-tabac: Shifting realms of necesssity and luxury in eighteenth-century France'. In *Consumers and Luxury: Consumer Culture in Europe 1650–1850,* ed. by Maxine Berg and Helen Clifford, 37–62. Manchester and New York: Manchester U.P., 1999.

Jones, Jennifer M. *Sexing La Mode: Gender, Fashion and Commercial Culture in Old Regime France.* Oxford/New York: Berg, 2004.

Jouets de princes 1770–1870: Musée national des châteaux de Malmaison et Bois-Préau, 16 octobre 2001–28 janvier 2002. Paris: Réunion des musées nationaux, 2001.

Kendall, Joshua. *The Man Who Made Lists: Love, Death, Madness, and the Creation of Roget's Thesaurus.* New York: Berkley Books, 2008.

Koch, Arthur. *Ein ‚Orbis Pictus' der Goethezeit: Friedrich Justin Bertuch und sein Bilderbuch für Kinder.* Weimar: Stadtmuseum Weimar, 1975.

Kuhles, Doris. 'Das „Journal des Luxus und Moden" (1786–1827): Zur Entstehung seines inhaltlichen Profils und seiner journalistischen Struktur'. In *Friedrich Justin Bertuch (1747–1822): Verleger, Schriftsteller und Unternehmer im Klassischen Weimar,* ed. by Gerard R. Kaiser and Siegfried Seifert, 489–99. Tübingen: Max Niemeyer Verlag, 2000.

Kwass, Michael. 'Ordering the World of Goods: Consumer Revolution and the Classification of Objects in Eighteenth-Century France'. *Representations* 82, no. 1 (2003): 87–116.

Maxted, Ian. 'Bertuch und England – Vorbild oder „Nachklang"'. In *Friedrich Justin Bertuch (1747–1822): Verleger, Schriftsteller und Unternehmer im Klassischen Weimar,* ed. by Gerard R. Kaiser and Siegfried Seifert, 409–16. Tübingen: Max Niemeyer Verlag, 2000.

McKendrick, Neil, John Brewer, and J. H. Plumb. *The Birth of a Consumer Society.* Bloomington: Indiana University Press, 1982.

Michaels, Teresa. 'Experiments before Breakfast: Toys, Education and Middle-Class Childhood'. In *The Nineteenth-Century Child and Consumer Culture*, ed. by Dennis Denisoff, 29–42. Aldershot: Ashgate, 2008.

Mintz, Sidney W. *Sweetness and Power: The Place of Sugar in Modern History*. New York: Random House, 1985.

'Moden-Neuigkeiten. 1. aus Teutschland'. *Journal des Luxus und der Moden* 6 (1791): 509–518.

'Moden-Neuigkeiten. 1. aus England'. *Journal des Luxus und der Moden* 6 (1791): 677–684.

Morrison-Low, A. D. *Making Scientific Instruments in the Industrial Revolution*. Aldershot, England / Burlington (Vermont), USA: Ashgate, 2007.

Mui, Hoh-Cheung, and Lorna H. Mui. *Shops and Shopkeeping in Eighteenth-Century England*. Kingston, Montreal: McGill Queen's University Press/London: Routledge, 1989.

Paterson, Alice. *The Edgeworths: A Study of later Eighteenth-Century Education*. London: W.B. Clive, 1914.

Porter, Roy. 'Enlightenment and Pleasure'. In *Pleasure in the Eighteenth Century*, ed. by Roy Porter and Marie Mulvey Roberts, 1–18. Houndmills, Basingstoke, Hampshire and London: MacMillan, 1996.

Prinz, Michael. 'Aufbruch in den Überfluss? Die Englische „Konsumrevolution" des 18. Jahrhunderts im Lichte der neuen Forschung'. In *Der lange Weg in den Überfluss: Anfänge und Entwicklung der Konsumgesellschaft seit der Vormoderne*, ed. by Michael Prinz, 191–217. Paderborn/München, Wien, Zürich: Ferdinand Schöningh, 2003.

Purdy, Daniel L. *The Tyranny of Elegance: Consumer, Cosmopolitanism in the Era of Goethe*. Baltimore: The Johns Hopkins University Press, 1998.

Roche, Daniel. *The Culture of Clothing: Dress and Fashion in the Ancien Regime*. Translated by Jean Birrell. Cambridge: Cambridge University Press, 1994 [1989 French original].

Sargentson, Carolyn. *Merchants and Luxury Markets: The Marchands Merciers of Eighteenth-Century Paris*. London: Victoria and Albert Museum in association with the J. Paul Getty Museum, 1996.

Shefrin, Jill. *Neatly Dissected for the Instruction of Young Ladies and Gentlemen in the Knowledge of Geography: John Spilsbury and Early Dissected Puzzles*. Los Angeles: Cotsen Occasional Press, 1999.

Shefrin, Jill. *Such Constant Affectionate Care: Lady Charlotte Finch—Royal Governess & The Children of George III*. Los Angeles: The Cotsen Occasional Press, 2003.

Sohl, Katrin. 'Der Spielwarenhandel auf der Leipziger Messe'. In *Leipzigs Messen 1497–1997. Vol. 1 1497–1914*, ed. by Hartmut Zwahr and Thomas Topfstedt, 421–430. Köln/Weimar/Wien: Böhlau Verlag, 1999.

Sombart, Werner. *Luxus und Kapitalismus: Studien über die Entwicklungsgeschichte der modernen Kapitalismus, erster Band*. München und Leipzig: Duncker und Heilblut, 1913.

'Spaziergang über die Elyseischen Felder. (…) Spielplätze und Beschreibung einiger Volksspiele. (…)'. *London und Paris* 5 (1800): 135–150.

Stäblein, Rita. *Altes Holzspielzeug aus Gröden: Die Entwicklung einer Heimindustrie*. Bozen: Verlagsanstalt Athesia, 1980.

Stauss, Thomas. *Frühe Spielwelten: Zur Belehrung und Unterhaltung. Die Spielwarenkataloge von Peter Friedrich Catel (1747–1791) und Georg Hieronimus Bestelmeier (1764–1829)*. Hochwald, Schweiz: Librum, 2015.

Steblin, Rita. 'Schubert's Pepi: His Love Affair with the Chambermaid Josepha Pöcklhofer and Her Surprising Fate'. *The Musical Times* 149, no. 1903 (2008): 47–69.

Torrens, Hugh, and Joseph Wachelder. 'Models, Toys and Beddoes' Struggle for Educational Reform 1790-1800'. In *The Enlightenment of Thomas Beddoes*, ed. by Trevor Levere, Larry Stewart, and Hugh Torrens, with Joseph Wachelder, 206–237. London: Routledge, 2016.

Townsend, J. R., ed. *Trade and Plumb-Cake for ever, Huzza! The Life and Work of John Newbery, 1713–67*. Cambridge: Colt Books, 1994.

Trentmann, Frank. *Empire of Things: How We Became a World of Consumers, from the Fifteenth Century to the Twenty-first*. n.p.: Allen Lane/Penguin Random House, 2016.

Turner, A. J. *From Pleasure and Profit to Science and Security: Etienne Lenoir and the Transformation of Precision Instrument-Making in France 1760–1830*. Cambridge: The Whipple Museum of the History of Science, 1989.

'Ueber das neue Modespiel: le Diable in Paris'. *Journal des Luxus und der Moden* 27 (1812): 676–679; Tafel 29 700b.

Veblen, Thorstein. *The Theory of the Leisure Class*. New York: Macmillan, 1899.

Wachelder, Joseph. 'Toys, Christmas Gifts and Consumption Culture in London's *Morning Chronicle*.' *ICON: Journal of the International Committee for the History of Technology* 19 (2013 [2014]): 13–32.

Walsh, Claire. 'Shop Design and the Display of Goods in Eighteenth-Century London.' *Journal of Design History* 8, no. 3 (1995): 157–176.

Wischermann, Clemens. 'Placing Advertising in the Modern Cultural History of the City.' In *Advertising and the European City: Historical Perspectives*, ed. by Clemens Wischermann and Elliot Store, 1–31. Aldershot, England/ Burlington (Vermont), USA: Ashgate, 2000.

Wurst, Karin. *Fabricating Pleasure: Fashion, Entertainment, and Cultural Consumption in Germany, 1780–1830*. Detroit: Wayne State U.P., 2005.

Mechanical and Precious: An Ottoman-era Watch from the Deutsches Museum Collection

Artemis Yagou

Abstract

An artefact from the timekeeping collection of the Deutsches Museum illuminates little-researched aspects of the relationship between technology and luxury. It is an early-nineteenth-century pocket watch intended for the markets of the Ottoman Empire. The watch is most likely an imitation of watches produced by the successful London maker George Prior, one of many English or continental producers supplying large numbers of pocket watches to Oriental markets during the long eighteenth century. These products, both technical novelties and fashionable accessories, were highly popular among the local multiethnic populations. This pocket watch is a manifestation of popular luxury, a phenomenon reflecting the rise of the individual, the growing significance of pleasurable consumption and the emergence of new forms of socialisation through product use. The essay discusses the object in relation to a range of themes, including technology, authenticity and consumption.

Keywords Watchmaking, Popular Luxury, Innovation, Forgery, Consumption, Fashion, Portability, Ottoman Empire, George Prior, Oskar von Miller

Introduction

Watchmaking is, by its very nature, a domain where technical innovation and luxury overlap. Personal, portable timekeepers have been produced since the fifteenth century through the application of extraordinary technical skills, and in the early days of their history they were inaccessible to all but the most privileged individuals. Gradually, technical and socioeconomic developments led to great variation in production and to the wider diffusion of watches.[1] Nowadays, public and private collections all over the world house a great number of watches, ranging from extremely valuable artefacts, considered 'masterpieces', to more mundane objects of modest value. Such low-profile watches, occupying some space in a museum showcase without attracting much attention or residing in storage rooms unseen by the visiting public, are not typically associated with luxury. However, as this essay will demonstrate, the entanglement of luxury with technology is not limited only to extravagant objects but extends to unpretentious ones. One of the tasks of a museum researcher consists in discovering such artefacts that remain away from the limelight, and highlighting the themes they express; in this case, the theme of luxury.

1 Oestmann, 'Early Watches'; Matthes, 'A Watch'; Landes, *Revolution in Time*.

A multifaceted acquisition

An early-nineteenth-century pocket watch of moderate value, made in Europe and intended for the markets of the Ottoman Empire, is exhibited in the 'Time measuring' (*Zeitmessung*) section of the Deutsches Museum, among many other pocket watches, without any reference to its special characteristics [Inventory number 29347][2] (Fig. 1). The most special feature of the watch is its distinctive numbering style, in other words the use on the dial of 'Ottoman-era numerals'[3] (Fig. 2). Clocks and watches for the Ottoman market were differentiated through such numerals employed in conjunction with the Arabic script predominant in the Ottoman Empire, which at the time occupied a vast area including most of Southeastern Europe, Asia Minor, the Middle East and North Africa.[4] Nowadays, these numerals enable us to visually identify objects intended for the Ottoman markets in an easy and direct way.[5] During the long eighteenth century, clocks and watches with Ottoman-era numerals were systematically exported from England or the European continent to the Ottoman Empire, and they became very popular in that domain.[6] Analysing the artefact under consideration enables us to shed light on so far inadequately explored aspects of the phenomenon of luxury in that geographical space and make connections with related concepts and mentalities in Western Europe. Through the analysis, we will demonstrate the complex interconnection between technology,

2 Watch dimensions: 75 x 55 x 25 mm. Total weight: 108 gr (watch mechanism and internal case: 80 gr, external case: 28 gr). Relevant documentation provided by the Deutsches Museum. I am indebted to Mareike Wöhler for bringing this object to my attention; I am grateful to her as well as to Panagiotis Poulopoulos and Elisabeth Vaupel for our inspiring discussions. I am also thankful to Christian Sicka and Thomas Rebényi for facilitating access to the object and its documentation, and to Hans-Joachim Becker and Reinhard Krause for the excellent photographs. An earlier version of this paper was presented during the Artefacts Meeting, Edinburgh, 20–22 October 2019.

3 The numerals mark the hours on the dial from 1 to 12 and the minutes from 5 to 60. Although these numerals are used with the Arabic script, it would be confusing to call them 'Arabic', as we use that designation nowadays for the numbers used with the Latin alphabet (Kurz, *European Clocks and Watches*, 74). The terms 'watches for the Turkish market' and 'Turkish numerals' have also been used in various publications. The author of the present essay employs the terms 'watches for the Ottoman market' and 'Ottoman-era numerals' as more accurate, since these artefacts were used by a broad range of people in the multiethnic, multilingual and multi-confessional Ottoman Empire. The Arabic script was employed with the Turkish language until the late 1920s, when the use of the Latin alphabet and numerals were imposed in the Republic of Turkey.

4 Howard, *A History of the Ottoman Empire*.

5 The collection of the Deutsches Museum includes two more clocks with Ottoman-era numerals. The first one is a seventeenth-century tabletop clock made in Augsburg (Inventory number 1985-551), Frieß, *Uhren und Automaten*, 30–1. The second one is a pocket watch from the early twentieth century (Inventory number 74942). Clocks and watches with Ottoman-era numerals kept in the Deutsches Museum have so far received little attention; they are not mentioned in the published overview of the horology collection, Habinger, Brendel, and Petzold, 'Die Uhrensammlung - Teil 1'; and 'Die Uhrensammlung - Teil 2').

6 The present essay focuses specifically on imported watches for the low-end market; for high-end products destined for diplomats, officials and the Sultan see: Meyer, *Catalogue of Clocks and Watches;* Reindl-Kiel, 'Luxury, Power Strategies, and the Question of Corruption Gifting'. The relatively limited local production of watches in Istanbul (White, *English Clocks*, 57) is likewise beyond the scope of this essay.

Fig. 1 View of the watch movement (mechanism).

Fig. 2 Frontal view of the watch dial.

novelty and luxury exemplified by this Ottoman-era pocket watch from the Deutsches Museum collection.

The trajectory by which this watch reached the collection of the Deutsches Museum is not fully known. According to the museum's acquisition book, the object was purchased in April 1911 by Oskar von Miller (1855–1934), the founder and major driving force of the museum, for the trivial sum of 12.75 Marks. No archival or other evidence survives about the seller's identity or the specific criteria behind the purchase. What we do know is that the beginning of the twentieth century, when von Miller acquired the watch, was a dynamic period of development for the museum. While the official inauguration of the institution had not yet taken place, its collection was gradually being built in a systematic fashion.[7] The museum was to include 'masterpieces of science and technology', following the model of foreign institutions, in particular the Musée des Arts et Métiers in Paris and the Science Museum of London.[8] A collection of clocks and watches was from the beginning integral to the conception of the museum.[9] For the purposes of creating the collection, von Miller was looking for appropriate objects all over the world.[10] This watch is neither a masterpiece nor particularly noteworthy in the wider scheme of horological technology or artistic design of the times. Nevertheless, according to von Miller himself, even non-masterpieces had an important role in the collection as 'gap fillers', representing intermediate steps of scientific and technical evolution as he understood it.[11] One imagines that this object would fill a technical as well as cultural 'gap', by representing an Oriental version of horological practice. The purchase may also be considered in the context of a broader and multifaceted German interest in the Orient. On one level, this interest was connected to imperialist aspirations and the export of technical expertise, at a time when the Ottoman Empire was using German know-how in order to implement substantial reforms.[12] Von Miller was familiar with the Ottoman Empire, as he had travelled to Smyrna (Izmir) and Constantinople (Istanbul) in 1899 together with entrepreneur Emil Rathenau (1838-1915) (of the firm AEG)[13] it is unclear whether the two men were exploring business opportunities or had other aims. On another level, we may assume that the purchase was also related to the longstanding German fascination with an imagined East.[14] The watch was acquired the year after the much-publicised Oriental art exhibition of 1910 in Munich, an event that not only reflected but also enhanced German interest in the Orient.[15]

7 Füßl and Trischler, *Geschichte des Deutschen Museums*, 407–409.
8 Ibid., 68–69.
9 Ibid., 417; Habinger, Brendel, and Petzold, 'Die Uhrensammlung - Teil 1', 10.
10 Habinger, Brendel, and Petzold, 'Die Uhrensammlung – Teil 1', 11.
11 Wöhler, 'Der Gott der Zeit', 57.
12 Christensen, *Germany and the Ottoman Railways*.
13 Füßl, *Oskar von Miller*, 85; Füßl, 'Pioniere der Elektricitätsversorgung'.
14 Marchand, *German Orientalism*; Boyd Whyte, *Bruno Taut*; Speidel, *Bruno Taut, Ex Oriente Lux*; Yagou, *Modernist Complexity*, 39–40.
15 *Chronik des Deutschen Museums*, 45; Vaupel and Lehnert, 'Ein Hauch von Orient', 42.

Fig. 3 Side view of the movement.

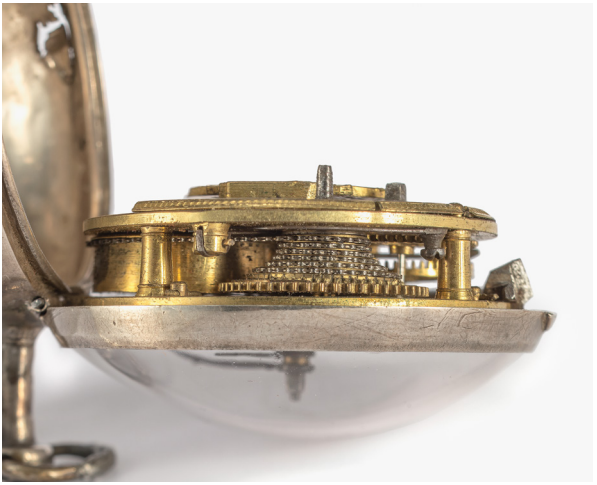

Fig. 4 Side view of the movement with the fusée in the foreground.

Technology, design and quality control

The heart of the watch is its mechanism, also known as 'movement', consisting of the motion-transmitting, moving parts of the timepiece.[16] The mechanism belongs to the 'full plate, fusée, crown wheel, verge escapement' type,[17] which is a typical technical configuration for low- and medium-range watches for the Ottoman market.[18] The energy required for the operation of the watch comes from the spring (also called mainspring), made of high-carbon steel, which stores energy when wound by a key and, as it unwinds controlled by the fusée, turns the clock's wheels until the next winding becomes necessary[19] (Figs. 3 and 4). Practically, as the spring runs down and gives less and less power, the fusée leverage increases and thus evens out the power of the spring.[20] The escapement, 'the rate-controlling mechanism of a timekeeper',[21] is of the 'verge' or 'crown wheel' type, so named because it includes a wheel with pointed teeth (resembling a crown).[22] The verge escapement was preferred for this kind of watch, as it was 'more robust and cheaper to make even if it was not such a good timekeeper as the alternatives'.[23] From a technical point of view, the mechanical parts of this watch are representative of late-eighteenth- and early-nineteenth-century horology; they result from a long line of technical developments striving to combine affordability, portability and precision. The miniaturisation of clock mechanisms was a long process, a transition that occurred more or less contemporaneously in different places. Initially, portability could be in the form either of a table-top clock or of a watch carried on one's own person. These technical objects gradually became more accessible and the widespread use of personal clocks and watches emphasised private time, as opposed to the public time of church bells and town square clocks. In the first stages of watch history, demand would of course have been very limited, rich patricians being the target group for this new accessory. Initially worn on a cord around the neck, this new contraption gradually became a 'pocket watch' in the eighteenth century. City dwellers of the rapidly growing urban centres, where time and productivity mattered, generated increasing demand for this type of object.[24]

The rigid framework enclosing and protecting the mechanism is described as 'full plate', which refers to the front and back metal plates joined by pillars to make the clock frame[25] (Figs. 3 and 4). The space between the two plates of the watch movement is se-

16 'Movement'; Bruton, *Dictionary of Clocks*, 116. For a glossary of technical terms see also: Michal, *Clocks and Watches*, 255–260.

17 Deutsches Museum documentation.

18 White, *English Clocks*; Kurz, *European Clocks and Watches*.

19 'Mainspring'. The fusée (meaning 'thread') is 'a grooved and trumpet-shaped pulley, a mechanical contrivance for equalizing the power of the mainspring of a watch, chronometer, or portable clock in all its different states of tension.' Rees, *The Cyclopedia*, quoted in Weiss, *Watch-making in England*, 83.

20 Bruton, *Dictionary of Clocks*, 79; Michal, *Clocks and Watches*, 257.

21 Bruton, *Dictionary of Clocks*, 69.

22 Ibid., 52–53, Fig. 12 on page 75, and 188–189.

23 Camerer Cuss, *The English Watch*, 261.

24 'Oestmann, 'Early Watches'; Matthes, 'A Watch'; Landes, *Revolution in Time*.

25 Bruton, *Dictionary of Clocks*, 133; 'Movement'.

Fig. 5 View of the movement and the inner side of the internal case.

cured by these pillars, 'the "distance pieces" which serve to keep the two plates in their relative positions'.[26] Pillars also enable viewing of the mechanism motions; this was considered an attractive feature by Ottoman customers, who enjoyed looking into the movements of the watches.[27] Additionally, pillars are often useful in dating watches, as they reflected popular decorative styles of a given time-period.[28] In this example, the pillars are plain and unornamented. In full-plate watches, the moving parts are mounted between the two plates, except the balance wheel, which is mounted on the outside of the top plate (Figs. 1 and 5). The balance cock, which holds the upper pivot of the balance wheel, is decorated with delicate perforated floral patterns in Rococo style, as well as with a crescent shape, which must have been intended to appeal to Muslim customers. The mechanism is visible when opening and raising the back cover of the watch, which has a small hole for inserting the winding key (Fig. 5).

The item belongs to the 'oignon' (onion) type, so called because of the layered cases enclosing the mechanism,[29] an internal and an external case in this example. Cases pro-

26 Camerer Cuss, *The English Watch*, 478.
27 White, *English Clocks*, 284.
28 Baillie, Ilbert, and Clutton, *Britten's Old Clocks* (1986), 145; Michal, *Clocks and Watches*, 258.
29 'Oignon (Montre)'; 'Montre Oignon'.

Fig. 6 View of the hallmarks on the inner side of the external case.

Fig. 7 The external case of the watch.

vided vital protection to the mechanism and were often decorated, offering customised, personalised features to clients.[30] The marks or hallmarks on mechanism and cases provide precious information. The internal silver case (Fig. 5) bears a mark showing a lion walking to the left, the so-called Lion Passant or Sterling Mark indicating that this was sterling silver, namely an alloy of silver containing 92.5 % by weight of silver and 7.5% by weight of other metals, usually copper.[31] There is also a crowned leopard's head, the town mark indicating that the place of manufacture was London.[32] A capital H enclosed in a frame (the so-called 'shield') is the date mark, indicating that the year of manufacture of the case is 1803.[33] The letters TC constitute the maker's mark, which since 1739 had to consist of the initials of forename and surname.[34] TC are presumably the initials of London-based craftsman Thomas Carpenter.[35] There is also an unidentified mark which looks like a 'T' enclosed in a frame; this might indicate the identity of a repair handyman. These marks are casually positioned and, furthermore, are not crisp and well-struck. Generally hallmarks were struck with very carefully made dies that left a sharp impression when they were first punched and would remain crisp even after long years of wear. A 'soft' or 'rubbed' appearance, as these marks on the internal case, could be one of the signs of the faker, who is not usually prepared to spend the time and money making high-grade dies. This is not to say that all 'soft' marks are suspect, as generally the makers' marks are less crisply struck than the official hallmarks.[36]

The hallmarks on the back of the external silver case (Figs. 6 and 7) are very similar to those on the internal one, which suggests that the two cases were meant to be paired together, although the marks on the external case are better struck and carefully positioned.[37] Again we have the Lion Passant, the crowned leopard's head, the date mark H and the letters TC RC, presumably the initials of partners Thomas Carpenter and Richard Carpenter (active 1776–1823), who were based on Islington Road in 1803.[38] There is also a W without frame or 'shield', which is an unidentified import or repair mark. On both internal and external silver cases, there is no duty mark, which would

30 Weiss, *Watch-making in England*, 195–211.

31 Banister, *Dealer Guides*, 9; Bly, *Discovering Hall Marks*, 9–10; 'Sterling Silver'.

32 Banister, *Dealer Guides*, 8–9; Bly, *Discovering Hall Marks*, 6–7.

33 Banister, *Dealer Guides*, 8, 26; Bly, *Discovering Hall Marks*, 52.

34 Banister, *Dealer Guides*, 7–8; Bly, *Discovering Hall Marks*, 7–8.

35 Grimwade, *London Goldsmiths*, 349; Priestley, *British Watchcase*, 260. A recent study hints at the connection of Thomas Carpenter with the trade of fake watches, Struthers, *Unravelling the Myth*, 151, 253–255.

36 Banister, *Dealer Guides*, 14–15; Jagger, *The Artistry*, 69.

37 In some watches, mechanism and case were of different origin and were combined to create a hybrid object; they could be made by different producers and later assembled together, so would not necessarily be contemporary. During the long eighteenth century, it was common for English watches to consist of parts made by different workshops, often situated in different towns, and then assembled or sold elsewhere. Although the vendors of the finished articles were mainly concentrated in London, various parts or incomplete watches would come from many other places, especially Liverpool, Coventry, Birmingham and Sheffield. Camerer Cuss, *The English Watch*, 256–258; Riello, 'Strategies and Boundaries'.

38 Grimwade, *London Goldsmiths*, 349; Priestley, *British Watchcase*, 261.

show the profile of the head of the current monarch, namely George III (1738–1820); this means that the requisite tax had not been paid to the Crown.[39]

Additionally, the internal case bears the number 3392, presumably a production serial number. The top plate of the mechanism bears the same number, from which it would be possible to date the watch (Fig. 8). As 'the numbering of the movements and silver cases of watches was demanded by [English] law',[40] the absence of numbering would be a strong indication of forgery; at the same time, the presence of a serial number does not necessarily guarantee authenticity. According to a certain attempt at periodisation, a four-digit serial number for a George Prior watch would mean that it was manufactured before 1772; a watch from around 1800 should have a five-digit serial number.[41] Therefore, the item's dating of 1803 (on the basis of its date mark) is incompatible with the four-digit serial number 3392. The suspicion of forgery is underpinned by the difference between the label 'Geo:Charle London' on the enamel dial (Fig. 9) and the inscription 'GeoCharle London' engraved on the top plate of the watch (Figs. 1 and 8). 'George Charles' was a label used by the English watchmaker George Prior (1735–1814), the market leader for pocket watches in the Ottoman market in the second half of the eighteenth century.[42] Apart from making and marketing high-end watches, Prior also 'had a large trade in lower quality watches that he signed with the name George Charles'.[43] The absence of the final 's' and the different spellings of the name on the dial and the top plate suggest the possibility of a forgery. Altogether, it is unclear from the watch's features whether this is an original George Prior item; the available evidence suggests that it is not. The existence of a market for imitations and fakes implies intense competition among producers resulting from the financial opportunities that the watch market represented.[44] At the same time, from the customer's perspective, these objects were highly desirable and sought after; they exemplified a special kind of luxury. The next section presents the broader context of supply and demand.

Complexities of production and consumption

The watch belongs to the quantity production of simple and relatively cheap pocket watches which constituted a mass market in the Ottoman Empire during the late eighteenth and early nineteenth centuries.[45] Many watches of this type may be found today

39 Banister, *Dealer Guides*, 10; Bly, *Discovering Hall Marks*, 12–13.

40 Kurz, *European Clocks and Watches*, 76.

41 Kraminer, 'Watches'; Kraminer, 'George Prior, Edward Prior'.

42 White, *English Clocks*, 62–70; Rees, *Rees's Clocks Watches*, 257–58; Baillie, Ilbert, and Clutton, *Britten's Old Clocks* (1978), 467–468; Baillie, Ilbert, and Clutton, *Britten's Old Clocks* (1986), 574; Camerer Cuss, *The English Watch*, 304.

43 White, *English Clocks*, 68.

44 Smith, 'The Swiss Connection'; Yagou, 'Novel and Desirable'.

45 Thompson, 'Watchmaking in England'; Vincent and Leopold with Sullivan, *European Clocks and Watches*, 212–217; Kremer, 'Astronomische Zifferblätter', 33.

Fig. 8 The maker's signature and the serial number, engraved on the top plate.

Fig. 9 The watch removed from its external case.

in various museums and collections all over the world, and they are regularly traded by auction houses.[46] The survival of a large number of similar, low- to mid-range watches manifests the wide diffusion of such products as well as the recurrence of basic design features that were 'much admired and wanted by Ottoman customers'.[47] These artefacts represent a standard typology, to be clearly distinguished from pocket watches of extreme luxury used as gifts among rulers and diplomats. High-end watches would represent the finest craftsmanship of their time and would incorporate precious materials and stones.[48] At the other end of the spectrum, the quantity-produced watches which the Deutsches Museum specimen exemplifies were much simpler and more accessible items, in high demand among the wider population. It is estimated that George Prior and his son Edward together sold over 78,000 watches in the Ottoman Empire.[49] This substantial number by just one family of makers illustrates the idiosyncratic nature of the pocket-watch market, which combined quantity production with perceived exclusivity at the point of sale.

The scale of the market, in particular George Prior's success and reputation for robustness and quality, led to the production and distribution of forgeries, which was practised mainly, but not exclusively, by continental, especially Swiss makers from Geneva or Neuchâtel.[50] Continental forgeries 'were usually of poor quality and easily detected'.[51] Fake English watches were often falsely signed and names misspelt; therefore, the information etched on surviving watches can be misleading and is by no means an accurate indication of origin. Furthermore, cynically enough, London manufacturers themselves illicitly imported 'Swiss movements, cases, and even complete watches, to be sold under their own names as London-made products'.[52] The history and practice of watch forgery therefore has many aspects, which makes the distinction between 'genuine' and 'fake' a highly contested matter that is important today in the context of auctions and the antiques market. Nevertheless, it is doubtful whether the buyers of these products in the long eighteenth century were aware of or interested in this distinction.[53]

46 For example, in the Clocks and Watches Collection of the National Historical Museum (NHM) in Athens, the Benaki Museum in Athens, the Silversmithing Museum of Ioannina (Greece), the Worshipful Company of Clockmakers Collection at the Science Museum in London, the Victoria & Albert Museum in London, the Fitzwilliam Museum in Cambridge, the Uhrenmuseum in Vienna, and the Nicolae Simache Clock Museum (NSCM) in Ploiesti (Romania), to mention but a few, as well as in many private collections. Yagou, 'Novel and Desirable Technology'; Yagou, 'Issues of Authenticity'.

47 White, *English Clocks*, 281.

48 Some of the most spectacular artefacts for the high-end market may be seen in the collection of the Topkapı Palace in Istanbul, Meyer, *Catalogue of Clocks and Watches*; Çakmut and Gürbüz, *Topkapı Palace Clock Collection*.

49 Kurz, *European Clocks and Watches*, 97. Another source indicates lower, but still high, sales numbers: Kraminer, 'George Prior, Edward Prior', 320.

50 White, *English Clocks*, 68, 681–685; Kurz, *European Clocks and Watches*, 79. See also: Donzé, 'How Switzerland Became'; Struthers, *Unravelling the Myth*.

51 White, *English Clocks*, 68.

52 Smith, 'The Swiss Connection', 132.

53 Yagou, 'Issues of Authenticity'.

Information regarding the actual use of clocks and watches in the Ottoman Empire is very limited. In Ottoman society, where Muslims were the dominant social group, time measurement was of a primarily religious character and was closely linked to the timing of daily prayers and the call of the muezzin.[54] For non-Muslims, time measurement would be relevant in the context of trade or other business transactions.[55] Nevertheless, it is questionable whether the timekeeping function of watches was really significant for any social group among the local multiethnic populations. It seems more likely that the role of watches would be predominantly symbolic, an index of status and an expression of identity.[56] In a rare example of visual evidence, 'an Ottoman youth in fine attire casually holds his pocket watch more to display the trinket than to tell the time'.[57] This would be in line with the general tendency, since the beginning of miniaturisation in clockmaking, for the watch 'as ornament or jewel, with primacy given to the container than the contents'.[58] Ownership of a pocket watch would enable users to regulate their activities and synchronise themselves with other people, but above all would be a manifestation of personal distinction.

This type of pocket watch would be typically accompanied by a 'chatelaine', a chain for suspending a watch or piece of jewellery on one's garments. Additionally, one or more winding keys, seals or other trinkets could be attached. Normally the decoration on the watch case was en suite with the decoration on the chatelaine.[59] Chains sometimes came with the watch, but often they were added locally, to suit the taste and status of the owner.[60] The importance of the chain as a fashion accessory visible on the wearer's clothes should be emphasised. Similarly to watches for the European market, personalisation was possible in items for the Ottoman market through various decorative attachments and details. A mid-nineteenth century Ottoman-era watch with silver case and elaborate chain, signed by Edward Prior and currently exhibited in the Silversmithing Museum of Ioannina, Greece, exemplifies the late period of the 'English pocket watch for the Ottoman Market'. It represents the culmination of this trade, since Edward Prior continued his father's business in selling 'good solid watches' until the late 1860s.[61] Subsequently, the direction of trade was reversed: English watches for the Ottoman market were considered 'old-fashioned and no longer needed', and gradually they became collectors' items.[62]

54 Georgeon and Hitzel, 'Présentation', 2.
55 For some examples of Christian users, see Yagou, 'Novel and Desirable Technology'.
56 Grehan, 'Fun and Games'.
57 Illustration in an eighteenth-century costume album, Collaço, 'Albums of Conspicuous Consumption'.
58 Landes, *Revolution in Time*, 99.
69 Camerer Cuss, *The English Watch*, 458; see also: Bruton, *Dictionary of Clocks*, 38.
60 White, *English Clocks*, 73; Kurz, *European Clocks and Watches*, 75.
61 Kurz, *European Clocks and Watches*, 98.
62 Ibid., 97–99.

A different kind of luxury

As the study of these watches illustrates, the common denominator among a range of consumers in the Ottoman Empire was the increasing significance of innovative products affording sensory experiences.[63] This was a general phenomenon in continental Europe and in England as early as the end of the seventeenth century. The pocket watch was the product that had enabled the art and industry of clockmaking to enter private homes (and pockets) of a much wider range of people.[64] Watches were highly desirable and became more accessible, but this did not mean that they were cheap or easy to acquire. According to historian Jan de Vries, the acquisition of 'surplus', 'luxury' items by wider social strata in early modern Western Europe was a result of work or 'industriousness', and consuming was a reflection of the significance of work for the user's identity.[65] The acquisition of pocket watches in particular reflected the rise of the individual, as the 'use of the watch and the concomitant "privatization" of time' marked 'the passage from time obedience to time awareness and (self-) discipline.'[66] In this vein, the private pocket watch appeared as a symbol of the emergence of the self-sufficient and assertive person. Widespread clock and watch ownership facilitated a new understanding of time by individuals, enabling the constitution of a self-consciously acting subject.[67]

In times of increased mobility, the object's portability was a feature further adding to its allure. Both functional item and fashion accessory, the watch was closely bound to the owner's body and could be easily carried around and shown off. At a time of expanding mobility through a variety of commercial and cultural activities, a portable technical object was a sign of innovation and distinction embedded in new forms of socialisation in the public sphere.[68] The use of pocket watches as personal accessories and visible marks of distinction made good sense in that social environment, where what mattered most was embracing change, pursuing novelty, actively seeking diversity and fun, and experiencing sensual gratification.[69] In this context, as the upwardly mobile urban middle classes were engaging in novel forms of consumption and sociability, the boundaries between social groups were becoming blurred and porous. These phenomena were present or emerging among the inhabitants of the Ottoman Empire, just as they were among people in central and western Europe, reflecting the internal dynamics of societies in flux and constituting 'common threads in the worldwide experience'. [70]

63 Göçek, *East Encounters West*, 104–106.

64 De Vries, *The Industrious Revolution*, 1–2; Styles, *The Dress of the People*, 96–107.

65 De Vries, *The Industrious Revolution*.

66 Lyberatos, 'Time and Timekeeping in the Balkans', 278.

67 Brendecke and Vogt, *The End of Fortuna*, 2–3.

68 Bernasconi, *Objets Portatifs;* Bernasconi, 'Luxe, Précision et Mesure du Temps', 77–79.

69 Hamadeh, *The City's Pleasures;* Grehan, 'Smoking and "Early Modern" Sociability'; Blondé and Van Damme, 'Fashioning Old and New'.

70 Grehan, 'Smoking and "Early Modern" Sociability', 1353.

Thus, a novel, portable technical object expressed both the individual's taste and active participation in the practice of timekeeping. According to the classification of 'Types of Products and Related Systems of Production' developed by historian Giorgio Riello,[71] 'populuxe' or 'popular luxury' is a category of products with the following characteristics: 'Bought for their appeal and innovation, these items entailed a certain degree of skill, but not necessarily extensive financial investment in fixed capital for their manufacture. Most such objects could be purchased ready-made, although they could be customised. Their main difference compared to "undifferentiated products" is that they were market-oriented ready-made products, conscious of the variations and vagaries of fashion, conspicuous consumption, and consumer whimsy.'[72] Pocket watches imported to the Ottoman Empire during the long eighteenth century satisfy the aforementioned criteria and may be classified as popular luxury intended for and enjoyed by wider social groups, as opposed to high luxury that would be accessible only to the uppermost levels of Ottoman society. Therefore, 'popular luxury' appears to be a valid terminology for certain aspects of horological practice in early modern Southeastern Europe and the Middle East, although substantial further research is necessary before specific elaborations on the topic can be formulated. Indeed, more evidence is required to clarify the nature of technology diffusion and use, especially among different ethnic and religious groups. Nowadays such watches are regularly traded in auctions and have become yet another form of modern luxury, albeit different from the original as well as constantly evolving.[73]

To sum up, in both Western Europe and the Ottoman Empire, the long eighteenth century was a period of rising mobility that witnessed the emergence and proliferation among broader social groups of new categories of portable objects. The diffusion and systematic use of such objects underpinned the development of original ways of acquiring technical knowledge through consumption and new forms of socialisation in the public domain. The pocket watch was among the key objects in this process of technical acculturation and self-fashioning, as both technical gadget and personal accessory. Users appropriated novel products according to their own needs and desires, looking for maximum satisfaction and enjoyment. The growing importance of consumers' tastes and preferences lay at the heart of this phenomenon. In contrast to the 'old luxuries' that were characterised by precious and durable materials, the 'new luxuries' were less about intrinsic value and durability; instead, they were about price accessibility and attractive design, and emphasised pleasurable use. Owning and using a pocket watch were elements of a modern mentality and a means of empowerment in the pursuit of fun. Large seg-

71 Riello, 'Strategies and Boundaries', 243–280.

72 Ibid., 264.

73 For example, the Nagel auction of 4 July 2018 included two watches with Ottoman-era numerals, one by Ralph Gout (London) and one by Edward Prior, both of the three-case, standard typology targeted to the Ottoman market, *760 Armband- & Taschenuhren*, items 100 and 101 on pages 114 and 115 respectively.

ments of the population could afford 'populuxe' products, a fact leading to a 'blurring of social boundaries'. The consumption of such items became more and more important, and it was 'solidly intertwined with an individual expression of the self'.[74] Individuals enlarged their horizons through the use of new technical objects and simultaneously expanded their options for self-expression through product personalisation.

Conclusion

The inconspicuous albeit fascinating Ottoman-era watch from the Deutsches Museum is distinguished by the interplay between its technical, aesthetic and usage elements. Arguably, the novelty expressed by technical aspects contributed crucially to the popularity and desirability of this type of object. On this basis, it makes sense to propose that pocket watches are not only examples of the emergence of 'popular luxury' beyond Western Europe but, furthermore, paradigmatic objects of 'technological popular luxury'; as such they deserve further attention. This watch illuminates a diversity that remains to be explored.

74 Blondé and Van Damme, 'Fashioning Old and New', 1–3. See also: Coquery, 'The Semi-luxury Market', 121–131; Fennetaux, 'Toying with Novelty', 17–28; de Vries, *The Industrious Revolution*.

Bibliography

760 Armband- & Taschenuhren, https://www.auction.de/catalogues/epaper-760-UH/epaper/ausgabe.pdf (accessed 17 December 2021).

Baillie, Granville H., Courtney Ilbert, and Cecil Clutton, eds., *Britten's Old Clocks and Watches and their Makers: A History of Styles in Clocks and Watches and their Mechanisms*. 8th Edition Revised and Enlarged by C. Clutton. London: Methuen, 1978.

Baillie, Granville H., Courtney Ilbert, and Cecil Clutton, eds. *Britten's Old Clocks and Watches and their Makers: A History of Styles in Clocks and Watches and their Mechanisms*. 9th Edition Revised and Enlarged by Cecil Clutton. London: Bloomsbury Books, 1986.

Banister, Judith, ed. *Dealer Guides: English Silver Hall-Marks*. London: Foulsham, 2014.

Bernasconi, Gianenrico. *Objets Portatifs au Siècle des Lumières*. Paris: CTHS, 2015.

Bernasconi, Gianenrico. 'Luxe, Précision et Mesure du Temps: Une Montre de John Arnold comme Document Matériel.' In *L'Europe des Sciences et des Techniques: Un Dialogue des Savoirs, XVe-XVIIe Siècle*, ed. by Liliane Hilaire-Pérez, Fabien Simon and Marie Thébaud-Sorger, 77–79. Rennes: Presses Universitaires, 2016.

Blondé, Bruno and Ilja Van Damme. 'Fashioning Old and New or Moulding the Material Culture of Europe (Late Seventeenth – Early Nineteenth Centuries)'. In *Fashioning Old and New: Changing Consumer Patterns in Western Europe (1650–1900)*, ed. by Bruno Blondé, Natacha Coquery, Jon Stobart and Ilja Van Damme, 1–13. Turnhout: Brepols, 2009.

Bly, John. *Discovering Hall Marks on English Silver*. Aylesbury: Shire Publications, 1986.

Boyd Whyte, Iain. *Bruno Taut and the Architecture of Activism*. Cambridge: Cambridge University Press, 2010.

Brendecke, Arndt and Peter Vogt. *The End of Fortuna and the Rise of Modernity: Contingency and Certainty in Early Modern History*. Munich: De Gruyter Oldenbourg, 2017.

Bruton, Eric. *Dictionary of Clocks and Watches*. London: Arco, 1962.

Çakmut, Feza and Sule Gürbüz. *Topkapı Palace Clock Collection: Exceptional Timepieces at the Seraglio*. Istanbul: Topkapı Palace Museum, 2013.

Camerer Cuss, Terence. *The English Watch, 1585–1970: A Unique Alliance of Art, Design and Inventive Genius*. Woodbridge: Antique Collectors Club, 2009.

Christensen, Peter H. *Germany and the Ottoman Railways: Art, Empire, and Infrastructure*. New Haven and London: Yale University Press, 2017.

Chronik des Deutschen Museums von Meisterwerken der Naturwissenschaft und Technik: Gründung, Grundsteinlegung und Eröffnung, 1903–1925. Munich: Deutsches Museum, 1927.

Collaço, Gwendolyn. 'Albums of Conspicuous Consumption: A Composite Mirror of an 18th-Century Collector's World'. *Journal18: A Journal of Eighteenth-century Art and Culture* 6 (2018).

Coquery, Natacha. 'The Semi-luxury Market, Shopkeepers and Social Diffusion: Marketing Chinoiseries in Eighteenth-Century Paris'. In *Fashioning Old and New: Changing Consumer Patterns in Western Europe (1650–1900)*, ed. by Bruno Blondé, Natacha Coquery, Jon Stobart and Ilja Van Damme, 121–132. Turnhout: Brepols, 2009.

De Vries, Jan. *The Industrious Revolution: Consumer Behaviour and the Household Economy, 1650 to the Present*. Cambridge: Cambridge University Press, 2008.

Donzé, Pierre-Yves. 'How Switzerland Became the Largest Watchmaking Nation in the World – A Short History of the Swiss Watch Industry from 1750 to 1850'. In *Simple and Perfect, Saxony's Path into the World of International Watchmaking. In Celebration of Ferdinand Adolph Lange's 200th Birthday*, 141–150. Dresden: Staatliche Kunstsammlungen Dresden, 2015.

Fennetaux, Ariane. 'Toying with Novelty: Toys, Consumption, and Novelty in Eighteenth-Century Britain'. In *Fashioning Old and New: Changing Consumer Patterns in Western Europe (1650-1900)*, ed. by Bruno Blondé, Natacha Coquery, Jon Stobart and Ilja Van Damme, 17–28. Turnhout: Brepols, 2009.

Frieß, Peter. *Uhren und Automaten: Vermächtnis Werner Brüggemann [Ausstellung im Dt. Museum, 17. Febr. 1986]*. Munich: Deutsches Museum, 1986.

Füßl, Wilhelm and Helmuth Trischler, eds. *Geschichte des Deutschen Museums: Akteure, Artefakte, Ausstellungen*. Munich: Prestel, 2003.

Füßl, Wilhelm. *Oskar von Miller 1855-1934 Eine Biographie*. Munich: C.H. Beck, 2005.

Füßl, Wilhelm. 'Pioniere der Elektricitätsversorgung'. https://blog.deutsches-museum.de/2018/09/21/zwei-ungewoehnliche-persoenlichkeiten-an-der-spitze-des-spaeteren-weltkonzerns-aeg-emil-rathenau-un/ (accessed 17 December 2021).

Georgeon, François and Frederic Hitzel. 'Présentation'. In *Les Ottomans et le Temps*, ed. by François Georgeon and Frederic Hitzel, 1–10. Leiden: Brill, 2011.

Göçek, Fatma Müge. *East Encounters West. France and the Ottoman Empire in the Eighteenth Century*. New York and Oxford: Oxford University Press, 1987.

Grehan, James. 'Smoking and "Early Modern" Sociability: The Great Tobacco Debate in the Ottoman Middle East (Seventeenth to Eighteenth Centuries)'. *The American Historical Review* 111, no. 5 (2006): 1352–1377.

Grehan, James. 'Fun and Games in Ottoman Aleppo: The Life and Times of a Local Schoolteacher (1835–1865)'. In *Entertainment among the Ottomans*, ed. by Ebru Boyar and Kate Fleet, 90–120. Leiden: Brill, 2019.

Grimwade, Arthur G. *London Goldsmiths 1697–1837*. London: Faber and Faber, 1976.

Habinger, Otto, Karl Brendel and Hartmut Petzold. 'Die Uhrensammlung im Deutschen Museum Teil 1'. *Uhren, Journal für Sammler Klassischer Zeitmesser* 2 (April/May 1993): 10–25.

Habinger, Otto, Karl Brendel and Hartmut Petzold. 'Die Uhrensammlung im Deutschen Museum Teil 2'. *Uhren, Journal für Sammler Klassischer Zeitmesser* 3 (June/July 1993): 10–25.

Hamadeh, Shirine. *The City's Pleasures: Istanbul in the Eighteenth Century*. Seattle: University of Washington Press, 2007.

Howard, Douglas A. *A History of the Ottoman Empire*. Cambridge: Cambridge University Press, 2017.

Jagger, Cedric. *The Artistry of the English Watch*. London and Newton Abbot: David & Charles, 1988.

Kraminer, Jan. 'George Prior, Edward Prior'. *Antiquarian Horology* 18, no. 3 (1989): 319–321.

Kraminer, Jan. 'Watches by George and Edward Prior – An Updated List'. *Antiquarian Horology* 27, no. 6 (2003): 710–711.

Kremer, Birgit. 'Astronomische Zifferblätter für die Türkei und aus der Türkei'. *Klassik Uhren* (January–February 2014): 32–37.

Kurz, Otto. *European Clocks and Watches in the Near East*. London: Warburg Institute, 1975).

Landes, David S. *Revolution in Time: Clocks and the Making of the Modern World*. Cambridge (MA): Belknapp Press/Harvard University Press, 1983.

Lyberatos, Andreas. 'Time and Timekeeping in the Balkans: Representations and Realities'. In *Entangled Histories of the Balkans: Concepts, Approaches and (Self-) Representations*, ed. by Roumen Daskalov, Diana Mishkova, Tchavdar Marinov and Alexander Vezenkov, 257–290. Leiden: Brill, 2017.

'Mainspring'. https://en.wikipedia.org/wiki/Mainspring (accessed 17 December 2021).

Marchand, Suzanne L. *German Orientalism in the Age of Empire: Religion, Race, and Scholarship*. Cambridge: Cambridge University Press, 2009.

Matthes, Dietrich. 'A Watch by Peter Henlein in London?'. *Antiquarian Horology* 36, no. 2 (2015): 183–194.

Meyer, Wolfgang. *Catalogue of Clocks and Watches in the Topkapı Sarayı Museum*. Istanbul, 1971.

Michal, Stanislav. *Clocks and Watches: A Catalogue of Clocks and Watches (16th to 20th Century) in the Collections of the National Technical Museum Prague*. Prague: Vytiskla Tiskárna Mir, 1974.

'Montre Oignon'. http://www.lepoint.fr/montres/Magazine/Dictionnaire-horlogerie/montre-oignon-10-12-2012-2018424_2975.php (accessed 17 December 2021).

'Movement'. https://www.merriam-webster.com/dictionary/movement (accessed 17 December 2021).

Oestmann, Günther. 'Early Watches – The Argument over Priority in Italy and Germany', *Antiquarian Horology* 39, no. 1 (2018): 92–97.

'Oignon (Montre)'. https://www.hautehorlogerie.org/fr/encyclopedie/lexique-de-lhorlogerie/s/oignon-montre/ (accessed 17 December 2021).

Priestley, Philip T. *British Watchcase Gold & Silver Marks 1670 to 1970*. Columbia (PA): The National Association of Watch & Clock Collectors, 2018.

Rees, Abraham. *The Cyclopedia; or, Universal Dictionary of Arts, Sciences, and Literature*. London, 1819–1820.

Rees, Abraham. *Rees's Clocks Watches and Chronometers (1819-20): A Selection from the Cyclopedia; or Universal Dictionary of Arts, Sciences and Literature*. Newton Abbot: David and Charles, 1970.

Reindl-Kiel, Hedda. 'Luxury, Power Strategies, and the Question of Corruption Gifting in the Ottoman Elite (16th–18th Centuries)'. In *Sehrâyîn: Die Welt Der Osmanen, Die Osmanen in Der Welt. Wahrnehmungen, Begegnungen und Abgrenzungen / Illuminating the Ottoman World. Perceptions, Encounters and Boundaries. Festschrift Hans Georg Majer*, ed. by Yavuz Köse, 107–120. Wiesbaden: Harrassowitz Verlag, 2012.

Riello, Giorgio. 'Strategies and Boundaries: Subcontracting and the London Trades in the Long Eighteenth Century'. *Enterprise & Society* 9, no. 2 (June 2008): 243–280.

Smith, Roger. 'The Swiss Connection: International Networks in Some Eighteenth-Century Luxury Trades'. *Journal of Design History* 17, no. 2 (2004): 123–139.

Speidel, Manfred, ed. *Bruno Taut, Ex Oriente Lux: Die Wirklichkeit einer Idee*. Berlin: Gebr. Mann Verlag, 2007.

'Sterling Silver'. https://en.wikipedia.org/wiki/Sterling_silver (accessed 17 December 2021).

Struthers, Rebecca. 'Unravelling the Myth of the "Dutch Forgery": The Production, Trade and Dissemination of Grey Market Watches in Europe, 1750–1820'. PhD diss., Birmingham City University, 2016.

Styles, John. *The Dress of the People: Everyday Fashion in Eighteenth-Century England*. New Haven and London: Yale University Press, 2010.

Thompson, David. 'Watchmaking in England in the Eighteenth Century'. In *Simple and Perfect. Saxony's Path into the World of International Watchmaking. In Celebration of Ferdinand Adolph Lange's 200th Birthday*, 27–55. Dresden: Staatliche Kunstsammlungen Dresden, 2015.

Vaupel, Elisabeth and Isolde Lehnert. 'Ein Hauch von Orient'. *Kultur & Technik* 3 (2015): 41–47.

Vincent, Clare and Jan Hendrik Leopold with Elisabeth Sullivan. *European Clocks and Watches in the Metropolitan Museum of Art*. New York: The Metropolitan Museum of Art, 2015.

Weiss, Leonard. *Watch-making in England*. London: Robert Hale, 1982.

White, Ian. *English Clocks for the Eastern Markets: English Clockmakers Trading in China and the Ottoman Empire 1580–1915*. Ticehurst: Antiquarian Horological Society, 2012.

Wöhler, Mareike. 'Der Gott der Zeit war am schnellsten'. *Kultur & Technik* 4 (2019): 56–57.

Yagou, Artemis. *Modernist Complexity on a Small Scale: The Dandanah Glass Building Blocks of 1920 from an Object-based Research Perspective*. Deutsches Museum Preprint 6. München: Deutsches Museum Verlag, 2013.

Yagou, Artemis. 'Novel and Desirable Technology: Pocket Watches for the Ottoman Market (late 18th – mid 19th c.)'. *ICON* 24 (2018/2019): 78–107.

Yagou, Artemis. 'Issues of Authenticity in Pocket Watches for the Ottoman Market'. In *Museums – Places of Authenticity?*, ed. by Dominik Kimmel and Stefan Brüggerhoff, 385–392. Mainz: Verlag des Römisch-Germanischen Zentralmuseums, 2020.

The Luxury Furniture Industry in Nineteenth-Century Paris: Between Resistance and Compromise

Camille Mestdagh

Abstract

The widespread expression 'industrial art' in late nineteenth-century Europe would seem to imply an integration of artistic practices and technical progress. Yet the study of French decorative arts in the second half of the nineteenth century, particularly the furniture industry, shows that practices were far from reflecting this ideal. The expansion of the middle class in the Western world encouraged the development of furniture mass-production, which relied on technology through mechanisation. The increasing use of woodcutting machines, originally introduced in Britain, cut down labour and ensured an economy of materials by reducing the thickness of panels and veneers. Affordable furniture also developed thanks to new techniques supporting the use of cheaper materials such as bentwood. In opposition, 'luxury' furniture showed increasing sophistication and used precious and expensive materials, relying only on skilled manual labour. As such, this type of furniture was commonly described at the time, in exhibition reports and press reviews, as 'artistic'. Indeed, the luxury side of the industry asserted its standards through the notion of the artistic quality of furniture, intwined with the preservation of traditional techniques, gradually appearing as a form of resistance against technological means and underlining the incompatibility between the concepts of democratisation and luxury.

Keywords Furniture, Luxury, Industry, Art, Decorative Arts, International Exhibitions, Craftsmanship, Workshop, Machine Tools, Precious Materials, Techniques, Design

Introduction

The nineteenth century was marked by a transformation of the conditions of production and consumption, affecting the materials and the workmanship involved in order to offer different ranges of quality[1]. Therefore, faced with the diversity of products on offer, the industry devoted to the production of luxury objects had to establish some forms of recognition. The five International Exhibitions held in Paris in the second half of the nineteenth century, designated *Expositions Universelles*, constitute a reliable source for analysing the evolution of the luxury end of Parisian furniture, considered as a specific branch of the furnishing industry.[2] At the time, the word *industry* did not necessarily

1 Sougy, 'Du beau et de l'utile', 25-37.

2 In 1892, Pierre de Maroussem published an investigation on the specificity of the Parisian luxury furniture industry: Maroussem, 'Ebéniste parisien de haut luxe'.

imply the process of industrialisation: in its traditional meaning, inherited from the pre-industrial era, it designated a combination of specific technical skills[3] that can, in some instances, be antonymous with industrial production in a contemporary sense. As argued by Jeff Horn, France's path towards industrialisation diverged from Britain's, slowing the pace of mechanisation, partly due to Revolutionary politics and the relations of the workforce to the state.[4] Economic prosperity relied instead on the variety of resources, skilled labour, expertise and product specialities. This argument can be reflected in the study of Parisian furniture workshops, which demonstrated resistance towards the use of steam-powered machines, compared with other industries such as the textile sector.

After the French Revolution, in the opening decades of the nineteenth century, the structure of furniture production changed progressively but slowly. At the end of the century, modern furniture factories were still very few in Paris. The first and second sections of this text trace the changes and continuity in the furniture industry, which relied on a complex network of skilled craftsmen, working collaboratively, and small firms employing on average 50–100 men, most of them not equipped with steam-power machines. The third and fourth sections examine pieces presented at the International Exhibitions, showing how luxury production asserted itself through two main qualities: the maintenance of traditional techniques and the use of precious materials, both depending on skilled manual labour affiliated with artistic qualities. The possession of furniture was always a sign of social position, and these qualities were reflected in the high prices. In promoting these pieces of furniture, the Exhibitions' rewards and reports encouraged the conception of furniture pieces as individual works of art, difficult to associate with steam-powered machine tools used for serial reproduction. The last section complements these arguments by revealing a certain compromise through technical innovations that relied on manual labour, and the search for new decorative techniques, highlighting the role of novelty and technological expertise within the luxury industries.

The structures of the furniture industry

As written in the *Furniture Gazette* at the time of the 1878 *Exposition Universelle*: 'France enjoyed the great advantage of having for a century or more devoted special attention to the cabinet-maker's craft'.[5] The influence of Paris as the taste maker for European furniture goes back as early as the late 1600s, notably through the work and commissions of André-Charles Boulle (1642–1732) who supplied furniture for the foreign courts. In the nineteenth century, with the organisation of the International Exhibitions, the development of transport connections, and the installation of a complex network of merchants

3 Luneau, 'Art et industrie au XIXe siècle', 19-20.

4 Horn, *The path not taken*.

5 'Furniture at the Paris exhibition', 169–170.

in most capitals, from New York to Saint Petersburg, the prestige of French furniture would only become greater.[6] In 1860 the gross of the overall Parisian furnishing industry was estimated at just under 200 million francs, and occupied nearly 38,000 men and women.[7] This turnover was ranked fourth in the Parisian economy, after the food, clothing and building industries. It combined a large variety of skilled activities, mostly operating in specialised workshops, including cabinet makers, upholsterers, bronze makers, chair makers, stone carvers, gilders and restorers, but also wallpaper manufacturers and so on. The major group was the cabinet makers, representing a third of the manpower, with more than 10,000 workers and a business turnover worth 35 million francs. Exportation was estimated at just under 4.5 million francs, concerning mostly the luxury industry, with the Americas as the main destination but also Russia and England, Spain and Brazil amongst others.[8]

Until the First World War, France remained a global reference for luxury furniture design and making, with the epicentre of production remaining in Paris, in the Faubourg Saint-Antoine and Marais districts. It had been the centre of production since the seventeenth century and, as detailed study of the workshops shows, tradition dominated in many ways. Reports from the nineteenth-century International Exhibitions describe furniture as a segment of 'industrial art'. The expression could be understood as a fusion between art and industrialisation, an integration of artistic practices and technical progress – but, on the contrary, the maintenance of traditional methods and skills in the luxury furniture industry can be perceived as antagonistic towards the introduction of new means of production. After the French Revolution, the organisation of furniture production changed gradually but not fundamentally. As a result of the abolition of the corporations regulating professions and practices through the Allarde Decree and the Le Chapelier Law in 1791, a single workshop could extend and diversify its production, but still depended on specialised labour. This influenced the organisation of many workshops, now allowed to combine the practice and use of various skills, techniques and materials under one roof, such as woodwork, metalwork, carving and upholstery. For example, in 1812 the leading furniture firm of Jacob-Desmalter owned a factory divided into thirteen workshops in order to produce all types of furniture (carved, veneered, marquetry) but also mechanisms, bronzes and locks, employing in total more than 300 men.[9] In the middle of the nineteenth century such firms still existed, as shown by the

6 Zeisler, 'De New York à Saint-Pétersbourg', 219.

7 *Statistique de l'industrie à Paris* (…) *pour l'année 1860*. The statistics record that for the overall industry 7,391 workshop owners and 30,254 men were employed; these figures include 11,372 woodworkers, active in cabinet- and chair-making and carpentry, and 5,732 doing metalwork including bronze mounts and objects (lighting etc.). 3,471 women were employed, too, mainly for upholstery and metal varnishing. The average salary for men varies between 3 and 5 francs per day. Two thirds of the workers were paid per day of work and one third per piece made.

8 Desvernay, *Exposition Universelle,* 22.

9 Garenc, *L'industrie du meuble en France,* 76.

establishment of Krieger (later Damon),[10] giving in-house work to 265 people.[11] However, such organisation remained an exception. Study of the Paris records of address reveals a system recently denominated as 'fabrique collective',[12] as can be seen in the many small passages and courtyards around the Faubourg Saint-Antoine, where many independent and specialised craftsmen, established in the same building or neighbourhood, contributed to make a single piece according to their specialities, sometimes subcontracted by larger establishments.[13] This organisation reflects how, despite the abolishment of the corporations, workers continued to work strongly in association. Horn also stresses the importance of the formation of brotherhoods in certain artisanal specialities in the first decades of the century, and the traditions of mutual aid 'that strongly influenced the actions of the state, [and] the perceptions of entrepreneurs'.[14] With the revolution and crisis of 1848, a third of the furniture workers found themselves unemployed,[15] and some of them had to work independently, causing the continuation of the predominance of small, specialised workshops. In 1860, more than half the Parisian workshops employed one worker maximum, and only 10% employed more than ten men.

The resistance to the implementation of machine tools

As the workshops' structure developed only relatively, the techniques involved in luxury furniture production remained mostly traditional too. At the beginning of the nineteenth century, technical advances such as the development of the steam engine and progress in the steel industry led to the invention of various tools and machines to facilitate the production of furniture. Woodworking machines were slowly introduced in France around 1825, mainly from England, and their usage developed around the 1855

10 The Krieger firm was founded in 1826, at 17 rue Saint-Nicolas by Antoine Krieger (1804–1869), originally from Strasbourg. It was then transferred to the Faubourg Saint-Antoine in 1838, and from 1856 it was taken over by his sons-in-law and renamed 'Racault et Cie'; the firm names changed many times, to become for example 'Damon et Cie' in 1882, but the brand name remained 'Krieger'. As reported in the *Moniteur de l'Ameublement* in January 1868: 'The Krieger house is of exceptional importance; the turnover involved is considerable. In the past we used to make the kind that is still called good current in this house (…). M. Racault manufactures today from the most modest furnishings to those that can be classified in the category of things of art', *Moniteur de l'Ameublement*, 168. The Krieger house grew considerably in delivering furniture sets, such as dining-room and bedroom furniture, intended for a middle-class clientele, but also in undertaking artistic furniture design and making for the major exhibitions. See Mestdagh, *L'ameublement d'art français*.

11 Lainé, 'Antoine Krieger', 283–303.

12 Gribaudi, *Paris, ville ouvrière*, 212–219.

13 See, for example, the setting-up of individual workshops in the passage du cheval blanc (leading to rue de la Roquette) in the 1880s: the buildings around the six courtyards of the entire passage were inhabited by numbers of cabinet makers, carpenters, wood-turners, marble workers, and wood and furniture merchants. Archives de Paris. Cadastres. D1P4/979.

14 Horn, *The path not taken*, 254.

15 *Statistique de l'industrie à Paris (…) pour les années 1847-1848*.

Exposition Universelle.[16] They were mainly powerful saws, facilitating the cutting and shaping of wood. In the first quarter of the century, pit sawyers started to see some of their work replaced first by horse-powered saws and then by machines, as some workshops were starting to send their wood to modern sawmills in order to cut the timber used for the furniture carcass. Soon, the leading wood merchants undertook or subcontracted the task, with the rapid development of the use of steam-powered saws to cut timber. This explains the regularity of wood surface found on the rails and panels of the carcass construction of nineteenth-century pieces of furniture, compared with eighteenth-century examples cut by hand. As for the construction timber, the veneer started to be mechanically cut. In the 1830s sawing machines for sheets of veneer started to be perfected in France with the Cochot saw ('scie Cochot'), and twenty years later the band saw was introduced, which allowed for very thin cuts and irregular shapes (Fig. 1). In 1867 there were around fifty establishments in Paris devoted to wood cutting.[17] By then, scroll saws were also largely in use for shaping wood boards, as well as specialised machine tools to make mouldings and some carved patterns. Small workshops could not afford this new equipment, but could either subcontract or rent access to those machines. In response to demand, coal-fired steam-engine power plants were installed in the basement of designated buildings of which the floors above were equipped with specific

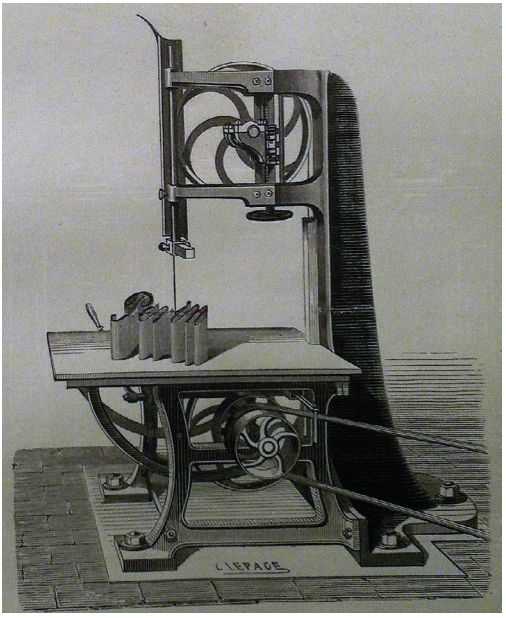

Fig. 1 Band saw manufactured by Périn, c. 1867.

16 Desvernay, *Exposition Universelle*; Cousté, *Rapport sur le matériel*, 3.

17 *Annuaire-Almanach du commerce de Paris*, 1867.

Fig. 2 A furniture workshop at Krieger, 74 Faubourg Saint-Antoine, Paris, c. 1880.

machine tools, available for rent by the different craftsmen in the area.[18] Nevertheless, even later in the century, it was rare for a large furniture factory to possess its own steam engine; one which did was Krieger-Damon, established in the Faubourg Saint-Antoine (Fig. 2).[19]

On the occasion of the 1878 *Exposition Universelle*, the cabinet-making firms wishing to participate in the exhibition had to fill in a questionnaire detailing the condition of their production, including the size of their workshop, the number of men, women or children employed, and listing the machine tools in use, if any.[20] Out of 293 applications, only 64 questionnaires are kept in the National Archives today, in which only nine firms' owners reveal using steam-powered machines in their own workshops, which employed an average of 50–200 men. In contrast, some of them strongly defend their production as 'entirely made by human hand', as declared by Julien Aimé Guéret, directing

18 Laurent, 'Industries du meuble', 118–124; Hamon, 'Cours et forces motrices', 164–169.

19 Turgan, 'Etablissements Krieger Damon & Cie'.

20 Archives nationales, Paris, Commerce et Industrie, F/12/3365; Lachaud and Massé, *Le meuble français.*

and training no fewer than 115 workers specialised in carved wood furniture.[21] 'As a man of Art my engines are my pencils and my tools', writes Jean-Pierre Lagnier, another wood carver. Indeed, the furniture firms seeking to show their work at the *Exposition Universelle* were, in the majority, participating in the luxury industry, and showcased their status through the intertwined concepts of manual and artistic work. In the 1890s, Pierre du Maroussem (1862–1936), a leading figure of the emerging French social sciences, investigated the conditions of work and specificity of the Parisian luxury furniture industry. His study confirms that apart from a few workshops combining carpentry work with cabinet making, machinery was absent from the luxury furniture firms, which represented approximately one quarter of the overall industry.[22] Research in the Paris land registry and tax office confirms that several famous luxury furniture establishments, which had fairly modern workshop installations and integrated their own showroom , such as the ones owned by Henry Dasson (1825–1896),[23] Alfred Beurdeley *fils* (1847–1919)[24] and Joseph-Emmanuel Zwiener (born 1949)[25] (also quoted by Maroussem), did not depend on steam power, although they employed between 50 and 100 men and received regular commissions from the international elite following their successes at the *Expositions Universelles*.[26]

A luxury that relied on manual/artistic skills

In the furniture industry, 'luxury' was also defined as 'artistic', and the two words were used interchangeably by the press and the official reports accompanying the *Expositions Universelles* from 1855 to 1889. The expression 'artistic industry' is more commonly found than 'luxury industry' because, as Francis Demier explains, producers 'seek their identity on the creator's side and not on the consumer's side'.[27] Luxury furniture was also

21 The Guéret firm was created in 1851 by two brothers, Onésime and Denis-Désiré, manufacturers of carved furniture. From 1870 they settled at 216 rue Lafayette. In 1876 they handed over the management of the company to their brother, Julien, and created Guéret Jeune et Cie. They retained the speciality of carved furniture, extending production to chairs. From 1855 they participated in all the International Exhibitions, where they won medals. Ledoux-Lebard, *Le mobilier du XIXe siècle*, 247–248; Lachaud and Massé, *Le meuble français*, 100–101.

22 Maroussem, 'Ebéniste parisien de haut luxe', 55.

23 First established as a bronze maker, Henry Dasson moved to 106 rue Vieille du Temple as a 'furniture maker' in 1876. He participated successfully at the Paris *Expositions Universelles* in 1878 and 1889. See Mestdagh, 'Henry Dasson'.

24 Louis Auguste Alfred Beurdeley *père* (1808–1883) inherited a shop of 'merchant of bronzes and curiosities' and developed the business considerably in the 1860s, associating the activity of designer of furniture with works of art, before handing over to his son, Emmanuel Alfred Beurdeley *fils*, who took the direction of a large workshop in 1875. See Mestdagh, 'The Beurdeleys'.

25 Joseph Emmanuel Zwiener was known as a 'cabinet maker' established in 'Roquette 2, cour du cheval blanc', in the heart of the Faubourg Saint Antoine, from 1882 to 1895; from 1895 J.H. Jansen bought Zwiener's business to set up as a cabinet maker. Zwiener then returned to Germany, where his brother Julius Zwiener was the head of a cabinet-making firm in Berlin. See Mestdagh, *L'ameublement d'art français;* Meiner, *Berliner Belle Epoque.*

26 Mestdagh, *L'ameublement d'art français.*

27 Démier, 'Du luxe au demi-luxe', 63–91.

called 'artistic' to imply that it was designed especially and made by skilled craftsmen. In contrast, the equipment of steam power and new machine tools was associated with the decline of skilled manual labour in order to increase production based on the repetition of the same designs. As observed by Maroussem, although many of the firms' leaders in the luxury segment were entrepreneurs and not necessarily trained craftsmen, the main distinction between the men working for them and the others was that they were highly trained and able to work from designs and plans: 'they [the workers in the luxury industry] are few in number and it is their rarity that makes their furniture expensive, made after a design out of the routine'.[28]

The International Exhibitions encouraged this type of production in selecting masterpieces and promoting luxury firms. They praised the design and the manual labour involved in these pieces, which were regarded as works of art. These 'artistic' values were

Fig. 3 Carved boxwood barometer-thermometer exhibited at the 1878 *Exposition Universelle* by Alfred Beurdeley *fils*.

Fig. 4 Table with Japanese lacquer, ebony, mother of pearl, copper and silver inlay by M. Martin, exhibited at the 1867 *Exposition Universelle* by Alfred Beurdeley *père*.

28 Larousse, 'Ebénistes', 39.

Fig. 5 Side cabinet with a central marquetry panel designed by J. Brandely, executed by J. Labarre and Mrs Poirier, exhibited at the 1867 *Exposition Universelle* by Alfred Beurdeley *père*.

based on the education and skills of the craftsmen, the uniqueness of the piece and the time spent creating it. Alfred Beurdeley *fils* reported in the press about a carved barometer his firm exhibited in 1878 (Fig. 3): 'it took no less than a full year to realise it. Three artists spent over two months to realise a scale model. Accomplishing the piece was the full-time work of five carvers for eight months'.[29] The value of his contributions was recognised by the French state, as five years later he received the Legion of Honour; he then explained: 'My efforts are very useful to the country; because workshops like mine, by training and maintaining workers with consummate skill (…) help to defend this superiority of the workforce, the only one perhaps which, in the field of the decorative arts, has remained the exclusive privilege of France'.[30] The honorific medal was the result of the international success his father and he had gained in exhibiting repeatedly since 1855. At the 1867 *Exposition Universelle*, Alfred Beurdeley *père* aimed to show that his creations involved a great variety of precious materials and techniques, insisting on the skills involved: 'my works can be distinguished by an exceptional quality of execution and finish'.[31] He notably presented a Japanese lacquer table with silver, ebony and mother of pearl marquetry, for which he had to employ a specialised craftsman described as an 'artist' (Fig. 4), and a side cabinet with a marquetry panel for which he employed a designer and two specialists in inlay work, associating stained wood mosaic and hot sand shading[32] (Fig. 5).

29 Larousse, 'Ebénistes', 39.

30 Letter dated 16 October 1883 to the Grande chancellerie de la Légion d'honneur. Paris, Archives Nationales.

31 Letter dated 4 July 1867 to the comte de Nieuwerkerke. Paris, Archives Nationales, Archives des musées nationaux K30.

32 Desvernay, *Exposition Universelle*, 11.

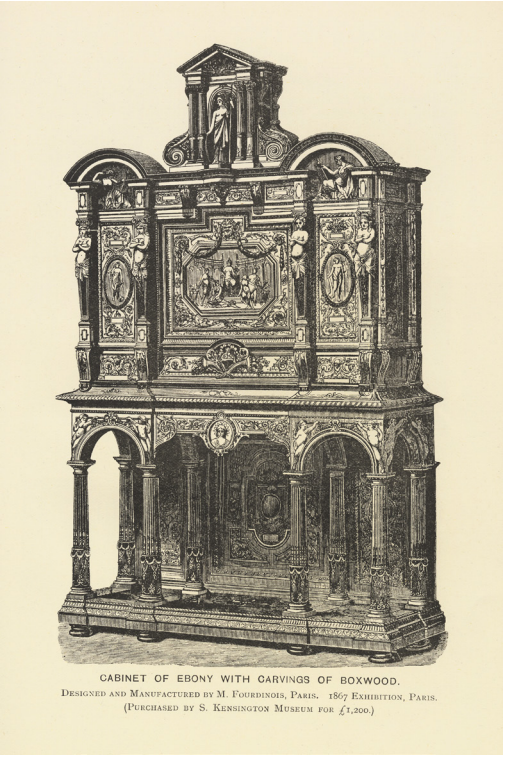

Fig. 6 Cabinet in ebony with inlay and carved boxwood decoration exhibited at the 1867 *Exposition Universelle* by Henri Auguste Fourdinois.

On the same occasion, an English report also praised the manual skills noticeable in the production of his counterpart Fourdinois,[33] the owner of another prestigious Parisian workshop: 'we saw the superiority of the French workmen in design and skill; I saw carvings that seemed to me to be impossible to have been done with tools [meaning machine tools]'.[34] This referred to a monumental cabinet with carved figures in oak, ebony, walnut and boxwood, showing intricate work in low and high reliefs, which won the Grand Prix and was soon acquired by the South Kensington Museum in London (today the Victoria & Albert Museum, Museum no. 721-1869) (Fig. 6). At the next *Exposition Universelle*, Fourdinois' participation was praised for his jewellery cabinet with carved ivory figures, lapis lazuli columns and silvered bronze mounts (Fig. 7). As Glenn Adamson concludes about the furniture at the *Expositions*: 'cabinet makers fashioned showpieces

33 Founded c. 1835 by Alexandre-Georges Fourdinois (1799–1871), the firm specialised in carved and marquetry furniture, including cabinet and chair making. Around 1860, his son Henri Auguste (1830–1907) took over the direction of the workshop and gained an international reputation; he closed it in 1887. See Gabet, 'Sources et modèles', 261–279.

34 *Reports of artisans.*

for purely visual consumption (…) in these extraordinary creations the skills of the cabinet maker were the only thing on display – they were pointedly divorced from utility of any kind'.[35] The pieces selected and published by the official reports and the press were all highly decorative, not only showing the skills involved in the complex marquetry or delicate carvings, often depicting high-relief figures and assimilated with fine art sculpture, but also a great variety of expensive materials.

Preciousness and price

Indeed, apart from the cost of specialised labour, the distinction was also based on the materials used. Luxury furniture showed increasing sophistication and used precious materials, such as exotic woods and ivory, precious metal, tortoiseshell, mother of pearl, lacquer and hardstone, often with a profusion of gilt or silvered bronze decoration. The intricacy of the design and the preciousness of the materials used were undeniably conditioned by skilled manual labour. For the bronze decoration they made a point in continuing the traditional, expensive, and invasive technique of mercury gilding also known as 'or moulu' (ormolu), in opposition to the newly introduced process of electro-gilding or plating. The 'Bibliothèque', exhibited by Alfred Beurdeley *père* in 1867, is

Fig. 7 Jewellery cabinet with carved ivory figures, lapis lazuli, enamel and silvered bronze mounts exhibited at the 1878 *Exposition Universelle* by Henri Auguste Fourdinois (detail).

35 Adamson, 'The Labor of Division', 272.

Fig. 8 *Grande bibliothèque* with gilt bronze mounts and hardstones exhibited at the 1867 *Exposition Universelle* by Alfred Beurdeley *père* (detail of the upper section).

an example of the association of ormolu gilt bronze mounts and hardstones, bringing colour and vivacity to a piece of furniture (Fig. 8); more than twenty years later, the jewellery cabinet exhibited in 1889 by Joseph-Emmanuel Zwiener, 'covered' in ormolu mounts and vernis Martin, shows that colours and gold brightness were still synonymous with luxury (Fig. 9). In developing such complex and expensive decoration, the workshops were continuing a tradition and proving that they were still able to master ancient techniques as they were to create pieces inspired by the past, stylistically as well as technically. As stressed by a report, 'All the efforts of the makers are directed towards the perfection of the workmanship and the choice (…) of old patterns from various periods to constitute new furniture [with] the preference given to pastiches of the French and Italian Renaissance, as well as of the Louis XVI style'.[36] These references to historical styles, criticised at the end of the nineteenth century and seen as lacking in creativity and innovation, indicated an appreciation of luxury which was based on historical objects in

36 *Exposition Universelle internationale de 1878*, 195–197.

which the materials formed an important part of the intrinsic value. The machinery was not conceived to work on this type of decoration. On the contrary, the increasing use of industrial wood-cutting machines was meant to save materials such as the electroplating gold; as such they were decreasing quality in reducing the thickness of the panels and veneers and the layer of gold applied. At the time mass-produced furniture developed, so did the introduction of substitutes and new materials imitating luxury ones, such as tortoiseshell and ivory, which reinforced the distinction between 'false' and 'authentic', between mass-consumption and luxury.[37] The use of precious materials and the continuation of traditional workshop practices, inherited from the French *Ancien Régime*, were dependent on highly skilled manual labour, defending a tradition with reference to historical styles.

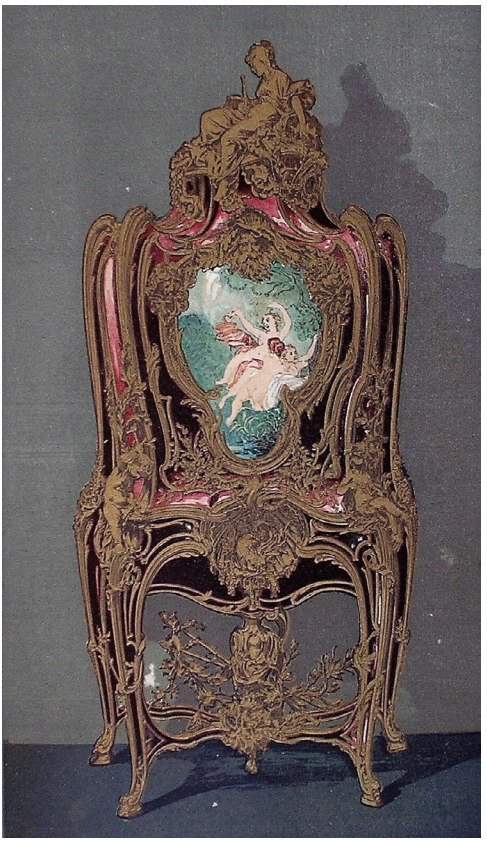

Fig. 9 Jewellery cabinet with gilt bronze mounts and vernis Martin exhibited at the 1889 *Exposition Universelle* by Joseph Emmanuel Zwiener.

37 Sougy, 'D'écaille, de nacre et d'ivoire', 219–226.

The *Expositions Universelles* were initially developed to publicise and reward technological advances, but the jury promoted pieces of furniture conceived as unique works of art and therefore difficult to associate with industrial progress. This contributed to raising luxury production as a national model, which nourished the myth of Parisian taste internationally, but was detrimental to the development of affordable production. In the context of these international events, the assimilation of luxury and tradition could be linked with the emerging concept of nation states, and could also be interpreted as resistance to a certain globalisation and uniformity through the adoption of industrial means. Around the same time, the proposition of the Arts and Crafts movement that developed in Great Britain could not be paralleled with the French luxury industry, although its representatives defended skilled manual labour in opposition to mechanisation and the principles of the industrial production of goods. William Morris' (1834–1896) philosophy was based on moral concepts and the idea of democratisation of beauty supported by the spread of manual skills to every level of society. On the contrary, as revealed by the opulence of the production on show at the International Exhibitions, the French luxury industry was aiming to attract the richest cosmopolitan clientele, relying on a traditional concept of luxury and maintaining the principles established in the *Ancien Régime*: luxury had to reflect the wealth and the social position of the owner. The gap between the furniture made for the majority of the people and the luxury furniture made for the rich was immense. From 1878 on, the juries of International Exhibitions divided their reports in two distinctive sections: 'the luxury' and 'the affordable'. As an example, in 1882, a Parisian competition was organised on the occasion of a furniture exhibition initiated by the *Union Centrale des Arts Décoratifs*: a bedroom set was chosen for cabinet makers from the 'affordable' category to compete on the functionality and simplicity of their production, having to be 'affordable for a young couple'. On the same occasion, the craftsmen working in the luxury side of the market were invited to present a side cabinet or vitrine. The affordable bedroom set selling price should not exceed '500 francs', while the price of the luxury single piece could not be higher than '6,000 francs' (six times the average annual salary of a cabinet maker at the time), more than ten times higher.[38] Consumption of furniture was always a sign of social position. So, luxury production asserted itself in opposition to the serial and mechanised production aimed at the middle-class market.

A compromise through innovation

The resistance of the luxury industry to adopting modern techniques is nuanced by the concept of novelty that accompanies the industrial revolution from the eighteenth century and extends the concept of luxury within the decorative arts.[39] Inventions devel-

38 Musée des Arts Décoratifs, Archives UCAD, Exposition 'Le Mobilier', 1882, D1/15.

39 Maxine Berg has introduced the concept of 'semi luxury'. See Berg, 'New Commodities'.

oped directly by furniture makers mostly involved the transfer and adaptation of innovative technical processes and new materials into their traditional experience. Makers adopted a compromised position and aimed to showcase technical expertise in producing luxury pieces which reflected their search for novelty. Marquetry is a central technique in cabinet making, using different veneers to create patterns or paintings in woods and to combine different materials such as metal inlay. In the second half of the nineteenth century, many patents were introduced by cabinet makers regarding innovative ways to develop marquetry decoration, the dedicated office registering nearly eighty specific patents between 1840 and 1880.[40] Following the invention in England in 1840 by Elkington and Ruolz of gilding and silvering metals by electroplating, the process was rapidly adapted to different purposes, including the reproduction of low-relief decoration in silver, bronze or other metals.[41] Several cabinet makers also experimented with the electroplating procedure for metal inlay in order to save cost in reducing the thickness of the metal needed, used with false tortoiseshell and other inclusions.

However, furniture made for the International Exhibitions also shows that the luxury industry could bring innovative techniques without compromising on skilled manual labour, for example in using the potential of new saws with such precision to be able to use porcelain or ivory as marquetry or veneer.[42] Fourdinois signed a patent in 1864 for a new process of carved solid wood inlay, or as he describes it 'a process of polychrome sculpture as mosaic',[43] a technique that can be seen on the cabinet he presented at the 1867 Exhibition, which won the Grand Prix (Fig. 6).[44] This new technique relied on manual labour and traditional tools adjusted for the purpose. Fourdinois' invention aimed to offer a type of inlay that would be more resistant than traditional veneers, but it implied a higher cost in increasing the use of expensive solid wood, ivory or other carved material. His intention was not to save costs but to promote existing skills in improving the precision in assembly techniques, while enhancing the relief of the carving. As it was very costly, this new technique was not developed outside of Fourdinois' workshop.

40 Arnauld and Maison, *Marqueteries virtuoses*, 44–45, 79–81.

41 In the 1854 *Annuaire général du commerce, de l'industrie, de la magistrature et de l'administration ou almanach des 500.000 adresses de Paris*, more than ten businesses devoted to the manufacture of small objects advertise the use of electroplating process or galvano, designated in French as 'galvanoplastie'.

42 Several patents were registered in 1849 by Julien Nicolas Rivart (1802–1867) for his procedure of porcelain incrustation in veneer. Pierre-Ferdinand Duvinage (1813–1876) registered patents from 1874 for a mosaic in ivory maintained by engraved strips of metal and combined with wood, mother of pearl inlay or other materials. Arnauld and Maison, *Marqueteries virtuoses*.

43 Archives de l'institut national de la propriété industrielle (INPI), Paris. Brevet d'invention déposé par Henri-Auguste Fourdinois le 25 mars 1864, n° 62425.

44 The cabinet was bought at the Exhibition by the South Kensington Museum (now Victoria & Albert Museum) for £2750. Made by the workshop of Henri-Auguste Fourdinois, the cabinet was a manifesto of his new technique of solid inlay, in which the carved ornaments are not applied, but the different woods extend through the thickness of the ebony background so that they can be carved in depth. The cabinet was designed by Nevillller, the carved figures by Hilaire and Pasti.

On the other hand, innovative new industrial processes were applied to furniture pieces by firms that were not initially furniture makers but manufacturers occupying a dominant position in the international luxury market, such as the silversmith firm of Christofle & Cie[45] and the bronze firm Barbedienne,[46] for example. Christofle used the process of electroplating or 'Galvano' to make ornaments such as a bronze ornamental plaque for a corner cabinet with a variation of patinas, gold and silver plating (today in the Musée des Arts décoratifs, Paris; Museum no. 27662).[47] Barbedienne exploited his process of bronze reduction to create figural gilt bronze mounts for monumental cabinets. At the London International Exhibition of 1862, he presented a bookcase with reduced copies of Michelangelo's *Slaves* and of French Renaissance low-relief panels, showing how sculpture could be integrated into furniture.[48] For Christofle, as for Barbedienne, Exhibition pieces were collaborative works, involving many subcontracted specialists such as designers and sculptors diverging from academic art. These examples do not emanate from furniture makers, but from other specialities representative of industrial art, such as silver and bronze, that relied on new technology to develop their specialised production. This transfer and adaptation of new means of decoration onto cabinets demonstrate, as has also been underlined by Kenneth Ames and Glenn Adamson, the pivotal role of furniture and its purpose to display – to showcase skills and artistic values as iconic International Exhibition pieces.[49]

Conclusion

Makers of Parisian 'artistic' furniture kept referring to traditional practices to mark its identity and invoke its long history of prestige. Indeed, 'artistic' furniture became iconic of a certain conception of luxury that lasted long past the nineteenth century and involved a certain denial of the economic and technical context of the time. Following the development of new technologies and the growth of a mass production synonymous with an economy of material and labour, it seems that new innovative designs and conceptions should have appeared. This goal was achieved outside France by the steam

45 First trained as a jeweller, in 1842 Charles Christofle (1805–1863) acquired from Elkington and Ruolz the patents to use electrolytic silvering and gilding. The company greatly developed French production of silver-plated metal and obtained his first global success at the 1855 Paris *Exposition Universelle*. After his death, his son Paul Christofle (1838-1907) and his nephew Henri Bouilhet (1830–1910) succeeded him.

46 Ferdinand Barbedienne (1810–1892) founded in 1838 a partnership with Achille Collas, the inventor of the mechanical process for the reproduction of sculpture in reduction. Their foundry specialised in the manufacture of small bronze reproductions of antique and academic models.

47 Exhibited in 1874 at the fourth *Exposition de l'Union Centrale des Arts appliqués à l'Industrie* and at the 1878 *Exposition Universelle*, the corner cabinet was made after a design by Emile Reiber, by Grohé Frères, cabinet makers, for Christofle & Cie, with the collaboration of several specialists: an enameller, sculptors, etc. It was given to the museum by the descendants of the owner of Christofle & Cie, Henri Bouilhet, in 1930.

48 Jones, *Sculptors and Design Reform in France*, 49–50.

49 Ames, 'The Battle of the Sideboards', 1–27; Adamson, 'The Labor of Division'.

bentwood furniture of the Thonet firm, for example.[50] On the contrary, the French pieces produced were conceived as works of art and became more removed from their intended purpose, with some art critics denunciating 'the vassalage of our manufacturers to the masters of the past (…) pushed, encouraged by the general public'.[51] Luxury production, erected as a model through the International Exhibitions, also constricted the new French middle-class-oriented industry that was developing, as the latter failed in imitating the luxury one. However, the luxury segment was already showing weaknesses at the beginning of the 1880s. A national survey was started in 1881 to reveal the progressive erosion of the Parisian luxury furniture industry.[52] Indeed, before the turn of the century many luxury firms disappeared, taking with them a large proportion of the qualified workforce, and abandoning their workshops to other uses. The firms' owners invoked several causes, including the generational effect, the decrease in the number of private fortunes in France, the increase in customs duties and the price of materials leading to growing competition with foreign countries, the difficulty for small businessmen to access exhibitions, and the absence of commissions from the state. The continuation of international exhibitions and fairs and the efforts made at the end of the nineteenth century for education and the creation of specialised schools did not reverse the situation. A few firms, founded at the end of the century, continued to exist until the Second World War, but it was mainly those which had diversified their offer or opened up to the different levels of consumption of modern society.

Towards the end of the century, the triple association of traditional skills, historical reference and luxury was also seen as the cause for the dichotomy between the beautiful and the useful, between luxury and democratisation, and was at the heart of the criticism emerging with the conception of Art Nouveau. As the official report of the 1900 Exposition notes, 'the desire to create new forms has been manifested' and 'the furniture renews its forms through an original interpretation of the flora applied to woodworking'.[53] Still, in the 1900s cabinet makers were torn between the love of their craftsmanship and the need for a democratisation of art, possible thanks to modern methods. Indeed, despite the search of simplicity, the artistic nature of Art Nouveau furniture continued to reflect the different sections of society. In his manifesto *L'Art social*, published in 1913, the art critic Roger Marx advocates the recognition of decorative arts and their role in the inte-

50 Thonet Brothers, established in Vienna, started producing steam-bent solid wood furniture from 1855. The firm was created in the 1830s by Michael Thonet (1796–1871), who started to bend laminated wood before his sons succeeded him in 1853 and discovered the possibilities of bending solid wood (mostly beechwood) in attaching a metal strip. Following their global success thanks to the international exhibitions, they adopted a mass production system in dividing the manufacture process and fragmenting the chairs in so many parts that could be adaptable to as many models as possible. See 'Thonet and Sons', http://www.vam.ac.uk/content/articles/t/thonet-and-sons/ (accessed 17 December 2021).

51 Monod, *Beaux-Arts et merveilles*, 177.

52 *Commission d'enquête.*

53 *Exposition universelle internationale de 1900*, 122.

gration of art in all spheres of society thanks to the adaptation to technological means: 'for art to spread, for the nation to prosper and for the worker to live, perfect prototypes are needed, suitable for being repeated in series, impeccably, with the certainty guaranteed to the industry by an ever better disciplined and always more flexible science'.[54]

Nevertheless, the development of the conception of an 'artistic' quality of furniture relying exclusively on the basis that it was made after a drawing, gradually isolated from its manufacture, led to an open cleavage between conception and making, a situation already feared and criticised in Victorian England by John Ruskin and William Morris. This distinction was formalised in the twentieth century with the compromised theories of 'design', dedicated to a modern production process and opening up another dimension of luxury, replacing tangible qualities by consumption subjectivity.

54 Marx, *L'Art social,* 31-32.

Bibliography

Adamson, Glenn. 'The Labor of Division: Cabinet Making and the Production of Knowledge'. In *Ways of Making and Knowing: The Material Culture of Empirical Knowledge,* ed. by Pamela H. Smith, Amy R. W. Meyers and Harold J. Cook, 243–272. Ann Arbor: University of Michigan Press, 2014.

Ames, Kenneth. 'The Battle of the Sideboards'. *Winterthur Portfolio* 9 (1974), 1–27.

Annuaire général du commerce, de l'industrie, de la magistrature et de l'administration ou almanach des 500.000 adresses de Paris, des Départements et des pays étrangers. Paris: Firmin Didot Frères, 1854.

Annuaire-almanach du commerce, de l'industrie, de la magistrature et de l'administration: ou almanach des 500.000 adresses de Paris, des départements et des pays étrangers. Paris: Firmin Didot et Bottin réunis, 1867.

Arnauld, Emmanuelle and Marc Maison. *Marqueteries virtuoses au XIXe siècle, Brevets d'invention.* Dijon: Faton, 2012.

Berg, Maxine. 'New commodities, luxuries and their consumers in eighteenth-century England'. In *Consumers and Luxury: Consumer Culture in Europe 1650–1850,* ed. by Maxine Berg and Helen Clifford, 63-85. Manchester: Manchester University Press, 1999.

Beurdeley, Alfred. *Album de l'Exposition de 1867.* Bibliothèque du musée des Arts décoratifs, Paris.

Chasrel, T. 'Le Meuble d'art à l'Exposition universelle de 1878'. *L'Art* (1878), XIII: 325-326.

Commission d'enquête sur la situation des ouvriers et des industries d'art instituée par décret en date du 24 décembre 1881. Paris: A. Quentin, 1884.

Cousté. *Rapport sur le matériel et les procédés de la confection des objets de mobilier et d'habitation, Groupe VI, classe 59, Ministère de l'agriculture et du commerce, Exposition Universelle internationale de 1878 à Paris.* Paris: Imprimerie Nationale, 1881.

Démier, Francis. 'Du luxe au demi-luxe, la réussite des bronziers parisiens au XIXe siècle'. In *Le luxe en France du siècle des Lumières à nos jours,* ed. by J. Marseille, 63–91. Paris: ADHE, 1999.

Desvernay, Arnould, ed. *Exposition Universelle de 1867 à Paris, rapports des délégations ouvrières, contenant l'origine et l'histoire des diverses professions, l'appréciation des objets exposés, la comparaison des arts et des industries en France et à l'étranger (…) ouvrage contenant 100 rapports rédigés par 315 délégués ouvriers nommés au suffrage universel.* Paris: A. Morel, 1868.

Exposition Universelle internationale de 1878 à Paris, Rapports du jury international, Groupe I, II, III, IV et V, rapport d'ensemble sur les art décoratifs par Edouard Didron. Ministère de l'agriculture et du commerce. Paris: Imprimerie Nationale, 1882.

Exposition universelle internationale de 1900 à Paris, Rapports du jury international, Groupe XII, décoration et mobilier des édifices publics et des habitations, classe 69 meubles de luxe et à bon marché. Ministère du commerce, de l'industrie, des postes et des télégraphes. Paris: Imprimerie nationale, 1902.

'Furniture at the Paris exhibition'. *The Furniture Gazette,* special exhibition no. 7 (September 1898): 169–170.

Gabet, Olivier. 'Sources et modèles d'un ébéniste au XIXe siècle: l'exemple d'Henri Fourdinois (1830-1907)'. *Bulletin de la Société de l'Histoire de l'Art français – Année 2002* (2003): 261–279.

Garenc, Paule. *L'industrie du meuble en France, thèse pour le doctorat ès lettres présentée à la faculté des lettres de l'université de Paris.* Paris: Presses Universitaires de France, 1957.

Gribaudi, Maurizio. *Paris, ville ouvrière, une histoire occultée 1789-1848.* Paris: la Découverte, 2014.

Hamon, Françoise. 'Cours et forces motrices'. In *Le faubourg Saint-Antoine, architecture et métiers d'art,* ed. by Béatrice de Andia, 164–169. Paris: Action Artistique de la ville de Paris, 1998.

Havard, Henry. *Dictionnaire de l'ameublement et de la décoration depuis le XIIIe siècle jusqu'à nos jours.* Paris: maison Quantin, 1887–90.

Horn, Jeff. *The path not taken. French industrialization in the age of Revolution 1750-1830.* Cambridge: MIT Press, 2006.

Jones, Claire. *Sculptors and Design Reform in France, 1848 to 1895: Sculpture and the Decorative Arts*. Farnham: Ashgate, 2014.

Lachaud, François and Marie-Madeleine Massé, eds. *Le meuble français à l'Exposition universelle de 1878. Demandes d'admission et questionnaires remplis par les exposants dans la classe 17: meubles de luxe et à bon marché*. Saint-Haon-le-Vieux: Libraire le Puits aux Livres, 2014.

Lainé, Brigitte. 'Antoine Krieger, ébéniste (1804-1869). Postérité et clientèle. Le rôle des dessins et modèles'. *Bulletin de la Société de l'Histoire de l'Art français – Année 2003* (2004): 283–303.

Larousse, Pierre. 'Ebénistes'. In *Grand dictionnaire universel du XIXe siècle*, ed. by Pierre Larousse, Vol. 7, 38-39. Paris: Administration du Grand Dictionnaire Universel, 1870.

Laurent, Stéphane. 'Industries du meuble'. In *Le faubourg Saint-Antoine, architecture et métiers d'art,* ed. by Béatrice de Andia, 118–124. Paris: Action Artistique de la ville de Paris, 1998.

Ledoux-Lebard, Denise. *Le mobilier du XIXe siècle 1795-1889, dictionnaire des ébénistes et des menuisiers*. Paris: Editions de l'amateur, 2000.

Lichtfield, Frederick. *Illustrated history of furniture from the earliest to the present time*. London: Truslove & Shirley, 1892.

Luneau, Jean-François. 'Art et industrie au XIXe siècle: des arts industriels aux industries d'art', in *Art & Industrie. XVIIIe – XXIe siècle,* ed.by Pierre Lamard, 17–24. Paris: Picard, 2013.

Maroussem, Pierre du. 'Ebéniste parisien de haut luxe, ouvrier journalier, dans le système des engagements momentanés. D'après les renseignements recueillis sur les lieux, en janvier et février 1891'. *Les ouvriers des deux mondes, publiés par la société d'économie sociale* 74. Paris: Firmin Didot et Cie, 1892.

Marx, Roger. *L'Art social*. Paris: Bibliothèque Charpentier, 1913.

Meiner, Jorg. *Berliner Belle Epoque. Der Ebenist Julius Zwiener und die Kunstmöbel für den Hof Kaiser Wilhelms II*. (1888-1918). Petersberg: Michael Imhof Verlag, 2014.

Mestdagh, Camille. 'Henry Dasson (1825-1896), ébéniste et bronzier parisien'. *L'Estampille l'Objet d'Art,* 417 (October 2006), 60-72.

Mestdagh, Camille, with the collaboration of Pierre Lécoules. *L'ameublement d'art français (1850-1900)*. Paris: Editions de l'amateur, 2010.

Mestdagh, Camille. 'The Beurdeleys (1818-1895), from boutique to workshop. A history of trade in curiosities and furniture making in 19th century Paris'. PhD diss., Université de Bourgogne and Lyon 2, 2019.

Moniteur de l'Ameublement. January 1868.

Monod, Edouard. *Beaux-Arts et merveilles de l'industrie à la fin du XIXe siècle, Exposition Universelle de 1889, grand ouvrage illustré, historique, encyclopédique, descriptif, 3 vol.* Paris: Ed. Dentu, 1889.

Reports of artisans selected by a committee appointed by the council of the Society of arts to visit the Paris Universal Exhibition, 1867. London: Bell and Dally, 1867.

Sougy, Nadège, 'Du beau et de l'utile. Les qualités des fabrications industrielles (1840-1870)'. In *Art & Industrie. XVIIIe – XXIe siècle,* ed. by Pierre Lamard, 25–37. Paris: Picard, 2013.

Sougy, Nadège. 'D'écaille, de nacre et d'ivoire. Les matières du désir au XIXe siècle'. In *Le commerce du luxe*, ed. by Natacha Coquery and Alain Bonnet, 219–226. Paris: Mare et Martin, 2015.

Statistique de l'industrie à Paris, résultant de l'enquête faite par la chambre de commerce pour les années 1847-1848. Paris: Chambre de commerce de Paris, 1851.

Statistique de l'industrie à Paris, résultant de l'enquête faite par la chambre de commerce pour l'année 1860. Paris: Chambre de commerce de Paris, 1864.

'Thonet and Sons'. http://www.vam.ac.uk/content/articles/t/thonet-and-sons/ (accessed 17 December 2021).

Turgan. 'Etablissements Krieger Damon & Cie'. *Les grandes usines. Etudes industrielles en France et à l'étranger* 16. Paris: Michel Lévy, 1884.

Zeisler, Wilfried. 'De New York à Saint-Pétersbourg, le commerce international du luxe à la belle-époque'. In *Le commerce du luxe,* ed. by Natacha Coquery and Alain Bonnet, 219–226. Paris: Mare et Martin, 2015.

Appendix

List of figures

Panagiotis Poulopoulos, Aspects of Technology in Populuxe Musical Instruments

Fig. 1: © Rijksmuseum, http://hdl.handle.net/10934/RM0001.COLLECT.643551. (accessed 12 August 2022).
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Joseph Wachelder, Instructive toys

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Fig. 7: *Archiv des menschlichen Unsinns: ein langweiliges Unterhaltingsblatt für Wahnwitzige*, Jahr 2, Nummer 26: 11. Handschriftensammlung HIN-68011 Wienbibliothek im Rathaus. Vienna.
Fig. 8: Georg H. Bestelmeier, *Systematisches Verzeichnis eines Magazins von verschiedenen Kunst- und andern nüzlichen Sachen zur lehrreichen und angenehmen Unterhaltung der Jugend als auch für Liebhaber der Künste und Wissenschaften.* Nuremberg. Sechstes Stück, Tafel VIII. Österreichische Nationalbibliothek, Vienna. © ÖNB Vienna 252.587-C, Tafel 49.
Fig. 9: Georg H. Bestelmeier, *Systematisches Verzeichnis eines Magazins von verschiedenen Kunst- und andern nüzlichen Sachen zur lehrreichen und angenehmen Unterhaltung der Jugend als auch für Liebhaber der Künste und Wissenschaften.* Nürnberg Bestelmeier's Catalogue 1803, Achtes Stück, Tafel V. Österreichische Nationalbibliothek, Vienna. © ÖNB Vienna 252.587-C, Tafel 67.

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Camille Mestdagh, The Luxury Furniture Industry in Nineteenth-Century Paris

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Fig. 2: Turgan. 'Etablissements Krieger Damon & Cie'. *Les grandes usines.* Paris: Michel Lévy, 1884, p. 4.
Fig. 3: Chasrel. T. 'Le Meuble d'art à l'Exposition universelle de 1878'. *L'Art,* Vol. XIII T.II, 1878, 326. Digitzed Version under: https://doi.org/10.11588/diglit.16909#0363 (accessed 12 August 2022).
Fig. 4: Beurdeley, Alfred. *Album de l'Exposition de 1867.* Self-published. Held by the Bibliothèque du musée des Arts décoratifs, Paris. Photograph by Camille Mestdagh.
Fig. 5: Beurdeley, Alfred. *Album de l'Exposition de 1867.* Self-published. Held by the Bibliothèque du musée des Arts décoratifs, Paris. Photograph by Camille Mestdagh.
Fig. 6: Lichtfield, Frederick. *Illustrated history of furniture from the earliest to the present time.* London: Truslove & Shirley, 1892, Chapter IX. Deutsches Museum, München, Archiv, CD_87377.
Fig. 7: Private collection.
Fig. 8: Private collection.
Fig. 9: Havard, Henry. *Dictionnaire de l'ameublement et de la décoration depuis le XIIIe siècle jusqu'à nos jours, Volume 4.* Paris: maison Quantin, 1890, p. 1020. Deutsches Museum, München, Archiv, CD_87378.

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