

Mid-Century Molecular: The Material Culture of X-ray Crystallographic Visualisation across Postwar British Science and Industrial Design

**Volume 2 of 2:
Part Two, Appendices, and Bibliography**

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Part Two: A Biography of Postwar British Ball-and-Rod Furnishings

Introduction

The next two chapters comprise a biography of a category of furnishings produced in postwar Britain that are united by their ‘ball-and-rod’ motif (such as the ball-footed magazine rack and the Antelope chair pictured in this thesis’s introduction)¹. Chapter three is a history of ball-and-rod furnishings in the postwar era. Chapter four continues their biography through an exploration of their lives today as second-hand commodities and mediators of postwar memory.

At first glance ball-and-rod objects might appear to be straightforwardly ‘of their time’. With their spindly rods and often colourful balls they display visual hallmarks many historians associate with the postwar ‘contemporary’ or ‘Festival’ style in British furniture and textile design, such as bright colours, thin contours (such as those of metal legs on furniture), and abstraction reminiscent of the work of modernist fine artists such as Joan Miro². In fact today ball-and-rod furnishings produced in the postwar period serve as archetypes of that era for historians, collectors, aficionados and museum-goers alike. They have recently re-emerged as ‘retro’ commodities and are among those objects that define what is now known as the ‘mid-century modern’ style³.

The ball-and-rod object’s archetypal status is accompanied by its characterisation as ‘molecular’ or ‘atomic’ by historians and collectors, as I explain below. But if ball-and-rod furnishings reference scientific visualisations (such as crystallographers’ molecular models), they do not do so ostentatiously; these items are, after all, shaped into the forms of everyday domestic furnishings

¹ See figures 6 and 7 in the thesis introduction.

² Ngozi Ikoku, ‘British Textile Design: 1940 to the Present’, in *British Textiles: 1700 to the Present*, ed. by Linda Parry (London: V&A, 2010), pp. 401-405; Jackson, *Twentieth Century Pattern Design*; Clive D. Edwards, *Twentieth Century Furniture: Materials, Manufacture and Markets* (Manchester: Manchester University Press, 1994); Jackson, *Contemporary*; Hazel Conway, *Ernest Race* (London: The Design Council, 1982).

³ Dominic Bradbury, *Mid-Century Modern Complete* (London: Thames and Hudson, 2014); Kate Beavis, *Style Your Modern Vintage Home: A Guide to Buying, Restoring and Styling from the 1920s to 1990s* (Devon: David & Charles, 2013); Madeleine Marsh, *Collecting the 1950s* (London: Miller’s, 1997); Christopher Pearce, *Fifties Source Book: A Visual Guide to the Style of a Decade* (London: Quarto, 1990); Cara Greenberg, *Mid-Century Modern* (New York: Thames and Hudson, 1984).

rather than those arcane structures of molecules constructed in the service of scientific investigations. So from a point of view that combines the history of both design and science in postwar Britain, questions arise immediately upon laying eyes on them: what exactly *is* their relationship to scientific forms? How does the ‘molecular’ fit into the story of their production, mediation and consumption? What does this indicate about the public reception of crystallography’s research into molecular structures in postwar Britain?

An exploration of these questions unfolds over the next two chapters. In pursuing such inquiries, however, this biography of ball-and-rod furnishings encounters larger issues. It is ultimately about much more than the objects themselves or their identity as ‘molecular’ ornament. It represents new research on the production, mediation and consumption of postwar British modernist design, the material culture of molecular forms in public in postwar Britain, and how postwar science is remembered today through objects of industrial design.

Ball-and-rod furnishings: The existing historical narrative

Surveys of postwar British design, across different genres of history-writing, almost always include at least one image of a ball-and-rod furnishing⁴. Yet there is no published research dedicated specifically to these objects. Most existing accounts instead treat ball-and-rod furnishings as part of a constellation of household objects associated with postwar period style.

Ball-and-rod furnishings are frequently found in ‘coffee-table’ books and publications for audiences of collectors and ‘retro’ enthusiasts, which are positioned outside scholarship strictly associated with academic research practiced in university contexts⁵. Texts by design historians working in academic

⁴ *British Design From 1948: Innovation in the Modern Age*, ed. by Christopher Breward and Ghislaine Wood (London: V&A, 2012); Woodham, *Twentieth-Century Ornament*; Jackson, *Contemporary*; Jonathan M. Woodham, *Twentieth-Century Design* (Oxford: Oxford University Press 1997); Jackson, *The New Look*; *Vital Forms*; Charlotte Fiell and Peter Fiell, *Modern Furniture Classics: Postwar to Post-modernism* (London: Thames and Hudson, 2001); Thomas Hine, *Populuxe* (London: Bloomsbury, 1987); Richard Horn, *Fifties Style: Then and Now* (New York: Quarto, 1985); Bevis Hillier, *The Style of the Century: 1900-1980* (London: The Herbert Press, 1983); Bevis Hillier, *Austerity/Binge: The Decorative Arts of the Forties and Fifties* (London: Studio Vista, 1975).

⁵ Examples include Beavis; Fiell and Fiell; George Marcus, *Design in the Fifties: When Everyone Went Modern* (Munich: Presel, 1998); Marsh, *Collecting the 1950s*; Pearce; Greenberg.

contexts also discuss these artefacts⁶. Additionally, much literature on ball-and-rod furnishings lies between academic design history discourse and history-writing situated outside it⁷. Texts originating outside academic discourse are not always acknowledged by academic historical research. In this case, however, they account for much historiography on the subject, so it is necessary to consider them. Such texts have also had a significant impact on the historical memory of these objects generally. Consequently they cannot be ignored in a review of historical literature.

Much historiography on ball-and-rod furnishings displays a modernist production-focus (in which ‘production’ refers to the canonical designer’s conception of an object). Even though this kind of history writing no longer dominates academic design history, ball-and-rod furnishings have not yet been considered outside of this framework. So-called ‘high’ design icons associated with named designers of the modernist canon are more likely to be mentioned by historians and collected by museums, while the cheaper, mass-produced, anonymously designed, ‘ordinary’ ball-and-rod objects (such as Woolworths’ ball-footed magazine racks) are omitted. The latter are sometimes explicitly dismissed as mere ‘imitators’ of icons within this out-dated mode of modernist design history-writing⁸. Race’s Antelope chair, with a ball-footed steel rod frame (stove-enamelled white) and bent-plywood seats, maintains a status in histories and museum collections today as an icon of postwar British design. As an object associated with a named designer who was a member of the postwar modernist design elite, it is the ball-and-rod artefact most frequently cited by historians of postwar British design, and in an international context, Race is joined by two iconic examples from the US, the ‘Ball Clock’ designed c. 1947/48 by Irving Harper for George Nelson (Figure 1) and Ray and Charles Eames’s 1953 ‘Hang-

⁶ Pat Kirkham and Susan Weber, *History of Design: Decorative Arts and Material Culture, 1400-2000* (New Haven, Connecticut: Yale University Press, 2013); Anne Massey, *Chair* (London: Reaktion, 2011); Woodham, *Twentieth-Century Design*; Woodham, *Twentieth-Century Ornament*; Conway.

⁷ This includes the work of critic Bevis Hillier and publications by Lesley Jackson on 1950s design, which are based in archival or period sources. These are aimed at a broader audience than academic texts and therefore operate largely outside the discourses or critical frameworks of academic design history research as it is practised in university contexts today. Jackson, *Contemporary*; Jackson, *The New Look*; Hillier, *The Style of the Century*; Hillier, *Austerity/Binge*.

⁸ Jackson, *The New Look*, p. 91; Greenberg, *Mid-Century Modern*.

it-all' wall-mounted coat rack (Figure 2)⁹.

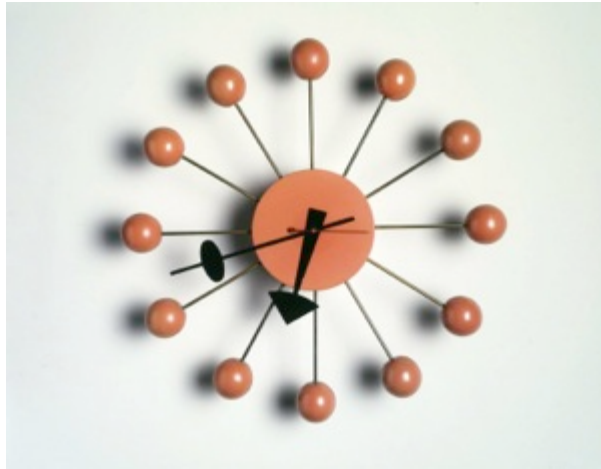


Figure 1 'Ball Clock' designed by Irving Harper for George Nelson Associates (c.1948).



Figure 2 Ray and Charles Eames's 1953 'Hang-it-all' manufactured by Tigrett Enterprises.

Ball-and-rod furnishings that are not associated with named designers, such as magazine racks or ball-footed bins, are most likely to be found in collectors' guides (Figures 3 and 4). They populate this genre of history text because collectors without extensive financial resources are more likely to be able to afford a postwar Woolworths magazine rack found at a boot fair (or, now, eBay) than a Race chair. Collectors' guides and eBay listings, however, lack accompanying information about these objects, so the details of their postwar lives have remained unknown.

⁹ Bradbury; *British Design From 1948; Vital Forms*; Jackson, *The New Look*; Woodham, *Twentieth-Century Design*; Woodham, *Twentieth-Century Ornament*.

MOLECULAR SHAPES

The Festival of Britain in 1951 wasn't just about great design, it was also about science. Displays in the Dome of Discovery revealed for the first time molecular structures explaining our universe and this was seen by millions. The science behind what would be achieved in the next decade in turn inspired our interiors in this decade. The love of space and all things unknown was becoming a fascination and these atomic molecules were replicated as ball feet on many home accessories.

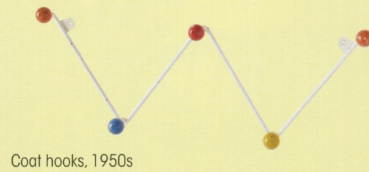
Starting off as painted wood balls, they were quickly replaced by primary-coloured plastic as people looked for more durable items. Magazine racks, coat stands, record racks, shot glass holders, planters and even waste-paper bins were all adorned with these ball feet.

STYLING TIP

As these were designed with primary-coloured ball feet, they look great in children's rooms. Attach hooks on the wall to hang their gym bags from, store comics in magazine racks or use a planter as storage or as a waste paper bin.



Umbrella stand, 1950s



Coat hooks, 1950s

The Finishing Touches:

- 1. Vernon Ward flamingo prints
- 2. Three-glass shade light
- 3. 1953 Coronation memorabilia
- 4. Pafona heater
- 5. Vinyl footstool on atomic legs

Figure 3 'Anonymous' plastic ball-footed bin, wall-mountable coat hooks and umbrella stand pictured in a 2013 'vintage' collectors' guide.

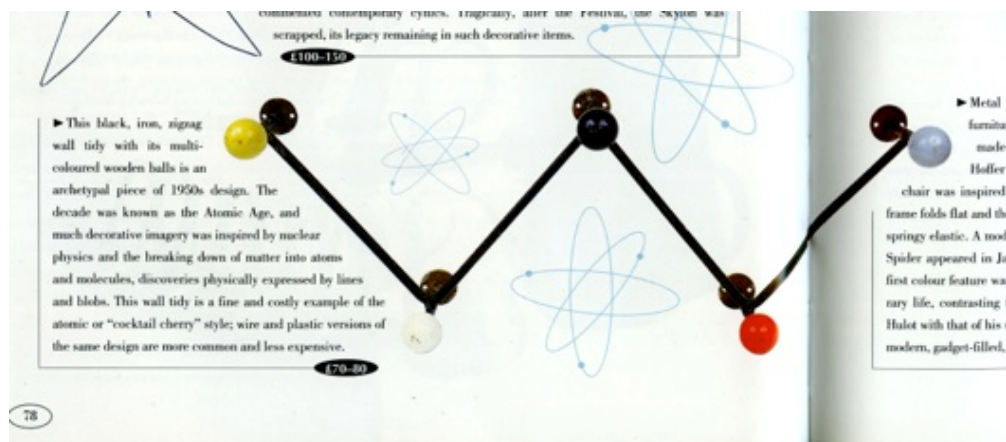


Figure 4 Ball-and-rod wall-mountable coat hooks pictured in a 1997 collectors' guide.

Despite the scant academic research on ball-and-rod furnishings there is an existing historical narrative concerning these objects constructed across genres of historical practice. Academic or archive-based histories, collectors' guides and 'coffee-table' books alike present ball-and-rod furnishings as examples of science-inflected ornament¹⁰. Often ball-and-rod furnishings are framed in this context within what authors identify as a more generalised postwar presence of molecular motifs in design.

Historians cite influence or inspiration from science, implied as being direct or self-explanatory, as the style's clear origins. 'This kind of decoration came right out of the laboratory and the chemistry class', writes critic Thomas Hine in *Populuxe*¹¹. Jackson describes ball-and-rod objects as 'inspired by ball-and-spoke molecular models'¹²; 'The fascination with all things atomic, particularly three-dimensional atomic structure models', she writes, 'led to a craze for accessories with ball-and spoke structures, such as coat hangers and magazine racks'¹³. The particular nature of the scientific reference is sometimes vague, resulting in a picture of a merged nuclear and molecular science. Charlotte and Peter Fiell explain the ball-and-rod style through the 'increasing interest in chemistry and nuclear physics' in the 1950s¹⁴. Critic Bevis Hillier speculates, 'I believe [the style] derived from nuclear physics, with its breaking-down of matter into atoms and molecules'¹⁵. Collectors' guides place ball-and-rod furnishings in the class of exuberant so-called 'atomic' designs of the postwar decades¹⁶.

These reflections on ball-and-rod furnishings' relationships to postwar science do not emanate from empirical research on the subject (indeed, as noted above, historians have not made ball-and-rod furnishings a serious subject of empirical research). Although the texts cited above provide valuable accounts of many aspects of postwar design history, the issue of postwar science-inflected

¹⁰ Kirkham and Weber; Massey, *Chair; Vital Forms*; Jackson, *From Atoms to Patterns*; Fiell and Fiell; Marcus; Jackson, *The New Look*; Marsh, *Collecting the 1950s*; Jackson, *Contemporary*; Woodham, *Twentieth-Century Ornament*; Pearce; Hine; Horn; Greenberg; Conway; Hillier, *The Style of the Century*; Conway; Hillier, *Austerity/Binge*.

¹¹ Hine, p. 132.

¹² Jackson, *Contemporary*, p. 160.

¹³ Jackson, *From Atoms to Patterns*, p. 32.

¹⁴ Fiell and Fiell, p. 50.

¹⁵ Hillier, *Austerity/Binge*, p. 159.

¹⁶ Marsh, *Collecting the 1950s*; Pearce; Greenberg.

design goes largely unexamined. This is undoubtedly due to the traditions of the discipline of design history, in which science, scientific objects, and scientific representation are rarely the subjects of research. Additionally, understanding the postwar lives of ball-and-rod objects involves studying non-canonical designed objects (since these account for most objects in the style), which poses practical challenges. Such investigation, as I show in chapter three, involves research into sources that are difficult to access and often ephemeral.

Historians of science also have not researched so-called ‘molecular’ or ‘atomic’ furniture, although these artefacts suggest questions about how science was received and negotiated in postwar British culture beyond the sphere of scientific elites. If ball-and-rod objects were received as ‘molecular’ in the past, they represent an example of a kind of circulation and reception of science among a wider public that historians of science Katherine Pandora and Karen Rader call ‘science in the vernacular’¹⁷. Pandora and Rader write that this category includes:

such seemingly trivial and ephemeral activities as puzzling over the view through a kaleidoscope and making pilgrimages to natural history museums and aquaria; watching *Bill Nye, the Science Guy* and Japanese monster movies¹⁸

The investigations that follow operate in the spirit of the expanded field for studying the reception of science in popular culture suggested by Pandora and Rader. This is because the topic of ‘molecular’ or ‘atomic’ furniture potentially offers a glimpse into the reception of scientific subject matter by consumers and producers of furniture, which has so far not been an area of research for historians of science in culture.

The next two chapters report on empirical research on ball-and-rod objects. This research investigated many aspects of their history that have previously not been examined. The following chapters explore the production, mediation and consumption of ball-and-rod furnishings in the postwar period, their consumption and narrativisation today, and their associations with science. To do so, they employ a biographical approach to these objects.

¹⁷ Katherine Pandora and Karen Rader, ‘Science in the Everyday World’, *Isis*, 99 (2) (June 2008), 350-364 (p. 351).

¹⁸ *Ibid.*

A biographical approach

The concept of the object biography is based on the idea that, as design historian Penny Sparke writes, ‘Like people, objects have lives’¹⁹. Over time their uses, meanings, and their physical contexts might shift. Consequently, as anthropologist Igor Kopytoff writes, we can ask questions about an object that we would pose when constructing a person’s biography, such as: what ‘are the biographical possibilities inherent in its “status” in the period and culture, and how are these possibilities realized?’, and ‘What are the recognized “ages” or periods in the thing’s “life,” and what are the cultural markers for them? How does the thing’s use change with its age, and what happens to it when it reaches the end of its usefulness?’²⁰.

Several of the questions outlined by Kopytoff underpin recent research across both the histories of science and design that acknowledge the shifting status of objects beyond the moment of their original production. This includes the turn to studies of consumption in design history mentioned earlier, which acknowledge the lives of objects, as Judy Attfield wrote, ‘past the check-out desk, when they are absorbed into the everyday world’²¹.

Recently in the history of science, the biographical study of objects has aided research on changes to the status or use of objects as they move through different local or epistemological contexts, or enter museum collections²². Lorraine Daston’s edited volume, *Biographies of Scientific Objects*, traces the shifting ontological status of a number of objects as ‘scientific’ subjects. From dreams to cytoplasmic particles, the essays in this book see objects both ‘come into being and pass away as objects of scientific inquiry’²³.

This research extends chronologically long past the era of ball-and-rod furnishings’ production, as I examine their lives as commodities today as well.

¹⁹ Sparke, *As Long As It’s Pink*, p. 8.

²⁰ Kopytoff, pp. 66-67.

²¹ Attfield, *Bringing Modernity Home*, p. 2; Lees-Maffei, ‘The Production – Consumption – Mediation Paradigm’. See also Dick Hebdige’s biography of the Italian motor scooter, ‘Object As Image: The Italian Scooter Cycle’, in *Hiding in the Light*, pp. 77-115.

²² Scheffler; Samuel J. M. M. Alberti, ‘Objects and the Museum’, *Isis*, 96 (4) (December 2005), 559-571; *Biographies of Scientific Objects*.

²³ Lorraine Daston, ‘Introduction: The Coming in to Being of Scientific Objects’, in *Biographies of Scientific Objects*, pp. 1-14 (p. 1).

This aspect of the research draws on ethnographic scholarship founded on the idea that objects might continue — or re-emerge — as commodities and meaningful possessions long after their so-called ‘first cycle’ of consumption²⁴. The next two chapters also take influence from a related approach developed in a different research area: historian of science and technology David Edgerton’s concept of the history of ‘things in use’²⁵. Edgerton points out that most histories see a given period through the lens of its innovations. At any given time, however, the innovations of the past exist alongside those of the present, and might even find greater resonance at a later date than they did in the era of their production (for example, he points to the guillotine’s twentieth-century use during its ‘gruesome return in the 1940s’)²⁶.

Across the next two chapters, I explore the changes in status, use and meaning of ball-and-rod objects over time, both within the postwar period and since the era of their production as they move through different contexts. This exploration allows for reflection on the postwar history of these objects and the longer history of their consumption. It also generates insights on how their history has been written thus far, through their classification as a part of historical categories and canons in the present.

Part two examines relationships between science and design that are less concrete and direct than in that of the FPG example. Therefore as I trace the biography of these objects there will be stretches of text in which I do not mention X-ray crystallography. This is simply reflective of the ways in which science appears (or fails to appear) outside the local context of scientific research or the activities of scientists, direct collaboration between scientists and practitioners in other fields, or top-down science communication activities (these absences are significant and noted as such). My narrative will, however, lead back to it.

²⁴ Sarah Elsie Baker, *Retro Style: Class, Gender and Design in the Home* (London: Bloomsbury 2013); Nicky Gregson and Louise Crewe, *Second-hand Cultures* (Oxford: Berg, 2003).

²⁵ Edgerton, *The Shock of the Old*, p. 212.

²⁶ *Ibid*, p. xii.

Chapter Three

Disassembling an Archetype: The Postwar Life of British Ball-And-Rod Furnishings

Introduction

This chapter is a postwar history of ball-and-rod furnishings during their first commodity cycle from 1946 to the early 1960s. It is both the first design history of ball-and-rod furnishings and an investigation of science in culture. This chapter represents research into the production, mediation and consumption of ball-and-rod furnishings, and into their relationship to molecular form in the period. It results in a fuller history of postwar British ball-and-rod furnishings, while also producing insights on the mediation of X-ray crystallography research in postwar British culture. This chapter also contributes to the history of the production, mediation and consumption of modernist designed objects in Britain more generally. Additionally, it prompts questions about the practice of history, which will carry over into discussions in chapter four.

This chapter generates a dramatic reassessment of the existing narratives of British ball-and-rod furnishings. In the period of their production, I argue, they were more marginal and less *loved* than current narratives imply. Their relationship to science was drastically different, lacking the overt associations with molecular visualisations that characterise their historiography. These findings problematise existing historical categories (such as ‘molecular’ design) and the ‘influence’ model of cultural transmission employed within design history accounts of ball-and-rod objects.

This chapter’s significance, however, extends beyond its refutation of the existing narratives. This is because in place of the existing narratives, it advances a new picture of the history of ball-and-rod objects. The text that follows establishes their distinct historical context within British modernist furniture design (so far overshadowed by the historiography’s emphasis on associations with molecular models and on icons of the style). It does so firstly, through a study of their production outside the mode of modernist history-writing within which they have been considered so far. In contrast to the connoisseurial approach of existing accounts that seek a single originary ball-and-rod object,

this research describes the early appearances of the style in postwar Britain through a collection of objects produced by CoID allies in the high modernist furniture industry and promoted in the Council's postwar 'good design' propaganda. Furthermore, rather than heralding a definitively 'new' postwar style, I argue that the earliest postwar ball-and-rod furnishings in Britain actually represent a continuation of material forms produced in the prewar British lighting industry (the industry which, I argue, accounted for most production in the style in this initial postwar period). My study of their production does not end here, however, as this research takes the history of their production beyond that of high-end firms that produced ball-and-rod objects in the late 1940s and early 1950s. It also explores the material contingencies shaping the production of more affordable furnishings in the style that were produced later in the period.

Secondly, the reception of these objects by mediators and consumers constitutes an important part of their postwar biography. I argue that their postwar reception is defined by their shifting position within the class politics of taste throughout the decade. It is also defined by a marked lack of identification with these objects among many consumers (much more than it is by notions of 'molecular' or 'atomic' form). These findings build on and augment existing research strands in postwar British design history. This chapter offers new research particularly to the history of the consumption of postwar British furniture and modernist design, which has seen surprisingly little published empirical research¹.

This chapter contributes to knowledge of science in postwar British culture in two respects. Firstly, its reassessment of the postwar significance of ball-and-rod furnishings emerges in part from an investigation of the mediation of molecular form in postwar British culture. The kind of deliberate cross-field communication and exchange represented by the FPG is not found in the context of ball-and-rod objects. Therefore exploring their relationship to scientific visualisations necessitated researching the mediation of molecular form in British culture through postwar television and exhibitions as a possible avenue of cultural transmission. This required original primary source research (for despite

¹ Attfield, *Bringing Modernity Home*; McDermott, 'Popular Taste and the Campaign for Contemporary Design in the 1950s'; Davies, 'Scandinavian Furniture in Britain'; Sparke, *As Long As It's Pink*.

historians' many references to the 'molecular' in postwar British culture, this area has seen very little research²). The focus on public displays of crystallography research in this chapter is less pronounced than other themes, however, in correspondence with its role in the cultural transmission investigated here. This is because, as I will argue, ball-and-rod objects did *not* possess the 'scientific' significance in the past that they do today. This finding relates to the second point regarding this chapter's investigation of science in postwar British culture: the absence of scientific reference is itself an important finding. This is firstly because it revises the narrative that these furnishings are part of the history of X-ray crystallography in postwar British culture. Secondly, the revelation of this absence has ramifications for broader questions about the practice of history. At the end of the chapter, I will reflect on how the research process involved in revealing this absence yields insights for this thesis's methodological and historiographical investigations.

Methodology and sources

Piecing together the history of the postwar production and social life of ball-and-rod objects required bringing together several types of sources and research methods. This was due in part to a challenge: as is commonplace in historical research on 'ordinary' objects, postwar sources pertaining directly to these objects are limited. V&A and Geffrye Museum collections and archives, the Race Furniture archive and the Design Council Archive (DCA) yielded some material on examples of the style from high-end modernist production (although sources on their design and production were scant). But for the vast majority of ball-and-rod furnishings, which were cheaper 'anonymously' designed objects rather than those by a named designer, little material pertaining to their design and production exists and they are rarely collected by museums and archives³.

² Aside from research on the FPG, the only studies of the postwar public display of X-ray crystallography visualisations include de Chadarevian's descriptions of instances of their exhibition and televising. Tim Boon's extensive research on postwar science television includes mentions of instances in which X-ray crystallography research and models were presented, but this is not the focus of his research. Boon, *Films of Fact*; de Chadarevian, 'Models and the Making of Molecular Biology'; de Chadarevian, *Designs for Life*; Forgan, 'Festivals of Science'.

³ The only exception to this I have found is an 'anonymous' table lamp in the collection of the Museum of Design in Plastic (MoDiP) of the Arts University Bournemouth. It is somewhat

Information on their production, however, was largely unavailable. For many of these items, it has not been possible to identify their producers. Where it has been possible, little trace of these producers survives. The small or medium businesses manufacturing cheaper ball-and-rod items have long since disappeared or have discarded records from the postwar decades. As have other researchers faced with the lack of sources and archives pertaining to ‘everyday’ or non-canonical objects, I made use of collections outside of those of large national institutions, print sources pertaining to the mediation of these designed objects in postwar British culture, and oral interviews, which I discuss below⁴. ebay.co.uk served as an informal archive of the kind of cheap, mass-produced objects unassociated with designer names, and was the best way to access these objects⁵. This research also draws upon Woolworths’ only, and unofficial, archive. A historian of Woolworths and former employee of the company, Paul Seaton, who was also interviewed for this research, has constructed and maintains this archive.

Postwar print sources included trade journals, newspapers, and sources pertaining to design promotion, which comprised publications aimed at consumers such as women’s magazines and advice literature⁶. Research into print sources involved page-by-page assessment. With the exception of some

vaguely aligned with the ball-and-rod style, with a base of three metal rods joined at a central ball. As is often the case with these more affordable versions of the style unassociated with a designer’s name, little is known about the lamp. The museum has listed it simply as ‘Sputnik inspired’ and dates it as originating between 1950-1959. Object number AIBDC: 0_3124. Museum of Design in Plastics, ‘The Collection’. Available at <http://www.modip.ac.uk/artefact/aibdc-03124>. Accessed 1 September 2014. Email correspondence with Pam Langdown, Collections Manager, Museum of Design in Plastic, 8 October 2013.

⁴ Attfield, *Wild Things; The Oral History Reader*, ed. by Robert Perks and Alistair Thomson (Oxon: Routledge, 2006); Paul Atkinson, ‘Man in a Briefcase: The Social Construction of the Laptop Computer and the Emergence of Type Form’, *Journal of Design History*, 18 (2) (Summer, 2005), pp. 191-205. When I mention ‘mediators’ I am referring to the various ‘mediating channels’, as Lees-Maffei has termed it (referenced earlier in the thesis introduction), which mediate between producers and consumers. They include marketing, exhibitions, reviews, television, advice literature, and retailing. These are often key to understanding the history of an object beyond the production context. Lees-Maffei has pointed in particular to advice literature aimed at a ‘mass audience (not associated with avant-garde consumption or the ‘early adopter’)’ as a valuable source for gaining knowledge of the broader consumption of modernist design in twentieth century Britain. Lees-Maffei, ‘The Production – Consumption – Mediation Paradigm’, p. 354; Lees-Maffei, ‘From Service to Self-Service’, p. 189.

⁵ Academic researchers increasingly acknowledge that eBay is a useful archive of materials, such as mass-produced objects, not collected elsewhere. *Everyday eBay: Culture, Collecting, and Desire*, ed. by Ken Hillis, Michael Petit and Nathan Scott Epley (London: Routledge, 2006).

⁶ These are listed in the bibliography.

newspapers, which are digitally archived, it is not possible to conduct word-searches of these publications. And even if it were possible, word-searching would not suffice because ball-and-rod objects were rarely referred to in text, and were instead only pictured.

Other ‘mediators’ consulted included materials pertaining to postwar exhibitions such as the Festival of Britain, the ‘Britain Can Make It’ exhibition and the ‘Daily Mail Ideal Home’ exhibitions held in the DCA and V&A Archives of Art and Design (AAD). Sources pertaining to retailers included marketing materials held in the Heal & Son Ltd and Sidney William Hamlyn archives at the AAD, the John Lewis Archive, and the Geffrye Museum Archive, as well as trade and consumer catalogues, which are listed in the bibliography.

There is a distinct absence of postwar sources on the consumption and reception of these items. Since very little consumer research was conducted at the time, a potential source on postwar consumption is the Mass Observation archive’s records of diaries and questionnaires (some of which concern furniture) collected from British citizens in the postwar period. This archive was consulted for this research, but revealed little on the subject of ball-and-rod objects. This may reflect the marginality of these objects in the period, but it also speaks to the limitations of the Mass Observation archive for systematic research on themes or subjects outside of those dictated by the archive’s creators⁷. Additionally most of

⁷ As other researchers have noted, there are several limitations to the Mass Observation archive’s data. This emanates from the archive’s large size, what historian Annebella Pollen calls its ‘eclectic form and content’ leading to issues concerning its representative quality, and, most significantly for this research, the fact that most Mass Observation data is in hand-written, hard-copy format, which makes it difficult to search in any thorough or systematic manner. Therefore, the data is best suited to studies that pertain to the themes of Mass Observation surveys and ‘directives’ (which were questions on specific given topics), such as Louise Purbrick’s research on wedding gifts in twentieth century Britain, which is based on a specific directive on wedding gifts given or received. Outside of these subjects, it is difficult to form a comprehensive picture of a given theme or to even search for a piece or type of data in the archive’s extensive collection (which for the period under consideration runs to 1000 cubic metres, contained in 2500 boxes). My consultation of the archive included study of responses to surveys concerning shopping, commodities, design, the atomic bomb, the Festival of Britain, opinions on science and scientists, as well as a selection of diaries. Louise Purbrick, ‘Wedding Presents: Marriage Gifts and the Limits of Consumption, Britain, 1945-2000’, *Journal of Design History*, 16 (3) (2003), 215-227. On the limitations of the Mass Observation archive see Rose Lindsey and Sarah Bulloch, ‘A Sociologist’s Field Notes to the Mass Observation Archive: A Consideration of the Challenges of ‘Re-using’ Mass Observation Data in a Longitudinal Mixed-Methods Study’, *Sociological Research Online*, 19 (3) (August 2014). Available at <http://www.socresonline.org.uk/19/3/8.html>. Accessed 25 August 2015; Annebella Pollen, ‘Research Methodology in Mass Observation, Past and Present: “Scientifically, About As Valuable As a Chimpanzee’s Tea Party at the Zoo”?’’, *History Workshop Journal*, 75 (1) (Spring 2013), 213-235.

the archive's materials for the postwar period end at 1950, before many ball-and-rod objects were produced. To illuminate ball-and-rod objects' reception and social lives in the home, I therefore conducted oral interviews with postwar consumers. Interviewees for this research, who primarily reside in London, represented a range of class backgrounds. I identified class background based on interviewees' occupations in the postwar period (or if they were children then, their parents' occupation), classifying wage earners as working class and salary earners as middle class⁸. Although this classification is somewhat crude given that class identification may be based on additional factors ranging from cultural identity to economic assets, it corresponds with relevant sources on postwar Britain's economic history⁹.

Research into the postwar material culture of molecular models in public involved study of postwar science television programmes at the British Film Institute's BBC archive, of documentation and audience figures at the BBC Written Archives Centre (WAC), and period print sources covering relevant exhibitions and television programmes.

The primary geographic focus of this chapter is London. This was conditioned by the period sources, many of which emanated from or referred to London, and by my interviewees' locations. Speaking to postwar consumers, most of whom were in their 80s, required liaising with gatekeepers, such as community centre organisers and care home staff. It was most feasible to build such relationships in London where I was based during this research.

This chapter is split into two halves. The first half, 'The 'origins' of ball-and-rod furniture', explores the conditions of the production and mediation of the earliest postwar ball-and-rod furnishings and investigates the question of scientific reference pertaining to these objects. The second half of the chapter, 'The unloved object' explores the shifting status of ball-and-rod furnishings as production and marketing of these furnishings increased during the second half of the 1950s. This chapter's analysis begins with an introduction to the mediation of crystallographic visualisations through public display in the 1950s. The subsequent sections of the chapter are structured according to the chronology of the postwar commodity cycle of ball-and-rod furnishings, with departures to

⁸ Detailed information on interviewees, including their occupations, is included in Appendix 2.

⁹ Sweininger-Bargielowska.

pursue relevant issues. I conclude with their gradual disappearance from the market, and the beginning of their retrospective narrativisation, in the early 1960s.

1. The ‘origins’ of ball-and-rod furniture

The ‘origins’ in title of this section is placed in quotes because it challenges the concept of the ‘origins’ of these objects that pervades existing historical narratives about them. Whereas the historiography describes the ball-and-rod style through recourse to iconic ‘originals’ and assumptions of influence from contemporary scientists’ molecular investigations, this analysis shows the icon-focus to be limiting and problematises the issue of scientific reference. It presents a new picture of the place of these objects in the history of postwar British design, and the conditions that shaped their material form, significance and initial status as a commodity.

Molecular models on display

An idea central to the existing historical narratives of ball-and-rod furnishings, noted in the introduction to part two, is that they reflect contemporaneous molecular investigations through their material form. Many historians describe the material form of ball-and-rod objects as referencing that of molecular models. The assumption of such narratives is that the existence of scientific discoveries of the era associated with molecular structure (which emanated from X-ray crystallography) means that molecular form was familiar to the public, and thus likely to have been integrated into objects by designers and easily recognised in designed objects by consumers. The actual mediation of molecular forms in postwar British culture beyond the laboratory, however, has not seen dedicated research.

This section surveys the appearances of crystallographic models, including ball-and-spoke molecular models, in public forums in the 1950s: at the Festival of Britain, the Brussels World’s Fair, and on early BBC science television. This investigation demonstrates the diachronic nature of the mediation

of molecular form in Britain in the 1950s. I argue that significant circulation of images of ball-and-spoke molecular models only occurs at the end of the 1950s. Throughout the decade generally, the mediation of molecular form in public forums was not as widespread as current narratives imply.

Although the 1951 Festival included exhibitions of science, ball-and-spoke molecular models were not a highly visible component of the Festival's displays. Molecular models were exhibited at the Festival, but their presentation was rather peripheral and did not lead to any significant circulation of images of molecular models in the press. The main Festival site on the South Bank included the Dome of Discovery's science displays, but there is scant evidence of the inclusion of molecular models there. The *1951 Exhibition London Catalogue of Exhibits* lists each object exhibited across the various displays on the South Bank¹⁰. In this list, which runs to 166 pages, the only object listed that possibly corresponds to a molecular model is a 'Model of Vitamin B 12 crystals'¹¹.

The South Kensington Exhibition of Science presented 'pure' science relating to the theme of the structure of matter, and included displays centred on molecular structure and the internal structure of the atom. At this exhibition, ball-and-spoke crystallographic models, including those of glycogen (a form of glucose) and steel, appeared¹². The display design at the South Kensington Science Exhibition also deployed some variations on scientific representations and their conventions for the purposes of illustrating the theme of the structure of matter. In addition to imagery associated with nuclear physics¹³, this included FPG products (many of which did not comprise ball-and-spoke patterns). These were used as wallpaper, upholstery, and backdrops in the South Kensington exhibition and in parts of the Dome of Discovery. The Exhibition of Science also featured lighting by the General Electric Company based on the structure of the carbon atom and designed in dialogue with the FPG¹⁴.

Images of the models (or features of exhibition design illustrating

¹⁰ *1951 Exhibition London Catalogue of Exhibits* (London: H.M. Stationery Office, 1951).

¹¹ *Ibid.*, p. 155.

¹² Bronowski, *1951 Exhibition of Science South Kensington Guide Catalogue*, p. 5.

¹³ For example, a large three-dimensional structure in the shape of the Rutherford atom diagram greeted visitors at the exhibition's entrance. This type of nuclear imagery appeared on the poster for the exhibition as well.

¹⁴ The General Electric Company's lighting was designed by the exhibition designer Brian Peake.

molecular themes) presented at South Kensington, however, did not circulate widely. Research into newspaper and other print coverage of the Festival, channels that might represent sites for the wider mediation of knowledge about molecular structure, yielded no examples of photographs or mentions of ball-and-spoke models shown at the Festival¹⁵. A further possible impediment to the mediation of knowledge of molecular structure through the Exhibition of Science was that this exhibition required a degree of scientific literacy. A *Punch* review criticised the education level to which it was pitched: ‘a little private study is called for before you make your visit, if you really want to get more out of it than a sensation of admiring ignorance and a renewed feeling of the vastness of the universe’¹⁶.

At the Festival, representations of molecular structures would have been easily lost amidst its much-documented architectural spectacles, scientific spectacles (science displays included live locusts and animated grasshopper models, for instance¹⁷), and sites devoted to leisure. This is evidenced by the fact that interviewees for this research who attended the Festival recounted many memories of it, but molecular structure did not surface in these accounts. Several interviewees remembered the Festival Pleasure Gardens, a funfair on the bank of the Thames in Battersea: ‘I went to a fancy dress thing there in a grass skirt’, recalled an interviewee¹⁸. Many mentioned the Skylon, a tall, wiry architectural construction on the South Bank: ‘It floated in space and there was this fascination – with how did they design it, how did they build it. You could stand underneath and look directly up into it’¹⁹. ‘The most impressive thing at the Festival of Britain was the pregnant woman’, remembered an East Londoner, who enthusiastically described a cut-away anatomical model of a pregnant woman shown at the Festival.

More substantial displays of molecular form came later in the decade. In 1958, crystallography models were exhibited at the Brussels World’s Fair.

¹⁵ The Science Exhibition guide catalogue discusses crystal and molecular structure in its text but does not picture any visualisations (although it features images of FPG fabrics). The only molecular model to appear in the catalogue is in an advertisement for Mullard Electronics Products, manufacturers of radio and television parts. Bronowski, *1951 Exhibition of Science South Kensington Guide Catalogue*, p. v.

¹⁶ B.A. Young, ‘Sorry No Miracles’, *Punch*, 6 June 1951, 682-683 (p. 682).

¹⁷ *1951 Exhibition London Catalogue of Exhibits*.

¹⁸ Group interview at Community Time Camden, Camden, North London, 9 July 2013.

¹⁹ Interview with William, 10 June 2013.

Displays in the International Science Hall (where W.L. Bragg curated the British contributions) included ball-and-spoke models of vitamin B12 and DNA, and John Ernest's polystyrene models of tobacco mosaic virus (TMV) and poliovirus (mentioned in chapter two). Models from the Science Hall were shown in Britain in 1959 as part of an exhibition of the British contributions to the Fair staged in London at the 'Daily Mail Ideal Home' exhibition that year, and the B12 model featured in that year's catalogue for the exhibition (Figure 1).

British press treatment of the Science Hall was minimal (perhaps due to the fact that its opening was delayed). Furthermore, much existing coverage focused on virus models rather than the ball-and-spoke forms. *The New Scientist* featured an article by Bragg on the Science Hall illustrated with Ernest's polio and TMV models (Figure 2). 'The virus bodies are very interesting because on the one hand they can be crystallised', he wrote. 'They are in an intermediate position between living and inert matter, and the new knowledge about their structure which has been won in the last few years may do much to increase our understanding of life-processes'²⁰.

This reflected a broader tendency in postwar British media attention to X-ray crystallography research to focus on its work in molecular biology, such as virus research. For example, a 1958 episode of the BBC science programme *Eye on Research*, entitled 'Smaller Than Life: Story of the Virus', included a live broadcast from Brussels featuring Klug discussing virus structure²¹. An image of Ernest's polystyrene TMV model also appeared in a 1959 *Sunday Times* article by Perutz spotlighting new research in molecular biology (Figure 3)²². In 1964 virus models appeared on another BBC programme (also called *Smaller Than Life*) spotlighting virus researchers at the LMB²³.

The virus models were visually quite unusual and therefore perhaps deemed most likely to catch the eyes of readers, viewers and exhibition visitors (at a time when many science television producers, as science historian Jean-Baptiste Gouyon claims, 'privilege[d] visual pleasure' over 'pedagogy'²⁴). A

²⁰ Lawrence Bragg, 'An International Survey of Recent Scientific Research', *The New Scientist*, 27 March 1958, 15-17 (p. 17).

²¹ 'Smaller Than Life: Story of the Virus', *Eye on Research*, BBC, 30 September 1958.

²² M.F. Perutz, 'Living Molecules', *Sunday Times*, 14 June 1959.

²³ *Smaller Than Life*, BBC, 25 February 1964.

²⁴ Gouyon, 'Making Science at Home', p. 6.

review of 1964's *Smaller Than Life* by the novelist Anthony Burgess captures their visual and material appeal. He wrote, 'The sense of beauty and intricate organization (the tobacco-mosaic virus like the plan of a new city) strikes with such awe that we forget we are looking at the enemy'. Polio was 'like a bunch of grapes'. 'Let us see them again sometime', he proclaimed of the virus models, 'as pure *objets d'art*'²⁵.

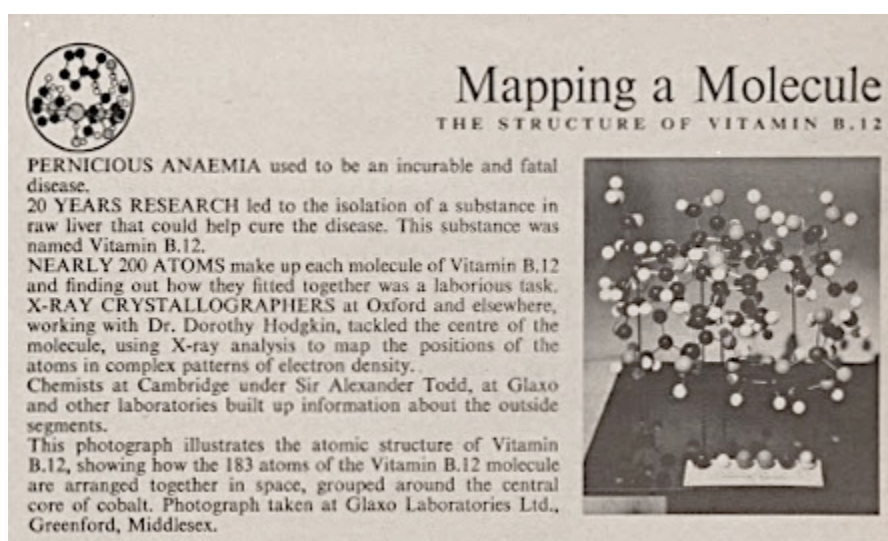


Figure 1 Photograph of B12 model featured in an exhibition guide to the British displays from Brussels shown at the 1959 'Daily Mail Ideal Home' exhibition.

²⁵ Anthony Burgess, 'Critic on the Hearth', *The Listener*, 5 March 1964, 406-407 (p. 406).

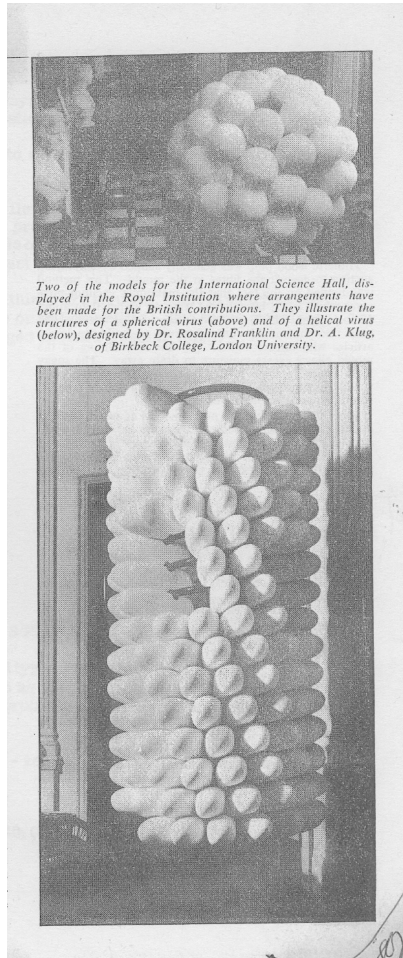


Figure 2 Photographs of virus models shown at Brussels pictured in *The New Scientist* (1958).

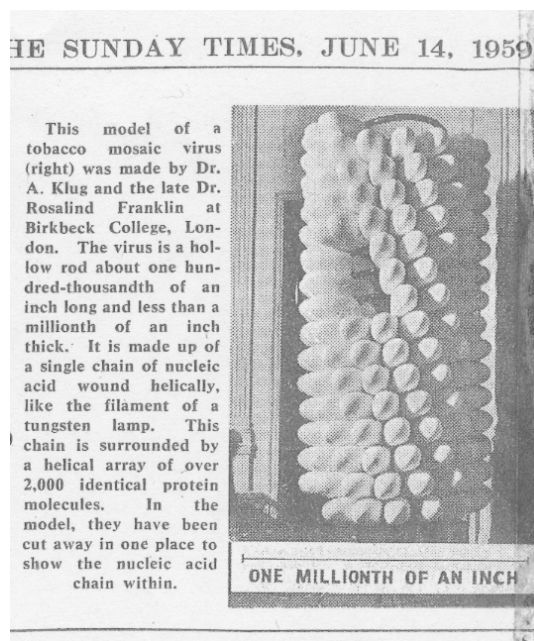


Figure 3 Photograph of TMV model featured in the *Sunday Times* (1959).

The most visible representation of a ball-and-spoke crystal structure at Brussels was the 335 foot tall Atomium that presided over the Fair. Designed by engineer André Waterkeyn and architects Jean and André Polak, the Atomium was based on the structure of atoms in an iron crystal magnified 156 billion times. It was the centrepiece of British media reportage of the Fair. Commentary on it is telling: reporters described the Atomium as an unfamiliar structure, which suggests that molecular models were not widely recognised at the time. For example, a *Punch* review remarked upon the ‘complete unfamiliarity of its shape’.

It is said to represent the atoms in a molecule of iron, magnified fifty million times and stood on one corner, but to those of us who seldom encounter iron molecules its aspect is as strange as if it came from another world (Mars, say)²⁶.

A *Times* correspondent described the Fair’s buildings as a collection of ‘new shapes and materials, dominated by the strangest shape of all – the inescapable Atomium’. The article continued:

Technically, this glittering symbol of mankind in the atomic age is described as representing “the atomic structure of a crystal of iron magnified 150 million times.” To the layman’s astonished eye, its nine steel spheres, each nearly 60ft. in diameter, resemble giant silver ping-pong balls miraculously perched on the ends of vast connecting tubes²⁷.

The content of mediators, such as this commentary, should not be confused with data on public reception. But it is nevertheless significant that reviewers clearly anticipated that the ball-and-spoke structure form was novel to their audiences. This corresponds to interview data collected for this research, which shows that many interviewees were not familiar with molecular forms in the 1950s.

The end of the decade also saw the first television appearances by crystallography models on several early BBC science programmes. Several programmes focusing on new research by crystallographers (usually concerning

²⁶ B.A. Young, ‘Brussels ‘58’, *Punch*, 1 April 1958, 512-13 (p. 513).

²⁷ Special Correspondent, ‘Atomic Crystal-gazing at Brussels Exhibition’, *Times*, 16 April 1958, p. 9.

molecular biology) featured models prominently because they added visual interest²⁸. Script directions for a 1960 *Eye on Research* episode, ‘Shapes of Life’, illustrate the models’ centrality to the production design of the episode: ‘TRACKING SHOT ALONG MODELS OF BIOLOGICAL SUBSTANCES’; PERUTZ PICKS UP MODEL OF AMINO ACID CHAIN and TWISTS IT ABOUT’²⁹. The episode also features a frame-filling close-up of a large intestinal myoglobin model that lasts almost an entire minute³⁰. Models appeared on screen in many early BBC science programmes to aid explanations of scientific subject matter as well as to serve as background set design, or as an internal *Eye on Research* planning document for a 1958 episode phrased it, for ‘both decoration and illustration’³¹. A spinning ball-and-spoke DNA model appeared in several programmes between 1958 and 1964, serving both purposes³².

These programmes might not have appealed to a broad segment of the population, however, as many required significant scientific knowledge to understand. One viewer, whose response is recorded in BBC audience reports, described mystification at the presenters’ ‘romping through polysyllabic words’³³. Reviewing a 1958 *Eye on Research* episode on DNA, critic Anthony Curtis wrote that ‘the nature of D.N.A. itself’ was rather hard to grasp from the programme (‘At the end one had a fuzzy idea of what D.N.A. was’), but that ‘they were very patient with us, producing models that might have been works of contemporary sculpture’³⁴. Curtis’ remark comparing DNA models to ‘contemporary sculpture’ again suggests not only the visual and material novelty

²⁸ These included episodes of *Eye on Research*, which profiled current scientific research; *Science International*, a 1959 two-part series with similar remit; episodes of *Horizon* from the early 1960s; and *The Thread of Life* (1964), a 10-part series presented by Kendrew. De Chadarevian discusses some of these appearances in *Designs for Life* and ‘Models and the Making of Molecular Biology’.

²⁹ ‘Eye on Research, series 6 ‘Shapes of Life’’. BBC WAC T14/1499/5.

³⁰ ‘Shapes of Life’, *Eye on Research*, BBC, 3 May 1960.

³¹ This quote is from BBC Studio Design Unit correspondence conducted during preparations for the 1958 *Eye on Research* episode ‘The Thread of Life’ and concerned a discussion about the need for ‘enough models for both decoration and illustration’. Colin McIntyre to Natasha Kroll, 23 February 1958. BBC WAC T14/1495/10.

³² It was powered by a record turntable hidden in its wooden base (see interview with Mike Fuller in Appendix 3). Programmes featuring this model include ‘The Thread of Life: DNA’, *Eye on Research*, BBC, February 1958; *Smaller Than Life*, 25 February 1964; ‘The Knowledge Explosion’, *Horizon*, BBC2, 21 September 1964; ‘Reproduction and Genetics’, *The Thread of Life*, BBC, 1 February 1964. See also de Chadarevian, *Designs for Life*.

³³ ‘Audience Research Reports, Television, General, Chronological, November and December 1959, Science International What is Life?’. BBC WAC R9/7/43.

³⁴ Anthony Curtis, ‘Critic on the Hearth’, *The Listener*, 13 February 1958, 292-293 (p. 293).

of such molecular forms – and of DNA specifically – to the non-scientist, but also the novelty of the concept. Curtis identifies DNA in this 1958 review as ‘the substance, D.N.A. (deoxyribonucleic acid)’, as one would introduce an unfamiliar term³⁵.

Indeed the now-iconic DNA double helix structure was not a widely disseminated image in the 1950s. Its elucidation was not heavily publicised in 1953 (when Crick and Watson published their research on the structure in *Nature*) or even, for the most part, throughout the 1950s³⁶. There was no press conference about its discovery in 1953, the Nobel Prize for DNA’s structure was not awarded until 1962, and photographer Antony Barrington-Brown’s now-famous photograph of Crick and Watson with their model was not published until Watson’s book *The Double Helix* was published in 1968³⁷. DNA’s iconic status today and knowledge that its structure was discovered in the 1950s might contribute to the assumption among design historians that molecular structures were widely-recognised in the 1950s³⁸. As de Chadarevian argues, however, the iconicity of the DNA model was for the most part achieved retrospectively in the late 1960s and in the mid-1970s when new developments in genetics research focused greater public attention on DNA³⁹. This is an example of the phenomenon described by David Edgerton in which what he terms an ‘innovation-centred timeline’ can suggest a misleading or partial picture of history⁴⁰. In this case, something that was new in the period (the knowledge of the DNA structure) did not take on a wider resonance beyond scientific elites until later.

³⁵ Ibid.

³⁶ For example, a search of the *Times* covering the years from 1953 to 1958 yields only four articles mentioning DNA. None of the articles are from 1953, the year of Crick and Watson’s elucidation of the double helix, and none of them include images. Two of the articles do not describe it using the familiar acronym ‘DNA’ but instead reference nucleic acid. For example, as in this tangential mention in an article about Perutz’s haemoglobin research: ‘A structure for nucleic acid has also been proposed by workers at Cambridge and King’s college’. ‘Protein Discovery at Cambridge’, *Times*, 30 January 1954, p. 8.

³⁷ Soraya de Chadarevian, ‘Relics, Replicas and Commemorations’, *Endeavour*, 27 (2) (June 2003), 75-79; Soraya de Chadarevian, ‘The Making of an Icon’, *Science*, 300 (5617) (11 April 2003), 255-257; Robert Olby, ‘Quiet Debut for the Double Helix’, *Nature*, 421 (2003), 401-405.

³⁸ On the iconic status of the DNA double helix today see Martin Kemp, *Christ to Coke: How Image Becomes Icon* (Oxford: Oxford University Press, 2012), p. 280; Suzanne Anker and Dorothy Nelkin, *The Molecular Gaze: Art in the Genetic Age* (Cold Spring Harbor, New York: Cold Spring Harbor Laboratory Press, 2004).

³⁹ de Chadarevian, ‘Relics, Replicas and Commemorations’.

⁴⁰ Edgerton, *The Shock of the Old*, p. xi.

This analysis of the public display and mediation of molecular models in postwar Britain indicates that ball-and-spoke molecular forms did not pervade British popular culture in the 1950s in the way that the historiography associated with ball-and-rod objects assumes⁴¹. An important point developed throughout the above analysis is that their mediation throughout the decade was not constant and undifferentiated. Rather, their significant circulation was weighted toward the very end of the decade (this chronological point will be important to the question of ball-and-rod objects' scientific reference discussed later). When images of ball-and-spoke structures circulated in 1958, they appeared as something novel, suggesting that molecular forms were not previously familiar among publics outside scientific research. This corresponds to historians of science Martin Bauer and Jane Gregory's research on science communication in Britain in the 1950s, in which they claim that science communication was 'dominated' by themes of nuclear power and space in the period⁴² (rather than molecular themes associated with crystallography research).

The subject of public displays of crystallography and its models in postwar Britain has seen very little historical research⁴³. The analysis in this section thus represents the initiation of a more dedicated inquiry into the mediation of crystallographic visualisations within British popular culture. It is necessarily brief given that it is not the primary focus of this chapter. But this analysis points to avenues for further research (such as the ways in which

⁴¹ There were other avenues in the period for the mediation of ball-and-spoke molecular form outside of the display of molecular models in exhibitions, on television and in press coverage of these forums. This includes graphic design, such as advertising imagery employing molecular form (for instance the designer F.H.K. Henrion produced advertisements for Shell in this period that contain ball-and-spoke structures). Such examples are, however, limited in the period. Furthermore, I have focused on public displays of science on television and in exhibitions because it is in these forums that the material form of the model is presented in the context of the scientific knowledge that it represents. This means it is more likely that the form would have been received as molecular when mediated through these channels. When it comes to graphic design, the researcher is faced with the same issue that arises with ball-and-rod furnishings. That is, that it is not clear whether consumers of these images would have regarded the circle-and-line or ball-and-spoke image as molecular or even scientific.

⁴² Bauer and Gregory. See also historian of science Jean-Baptiste Gouyon's recent research on public displays of nuclear and space science in postwar Britain (Gouyon, 'Making Science at Home').

⁴³ De Chadarevian's research into some aspects of the public display of crystallography models in postwar Britain is an exception. But whereas this chapter section focuses on public reception and mediation, she largely focuses on the fact that LMB models appeared in public as tools to publicise molecular biology and disseminate a peaceful image of science. de Chadarevian, 'Models and the Making of Molecular Biology'; de Chadarevian, *Designs for Life*.

material and visual forms of the display of models affected the reception of the science represented⁴⁴).

This section initiates a thread concerning science in culture, and molecular form specifically, that runs through this chapter. Next, I turn to the furniture context. Below I explore the aspects of the production and mediation of early ball-and-rod furnishings in postwar Britain, and subsequently discuss the relationship between these two strands, molecular models and ball-and-rod furnishings, that I set in motion in this half of the chapter.

Early life as ‘good design’: 1946-1951

This section begins an exploration of the context in which ball-and-rod objects were produced in postwar Britain. It shows that the ball-and-rod motif in postwar British furnishings began life among the ranks of CoID-approved ‘good design’, produced and sold by CoID allies in the furniture trade and promoted in CoID propaganda. It explores the ramifications of this for understandings of the aesthetic and ideological underpinnings of the style and its status within the postwar class politics of taste in this early period of the commodity life of ball-and-rod furnishings.

The earliest evidence of postwar ball-and-rod objects is found in sources associated with the CoID’s extensive postwar design promotion. The CoID included several early ball-and-rod objects in their ‘good design’ propaganda aimed at industrial regeneration and social reform in the period. The earliest example of the ball-and-rod motif in postwar British furniture identified in this research is a standard lamp with tripod legs and metal ball-feet by the London-based lighting firm Dernier & Hamlyn, which was shown at the CoID’s 1946 ‘Britain Can Make It’ exhibition at the V&A (Figure 4)⁴⁵. The exhibition was one

⁴⁴ Indeed studies considering the visual and material aspects of public displays of science in postwar Britain in any depth are extremely limited. See Gouyon, ‘Making Science at Home’ for an assessment of the historiography from this perspective, and a rare example of analysis of visual and material aspects of public displays of science in postwar Britain.

⁴⁵ To the best of my research, this is the only clear example of the ball-and-rod style in Britain in the 1940s. This indicates that the style was rare at the time, but by no means signals that this lamp was the first or only one of the period. Its status as such is not possible to confirm with

of the CoID's earliest postwar efforts to promote 'good design' to the British consumer and showcase British products for the export market in accordance with the BoT's economic aims⁴⁶.



Figure 4 Photograph of standard lamp produced by Dernier & Hamlyn Ltd at the 1946 'Britain Can Make It' exhibition.

The inclusion of this lamp at 'Britain Can Make It' does not reflect its presence in the lives of British consumers at this time. The Dernier & Hamlyn lamp was not actually available on the domestic market when the exhibition took place⁴⁷. Although many products exhibited were available for export, valuable production resources had not yet been devoted to the domestic market, earning

certainly; due to the tremendous disruption of the war, catalogues for firms producing such furnishing are few and far between for the immediate postwar years.

⁴⁶ On the 'Britain Can Make It' exhibition see: Buckley; *Did Britain Make It?*; Hayward; *Design and Cultural Politics in Postwar Britain*.

⁴⁷ In the exhibition catalogue it is listed as 'available soon' rather than currently available for purchase (this information is provided for each product exhibited, probably because so many were not yet available). Council of Industrial Design, *Britain Can Make It Exhibition Catalogue* (London: H.M. Stationery Office, 1946), p. 98.

the exhibition the nickname ‘Britain Can’t Have It’⁴⁸. Even as an object whose purpose at the exhibition was primarily didactic (to ‘teach’ British consumers about ‘good design’), the Dernier & Hamlyn lamp was a marginal presence at ‘Britain Can Make It’. It was not commented upon or pictured in the Council’s exhibition guides⁴⁹. As becomes clear throughout this chapter, this marginality was typical of postwar ball-and-rod furnishings; even when exhibited or pictured in publications (ranging from CoID promotional material to women’s magazines), they were rarely actually written about.

The Dernier & Hamlyn lamp is also typical of many ball-and-rod furnishings produced in the early postwar period in that, as was common among the designed objects the CoID promoted, it was produced by a high-end firm aligned with the modernist design establishment. Lighting firms allied with this community and centred in the southeast (like the CoID itself) also produced the other earliest examples of the ball-and-rod motif in furnishings, many of which were promoted in CoID propaganda. These include the London lighting firm Troughton & Young’s 1950 ball-footed table lamp designed by their director Alfred Burgess (A.B.) Read, a figure active in circles of modernist design reformers since before the war (Figure 5). In 1950 the CoID’s Scottish Committee selected a ball-footed table lamp produced by the Middlesex lighting firm Merchant Adventurers for a Glasgow exhibition (Figure 6)⁵⁰. The following year *The Studio*, a journal committed to ‘good design’, presented a similar Merchant Adventurers lamp in its annual yearbook (Figure 7).

⁴⁸ Arthur Marwick, *British Society Since 1945* (London: Penguin, 1996), p. 89.

⁴⁹ It was exhibited in the ‘Domestic Furnishing’ section of the exhibition where it was displayed alongside - and possibly upstaged by - radio equipment. The Murphy Radio visible beside the lamp in the photograph (Figure 4) is featured by Gordon Russell in the CoID’s *Design ’46* survey accompanying the exhibition, whereas the lamp is not pictured at all in this survey or the exhibition catalogue. Council of Industrial Design, *Design ’46: Survey of British Industrial Design as Displayed at the “Britain Can Make It” Exhibition* (London: H.M. Stationery Office, 1946); *Britain Can Make It Exhibition Catalogue*.

⁵⁰ This lamp was unique for this period in having rubber rather than metal ball-feet (chosen perhaps because of rubber’s suitability to keeping the lamp perched on a surface at a slight diagonal).



Figure 5 Troughton & Young table lamp designed by A.B. Read pictured in *House and Garden* (1951).



Figure 6 Photograph of ball-footed desk lamp produced by Merchant Adventurers Ltd and designed by Roger and Robert Nicholson at 'Exhibition of European Light Fittings', Glasgow, Scotland, January-February 1950.

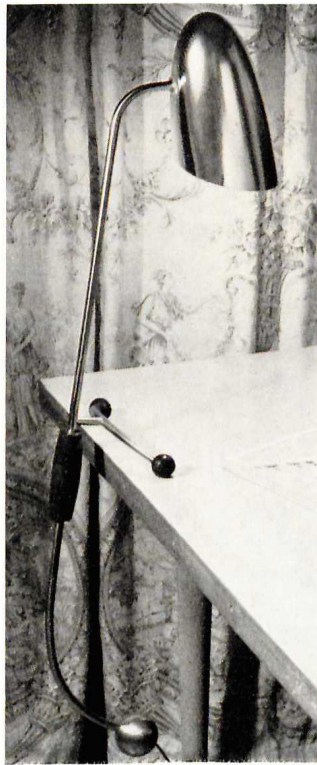


Figure 7 Photograph of ball-footed desk lamp with ball counterweight produced by Merchant Adventurers Ltd, published in *The Studio's* 1951-2 yearbook.

Design historians have pointed to the fact that much of the design promoted by the modernist CoID in this period was not popular with most consumers, who favoured traditional styles⁵¹. Modernist design was the purview of a small segment of middle-class consumers at this time. As Penny Sparke has pointed out, the market for modernist furniture was so limited that even at what she calls the ‘top end of the market’ where modernist design was found, the more widely popular ‘traditional, repro-traditional and antique furniture’ was displayed alongside it⁵². The taste gap between the CoID and most of the British population was due in part, design historian Jonathan Woodham observes, to ‘the restricted social constituency of the early members’ of the CoID, who hailed from the southeast and represented middle class tastes⁵³.

⁵¹ The taste gap between the modernist design reformers and the majority of the public is referenced in numerous postwar accounts of British design including Atha, ‘Dirt and Disorder’; Woodham, ‘Managing British Design Reform II’; Woodham, ‘Managing British Design Reform I’; *Design and Cultural Politics in Postwar Britain*; McDermott.

⁵² Penny Sparke, ‘The Furniture Retailer as Taste-Maker’, in *Did Britain Make It?*, pp. 128-142 (p. 131).

⁵³ Woodham, ‘Managing British Design Reform II’, p. 101.

As objects produced by high-end modernist firms and promoted by the CoID, the early ball-and-rod furnishings produced in Britain occupied the matrix of taste and class linked with that of the CoID's modernist design reformers. The modernist firms producing ball-and-rod objects between 1946 and 1950 supplied retailers whose intended consumer was middle-class (frequently upper-middle-class), such as Heal's, Maples, Liberty and the exclusive gallery Primavera of Sloane Street, which was orientated toward craft and Scandinavian design. Additionally, Troughton & Young's showroom was located in the elite Knightsbridge area of London, which indicates the class of consumer they courted.

Furnishings in the ball-and-rod style were consequently not widely visible to the British public until the Festival of Britain, where they were shown, again, as part of the CoID's promotion of 'good design'. Read's ball-footed lamp for Troughton & Young appeared in the South Bank site's 'Homes and Gardens' pavilion in the 'Music Lover's Room', a constructed display interior (Figure 8)⁵⁴. The Festival also saw the debut of the Antelope chair, produced by Ernest Race Ltd, another CoID 'good design' ally⁵⁵. The Antelope chair emerged within the context of CoID propaganda and the high modernist furniture industry, as one of many ball-and-rod objects to do so in this period.

⁵⁴ This interior was curated by furniture designer Robin Day (sections of the exhibition devoted to industrial design were curated by individual designers associated with the CoID's high modernist tastes).

⁵⁵ The firm started out in 1945 producing Utility furniture (under the government scheme headed by Gordon Russell). Information on the Utility furniture scheme is provided in the thesis introduction.



Figure 8 Festival of Britain Homes and Gardens Pavilion ‘Music Lover’s Room’ designed by Robin Day, featuring Troughton & Young table lamp.

The Antelope chair was selected by the CoID from a pool of submissions for Festival public seating. There, it was accompanied by a two-seater version and Race’s similarly ball-footed Springbok chair with a seat and back of coil springs covered in PVC tubing and stretched across a wire frame. Their Festival presence was extensive: 4500 Antelope and Springbok chairs were used throughout the Festival sites from London’s South Bank to Northern Ireland (Figure 9)⁵⁶. The official promotion of these Race chairs continued in subsequent

⁵⁶ Alec Davies, ‘The Chairs of the Year’, *Design*, December 1951, 17-19; ‘News of New Products’, *Design*, October 1950, 12-14.

years as Gordon Russell presented them as exemplary designs in didactic advice books on furniture for consumers (Figure 10)⁵⁷.

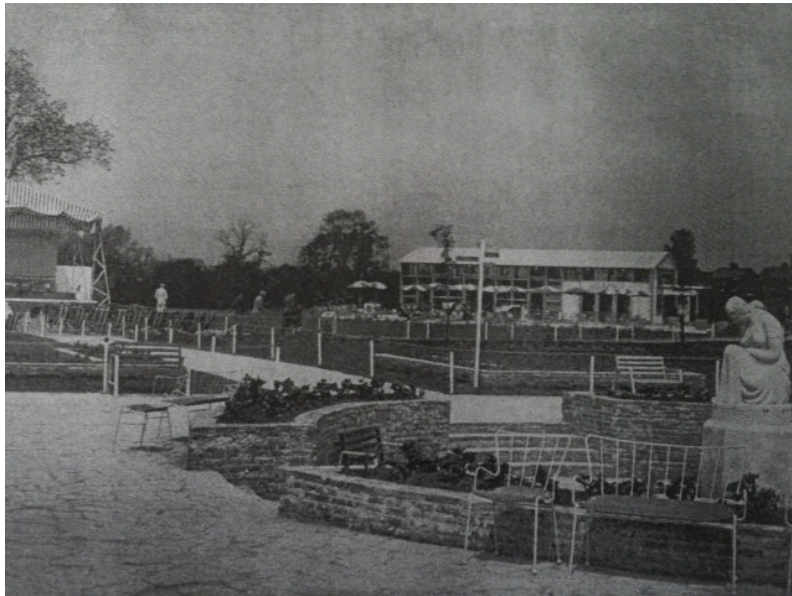


Figure 9 Antelope seating at a Festival site in Northern Ireland (1951).



Different methods and materials used in chairmaking. Pressed aluminium, foam rubber upholstery, Scottish Furniture Manufacturers; steel, with coloured plywood seats, by Race; birch and Lintafelt by Howard Keith

Figure 10 Page from Gordon Russell and Alan Jarvis's 1953 *How To Furnish Your Home* featuring the Antelope chair.

⁵⁷ Gordon Russell and Alan Jarvis, *How To Furnish Your Home* (London: Newman Neame, 1953); Gordon Russell, *The Things We See: Furniture* (Harmondsworth: Penguin, 1953).

Ball-and-rod furnishings typify CoID-promoted ‘good design’ in several ways. These can be found in details of their materiality, which speak to postwar economic conditions and the aesthetic ideology of CoID reformers and their allies in industry. A key point here is that the ball-and-rod style in furnishings produced throughout the period relied upon metal. Although they are sometimes associated today with the exuberance and light-hearted attitude announced by the Festival, this aspect of their materiality indicates that the earliest instances of the style are grounded in an aspect of ‘good design’ conditioned by the economic exigencies of postwar austerity with which the CoID contended, and which provided partial justification for the features promoted as ‘good design’: materials shortages.

Due to wartime and postwar timber shortages, the BoT restricted access to timber by furniture manufacturers⁵⁸. Metal furnishings – or those employing a minimum of timber – therefore represented an efficient use of resources, and the CoID promoted metal furniture heavily after the war⁵⁹. The emphasis on such efficient use of materials is evident in *Design* commentary on the Antelope chair that drew connections to wartime industrial production. A 1950 *Design* article announced, ‘As spare in line as a drawn bow, the new nesting seat by Ernest Race Ltd is almost as dependent on modern manufacturing methods as a jet ‘plane’⁶⁰. A 1951 article in *Design* highlighted the fact that ‘second-hand sheet steel had to be employed’ to produce the Festival seating: ‘a Race against time – as well as a battle against material shortages’⁶¹.

On one hand, the industrial associations and slender contours afforded by metal aligned with aesthetic features of continental modernist design that many British ‘good design’ reformers favoured⁶² (but which were rare in British

⁵⁸ Timber licences were limited to a small number of firms whose production was deemed of ‘national importance’, usually meaning they were manufacturing rationed furniture. Attfield, ‘Give ‘em Something Dark and Heavy’’, p. 190.

⁵⁹ For instance, the CoID promoted Race’s cast aluminium ‘BA’ dining chair at the ‘Britain Can Make It’ exhibition. Race made extensive use of available metals in the immediate postwar years, as the firm’s BoT licence for furniture manufacture did not allow the use of hardwood (this was common for such newly established manufacturers). Conway; Edwards, *Twentieth Century Furniture*.

⁶⁰ ‘News of New Products’, p. 12.

⁶¹ Davies, p.17.

⁶² Other authors acknowledge the Antelope chair’s place in a broader context of modernist metal and plywood furniture. In particular, it resembles Charles Eames’ 1946 LCM-1 and DCM-1 chairs with metal frames and moulded plywood seats. Conway; Reyner Banham, ‘The Style: ‘Flimsy...Effeminate’?’, in *A Tonic To the Nation*, pp. 190-198.

domestic furniture by 1951⁶³). Metal furniture for domestic use had a long history in continental modernism by this point (Marcel Breuer's 1925 'Wassily' chair is usually cited as the first use of tubular steel by a modernist designer⁶⁴). Bent plywood had also been used in modernist furniture before the war and since the 1940s by Ray and Charles Eames in the US⁶⁵.

On the other hand, in some respects early postwar ball-and-rod objects also reflect the desire of design reformers in the CoID and their allies in industry to differentiate British design from continental modernism. As mentioned earlier, some British modernist industrial design circles had, since before the war, decried the continental modern movement's perceived rational aesthetic and industrial surfaces as cold (design reformer John Gloag denounced it as 'Robot modernism')⁶⁶. CoID postwar design promotion focused on so-called 'contemporary' design, which aligned with design reformers' taste and modernist ideology associated with 'good design'. CoID rhetoric on 'contemporary' emphasised a marriage of the modern with national tradition. This is evident in the Antelope chair, for example, which echoes a 'vernacular' mainstay of the British domestic interior: the traditional wooden, rail-back Windsor chairs made by High Wycombe manufacturers since the eighteenth century⁶⁷. The urge to distinguish 'contemporary' from continental modernism is also evident in commentary on the Festival from those in the design establishment who lauded British designers' 'elegant' and 'pleasant' designs in steel rod as preferable to continental European modernist tubular steel⁶⁸.

⁶³ Penny Sparke, *Furniture* (London: Bell & Hyman Ltd, 1986); Edwards, *Twentieth Century Furniture*. Production of metal domestic furniture in England before the war was limited. Manufactures of tubular steel furniture (a material linked with continental modernist furniture design) included the Birmingham firms Cox and Co. (formerly producers of vehicle components), and Pel, also a Birmingham-based company that previously produced steel tubes for industrial uses. Thonet, the Austrian furniture producer of designs by continental modernist designers such as Marcel Breuer, Le Corbusier and Charlotte Perriand, began selling tubular steel furniture in their London outpost in 1929. Cherie Fehrman and Kenneth Fehrman, *Postwar Interior Design: 1945-1960* (New York: Van Nostrand Reinhold, 1987); Barbie Campbell-Cole, 'The Arrival of Tubular Steel Furniture in Britain', in *Tubular Steel Furniture*, ed. by Barbie Campbell-Cole and Tim Benton (London: The Art Book Company, 1979), pp. 52-67.

⁶⁴ Edwards, *Twentieth Century Furniture*.

⁶⁵ Pat Kirkham, *Charles and Ray Eames: Designers of the 20th Century* (MIT, 1995).

⁶⁶ John Gloag, 'Wood or Metal?' [1929], in *Form and Function*, ed. by Tim Benton and Charlotte Benton (London: Crosby Lockwood Staples, 1975), pp. 230-232 (p. 231).

⁶⁷ Massey, *Chair*, p. 144.

⁶⁸ A caption to a photograph of an Antelope chair in a 1952 *Design* article by Reilly read, 'In few industries is the trend towards lightness and elegance more marked than in metal furniture, due partly to the current popularity of bent rod in place of tube but also expressed in more fluid lines'.

Given this CoID rhetoric of ‘contemporary’, it is easy to overlook the fact that the initial appearance of the ball-and-rod motif in British furnishings was actually conditioned by a continuity of prewar modernist styles and material practices. In the lighting industry, the most prolific (and possibly earliest) producers of ball-and-rod furnishings in the postwar era, this motif has roots in prewar modernist production directly related to early twentieth-century continental modernist design. The next section’s examination of the prewar output of several of the same manufacturers who produced ball-and-rod designs in the postwar period illuminates these roots.

Prewar modernist roots of the ball-and-rod

The continued use of specific prewar material forms in the postwar British modernist lighting industry is key to understanding the aesthetic underpinnings of the ball-and-rod style’s early postwar manifestations. The British lighting industry had a strong tradition of modernist design by the postwar period⁶⁹. This may be due in part to the fact that this industry was faced with substantial change when the electrical grid’s establishment engendered the beginning of widespread electrification of homes in the 1930s, providing modernist reformers with an opportunity to agitate for new material forms in lighting⁷⁰. A.B. Read called for such a shift in 1933 (while voicing a common modernist complaint against imitative ornament): ‘Why light fittings should hang down, imitating oil lamps

Paul Reilly, ‘The Changing Face of Modern Design and What It May Mean Commercially’, *Design*, August 1952, 15-21 (p. 18). Russell’s caption for the Springbok chair in the advice book *The Things We See* describes it as ‘Pleasant in colour and shape’ (Russell, *The Things We See: Furniture*, p. 62). And on the ‘decorative use of steel’ on the South Bank at the Festival, the architect Lionel Brett wrote in *Design* that ‘solid steel has almost everywhere replaced tubular steel for chairs, with a consequent gain in elegance and freedom of line’. Lionel Brett, ‘Detail on the South Bank’, *Design*, August 1951, 2-7 (pp. 3, 5).

⁶⁹ On modernist lighting firms active in Britain by this period see Richard Chamberlain and Geoffrey Rayner, ‘Domestic Equipment and Product Design’, in *Austerity to Affluence: British Art & Design 1945-1962*, ed. by Richard Chamberlain, Geoffrey Rayner, and Annamarie Stapleton (London: Merrell Holberton, 1997), pp. 91-106; Kate Child, ‘Best & Lloyd Ltd 1868-1989’, in *Made in Birmingham: Design and Industry 1889-1989*, ed. by Barbara Tilson (Studley: Brewin Books, 1989), pp. 125-138.

⁷⁰ Electricity was brought into an increasing number of homes from 1934 when The National Grid was established. Maureen Dillon, *Artificial Sunshine: A Social History of Domestic Lighting* (London: National Trust, 2002).

and candle fittings, passes my comprehension', he wrote. '[F]lames that never flicker, and drops that never drip, are just bits of obsolete sentimentality'⁷¹.

In the 1930s several British lighting firms produced lamps that echoed those made in the Bauhaus Metal Workshop in the 1920s⁷². One of these was Troughton & Young, under head designer A.B. Read who, as an enthusiastic student of the modern movement, had visited the Bauhaus early in his career⁷³. Read's 1930s lighting for Troughton & Young feature the opalescent glass and metal rod and pendant constructions of Bauhaus lighting. Read wrote in 1938 that the quintessential modern fitting consists of the 'simple spherical ball fitting of the ceiling or pendant type'⁷⁴. This describes Read's 1934 'Ultralux' ceiling and pendant lights of opalescent glass and shimmering chrome (Figure 11), which echo the Bauhaus student Hin Bredendieck's late 1920s pendant light (Figure 12). These were often chrome or copper plated, yielding the look of an industrial surface.

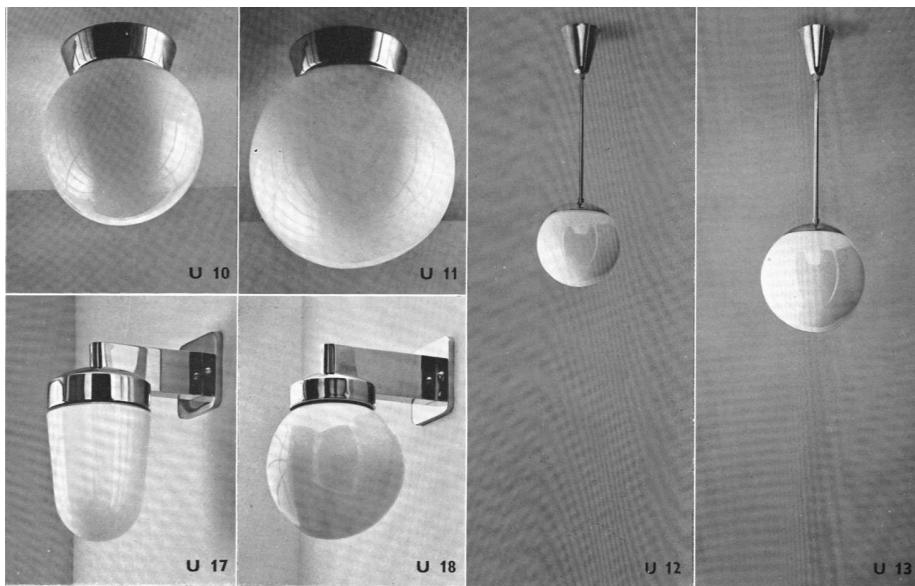


Figure 11 'Ultralux' lighting in 1935 Troughton & Young 'Ultralux' catalogue.

⁷¹ A.B. Read, 'The Design of Illumination', in *Design In Modern Life*, ed. by John Gloag (London: George Allen & Unwin Limited, 1946), pp. 73-80 (p. 78). This text was based on a radio broadcast from the 1933 series 'Design in Modern Life'.

⁷² For example, the Birmingham firm Best & Lloyd manufactured the Bestlite, which emulated a desk lamp by designer and metalworker Christian Dell of the Bauhaus metal workshop. On Best & Lloyd see Child.

⁷³ Read's *Times* obituary quoted Gloag's praise for him as 'one of the pioneer designers in the "Modern Movement" of the 1920s and 1930s', invoking the title of Pevsner's history of modernism that had so galvanised British design reformers. 'Mr AB Read – Lighting Design Pioneer', *Times*, 17 October 1973, p. 23.

⁷⁴ A.B. Read, *Lighting the Home* (London: Country Life Ltd, 1938), p. 17.

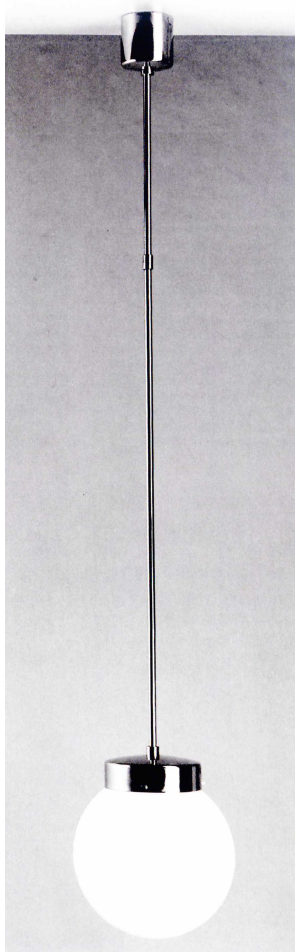


Figure 12 Ceiling light designed by Hin Bredendieck at the Bauhaus.

Early instances of the use of metal rods and metal balls as components in lighting are found in the prewar production of British lighting firms that mirrored the forms and surfaces of designed objects associated with the continental modern movement. For example, one of Read's prewar Bauhaus-inspired light fittings for Troughton & Young comprises a metal rod, punctuated by a glass fitting, which terminates in a reflective metal ball (Figure 13). Dernier & Hamlyn, producer of the ball-footed lamp shown at the 'Britain Can Make It' exhibition, also manufactured lighting using metal rod and ball components before the war. In the 1920s and 1930s, Dernier & Hamlyn produced the 'Neolux' range. Although in many respects the 'Neolux' designs are different from their postwar ball-footed lamp, lighting from this prewar range comprised tubular metal and spherical pendants (Figure 14). Their surfaces, inspired by the industrial sheen of Bauhaus lighting, were chrome- or copper-plated.

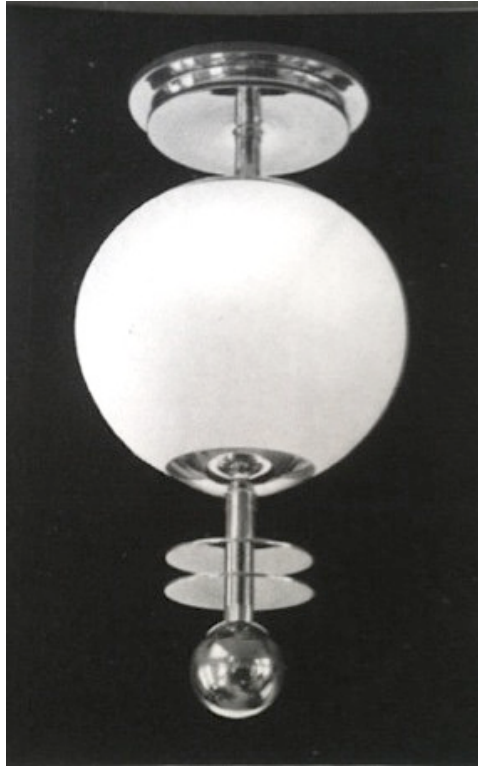


Figure 13 Troughton & Young ceiling light (1935).



Figure 14 Dernier & Hamlyn 'Neolux' lighting (1936).

The metallic surfaces of the prewar Troughton & Young and Dernier & Hamlyn lamps reflect the ‘machine aesthetic’ of the early twentieth century continental modern movement. The ‘machine aesthetic’ refers to the valorisation of the materials and rationalisation associated with industrial production and the work of the engineer. For example, to Swiss-French modernist architect Le Corbusier, the automobile was his generation’s Parthenon, and the house, ‘a machine for living in’⁷⁵.

The gleaming ball pendants of the prewar British modernist lighting presented above echo ball bearings, which symbolised the modernist commitment to industrial production and engineering logic in the 1920s and 1930s⁷⁶. This is best illustrated by the 1934 *Machine Art* exhibition of industrial products at the Museum of Modern Art in New York where the values of the machine aesthetic went on display. Swedish engineer Sven Wingquist’s chrome-plated self-aligning ball bearing graced the cover of the exhibition catalogue⁷⁷. The curator of the exhibition, museum director Alfred Barr wrote, ‘The circles and spheres of a ball bearing [...] are greatly enhanced by the contrasting surfaces of brushed steel races, shining polished steel balls, and brass carriers’⁷⁸.

Viewed in the historical context introduced above, it becomes evident that the postwar ball-and-rod style speaks to specific prewar modernist tropes. Formal and material characteristics of prewar lighting produced by British modernist firms carried over into the postwar production of the lighting industry. In fact some early examples of postwar ball-and-rod lighting produced after the war employ the chrome ball at the end of a tubular metal rod in a close reiteration of prewar styles. This includes the 1950 Merchant Adventurers lamp with a ball counterweight discussed earlier (Figure 7) and the postwar wall lamp manufactured by another London-based lighting firm, Falk Stadelmann and Co.

⁷⁵ Le Corbusier, *Towards a New Architecture*, trans. by Frederick Etchells (London: The Architectural Press, 1982 [1923]), p. 10.

⁷⁶ For example, French modernist furniture designer Charlotte Perriand wore a necklace strung with ‘ball bearings’ (for practical reasons, she used chrome steel balls instead of real ball bearings) as though they were pearls in the late 1920s, a gesture that signalled an elevated status of the machine part. Simon Bliss, ‘Charlotte Perriand, Ball-Bearings, and Modernist Jewelry’, *Modernism/Modernity*, 20 (2) (2013), 169–188.

⁷⁷ *Machine Art* (New York: Museum of Modern Art, 1934).

⁷⁸ Alfred Barr, ‘Forward’, in *Machine Art*, pp. 13–16 (p. 14).

(Figure 15)⁷⁹. Read's 1948 'Versalite' for Troughton & Young employed a steel rod and brass ball construction that also echoes the styles of his prewar lighting (Figure 16).



Figure 15 Falk Stadelmann and Co light with chromium plated brass rod stem.



Figure 16 A.B. Read's 1948 'Versalite', with aluminium shades, brass sphere and chromium-plated steel rod.

⁷⁹ This example also exhibits the tendency of British industrial design to emulate Danish modernist objects of the period as it mimics a similar ball-and-rod lamp produced by the Copenhagen firm Le Klint in 1950.

The evidence presented above suggests that the postwar production of ball-and-rod lighting involved the resumption of practices and designs deployed in the prewar lighting industry (and in some cases, by the same firm). Given postwar economic difficulties and the challenges of resuming peacetime production (like many firms, during the war Dernier & Hamlyn had turned its energies and resources to production for the war effort), it would have probably been much easier to resume producing already familiar forms rather than adopt completely new ones, which might require expensive overhauls of equipment.

Furthermore, the ball and rod components might be recombined in a variety of configurations. These components therefore afford the production of a number of different designs while using resources, such as the tooling necessary for producing these components, efficiently (which was especially crucial in the economically difficult immediate postwar years). This recombination of components is evident outside the lighting industry as well, in the practices of another early producer of ball-and-rod objects: at Ernest Race Ltd two component types, the rod (mild steel in this case) and ball (probably brass), were re-used in the manufacture of a number of different designs including not only the Antelope and Springbok chairs, but also the Roebuck, a chair with a plywood seat and back, designed in 1951 (the Race firm often reused the same jigs for forming the steel rod across different chair designs as well⁸⁰). Interestingly, like the postwar producers of ball-and-rod lighting described here, Ernest Race had also participated before the war in the work of a firm producing furnishings using the rod and ball components in the mode of the modern movement's machine aesthetic. Race worked as a draughtsman for Troughton & Young for several years beginning in 1935, when A.B. Read was chief designer (but it is not possible to state definitively whether or not this affected Race's later work).

The above investigation of the British modernist lighting industry shows that the postwar ball-and-rod motif's roots lie, at least in part, in material tropes of the prewar modern movement. Design historians acknowledge the legacy of prewar modernism in postwar British design in a general sense⁸¹. But its relationship to the ball-and-rod motif has been overlooked. (Historians of postwar British furniture also rarely acknowledge the use of steel tube in British

⁸⁰ Conway.

⁸¹ Buckley; Jackson, *Contemporary*; Conway.

industrial design, which was part of the analysis of the lighting industry above, possibly because CoID members derided its use as a feature of ‘cold’ continental modernism). Most of all, it is the very status of the motif today as a postwar archetype — solidly associated with the period and its science — that has obscured questions of its historical roots, and thus, of its strong ties to modern movement design.

Several points emerge from the preceding survey of early ball-and-rod furnishings. That the postwar ball-and-rod style existed as early as 1946 indicates that British iterations of the ball-and-rod motif were not merely ‘imitators’ of the now-iconic ‘Ball’ clock of 1947/48 or the Antelope chair (which was one of several ball-and-rod objects produced and promoted at the time under similar conditions). They have their own distinct historical context within British modernist furniture design, produced by CoID allies in industry, promoted in the Council’s postwar ‘good design’ propaganda, and even registering the continuation of material forms produced in the prewar British lighting industry. As such their early life is indelibly attached to the rarefied modernist taste of the middle-class design establishment, which is an issue key to analyses later in the chapter. But first, now that the subjects of the mediation of molecular form in postwar British culture and of ball-and-rod furnishings have been introduced, I will depart temporarily from the chronological narrative of the postwar biography of these objects to consider the question of their scientific reference.

The absent ‘atomic’

Mention of science has been — perhaps conspicuously — absent from the preceding pages. This absence reflects the fact that in the period sources pertaining to the ball-and-rod style, the theme of science is nearly non-existent. This section investigates this absence closely. I reflect on what it reveals about science-inflected ornament in the aesthetic frameworks operating in postwar British modernist design, and about the mediation of the science of X-ray crystallography in postwar British culture.

The Antelope chair was the most visible ball-and-rod object produced in Britain in this period and the one most frequently covered by historians of British design, so it is an appropriate starting point for this section's exploration. Today historians associate the Antelope chair, like other postwar ball-footed furnishings, with the era's scientific research⁸². Design historian Hazel Conway compares the Antelope's legs and ball-feet to 'atomic structure and models for atoms and electrons', and suggests X-ray crystallography as an influence on its designer⁸³. Woodham describes the chair as having "'molecular" feet'⁸⁴. An image of the chair was also included in 'Hidden Structures', a recent exhibition of X-ray crystallography models at the Science Museum, described as part of X-ray crystallography's influence on design⁸⁵.

As mentioned earlier, the historiography on ball-and-rod furnishings links these objects with a wider manifestation of 'molecular' design in the 1950s in Britain. These are associated particularly with the Festival, where the Antelope debuted. The art critic William Feaver wrote that the Festival is remembered largely through a number of 'conventions', one of which is the 'molecule':

Braced legs, indoor plants, colour-rinse concrete, lily-of-the-valley splay of light bulbs, canework, aluminium lattices, Cotswold-type walling with picture windows, flying staircases, blond wood, the thorn, the spike, the molecule: all these became the Festival Style.⁸⁶

Perspectives from the history of science make similar observations concerning the pervasiveness of crystallographic forms in design at the Festival in background glosses⁸⁷.

The implicit premise of the historiography is that these objects, especially those associated with the Festival, such as the Antelope chair, were received and produced as 'scientific'. But, as I explain below, this misrepresents both the reception of these designs and the conditions of their production.

⁸² Kirkham and Weber; Massey, *Chair*; Woodham, *Twentieth-Century Ornament*; Fiell and Fiell; Conway.

⁸³ Conway, p. 44.

⁸⁴ Woodham, *Twentieth-Century Ornament*, p. 204.

⁸⁵ Science Museum, London, 'Hidden Structures: 100 Years of X-ray Crystallography' (7th March 2013 – 1st January 2014).

⁸⁶ William Feaver, 'Festival Star', in *A Tonic To the Nation*, pp. 40-55 (p. 54).

⁸⁷ Robert Bud, 'Life, DNA and the Model', *British Journal for the History of Science*, 46 (2) (June 2013), 311–334 (p. 320); 'Hidden Structures'.

Reference to the Antelope chair as ‘molecular’ or ‘atomic’ is nowhere to be found in the 1950s. It is found neither in the pages of Russell’s design guides nor in CoID publications such as *Design* or the Festival guides, nor in other design industry press covering the Festival (such as *The Architectural Review*). The Race seating was not described as such in the popular press either. Newspapers and weeklies such as *Punch* and *Picture Post* covered the Festival extensively but to the best of my research there was no mention of the atom or molecule as a reference made by furniture⁸⁸.

I must briefly jump ahead chronologically beyond the early CoID-approved instances of the style, to make a larger point: ball-and-rod furnishings were not associated with the terms ‘atomic’ or ‘molecular’ throughout the entire decade (incidentally, nor were any other domestic furnishings aside from those of the FPG in the sources consulted). The terminology is an anachronism. A single name to describe the style did not even consolidate around the motif in the period. In the design press, women’s magazines, and in manufacturers’ and retailers’ advertisements for these items, they were simply described as furnishings with ‘rods’ and ‘balls’ or ‘knobs’. Judging from this use of language, the molecular was not foremost in the minds of producers, retailers, advertisers and commentators - if it was there at all.

The word ‘atomic’ was invoked as a marketing strategy in Britain at this time, but not in connection with ball-and-rod furnishings — and perhaps less frequently than today’s use of the term in connection with period artefacts implies. It was shorthand for effectiveness, drawing on the ‘atomic’ of bomb and energy, often to advertise comparatively banal products. An example is the ‘atomic draught-sealing strip’ sold by the Atomic Draught-Sealing Co (Figure 17).

⁸⁸ Publications consulted are listed in the bibliography.

114 Da

"Draughty Corner"

becomes
"Cosy Villa"

AFTER YOU'VE FITTED

**ATOMIC
DRAUGHT-SEALING
STRIP**

Chilling, penetrating draught. It invades your home and attacks you at your very fireside. Here, at last, is the latest, complete answer to the draught problem—

**ATOMIC PHOSPHOR-BRONZE
SEALING STRIP**

easy to fit to doors and windows • non-corroding • lasts a lifetime • keeps draughts outside, maintains warmth and comfort inside

FIT IT YOURSELF
See it at **STAND 55**—take it away and try it



Supplied in minimum lengths of 20 ft. of strip with full instructions and special springing tool for 30/- complete. Or longer lengths as required @ 1/6 per ft.

ATOMIC
DRAUGHT-SEALING CO.,
15, MAIDEN LANE, STRAND, W.C.2
Phone: TEM 5484

Figure 17 Advertisement for 'atomic' draught-sealing strips (1950).

This application of the word 'atomic' to banal or trivial subjects is representative of what the American journalist Norman Cousins, writing in 1946, called the 'standardization of catastrophe'⁸⁹. He was referring to the trivialising of the atomic bomb that erupted soon after the end of the war. This was a phenomenon on both sides of the Atlantic⁹⁰. For example, a young Mass Observation respondent reported in 1945 that 'For several days after the news the

⁸⁹ Norman Cousins, 'The Standardization of Catastrophe', *Saturday Review*, 10 August 1946, 16-18.

⁹⁰ For example, in the US, 'Atomic Cocktails' debuted at the Washington Press Club the same day the bomb was dropped. And in 1947 French designer Louis Reart debuted the 'bikini', swimwear named after Bikini Atoll where the US conducted nuclear bomb tests. See Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* (New York: Pantheon, 1985).

atom bomb was used facetiously to raise a laugh in connection with any subject'⁹¹.

One context in which 'atomic' was not used, however, was that of ball-and-rod furnishings. In addition to its absence from marketing language, oral interviews with postwar consumers suggest that 'atomic' or 'molecular' were not colloquial appellations for these objects either. Interviewees indicated that, just as in print, there was no single term used for them in conversation. If anything, interviewees referred to these objects descriptively as furniture with 'knobs' or 'with the round balls on'⁹². 'I don't recall any specific name for [the style]', said William, an interviewee who had sold textiles at John Lewis and Heal's in the early 1950s and was a self-described enthusiast of 'contemporary' design⁹³.

Most postwar consumers interviewed for this research simply do not remember associating these objects with science⁹⁴. This may reflect the character of public knowledge of molecular science at the time. Although as yet there has been no study of chemistry knowledge or education in Britain at this time (the discipline through which non-scientists might have encountered molecular forms in school, for instance), my analysis of the mediation of molecular models in postwar popular culture suggests that especially before 1958, the ball-and-spoke molecular form was not highly recognisable by much of the British public.

Scientific knowledge cannot be the only factor at issue, however, because the lack of recollection of scientific associations applied for interviewees across class and educational background – including those with knowledge of chemistry. Two interviewees had been educated at a higher level in chemistry and both did not recall seeing ball-and-rod furniture as resembling the forms of molecular models at the time⁹⁵. For example, when I asked Linda, who had studied chemistry at university in the 1940s, if she had, in the past, noted the furnishings' relationship to any scientific form, she said,

⁹¹ 'Directive August 1945: Atomic Bomb'. Mass Observation Archive SxMOA1/3/87.

⁹² Interview with Valerie, 14 February 2013; interview with Susan, 29 July 2013.

⁹³ Interview with William, 10 June 2013.

⁹⁴ Of course, I do not claim that the postwar consumers interviewed for this research are representative of all consumers in Britain in the period. The lack of scientific reference in the reception of ball-and-rod furnishings that emerged in the interviews, however, must be understood as indicative.

⁹⁵ Joe, an interviewee who attended a group interview session at the Positive Age Centre on 3 June 2013 was a chemist working in industry by 1960, and Linda, interviewed at the Highgate Care Home on 21 November 2013 had studied chemistry and zoology at university in the 1940s.

No I just thought it was modern. I ought to have thought it was scientific — I was doing chemistry at the university! But it wasn't how I associated it. I thought it was modern⁹⁶.

There is an issue of expectations here; the fact that those educated in chemistry also did not receive these objects as molecular suggests that postwar consumers did not expect to see scientific forms in their furnishings. This begins to point to the fact that domestic design was not, as far as most consumers were concerned, a significant site of science in culture in this period — at least not in the way in which historians and collectors today imagine it to have been.

This contrast between the postwar past and today's memory of it came out in an interview with William, the textiles salesperson. He was the only postwar consumer interviewed for this research who definitively claimed to have associated the ball-and-rod style with science at all in the past:

I knew the link with the atomic world, yes. But as far as I was concerned it became merely a decorative feature. I didn't see the relevance as we see it today, the importance of the link.

Even though he reports an awareness of a resemblance between ball-footed furniture and what he calls 'the atomic world' (he seemed to be referring to nuclear physics, calling it 'atomic energy' at another point in our conversation), William is aware of a disjuncture between its significance in the past (which he implies as minimal) and that of the present. The peripherality of the notion of science in connection with these furnishings that he described is furthered by his claim that he never spoke about it with anyone. If the association was in the back of his mind, it stayed there; it simply was not a topic of discussion:

Honestly I didn't meet anybody where this ever came up in conversation. There was very little interest in science generally or certainly in the design of things based on science [...] that issue never arose.

⁹⁶ Interview with Linda, 21 November 2013.

This is significant given that he worked at Heal's, which was, as I demonstrate later in the chapter, a major retailer of ball-and-rod furnishings during the 1950s.

In connection with William's recollection of a 'link with the atomic world', I must also mention a possible caveat pertaining further to the dynamics of popular memory. I encountered difficulty in some interviews in distinguishing between how interviewees remember receiving ball-and-rod objects in the past and how they see them today. In a few instances, an interviewee expressed an association between ball-and-rod objects and scientific models, such as, 'They were using those sort of things to construct atoms weren't they?'. When I asked if that was what the interviewee thought in the postwar period, however, they said that they did not; the association reflects their current reception of such objects⁹⁷.

Such interventions of the present-day notions of the postwar past (such as those embodied in the historiography on ball-and-rod objects) in memories of the postwar period are a possibility where William's recollection is concerned. But if it is not, the shift in the importance of the scientific reference, which he noted, is nevertheless significant. In this case, consumers' associations of ball-and-rod furnishings with science may simply be dramatically less prevalent in the past than the literature suggests, rather than non-existent. When investigating an absence, it is impossible to make a claim with complete certainty. But one thing is certain: the period sources portray a very different picture from that of the existing literature on this subject. The primary sources confirm a notable lack of 'atomic' or 'molecular' reference in the mediation and reception of ball-and-rod furnishings in the 1950s. This is corroborated by further interview data presented in the second half of this chapter indicating that postwar consumers had very little interest in the ball-and-rod style in the first place.

The same goes for their production. Sources pertaining to the design of these objects, including postwar texts by designers such as Race or A.B. Read, also describe an absence on the question of scientific reference⁹⁸. This is not

⁹⁷ The example here comes from an exchange with an interviewee at the Positive Age Centre, 3 June 2013.

⁹⁸ Again, it is impossible to state with absolute certainty that designers did *not* base the form of their furnishings on molecular models, particularly because sources pertaining to the design and production of these objects are extremely scant. Most objects are not traceable to a designer or manufacturer and for those that are, records of the design process are not available. Ernest Race

surprising, however, given the finding that ball-and-rod furnishings were produced years before the significant circulation of images of molecular models in British material and visual culture.

The character of the aesthetic ideology operating in these design circles also undermines the notion that ball-and-rod furnishings manifest science-inflected ornament. It is illuminating on the question of ball-and-rod furnishings' relationship to science to recall a point developed earlier in this chapter: ball-and-rod objects, such as those shown at the Festival, were originally produced, mediated and consumed within the culture of modernist design aligned with CoID reformers. An article in the 1951-52 *Daily Mail Ideal Home Book* makes clear that imitative ornament was actually rather improbable in postwar British high modernist furniture production. Its author Victoria Morris distinguishes the modern furniture of designers such as Russell and Race from the imitative ornament of earlier eras. She singles out 'embellishments inspired by goings-on in the world scene', such as 'Dolphin furniture made to commemorate Lord Nelson's fabulous victories', as a thing of the past:

This charming custom has died under the stampede of the machine age. One can hardly imagine Gordon Russell or Ernest Race embodying a dear little atom bomb in the trimmings of their chairs or tables⁹⁹.

Morris's quote is significant because the very thing she identifies as beyond the realm of possibility is precisely the kind of reference historians today imagine that Race's Antelope embodies (that is, the sciences so strongly linked with this particular period, one of the 'goings-on in the world scene'). To a contemporary commentator aware of the ideological context within which actors such as Russell and Race operated, referencing the atomic in furniture was a laughable idea.

Ltd presents an exception to the lack of archival material, as mentioned earlier. The firm's archive, however, contains very little material on the design and production of the Festival seating such as the Antelope and Springbok chairs, and that which exists suggests no scientific reference. Race's son Robert Race, furthermore, reports that the designer displayed little interest in science; Robert does not remember his father mentioning crystallography or molecular or atomic themes (interview with Robert Race, 5 July 2013).

⁹⁹ Victoria Morris, 'A Matter of Style', *Daily Mail Ideal Home Book*, 1951-52, 76-80 (p. 80).

The culture of industrial design practice in which the style originated was suspicious of ‘imitation’. For example, a CoID *Design Quiz* pamphlet made for ‘Britain Can Make It’ instructed readers on how to identify ‘good design’ with this advice: ‘Always reject a design which imitates something else’¹⁰⁰. This was tied to the convictions and standards of ‘good’ taste of those in the CoID concerning the quality of materials, so-called ‘honest’ workmanship and modernist beliefs in ‘truth’ in design¹⁰¹.

This suspicion of imitation extended to imitative ornament. The CoID’s 1948 didactic film *Deadly Lampshade* is an example of design reformers’ campaign against imitative ornament, and a very salient one for this chapter, for it used lighting as an example. The film condemned light fittings that mimicked other objects, such as a Viking ship, as ‘bad’ design¹⁰². A.B. Read, designer of the ball-and-rod Troughton & Young lamp shown at the Festival, was a consultant on the film. Here is a further and very direct link between the eschewal of imitative ornament (such as the possibility of ‘embodying’ an atom bomb, molecule or Viking ship) and actors involved in the production and mediation of the ball-and-rod style in postwar furnishings.

The fact that the ball-and-rod style emerged within an aesthetic regime that eschewed imitation begins to present a very different picture of these objects from the existing narratives that speak of exuberant ‘atomic’ and ‘molecular’ design. Studies of science in culture rarely contend with questions of aesthetic taste, but taste provides a key here to greater understanding of the relationship between these designed objects and contemporaneous science. Issues of taste are therefore key to the investigation of the possible presence of science in culture in the instance of ball-and-rod furnishings. The molecular form was not, as the historiography implies, flowing easily across cultural spheres; this discussion of modernist furniture design indicates that there was a forum in which it was *not permitted*.

¹⁰⁰ *Design Quiz* (London: Council of Industrial Design, 1946), AAD 1996/10/109.

¹⁰¹ Spark, *Furniture*, p. 78.

¹⁰² *Deadly Lampshade* was not ultimately released and the footage was destroyed for a number of possible reasons that are pursued by Woodham, including concerns that the film was too didactic, that the public might actually like and seek out examples of ‘bad’ design such as the Viking ship lamp, and that it might appear as though the CoID was devoting excessive resources to an expensive film project. Woodham, ‘Managing British Design Reform II’, p. 108.

The above analysis indicates a significant gulf between the period sources on ball-and-rod objects and their characterisation as a form of science-inflected ornament by historians. This is a productive moment at which to begin to reflect on historiographical issues that this finding prompts. The contrast between the period sources and the historiography on ball-and-rod objects that has emerged in this research speaks to a larger issue concerning historians' expectations surrounding science-inflected ornament in postwar design. This appears to emanate in part from knowledge of the FPG. For example, in the absence of any documented crystallographic reference point for Race's Antelope chair, Conway speculates that perhaps the designer attended and was influenced by Lonsdale's 1949 Society of Industrial Artists (SIA) talk that spawned the FPG¹⁰³. Race was a member of the SIA and he indeed attended the weekend 'summer school' at Ashridge at which Lonsdale spoke¹⁰⁴. But it is not possible to ascertain its influence, if any, on his work. He certainly expressed no enthusiasm about it. In a letter to the SIA journal after the event, Race did not mention crystallography or Lonsdale's talk, but noted, 'by Saturday night [when Lonsdale's talk occurred] many of us felt we had reached saturation point for new learning'¹⁰⁵. This speculation points to the expectation that Race might have been influenced by scientific representations in the same way in which Hartland Thomas was when he was prompted to initiate the FPG. As I explain below, however, generalisation from the FPG does not represent a reliable approach to questions of science-inflected design in postwar Britain.

Much of the historiography on the Festival (with which ball-and-rod furnishings are closely associated in existing accounts) sees the FPG as one example of a wider Festival or CoID goal concerning 'the marriage of art and science'¹⁰⁶. But there are significant differences between the case of the FPG and that of other designed objects displayed at the Festival, including ball-and-rod objects, which illuminate questions about science in postwar British industrial design more broadly. I will now return briefly to a discussion of the FPG,

¹⁰³ Conway.

¹⁰⁴ Advertisement for Ashridge summer school, *Journal of the Society of Industrial Artists*, April 1949, p. 9; 'Some of the Speakers', *Journal of the Society of Industrial Artists*, April 1949, p. 10.

¹⁰⁵ 'Letters to the Editor', *Journal of the Society of Industrial Artists*, August 1949, 15-17 (p.15).

¹⁰⁶ Christopher Breward and Ghislaine Wood, 'In the Service of the State: Change and Continuity in Design', in *British Design From 1948*, pp. 42-63 (p. 48). Forgan, 'Festivals of Science'; Conekin, *The Autobiography of a Nation*; Woodham, *Twentieth-Century Ornament*.

because specific details of the project raise points relevant to the intertwined historical and historiographical arguments of this chapter regarding science-inflected ornament in postwar British design.

Although the FPG slotted in with overall Festival aims regarding the celebration of British achievement in science, industry and the arts, there is no evidence that the merging of scientific form with industrial design *in individual objects* was an overarching goal for the CoID in planning the industrial design exhibits. Nor was it a particular goal of CoID-promoted ‘contemporary’ (which guided the selection of industrial design at the Festival). Chapter two argued that the aesthetic impulse toward science-inflected design at the root of the FPG’s aesthetic project was founded in a network of specific interests, none of which represented overarching CoID goals — a point relevant to this chapter’s broader exploration of science-inflected design¹⁰⁷. In fact, the FPG’s coherence with the Science Exhibition’s structure of matter theme was apparently serendipitous. Hartland Thomas reported speaking to the Festival’s Director of Science and Technology Ian Cox only after he came up with the idea for the FPG (upon attending Lonsdale’s SIA talk), whereupon Cox then informed him of its correspondence to a theme of his science exhibits¹⁰⁸. Hartland Thomas noted that he was initially worried that the FPG’s use of diagrams in pattern design might ‘give offence to my scientific colleagues’ planning the Festival’s science exhibits¹⁰⁹. Hartland Thomas appears concerned about his design exhibits overlapping with those of the science exhibits (essentially the kind of ‘marriage of art and design’ historians see the FPG as exemplifying). His concern further indicates that the FPG is not representative of a more generalised merging of the remits of the design and science exhibits at the Festival or in CoID activities.

Additionally, it is unlikely that the FPG influenced design after the Festival in any substantial way, serving for instance as the source for further crystallography-influenced objects (or as a significant agent for the communication of science). As Paul Reilly, the CoID’s information officer in the

¹⁰⁷ Rather, a particular member of the CoID, Hartland Thomas, was drawn to the possibilities of crystallographic diagrams, for reasons rooted outside the modernist aesthetic ideology of the CoID. Russell, the CoID Director, for instance, was ambivalent about the science-inspired patterns, and saw the project as an opportunity to strengthen ties with industry.

¹⁰⁸ Hartland Thomas, *The Souvenir Book*.

¹⁰⁹ Hartland Thomas to Brian Peake, 2 June 1950. DCA 5384.

1950s (later its director), remarked in reflections on the Festival in 1976, the FPG can ‘hardly be said to have laid the foundations for a new school of design – indeed they barely survived the Festival year’¹¹⁰. In addition to the fact that many FPG prototypes did not go into commercial production¹¹¹, the CoID did not promote the FPG heavily. The CoID’s own ‘Design in the Festival’ guide, a piece of ‘good design’ propaganda highlighting ‘well-designed British goods’ shown at the Festival, did not even feature any FPG products¹¹². The official South Bank Festival guide only mentioned the FPG under a ‘Where to eat and drink’ section at the back as part of a description of the Regatta Restaurant¹¹³. This lack of promotion may stem from the fact that some modernist design reformers saw the FPG’s close adherence to scientific forms as counteracting their efforts at the time to secure the role of the designer in industry as, in reformer Michael Farr’s words, ‘a creative artist’¹¹⁴.

As suggested in chapter two, the ‘marriage of art and science’ for its own sake was not a clear value evidenced in postwar design communities¹¹⁵. This generalisation is revealed as problematic by research, drawing on network approaches, into specific actors and interests, such as those outlined in chapter

¹¹⁰ Paul Reilly, ‘The Role of the Design Council’, in *A Tonic To the Nation*, pp. 58-61 (p. 61).

¹¹¹ As Jackson has shown, commercial production of most FPG prototypes was precluded by continued wartime material shortages and a lack of interest in the products from buyers (Jackson, *From Atoms to Patterns*). Furthermore, given the dominance of tastes in traditional styles among most consumers at the time, the FPG’s abstract crystallographic patterns would not have appealed to a broad market.

¹¹² Council of Industrial Design, *Design in the Festival: Illustrating a Selection of Well-Designed British Goods in Production in the Festival Year 1951* (London: H.M. Stationary Office, 1951).

¹¹³ Ian Cox, *The South Bank Exhibition: A Guide to the Story It Tells* (London: H.M. Stationary Office), p. 91.

¹¹⁴ An editorial in the *Architectural Review* in April 1951 commented on the FPG’s use of diagrams as ‘raw material for the artist’, stressing that ‘the operative word is ‘raw,’ [...] there is still no convenient short cut to a work of art’. The journal’s December 1951 ‘CoID Progress Report’ leveled this criticism again: ‘the acute danger with these crystal diagrams is that they encourage manufacturers to think that science can take the place of the designer’. The *Architectural Review* was a stronghold of the modernist design establishment (J.M. Richards, one of Britain’s most influential promoters of modernist architecture, was its editor, and Pevsner was on its editorial board), and this criticism reflects anxieties about the designer’s role in industry that pervaded industrial design circles (including those of the CoID) at this time. Many were concerned about the low status of the staff designer. For instance, design reformer Michael Farr bemoaned the state of staff designers before the war who, he complained, spent their first year completing ‘hack work for the head designer, such as copying out designs on to squared paper’. Editorial preface to Helen Megaw, ‘The Investigation of Crystal Structure’, *Architectural Review*, April 1951, 236-239 (p. 236); ‘COID: Progress Report’, *Architectural Review* (December 1951), 349-359 (p. 351); Michael Farr, *Design in British Industry: A Mid-Century Survey* (Cambridge: Cambridge University Press 1955), pp. 267, 18.

¹¹⁵ It is, however, a value evidenced in arts and humanities discourse and the cultural sector today, which may influence historical perspectives on relationships between design and science. This is discussed in the thesis conclusion.

two and in this chapter. Generalisation about the place of science in postwar British modernist design (from knowledge of the FPG) risks overlooking important factors, such as the details of the aesthetic ideologies operating in the production of specific objects.

In addition to the fact that historiography on ball-and-rod objects suggests that historians have generalised about postwar science-inflected design based on the FPG, some historiography also evidences a conflation of the exhibition design at the Festival with the industrial design exhibited there¹¹⁶. This serves to further bolster the historiographical category of molecular or atomic design that, I argued earlier, acts as a lens for many histories of postwar British design. Evocations of the atomic and molecular world were on display at the Festival, as noted at the beginning of this chapter. But I argue these were more pronounced when it came to the exhibition design used to illustrate themes of the science exhibits, rather than objects of industrial design¹¹⁷.

In sum, this section argues that ball-and-rod furnishings do not represent a significant site for the mediation of X-ray crystallographic visualisation in postwar culture. It points to an absence of evidence for the cultural transmission of molecular form between science communication and the design of ball-and-rod

¹¹⁶ The sense that crystallography-inspired design extended beyond that of the FPG at the Festival may result from dynamics at work in the historiography on the Festival: On one hand the FPG is often categorised with examples of deployments of nuclear imagery. Such accounts characterise the FPG as one example of a larger phenomenon (see for example Jolivette; Hornsey). On the other hand, characteristics of the FPG are sometimes projected upon design at the Festival generally. For example in an article on controversies about the material basis of life in the context of the elucidation of the DNA structure, historian of science Robert Bud mentions that ‘the dominant designs’ at the Festival ‘derived from crystallography. Electron-density maps of insulin exemplified the new aesthetic’. Bud, p. 320.

¹¹⁷ Even in cases of exhibition design, it is often difficult to ascertain the character of their postwar reception (including whether visitors received aspects of exhibition design as molecular). An example that reveals great contrast between postwar and contemporary sources on the subject of scientific reference is the screen of coloured balls erected on Waterloo Bridge for the Festival. Designed by Edward Mills, and sometimes known as the ‘Abacus screen’, it may also reflect themes of the science exhibitions. In contrast to its current identification by historians as molecular, however, it was not referenced as such in postwar print sources. To the best of my research, it appears that in postwar press, the screen was not referenced as ‘molecular’ or ‘atomic’, and was most often commented upon in terms of its screening out of the views of South London beyond the Festival. Reflecting on the screen in a 1997 interview, its designer, Mills, said, ‘in a sense the science background to the exhibition was the atom’. There is a disconnect between the exhibition designer’s own reference and the screen’s reception, but this also parallels the temporal shift in the screen’s reception; Mills’ statement corresponds to a larger role for the ‘atomic’ in the public memory of the 1950s carved out by 1997 (detailed further in the next chapter). Mills interviewed by Louise Brodie ‘Architects’ Lives’, 1997, British Library Online Information Service, cited in Atkinson, p. 51.

objects. It also reveals the near-absence of scientific reference in the reception of these furnishings by consumers interviewed for this thesis. The reception of ball-and-rod objects is an issue that is not even broached in the existing historiography, which evidences a modernist production-focus. These findings revise the narrative that ball-and-rod furnishings are part of the history of X-ray crystallography in postwar British culture. This section's analysis also reveals the methodological problems with claims regarding the influence of science on postwar design. The matter-of-fact enumeration of science as a formal trope of postwar British modernism overlooks the complexities of the conditions of science in British culture, the aesthetic ideologies operating in design, and the contingencies that either afford or preclude transmission between cultural spheres.

This study points to the dangers of conflating production with reception. We know that X-ray crystallography yielded now-well-known discoveries in this period and that its visualisations appeared in several forms at the Festival. But this does not mean the ball-and-spoke forms that characterised so many crystallographers' models entered immediately and strongly into the 'vernacular' experience of science among publics outside the scientific community or that their echoes would necessarily have been recognised by consumers in the motifs of furniture.

This revision of the notion of ball-and-rod objects' relationship to science is one of several ways in which this half of the chapter reassesses the very concept of the 'origins' of ball-and-rod furnishings. Neither the idea of a single originary object nor 'influence' from science serve as satisfactory interpretive approaches. Rather, the emergence of these objects in postwar Britain is associated with a constellation of other factors. These factors include the aesthetic ideologies of postwar design reformers and material contingencies affecting furniture production. A consequence of this study is the demotion of historiographical archetypes of postwar British culture: Firstly, the Antelope chair, shown here as one of many ball-and-rod objects produced and promoted under the aegis of 'good design'. Secondly, this research questions the notion of the wide mediation of 'molecular' forms in postwar British culture. In the next section, the notion of the ball-and-rod furnishing itself as postwar archetype

comes in for question, as I describe the shifting status of ball-and-rod objects after the immediate postwar years.

2. The unloved object

Among the various meanings of the French word *objet*, the Littré dictionary gives this: ‘Anything which is the cause or subject of a passion. Figuratively and most typically: the loved object [...] It is all my own, the object of my passion’.

Jean Baudrillard, ‘The System of Collecting’¹¹⁸

During the period in which I was researching postwar ball-and-rod furnishings, I encountered one that had been under my nose for years. I was visiting my husband’s grandmother at her home in Wales, sitting in her kitchen as I had done dozens of times before, when I glanced down at a corner just beside me. There, hidden in the shadow of a heavy wooden sideboard and tucked behind a stool, I noticed a black wire magazine rack with red ball feet (the kind sold at Woolworths in the late 1950s and early 1960s). Low to the ground and camouflaged by its contents, it was almost invisible (Figure 18). I had certainly looked its way countless times but I had never actually *seen* this object.



Figure 18 My grandmother-in-law’s barely visible ball-and-rod magazine rack.

¹¹⁸ Jean Baudrillard, ‘The System of Collecting’, in *The Cultures of Collecting*, ed. by John Elsner and Roger Cardinal (Cambridge, Massachusetts: Harvard University Press, 1994), pp. 7-24 (p. 7).

When I asked about it, I received some puzzled looks. That was, firstly, because the family had forgotten it was there. And secondly — of all the things in someone's home to comment upon, a magazine rack? It is, after all, a relatively minor household accessory. Very little information was remembered about the object: only that it must have arrived at the house sometime in the 1950s or early 1960s, and as far as anyone knew, it had always been right there in the corner. Hidden in plain sight, this object had literally become part of the furniture.

Although the historiography associated with these furnishings today imagines them as highly visible archetypes of their time, their actual status in the postwar years is better represented by that of the magazine rack I encountered at the home of my grandmother-in-law. Relegated to the corner of a room and languishing in the shadow of a not-so-modern Victorian sideboard, its peripheral habitat and insignificance to the postwar consumer is typical of its life in the period of its production.

This half of the chapter explores the shifting position of ball-and-rod furnishings within the postwar class politics of taste that accompanied the rise in their production and retailing from 1953 through the early 1960s, changes in the production of these objects in the period, and their reception by consumers. It shows that even as the ball-and-rod object became more prevalent in visual and material culture of Britain in the 1950s, it did not attain the status of the 'loved object' Jean Baudrillard described in 'The System of Collecting'. In the era of its production, the ball-and-rod furnishing remained marginal and distinctly unloved, something no one identified with as 'all my own'.

The birth of a 'fashion'

1953 marks a significant moment in the postwar commodity life of ball-and-rod furnishings. The style appeared in an increasing number of objects, which were pictured with increasing frequency in advertising and print media. This was coincident with the first palpable growth in the British economy since the end of

the war. Historian David Kynaston highlights 1953 as ‘the breakthrough year in terms of moving away from austerity’¹¹⁹. Between 1952 and 1954, rationing decreased and ultimately ended, and consumer spending began to increase¹²⁰. This includes an increase in the consumption of household items¹²¹.

1953 also marks the beginning of the ball-and-rod furnishing’s life beyond the rarefied market associated with the small upper-middle-class elite of early postwar consumers of modernist furniture. Ball-and-rod furnishings became affordable to a broader range of middle-class consumer than they had been previously. They now appeared not only in design journals and the most upscale women’s magazine *House and Garden* (which had featured Read’s ball-footed lamp for Troughton & Young in 1951), but also in *Good Housekeeping*, which was aimed at women of ‘the aspiring professional classes’, and *Ideal Home*, which catered to a younger but similar class demographic¹²².

This means that the market for these objects, while broader than before, was still somewhat limited in that it did not include lower-middle class or working class consumers. Relative to the higher-end magazines, ball-and-rod furnishings were rarely found in the popular women’s weeklies *Woman* and *Woman’s Own*, whose readership comprised lower middle and working class women (and accounted for the largest circulation of any women’s magazines by 1958¹²³). Retailers catering to middle-class consumers such as Heal’s and Liberty sold ball-and-rod furnishings. Many of them cost between £1 and £3. This price would have been a significant portion of the average weekly wage for a manual worker in 1953, which was about £7¹²⁴.

Most ball-and-rod furnishings advertised around 1953 were small, somewhat peripheral furnishings such as table lamps, plant pots and coat hooks. This type of peripheral object speaks to the ball-and-rod furnishing’s position as a commodity at this time; for consumers who could not afford larger items of modern furniture, purchasing smaller items such as a magazine rack or table

¹¹⁹ Kynaston, *Family Britain*, p. 317.

¹²⁰ Sweininger-Bargielowska.

¹²¹ Kynaston, *Family Britain*.

¹²² Marjorie Ferguson, *Forever Feminine: Women’s Magazines and the Cult of Femininity* (London: Heinemann, 1983), p. 34. This accompanied a shift at this time in the content of British women’s magazines toward devoting more attention to furniture than they had before. Jeremiah.

¹²³ Cynthia L. White, *Women’s Magazines 1693-1968* (London: Michael Joseph, 1970).

¹²⁴ Office for National Statistics, ‘Average Gross Weekly Earnings 1938 – 2011’, 12 December 2012. Available at www.ons.gov.uk. Accessed 13 July 2015.

lamp might be possible. The ball-and-rod furnishings of London manufacturer Hiscock, Appleby & Co, a key producer in this area, typified the character of object that commonly manifested the style. They produced ball-and-rod lamps (with thin, sometimes stove-enamelled, wire frames tracing graphic outlines, as in Figure 19) and other smaller furnishings in the style such as plant stands and wall racks (Figure 20)¹²⁵.

7. One of the range of fittings designed by Mr. Hiscock, complete for £2 9s. 9d., inclusive of Purchase Tax.

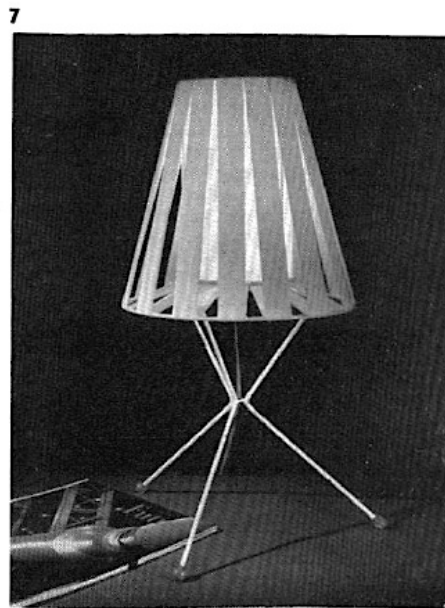


Figure 19 Hiscock's ball-and-rod lamp featured in *Architectural Design* (1953).

¹²⁵ Many resemble the wire forms of the Italian lighting manufacturer Arteluce, some of which also had ball-feet, and which were shown at the 1951 Milan Triennale and publicised in British journals such as *Architectural Design* earlier in the decade.

INDOOR GARDENS
designed by
R. C. HISCOCK



Imaginative Plant Rail Stand
 White with four
 Sprout Green' holders.
 Model HA10 at 74/- incl. tax.
 Stands in modern fireplace.
 A wall model on the same
 principle is also available.
*From most leading stores, or
 enquiries direct to:-*
HISCOCK, APPLEBY & CO.
 31a, Pavilion Road, S.W.1 SLO 5804

Figure 20 Advertisement for ball-footed Hiscock, Appleby & Co plant stand.

Despite the increasing prevalence of these objects in advertising, magazines and retail contexts, their life in this period is in many ways characterised by the notion that they were suited to the tastes of *someone else*. This is apparent not only in their reception by consumers (as we will see later), but also in the marketing and promotion of these furnishings. For example, they were frequently advertised as something consumers were not expected to buy for themselves: gifts. For example, Hiscock's advertised a ball-footed lamp as an 'original' and 'inexpensive' Christmas gift (they were frequently advertised as curious, 'original' novelties) (Figure 21). In 1953 even *Woman*, in a Christmas shopping guide, featured a ball-footed table lamp produced by Wireworms Ltd, a firm devoted specifically to ball-footed lamps with wiry tripod bases and lampshades made of 'contemporary' fabrics by textile manufacturer David

Whitehead (Figure 22)¹²⁶. From 1953 to 1956, Heal's advertised minor ball-and-rod furnishings (including a wall rack, umbrella stand and fire irons) in their annual 'Presents for Particular People' catalogue. There, Christmas shoppers, stumped for gift ideas for their 'most exacting friends' were promised a selection of 'presents of unusual character' (Figures 23 and 24)¹²⁷.

That ball-and-rod objects were marketed as gifts one might purchase for someone else suggests that the new middle-class consumer for these objects might not strongly identify with modernist design, which as mentioned earlier was the province of a relatively small segment of British consumers in the early postwar period. The Heal's catalogue, which presented ball-and-rod furnishings as potential gifts for 'your most exacting friends' reflects the notion that ball-and-rod objects were identified with someone of more discerning, 'sophisticated' or modern taste¹²⁸. 'Exacting' refers to a kind of distinction, such as the middle-class modernist taste the CoID deployed such objects to promote earlier in the decade through promotion activities such as the 1951 Festival.

¹²⁶ This research revealed no evidence of Wireworms in any publications after the late 1950s, suggesting the company did not outlive the height of the fashion for the ball-and-rod style. Additionally, like many of the smaller companies that produced these items, they have not left behind documentation of their postwar operations.

¹²⁷ Heal & Son Ltd, 'Presents for Particular People', 1953, p. 2.

¹²⁸ Ibid.

An ORIGINAL Xmas gift.
Contemporary, Exclusive
and Inexpensive.



Pedestal N. 210 Shade No. G17*

Price complete incl. Tax ... 34/10
Postage & Packing 2/6

Washable Shade with ribbon in
Snowdrop White, Red Spot on
White, Peach, Champagne,
Lemon and Cherry.

Pedestal, White Enamel with
ball feet coloured Cherry, Citron,
Willow Green.

H. C. HISCOCK LTD.,
55, Old Church Street,
Chelsea FLA 3915

Obtainable from all leading stores

Figure 21 Hiscock's ball-footed lamp advertised in 1953.

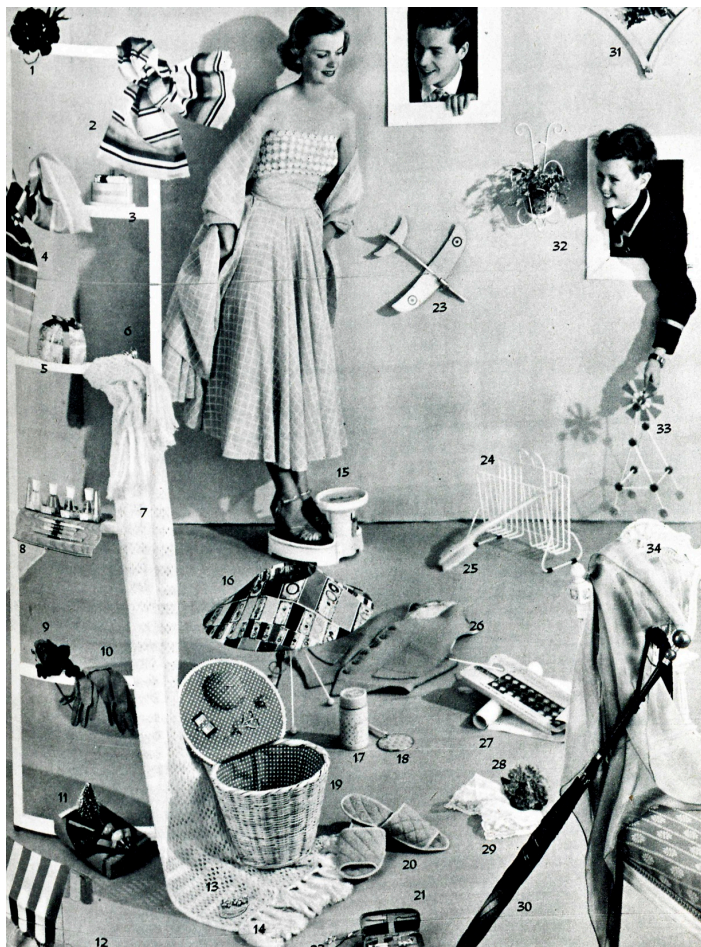
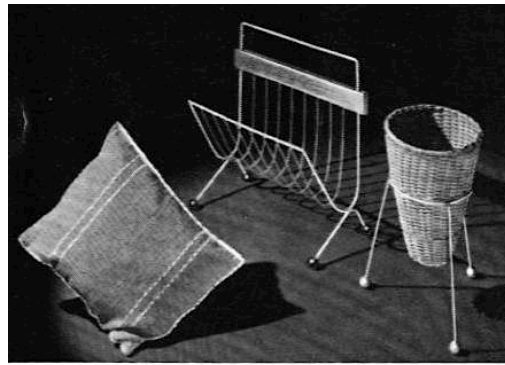


Figure 22 Wireworms ball-footed lamp featured *Woman* (1953).



COTTON CUSHION COVER, CM/S 480
Hand-woven in red, emerald or yellow, trimmed white ric-rac. 14" × 18". (Postage 1s.) £1. 17. 6

CUSHION (for above), CM/S 483
Filled with down and feather. 14" × 18".
(Postage 1s.) 10s. 6d.

WASTE PAPER BASKET, CM/MW 140
Wicker with black or red metal frame (15½" high overall). (Packing & Postage 2s.) £1. 8. 3

MAGAZINE RACK, CM/MW 96
White metal and natural walnut. 19½" high × 15" long. (Packing & Carriage 5s.) £2. 17. 9

Figure 23 Heal's catalogue featuring ball-and-rod furnishings (1953).

Heal's Striped Linen Tray-cloth, L229. In red, chartreuse, gold or green; can also be used as glass-cloth, trolley-cloth, or chair-back; 21 in. × 31 in.
(Postage 4d.) 5s. 9d.

Magazine Rack, CM/MW9810. For wall hanging; enamelled white, with red, yellow or black knobs
(Postage 1s. 1d.) 6s. 9d.

Individual Covered Casserole, P250. Denby 'Peasant' ovenware; pastel colours on grey ground
(Packing and postage 1s. 3d.) 7s. 0d.

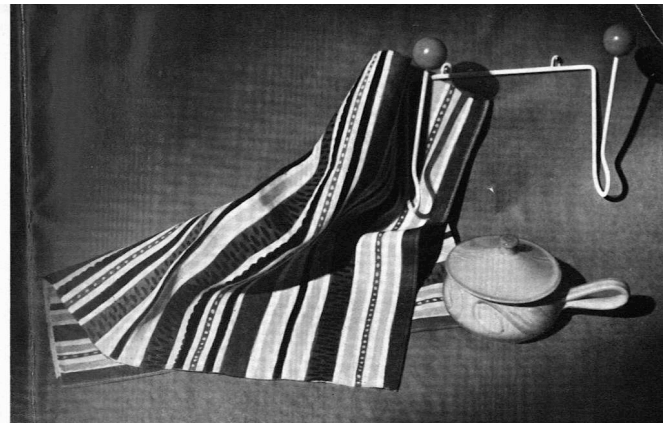
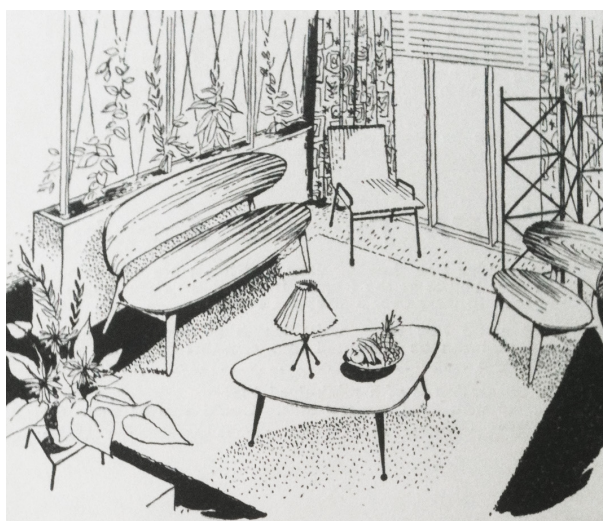


Figure 24 Heal's catalogue featuring ball-and-rod furnishings (1955).

The increased production and mediation of ball-and-rod objects beginning in 1953 was part of a larger rise in the marketing of mass-produced commodities in general at this moment¹²⁹. The ball-and-rod motif's dissemination was accompanied by the more frequent appearance in domestic designed objects of many conventions that came to be associated by consumers,

¹²⁹ Sweininger-Bargielowska.

manufacturers and retailers outside the CoID's ambit with the term 'contemporary'. These conventions include splayed legs on furniture, wire forms and ball-feet. For instance, the *Woman* feature above includes two other wire-frame objects, a magazine rack and toy (Figure 22). A 1953 advertising pamphlet for London's John Lewis department store pictures a ball-and-rod lamp atop a splayed-leg coffee table before a curved wooden 'flying saucer' settee in a sitting room with a wire-frame chair, hemmed in by indoor plants, which were another marker of the postwar modernist domestic interior mediated in advertising and women's magazines aimed at middle-class consumers (Figure 25).



There is always something new to see in this attractive corner of our Furniture Department on the Third Floor of the Cavendish Square building.

Our illustration depicts:

"Flying Saucer" 2-seater settee **£22 10s. 0d.**
 and matching armchair **£16 10s. 0d.**
 These are in walnut and beechwood.

Three-cornered table, in satin beechwood, with ebonised finish legs **12 Gns.**

Attractive iron screen by one of the foremost English designers **£9 10s. 0d.**

Cane chair with metal frame **6 Gns.**

There is also a matching stool, not illustrated, that costs **£2 9s. 6d.** Both by one of the foremost English designers of contemporary furniture.

The attractive little wrought iron lamp is **19/11** and the fluted shade in various colours is available at **26/10.**

Figure 25 John Lewis 'Shopping News' (1953).

The rise in consumption in the early 1950s stoked CoID officers' anxieties about market-driven design, especially as it concerned objects marketed as 'contemporary', such as those enumerated above. The increasing availability and mediation of ball-and-rod furnishings at this time made them a target for design reformers. In 1953 *Design* reported that the combination of 'knob feet' and 'steel rods' was 'part of the fashion trend' in furniture, and cautioned that 'Ball feet and bent metal rod are in danger of becoming a modern cliché if used without restraint'¹³⁰.

Coming from the CoID mouthpiece, the identification of the style as a 'fashion trend' is disparaging. 'Fashion' was a much-dreaded phenomenon among modernist design reformers. Fashion cycles are associated with consumption driven by ever-renewed novelty, what Roland Barthes dubbed 'neomania'¹³¹. CoID officials dreaded such novelty-driven mass consumption, which threatened the maintenance of the CoID's largely unpopular 'good design' standards. After all, the goals of 'good design' were underpinned by the modernist urge toward social reform through design, which involved a top-down pedagogical impulse and a corresponding distrust of a consumer-led market for furniture¹³².

Such concerns were at the heart of CoID anxieties about 'contemporary' that became palpable at this time. CoID reformers claimed 'contemporary' was, as Paul Reilly stated, a 'classless style'¹³³. But as soon as 'contemporary' was out of the hands of producers sympathetic to the elite middle-class modernist tastes of the CoID reformers such as Reilly and Russell, they saw it as vulgarised by mass market 'imitations'¹³⁴. The need to distinguish between different markers of taste bred a vocabulary within the CoID in which cheaper products with 'contemporary' characteristics, which were not necessarily bound by modernist aesthetic values, were called, pejoratively, 'repro-contemporary'¹³⁵. 'All clichés

¹³⁰ 'Outdoor Seats: A Competition for Manufacturers', *Design*, June 1953, 30-32 (p. 32); 'Review of Current Design', *Design*, November 1953, 20-21 (p. 20).

¹³¹ Roland Barthes, *The Fashion System*, trans. by Matthew Ward and Richard Howard (London: Jonathan Cape, 1985), p. 300.

¹³² Nigel Whiteley, *Design For Society* (London: Reaktion, 1993).

¹³³ 'Contemporary furniture and textiles look just as well in a Council house as in a West End flat, just as well in a City office as in a Chelsea studio', he wrote. Paul Reilly, 'Don't Be Afraid of Contemporary Design', *Daily Mail Ideal Home Book*, 1953-54, 126-130 (p. 130).

¹³⁴ Sparke, 'The Furniture Retailer as Taste-maker'.

¹³⁵ Reilly, 'Don't Be Afraid of Contemporary Design', p. 130.

will be seized on avidly and such features as tapered legs will be over-played', cautioned Russell in advice to consumers on identifying 'imitations' of 'contemporary'¹³⁶. In their post-1953 marketing as novelties, the 'original' form of the ball-and-rod furnishing was highlighted as a feature distinct from function, which marks a change from their roots in the CoID's didactic displays of functional yet 'pleasant' 'good design'.

The consumption of objects marked by such 'contemporary' conventions (or 'clichés' as CoID reformers saw them) was taken as evidence that the public had missed the point of 'good design'. To the self-appointed taste-makers at the CoID, these furnishings did not reflect the central moral dimensions of 'good design' that were driven by convictions about materials and workmanship. In 1953 Ernest Race complained that 'so many people [...] see the "Contemporary Style" merely as a fashion without understanding the logical and common-sense basis on which it is founded'¹³⁷. Reilly inveighed against such 'imitators' as the products of fashion's neomania:

So long as the furniture industry believes itself to be a fashion industry, so long as seasonal or annual novelty is the impetus in manufacture, the ideas of the conscientious designers will be distorted and caricatured. Imitators will seize on the superficial characteristics of their designs and work them to death, oblivious of the essential fact that good furniture is the product of honest workmanship, careful choice of right materials, considerate study of the consumers' needs and pocket, and only lastly of a sense for contemporary style.¹³⁸

Throughout the 1950s the CoID guarded a strict line of demarcation between 'contemporary' furniture acceptable to their taste in 'good design' and such so-called 'imitators' (some existing historiography on ball-and-rod furnishings described in the introduction to part two directly echoes this modernist value system). From this period through the end of the postwar commodity cycle for ball-and-rod furnishings, design elites no longer promoted the style. Their ambivalence toward it was expressed largely through silence during the remainder of the decade. The inclusion of ball-and-rod furnishings in

¹³⁶ Gordon Russell, 'On Buying Furniture', *Daily Mail Ideal Home Book*, 1953-54, 58-62 (p. 61).

¹³⁷ Ernest Race, 'Design in Modern Furniture', *Daily Mail Ideal Home Book*, 1952/3, 62-65 (p. 62).

¹³⁸ P.R., 'Beware Fashion in Furniture', *Design*, March 1951, p. 1.

publications devoted to ‘good design’ such as *Design*, the *Studio Yearbook*, and *Architectural Design* became increasingly infrequent and no text was devoted to them.

Now most mediators of ball-and-rod furnishings were positioned outside CoID circles. For example, at the 1954 ‘Daily Mail Ideal Home’ exhibition a ball-and-rod book stand was shown in a display interior and Wireworms occupied a stand where they sold ball-footed lamps (Figures 26 and 27). This exhibition, which had been staged annually at London’s Olympia since 1908 by the *Daily Mail* newspaper was, unlike the exhibitions of the CoID, largely commercially-driven and did not explicitly cater to a modernist taste in ‘good design’. The exhibition was at the height of its popularity in the mid to late 1950s, aimed at the lower-middle-class consumer (and consequently traditionally dismissed by design elites and modernist design histories)¹³⁹.



Figure 26 Photograph of display interior at 1954 ‘Daily Mail Ideal Home’ exhibition showing a ball-footed wireframe book stand on the mantle.

¹³⁹ Deborah S. Ryan, *The Ideal Home Through the Twentieth Century* (London: Hazar, 1997); Deborah Sugg, ‘Redefining Modernism: Ideal Homes at London’s Design Museum’, *The Journal of Museum Education*, 18 (3) (1993), 11-14.



Figure 27 Wireworms stand at the 1954 *Daily Mail Ideal Home Exhibition*.

In the mid-1950s the image of the ball-and-rod object (usually a lamp) became an aspirational symbol associated with the modern interior in advertising and advice literature. This is best illustrated through the deployment of the ball-footed table lamp in advice literature aimed at a ‘Daily Mail Ideal Home’ audience on achieving the distribution and variety of lighting points in the home (as opposed to the traditional single ceiling light) that was associated with modernist interior design¹⁴⁰. Broadcaster Jeanne Heal’s 1956 advice book *Planning an Ideal Home* encouraged spending the ‘£2 or so for new wall sockets, so you can really move the lamps around till you get a lovely effect at night of pools of light in the room’¹⁴¹ (an impediment to using table or standard lamps at the time was that most homes did not have many electrical outlets). A drawing of a ball-and-rod table lamp illustrates her text. The lamp itself is not discussed. Rather it functions on the page as a symbol of the aspirational middle-class modern interior the text describes (Figure 28).

¹⁴⁰ For example, in 1955 the architect J.M. Austin Smith recommended Wireworms’ ‘cheap and well designed’ table lamps to readers of the *Daily Mail Ideal Home Book* as an economical way to achieve this kind of interior. J.M. Austin Smith, ‘Light Affairs’, *Daily Mail Ideal Home Book*, 1955, 81-85 (p. 85). Advice literature recommending a distribution of lighting points includes: Jeanne Heal, *Planning an Ideal Home* (London: Associated Newspapers Ltd, 1956); M. Pleydell-Bouverie, *Daily Mail Book of Postwar Homes* (London: Associated Newspapers Ltd, 1944).

¹⁴¹ Heal, *Planning an Ideal Home*, p. 94.

Limitation of Points

Well I'd say give a lot of time to planning the lighting of your room. If you are unfortunate enough to have a house with only one ceiling point and one in the skirting you may still find it worthwhile scrapping the ceiling point altogether, and putting out £2 or so for new wall sockets, so you can really move the lamps around till you get a lovely effect at night of pools of light in the room where you need them most, and where they will make it look warm and friendly.

We were lucky in controlling how many points went into our house and it isn't very expensive if you put in quite a number too many when you are building, it's only when they become additions that they run away with the money. And we thought it worth spending a comparatively big amount on a few good fittings, and adding to the interest of the room with candlelight which of course costs

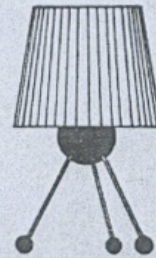


Figure 28 Page section from Jeanne Heal's 1956 *Planning an Ideal Home*.

In one of the few studies of the mediation of modernist design in Britain outside the context of the CoID's design promotion, Lees-Maffei argues, 'Advice writers were the unsung heroes of the attempt to reconcile British consumers with modernist designs' from the 1920s to the late 1960s¹⁴². The ball-footed lamp – or, more precisely, its image – was a part of this history of the promotion of modernist design in Britain to consumers who did not belong to the ranks of what Lees-Maffei calls the modernist 'early adopter'¹⁴³. This is part of the social life of ball-and-rod objects beyond their early CoID favour, a life charted more fully in the following sections.

The ball-and-rod 'boom'

In 1957 and 1958 the marketing and promotion of ball-and-rod furnishings peaked. This coincides with the so-called 'consumer boom': these years saw a sharp increase in consumer spending in Britain¹⁴⁴. Overall incomes increased; average weekly earnings rose 3 per cent in the second half of the decade, and

¹⁴² Lees-Maffei, 'From Service to Self-Service', p. 189.

¹⁴³ Ibid.

¹⁴⁴ Lawrence Black and High Pemberton, *An Affluent Society?: Britain's Postwar 'Golden Age' Revisited* (Aldershot: Ashgate, 2004); James Obelkevich, 'Consumption', in *Understanding Postwar British Society*, ed. by James Obelkevich and Peter Catterall (Routledge, London 1994), pp. 141-154 (p. 141).

working class earnings increased by more than 50 per cent¹⁴⁵. This period also coincides with the circulation of images of the Atomium, the launch of the Sputnik satellite (also a ball-and-rod form) and the first BBC science television programmes to feature crystallography models, but identifiable links or associations with science remain absent from the sources for these years.

Ball-and-rod furnishings became available more cheaply from 1957, and were marketed to consumers with lower incomes than they were earlier in the decade. Many sold for around £1. Consumers could acquire their own ball-and-rod magazine rack or plant pot even more cheaply by making one themselves using one of the kits advertised in *Do-It-Yourself*¹⁴⁶, a magazine reflecting the postwar popularity of do-it-yourself work around the home as a leisure activity among Britons of a range of class backgrounds (Figure 29)¹⁴⁷.



Figure 29 'Do It Yourself' magazine rack advertised in *Do-It-Yourself* magazine (1958).

¹⁴⁵ Marwick.

¹⁴⁶ The 1958 advertisement for the "Do It Yourself" Magazine Rack' features a kit costing fewer than 10 shillings (half a pound). The magazine also published instructions for making a ball-footed plant pot that year 'for less than ten shillings'. R.W. Harrison, 'A Plant Trough for Less Than Ten Shillings', *Do-It-Yourself*, July 1958, 692.

¹⁴⁷ Paul Atkinson, 'Do It Yourself: Democracy and Design', *Journal of Design History*, 19 (1) (2006), 1-10.

Woolworths was a major retailer of ball-footed items from at least 1958. A company report and photograph of a shop interior from this year show evidence of these items (see the photograph of a Woolworths display in figure 5 in the introduction to this thesis, and the 1958 Annual Report below in figure 30, which shows a ball-footed magazine rack). The company sold wall-mountable coat hooks, racks for storing records, and at least two kinds of ball-footed magazine rack¹⁴⁸. The ball-and-rod magazine racks Woolworths sold in 1958 continued to be stocked well past the 1950s, as the 1964 Woolworths display in figure 31 attests (the smaller white enamelled magazine rack with red ball-feet is barely visible under the 'occasional tables' sign). Paul Seaton, keeper of the company's unofficial archive, explained that these items 'stayed unchanged from the late fifties until the mid-sixties as the management concentrated on other areas'¹⁴⁹. This persistence is not necessarily suggestive of a great popularity of the style with consumers (who, as I explain later, had little choice when it came to purchasing ball-and-rod objects), but was instead due to a degree of ambivalence on the part of the retailer. During my interview with him, Seaton commented, of the ball-and-rod style, '[it's] important to you but it wasn't important to Woolworths at all'¹⁵⁰. In addition to communicating that Woolworths might not have devoted much energy to these products, this comment shows that Seaton was, like many interviewees for this research, struck by my apparent interest in these seemingly marginal items to which he had never devoted a second thought.

¹⁴⁸ Again, sources on this subject are limited. Woolworths did not publish a catalogue during this period and have no official archive. Consequently I have relied on other company advertising and internal materials, and interviews with Paul Seaton, who spent his career in managerial positions at Woolworths and is now a collector of Woolworths ephemera and the author of a history of the company.

¹⁴⁹ Email correspondence with Paul Seaton, 7 August 2013.

¹⁵⁰ Interview with Paul Seaton, 2 July 2014.

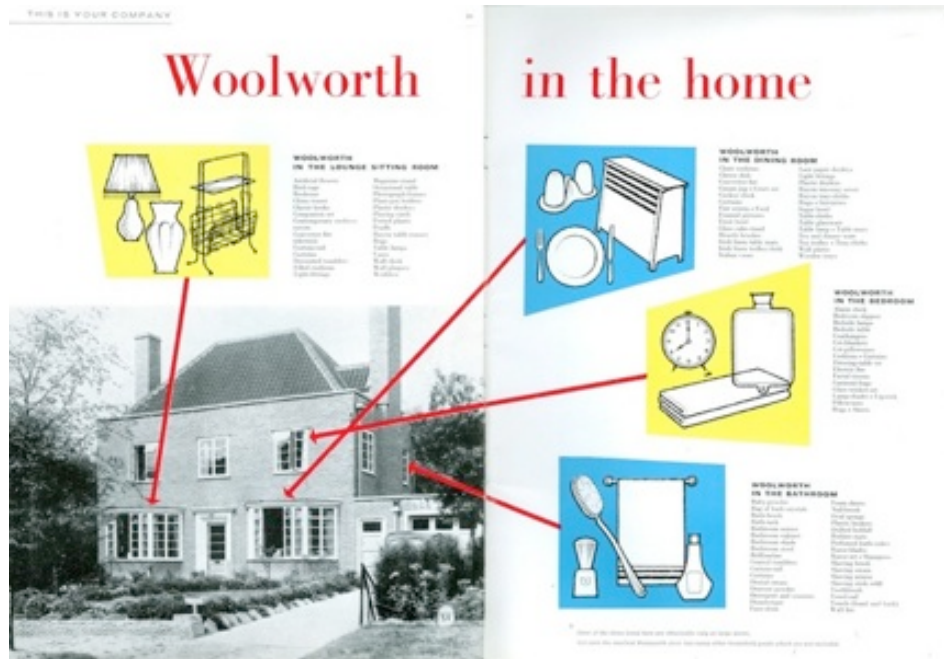


Figure 30 A 1958 Woolworths Annual Report picturing a ball-footed magazine rack with small shelf in the upper left alongside a lamp and vase.



Figure 31 1964 image of a Woolworths display. I have included circles indicating the location of white wire-frame and red ball-footed magazine racks.

It was probably financially worthwhile for Woolworths to keep ball-and-rod items on their shelves if they did so for so many years, but Seaton's point is that keeping them there required little investment of energy or resources on the part of the retailer. Readers Fancicraft Ltd of the Isle of Wight was Woolworths main supplier of 'wire-ware' by the late 1950s and therefore a likely

manufacturer of ball-and-rod items sold in Woolworths shops¹⁵¹. For such manufacturers, the production of ball-and-rod objects would not have required extensive new resources and tooling.

In the late 1950s, firms already manufacturing goods using materials or equipment suited to the production of ball-and-rod objects began to mass-produce them. Small manufacturers of metals and plastics took the opportunity to produce ‘contemporary’ products, a word which at this time denoted among other characteristics, ball-feet and wire legs. In his 1955 ‘mid-century survey’ of industrial design in Britain, design reformer Michael Farr commented on designs based on this kind of recycling of existing components in the context of complaints about the diminutive role of the staff designer in most firms. In his view many light fittings suffered from being designed by engineering draughtsmen who engaged in this kind of pastiche:

The problem of design is [...] similar to that in the cheap jewellery trade, where the designer has to create new patterns by juggling with stock components. I found that most draughtsmen prefer to use antique and modernistic styles, where the various scrolls and angles can be formed into an apparently endless series of ‘new’ patterns¹⁵².

The Peerage brassware firm, which advertised a ball-footed ‘contemporary style’ lamp in a 1957 issue of *Ideal Home* is one such example of a metal-ware manufacturer seeking to capitalise on this style, which was easy to configure out of simple components (Figure 32). Ball-and-rod objects were almost always accompanied by the term ‘contemporary’ by this time in consumer magazines.

¹⁵¹ Records for the manufacturer from this period no longer exist.

¹⁵² Farr, p. 64.

Buy only
the best
brassware for
your home

Every piece of "Peerage" Brassware in your home reflects your good judgment—your appreciation of beautiful things. Choose today from a thousand-and-one lovely "Peerage" designs and see that the name "Peerage" is on every piece you buy.

BOX SEATS from 77/6
TABLE LAMPS in contemporary style from 39/6
COMPANION SETS from 43/-

insist on
"Peerage"
BRASSWARE AT ITS BEST
NEEDS NO CLEANING
ACCEPT NO SUBSTITUTES

Look for the name **"Peerage"** on every piece you buy

FREE BOOK
Please send me a FREE copy of the "Peerage" new 16-page full colour booklet, "Symphony in Brass."

NAME _____
ADDRESS _____

To
PEARSON-PAGE-JEWSBURY CO. LTD.
(Dept. 9), Westwood Works, Westwood Road, Birmingham, 6.

23

Figure 32 Advertisement for a 'contemporary style' ball-and-rod lamp by the Peerage brassware firm.

Firms specialising in injection-moulded plastics also entered the market for affordable 'contemporary' furnishings in the late 1950s. Producing ball-feet using injection moulding had just become easy and cheap in the late 1950s. Britain's production of plastics increased throughout the 1950s, and in the second half of the decade, the cheaper and more versatile thermoplastics began to dominate over the older thermosetting plastics¹⁵³. Thermoplastics, such as

¹⁵³ Barbara Tilson, *The Development of the British Plastics Industry 1855-1990: Design, Manufacture, Applications and International Connections, Focusing on the Bakelite and Beetle Era 1920-1970* (Birmingham: University of Birmingham Centre for Urban and Regional Studies, 1999).

polythene, were better suited for injection moulding, the process through which plastic ball-feet were produced¹⁵⁴. The small Sussex plastics firm, Colplas Ltd, took advantage of this, advertising their injection-moulded polythene ball-feet ‘for use with furniture’ in iron and plastics trade journals from 1958 through the early 1960s (Figure 33)¹⁵⁵. Another plastics firm, Stewart Plastics of Surrey, produced household items with plastic feet in the late 1950s and early 1960s, such as the coal bucket (Figure 34) and fruit bowl (Figure 35) below.

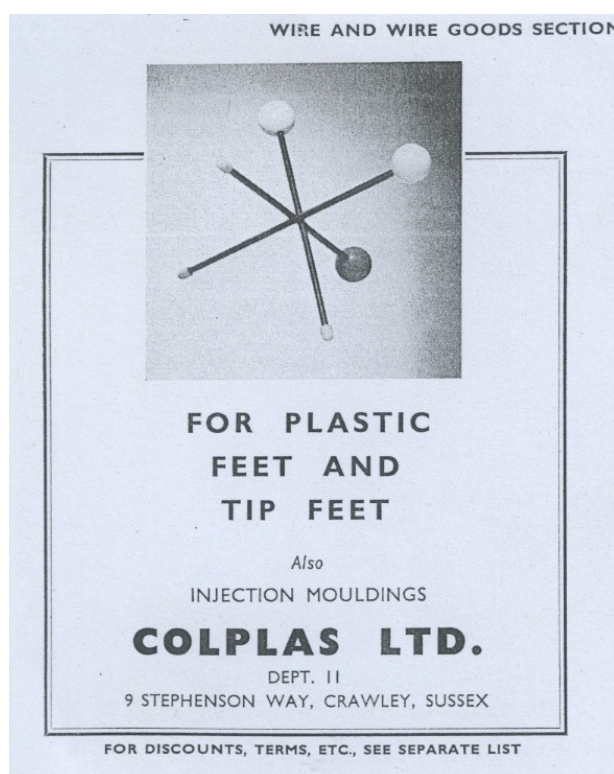


Figure 33 Colplas Ltd advertisement for plastic ball-feet (1960).

¹⁵⁴ Imperial Chemical Industries Limited, ‘Alkathene’ *Brand of Polythene* (Imperial Chemical Industries Limited, 1954).

¹⁵⁵ ‘Plastics Applications’, *British Plastics*, August 1958, 328-331 (p. 329).

The Stewart contemporary

COAL BUCKET



This lightweight, modern styled Coal Bucket is strongly made in the new *hard* polythene and is practically unbreakable. It is noiseless in use, and can be cleaned even in boiling water. The bucket has a chromium plated handle and rests in a robust, stove enamelled, matt black finish iron stand, with screw-on ball feet in colour to match the easy-grip bucket handle. Colour of handle and ball feet either red or yellow.

Price 29/11

Available at all good shops and stores.

In case of difficulty write for address of nearest stockists.

STEWART PLASTICS LTD
PURLEY WAY · CROYDON · SURREY · Telephone: MUNICIPAL 2231 (PBX)

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Figure 34 Stewart Plastics Ltd advertisement for ball-footed coal bucket (1960).



Figure 35 Stewart Plastics fruit bowl featured in the trade journal *British Plastics* (1958).

The use of plastic in ball-and-rod furnishings illuminates their shift in status by this time. The objects produced by these firms would surely have been considered ‘imitators’ by the design establishment. CoID-approved

‘contemporary’ designs never had plastic ball-feet, instead employing ‘honest’ materials such as wood, metal, or occasionally rubber, for these components. Plastics were linked with the ‘cheapness’ or ‘bad taste’ such design reformers associated with the new mass consumption¹⁵⁶. They were, as design historian Tom Fisher writes, the very ‘stuff of imitation’¹⁵⁷. The introduction of plastic feet is emblematic of the style’s exit from the sphere of more upscale consumption. (Additionally, the shift to more practical necessities, such as the coal bucket, in this period also indicates the intended consumer was of a lower income level). By this time ball-and-rod furnishings had vanished from Heal’s catalogues and in 1957, that high design icon of the ball-and-rod style, the Antelope chair, abandoned ball feet for minimal plastic tips.

Someone else’s style

The sections above explored the increasing production and mediation of ball-and-rod furnishings through the 1950s. The mediation, or even increased supply, of designed objects, however, does not necessarily reflect their status among consumers. To understand their postwar consumption, the analysis below draws upon oral interviews with postwar consumers of varied class backgrounds.

If middle-class design elites sought to distance themselves from what *Design* warned in 1953 was becoming a ‘modern cliché’¹⁵⁸, consumers of a range of class backgrounds were at best ambivalent about the style. Although many interviewees recognised the ball-and-rod style, noted its ubiquity in the period, or reported that they had owned ball-and-rod furnishings, interviews for this research revealed an overwhelming lack of enthusiasm for the style. The ball-and-rod style was frequently *someone else’s* style. That is, it was often identified by interviewees with the tastes of others, usually of a higher class, but not their own taste or their own class.

¹⁵⁶ Penny Sparke, ‘Introduction: On the Meanings of Plastics in the Twentieth-Century’, in *The Plastics Age: From Modernity to Post-modernity*, ed. by Penny Sparke (London: V&A, 1990), pp. 6-11 (p. 8); Claire Catterall, ‘Perceptions of Plastics: A Study of Plastics in Britain 1945-1956’, *The Plastics Age*, pp. 67-73.

¹⁵⁷ Tom Fisher, ‘A World of Colour and Bright Shining Surfaces: Experiences of Plastics after the Second World War’, *Journal of Design History*, 26 (3) (2013), 285-303 (p. 287).

¹⁵⁸ ‘Review of Current Design’, p. 20.

For working-class consumers, the status of ball-and-rod furnishings as a novelty or decorative object was cause to discount them on the grounds that they were not necessities. To some, these objects represented a kind of luxury they could not afford in the period: ‘we don’t need it. It’s an accessory we don’t need’, said one working class interviewee, enacting for me his probable response to these objects in the postwar period during the interview¹⁵⁹.

Working-class consumers’ ambivalence toward these objects was not only driven by financial concerns. Their ambivalence was rooted in class identity and associated coordinates of taste. Some working-class interviewees associated these objects with middle-class taste rather than their own. ‘Posh people had them’, remembered Frank, a working-class East Londoner:

You’d have seen them in vicars’ houses, clergymen’s houses, doctors’ houses. People - professionals would have something that in the drawing rooms and whatever. But the ordinary people, no¹⁶⁰.

Christine Atha has shown that much of the rhetoric of the British pre- and postwar design reformers was directed at improving the taste of the working classes specifically¹⁶¹. But working-class taste, like that of many British consumers, was not altered by the modernist ethics of the wartime Utility scheme or the CoID’s subsequent design promotion¹⁶². In his 1957 survey of British working-class life, *The Uses of Literacy*, Richard Hoggart wrote, ‘The world of many a middle-aged working class couple is still largely Edwardian, their living-rooms little changed from the time they equipped them or took them over from their parents’¹⁶³.

Yet it is not so easy to completely discount the working classes from the history of modernist design. The distaste of many working-class consumers for modernist design is certainly part of this history. Furthermore, some modernist objects crossed class boundaries. The Antelope is an example. Produced by a ‘named’ designer of high modernist furniture, it appeared in modernist industry

¹⁵⁹ Interview with Sam, 26 February 2013.

¹⁶⁰ Interview with Frank, 20 February 2013.

¹⁶¹ Atha.

¹⁶² Ibid.

¹⁶³ Richard Hoggart, *The Uses of Literacy* (New Brunswick, New Jersey: Transaction Publishers, 2006 [1957]), p. 16.

publications such as *The Studio* through the middle of the decade. But the Antelope chair was also used throughout the decade as public seating, so it was familiar to some of my working-class interviewees who lived in East London. One remembered encountering Antelope chairs ‘in cafeterias’, where their hard contours, while integral to the form and materiality praised by the CoID champions of ‘contemporary’, were modified for comfort: ‘they’d put a cushion on them and sit on the cushion’, she remembered¹⁶⁴. Another working-class East Londoner remembered sitting in one: ‘I think it was in a milk bar. Not comfortable’¹⁶⁵. And although the Antelope chair originally retailed for £4 15s, hundreds were sold off for £2 each at the South Bank after the Festival, meaning they were just about affordable for some middle-class consumers who might not otherwise have purchased high-end modernist design in 1951¹⁶⁶. Susan, a teacher living in Kennington, South London after the war, interviewed for this research, remembers purchasing one — but only after walking to the South Bank to save money. She too modified the Antelope: ‘You wouldn’t want to spend a whole evening in it. At one point I made some cushions to put on the top but they used to flip off frequently’¹⁶⁷. Inserted into the leisure and home lives of a broader class constituency, outside the remit of high modernist display, the Antelope was materially transformed: the cushions its users added amount to a kind of improvised upholstery, bringing it closer to the heavily-stuffed Victorian reproduction furniture popular with many consumers.

For Susan, the schoolteacher, the Antelope’s significance was connected to her memory of the Festival, and she kept the chair for decades before recently donating it to the V&A. Although she reported liking modern furniture, she felt no particular affection for the ball-and-rod style. In contrast to the Antelope chair, to which she attached nostalgic value, she remembered having owned a ball-and-rod magazine rack and coat pegs, but neither recalled how she had acquired *nor* discarded them. ‘It obviously wasn’t very important to me otherwise I would have remembered’, she said¹⁶⁸.

¹⁶⁴ Interview with Valerie, 14 February 2013.

¹⁶⁵ Interview with Sam, 26 February 2013.

¹⁶⁶ ‘Sale of Festival Souvenirs’, *Times*, 11 December 1951, p. 4

¹⁶⁷ Interview with Susan, 29 July 2013.

¹⁶⁸ *Ibid.*

Susan's lack of affection for the style was typical of middle-class interviewees, most of whom displayed a distinct lack of identification with ball-and-rod objects. At a group interview comprising people of varied middle-class backgrounds one woman dismissively declared that these furnishings were for 'toffs' – a derisive moniker for aristocracy that got the point across that she clearly ascribes the taste for the style to those of a higher class (echoing the working-class interviewees' conviction that these objects were for middle-class consumers)¹⁶⁹. Others simply recoiled at the sight of ball-and-rod furnishings. They remarked of the style, 'horrible, isn't it?'; 'grotesque!'¹⁷⁰.

The reception of ball-and-rod furnishings was thus inflected by class politics of taste, but not in the way one might expect: their dismissal by modernist design reformers was not attended by a strong desire for these objects by consumers of other class backgrounds. They transcended the often-cited taste gap between the modernist elite taste of the CoID and the majority of the consuming public in that they were almost universally unloved.

Only one interviewee clearly and definitively reported liking ball-footed furnishings in the past: William, the textiles seller and modern furniture enthusiast. He represents a very narrow demographic as a middle-class consumer with a particular interest in modern design (the rare modernist 'early-adopter', perhaps). Yet this did not translate into consumption, as even he did not report actually owning any ball-and-rod furnishings. So while there might have been a narrow band of middle-class consumer who did not recoil from ball-and-rod objects, strong feelings toward them were not in evidence in the interviews carried out for this research.

An important aspect of many consumers' ambivalence toward ball-and-rod furnishings is the lack of voluntary consumption of these objects. When I asked interviewees whether or not they liked ball-and-rod furnishings, I repeatedly received a reply that implied that *liking* them was not a relevant factor in their consumption: 'There weren't that many things to buy'¹⁷¹. Often a ball-footed version of a given household item was the only one available. Another

¹⁶⁹ Group interview at the Positive Age Centre, North Kensington, 3 June 2013.

¹⁷⁰ Ibid.

¹⁷¹ Ibid.

interviewee stated, ‘If you were lucky enough to have the new thing, it didn’t matter much what it looked like to me’¹⁷².

Overwhelmingly interviewees associated these objects with the *new*: ‘I just thought it was modern. New modern’, remembered one interviewee¹⁷³. But such novelties did not define the era for most people who lived through it. To my interviewees, ball-and-rod furnishings were not era-defining. Ambivalence toward these objects was such that it was difficult to keep interviews on the topic of these objects. When I brought up ball-and-rod items in interviews I sensed frustration on the part of interviewees, who were otherwise excited to talk about their memories of the period, that they were being asked about them. Even Seaton, an inveterate collector of historical ephemera, owned a ball-footed record stand in the period, but has not kept it. ‘Mine lasted more than forty years before being consigned to the dump’, he explained. For Seaton, the ball-and-rod record stand had no ‘historical interest’, as he put it¹⁷⁴. These objects do not have ‘historical interest’ for those who lived through the postwar era, because they do not embody their memory of the time. Often identified with a more privileged consumer, these objects represented a fantasy home occupied by *someone else* — perhaps the imaginary resident of the ‘ideal’ aspirational interior described in advice literature and conjured in advertising, but which conflicts with postwar memories.

When ball-and-rod furnishings entered the home, especially the more common marginal objects, such as the Woolworths magazine racks, they most likely resided not in the fantasy *Ideal Home* interior in which all the furnishings were up-to-date. More often, the natural habitat of the ball-and-rod object might be the shadowy corner next to a piece of heavy wooden furniture, where I found the ball-footed magazine rack (which resembles the ones sold in Woolworths) at my in-laws’ home. As mentioned earlier, Sparke has shown that in the postwar years even high-end retailers sold traditional furniture. And for everyone else, ‘it was simply a case of making do or of buying on the second-hand market’¹⁷⁵. ‘[F]reed from the bonds of Austerity’, Sparke writes, ‘it wasn’t long before the

¹⁷² Group interview at Warwick Open Age, West London, 12 August 2013.

¹⁷³ Group interview at Community Time Camden, Camden, North London, 9 July 2013.

¹⁷⁴ Email correspondence with Paul Seaton, 7 August 2013.

¹⁷⁵ Sparke, ‘The Furniture Retailer as Taste-maker’, p. 131.

public was clamouring once again for the bulky three-piece suites that it had coveted in the pre-War years'¹⁷⁶. This — the *past's own past* — is seldom the focus of historical accounts, in contrast to emphasis on an era's innovation. This dynamic has perhaps led to the disproportionate representation of ball-and-rod items in many accounts of postwar British design. This corresponds to David Edgerton's conviction that a history focused only on a period's innovations presents an incomplete picture of what was actually used. Yet so often, historians write histories of an era's novelties, rather than the history of 'things in use', as Edgerton has argued¹⁷⁷. The existing historiography on ball-and-rod objects presents the story of a novelty as representative of the experience of design and furniture in the period. This thesis undermines such narratives, presenting a history of the ball-and-rod object as a marginal innovation in the period of its production, and – in the next chapter – showing that a history of its use must focus also on the present.

The end of a commodity cycle, the beginning of memory

The postwar commodity cycle of ball-and-rod furnishings concluded in the early 1960s. By this point, the ball-and-rod motif had already been condemned among the design establishment, but in 1961, it was officially declared dead by *Design* magazine. The style was still alive at this time at the more affordable end of the market but this would have been, if anything, proof of its death for the CoID community.

The *Design* article in question is an assessment of the Festival ten years on by a number of design commentators, and reprises criticisms of ball-and-rod furnishings levelled by the design establishment in the early 1950s. John Murray, who had promoted 'contemporary' pattern design as the director of David Whitehead in the late 1940s and early 1950s (which was probably before their involvement with Wireworms) derided the decade's 'mass-produced 'contemporary with knobs on'', calling them 'Frankensteins of our unconscious making [that] have leered out at us from miles of misbegotten textiles and acres

¹⁷⁶ Ibid, p. 130.

¹⁷⁷ Edgerton, *The Shock of the Old*, pp. 212.

of jazzy carpets during the past decade'¹⁷⁸. Design reformers used 'jazzy' as a derisive term to register their distaste of mass-market products that were seen as catering to 'popular taste'¹⁷⁹. One of the commentators quoted at length in the article was a figure positioned outside CoID circles, Richard Hamilton. The designers and architects of his milieu defined themselves against the values of the CoID-centred design establishment, and Hamilton was critical of the conventional CoID/*Design* line that the Festival had a positive effect on British design. But on at least one point they agreed. Arguing for the Festival's negative influence in *Design*, he singled out one convention of the 'Festival style' for attack: 'thin rod structures often with balls at the terminations'¹⁸⁰. Hamilton claimed this sparked a 'disastrous perpetuation of the style in furnishing'¹⁸¹. His comment is illustrated with a photograph of a ball-and-rod umbrella stand possessing a nearly hyperbolic combination of ornamental attributes (Figure 36).

¹⁷⁸ 'FOB+10', *Design*, May 1961, 40-51 (p. 45).

¹⁷⁹ Atha; Hayward; Hebdige, p. 72; Pauline Madge, 'An Enquiry Into Pevsner's Enquiry', *Journal of Design History*, 1 (2) (1998), 113-126.

¹⁸⁰ 'FOB+10', p. 44.

¹⁸¹ *Ibid.*

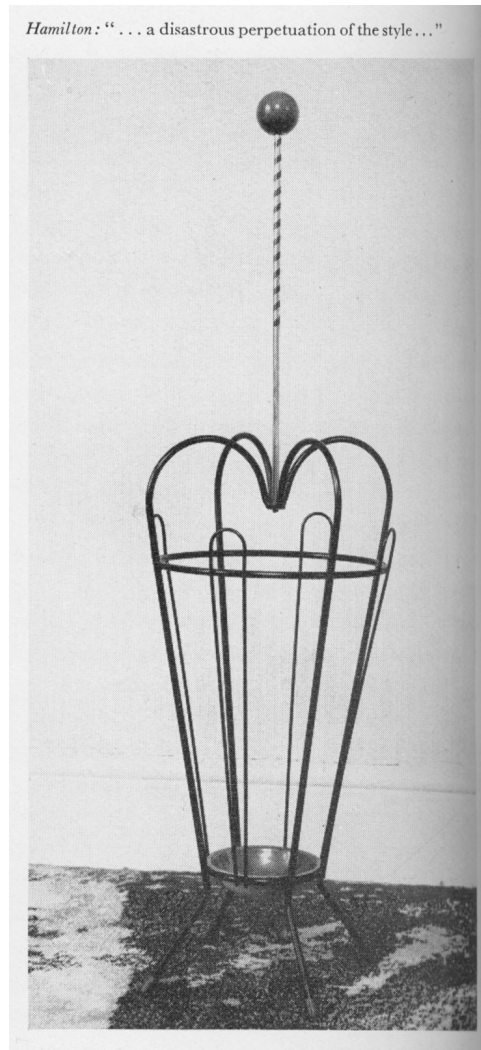


Figure 36 Ball-and-rod umbrella stand pictured in 'FOB+10'.

In this article, *Design* pronounced the style 'out'. And in doing so, the magazine actually printed the term 'molecule' in relation to the style for the first time:

molecule-type balls on rods are definitely *Festival of Britain* (=Out).
Space-type balls, however, are just as definitely In (=Way Out)¹⁸².

This captioned a dramatically enlarged photograph of a golf ball (Figure 37). The image acted as a gigantic full-page full stop, echoing the defining feature of the out-going fashion ('balls on rods'), and heralding its successor (the 'Way Out' celestial sphere).

¹⁸² 'FOB+10', p. 39.



Figure 37 Full-page photograph of a golf ball accompanying the article 'FOB+10'.

This pronouncement of the ball-and-rod style's death marks the beginning of its remembering, the first inkling of the retrospective view of the style as molecular. It was not, however, reflective of a larger reception of ball-and-rod furnishings as molecular at the time. The caption's 'molecule' reference was a loosely quoted comment by Hamilton; in the article he stated that the ball-and-rod construction was 'a sympathetic echo of the current delight in molecular models'¹⁸³. His phrasing, which spells out the connection he sees between ball-and-rod furnishings and the molecular (via molecular models), suggests that this was not a common association already in existence. Hamilton appears to be announcing a new insight, drawing a new connection to 'molecular models'. By 'current delight' Hamilton may be referring to the larger-than-life visage of the

¹⁸³ Ibid, p. 44.

Atomium. Or he may be referencing a less mainstream phenomenon (as a member of the Independent Group Hamilton represented a particular cultural niche of artists and designers who were in dialogue with scientists, so this ‘current delight in molecular models’ is not necessarily a widespread one).

This 1961 *Design* commentary is striking because it is not only the ball-and-rod motif that is so unceremoniously denounced as passé. Along with it, a *scientific* topic (the retrospectively identified ‘molecule’) is subjected to the same merciless dynamics of the fashion cycle as the ‘disastrous’ umbrella stand. Science becomes embedded in the coordinates of taste associated with design. This kind of retrospective glance, which merges science with style, is the subject of the next chapter as I follow the biography of postwar ball-and-rod furnishings into the present.

Conclusion

This chapter’s research into the postwar production, mediation and consumption of ball-and-rod furnishings problematises many aspects of existing histories of ball-and-rod objects. In the period of their production ball-and-rod objects were marginal and unloved (they did not even acquire a name). They were not mediated or widely received as ‘molecular’, and the history of their production is not adequately accounted for by the notion of ‘influence’ from contemporaneous scientific research. Below I discuss the ramifications of this chapter’s exploration of science-inflected design, but first it is important to note the contributions of this research that concern other aspects of postwar British design history.

The distinct postwar British history of these objects that emerged in this chapter brings this topic, not previously covered outside the frameworks of modernist design history-writing, into the arena of current design history discourse. An important way in which it does this is through the broadening of our view of these artefacts beyond the modernist emphasis on iconic objects. The social life of ball-and-rod objects described here is characterised in part by their production, mediation and consumption outside the realm of high-end production and the modernist ‘early adopter’. Furthermore, the iconicity of supposed

'originals' dissolves as I describe the distinct material and aesthetic contexts in which ball-and-rod objects were produced and mediated in postwar Britain.

This research in many ways presents a dramatically revised narrative of ball-and-rod objects, as I have noted throughout, but it is also essential to observe the ways in which it contributes to design history through confirmation of theories historians have put forth about industrial design in postwar Britain. For example, the argument that the ball-and-rod style is rooted in specific prewar modernist tropes in the lighting industry corresponds to more general observations in the historiography that aspects of postwar British design spoke to prewar modernism. The sources pertaining to ball-and-rod objects also confirm the historical claim that the taste of the British public was at odds with that of the CoID. This research contributes empirical confirmation of this claim, as interview methods illuminated questions of taste operating in the reception of ball-and-rod objects (including their reception among postwar working-class consumers, whose experiences are sidelined by modernist histories). Empirical research such as this that confirms general theory is undervalued, but it is important to the functioning of historical discourse, especially in areas such as the consumption of modernist design in postwar Britain, which has seen less published empirical research than one might expect.

A key outcome of this chapter is its problematisation of the existing narrative of ball-and-rod objects' scientific associations. This required marshaling an interdisciplinary set of sources and scholarly perspectives, and triangulating data pertaining to design history sources with those related to the history of crystallographic display in public in postwar Britain. This research indicated that the aesthetic regime in which these objects were originally produced – that of modernist 'good design' – eschewed imitative ornament (and that other factors describe the production of these objects more definitively than scientific 'influence'). Furthermore, research into postwar mediators and oral interviews with postwar consumers revealed that scientific reference was a nearly non-existent feature of the significance of ball-and-rod furnishings in the 1950s. This is corroborated by the finding that ball-and-rod objects were largely unloved by consumers generally. Their marginal presence in the period indicates that they would have been unlikely to serve as archetypes at the time of

contemporaneous scientific discoveries. That they probably did not signify molecular structure in the postwar period is also suggested by an additional finding. That is that the ball-and-spoke molecular form was not as widely disseminated in postwar British culture as a historical view of the period through the lens of the era's scientific innovation might assume. This chapter indicates that the mediation of molecular form through public display was not a constant feature of the postwar period, but rather, relatively minimal, especially until the end of the 1950s.

The topic of postwar British ball-and-rod objects is ultimately not literally an example of 'science in culture', because, as this chapter argues, evidence for links between these objects and scientific reference is nearly non-existent. This research is a valuable investigation within this strand of history of science research, however, precisely because it revealed the complex workings of science in culture. That ball-and-rod objects were not part of the experience of what Pandora and Rader have called 'science in the vernacular' by members of publics outside of scientific expertise in postwar Britain revises the historiography on these objects that suggests that they were. It required working with ephemeral sources, from interviews with consumers about what they thought about an object more than half a century ago, to the production of short-lived small manufacturers who have left little trace of their postwar activities. Consequently, absolute certainty is impossible to achieve. The investigation of ephemeral sources, however, simply corresponds to the ephemerality that so often characterises such interactions between fields and cultures themselves. As historian of science Katy Price acknowledges in her study of the British public's negotiation of Einstein's relativity theory in the 1920s and 1930s, ephemeral or 'fleeting' interactions between science and other cultural spheres are a feature of the history of science in culture, especially when it concerns the reception and negotiation of scientific knowledge in public¹⁸⁴. Any further interdisciplinary research on the production and consumption of science-inflected design will surely contend with ephemeral sources as well.

On the subject of such further research, this research prompts methodological reflections. This is because it suggests designed objects as a

¹⁸⁴ Price, *Loving Faster Than Light*, p. 9. Price quotes Gillian Beer on the "fleeting and discontinuous" encounters between literature and science'. Gillian Beer, *Open Fields*, p. 173.

subject for researchers of science in culture. Such inquiries can contribute to ongoing efforts in this research strand of the history of science to move beyond the limiting and outdated framework of the ‘diffusion’ or ‘deficit model’ of science in culture or science ‘popularisation’, which presents scientific knowledge as disseminated in ‘watered-down’ form to publics beyond scientific communities without consideration of the agency of those outside such scientific elites¹⁸⁵. A way to contribute to a fuller picture of science in culture is to examine the reception and negotiation of scientific knowledge in public in a way that studies ‘the reader or viewer as “active consumer”’, as historian of science Ralph O’Connor writes¹⁸⁶. Such a view enables inquiry into ways in which consumers of science are motivated by varied interests (other than or in addition to, for instance, gaining ‘accurate’ – according to a scientist – understandings of a scientific subject) and might understand and approach science in ways that depart from how a scientist or science communicator might do so. The topic of this chapter points to the possibility that the designer or consumer of designed objects might be just such an ‘active consumer’ of science. Historians of science do not currently work on science-inflected design. (In the same way that historians of design touch fleetingly on science, historians of science have not researched design as it is understood by design historians.) However, science-inflected design presents potentially productive subject matter through which to examine the reception of science outside of communities of scientific elites. Studies of design can offer an alternative angle in which the publics for science might be observed actively negotiating scientific knowledge and material forms outside the spheres of scientific practice and communication, through both the production and consumption of designed objects.

And finally, this chapter invites historiographical reflections. It is, in many ways, a record of my process of investigating the postwar life of ball-and-rod objects: from detecting unanswered questions in the historiography, to pursuing avenues suggested by these questions and by the sources themselves, to seeing the frameworks and explanatory models of existing narratives dissolve as

¹⁸⁵ Gregory and Miller, p. 87; Pandora and Rader, p. 352; Andreas W. Daum, ‘Varieties of Popular Science and the Transformations of Public Knowledge: Some Historical Reflections’, *Isis*, 100 (2009), 319–332; Cooter and Pumphrey.

¹⁸⁶ Ralph O’Connor, ‘Reflections on Popular Science in Britain: Genres, Categories, and Historians’, *Isis*, 100 (2009), 333–345 (p. 335).

a result. This arc of the chapter pertains to a larger argument. It points to a problematic reliance within the historiography on a historical category. The notion of ‘molecular’ design, although unquestioned, provides the interpretive frame for historians’ perspectives on ball-and-rod furnishings (numerous other categories deployed in the historiography in a tautological manner buttress this category including ‘contemporary’, ‘Festival style’ and the ‘Atomic Age’). It became clear through the research process that this is a retrospective category imposed on the postwar history of these objects.

This chapter’s empirical research on postwar ball-and-rod furnishings has problematised the existing historiography’s reliance on contemporary historical categories. The character of this empirical research parallels that which historian of science Jeff Hughes calls for in the context of an area of scholarship which has witnessed a comparable issue concerning the deployment of a historical category: ‘nuclear culture’. He writes, ‘Instances of ‘nuclear culture’ have been treated as free-floating entities whose meanings are presumed to have been as obvious to their audiences as they are to later historians’¹⁸⁷. Yet, like claims about ‘molecular’ style in postwar design, the claims concerning ‘nuclear culture’, Hughes observes, require further studies of ‘mechanisms of cultural production and circulation of particular cultural items or the specific circumstances of their reception and consumption in different synchronic and diachronic contexts’¹⁸⁸. This chapter (and the next one) take on this very kind of empirical research into ball-and-rod objects, examining the ‘mechanisms’ of their production and consumption, and how their lives, reception and significance changed over time.

The findings of this examination, so far, challenge the way in which these objects are categorised in historical accounts. But this does not mean that the identity of these artefacts as ‘molecular’ or ‘atomic’ must be dismissed, under the assumption that we now know their ‘real’ history. The present, that is, the period in which they *are* ‘scientific’, is an important stage in the life of ball-and-rod objects. That is the subject of the next chapter.

¹⁸⁷ Hughes, ‘What is British Nuclear Culture?’, p. 505.

¹⁸⁸ Ibid.

Chapter Four

Making ‘Atomic’ History: British Ball-and-Rod Furnishings Today

Introduction

The first commodity cycle of ball-and-rod furnishings ended in the early 1960s, as chapter three indicated. Although mention of these furnishings disappears from design history narratives at this point, the objects themselves, of course, did not vanish. Since the postwar period, many have languished in the homes of their postwar consumers, present but perhaps long forgotten like my grandmother-in-law’s magazine rack – hardly the object of passion. Others were cast out of the living spaces of their original consumers, consigned to the shed, the loft or the charity shop. But today, these furnishings have reappeared as commodities. Their recent re-emergence on the second-hand market began around 2008¹. It was coincident with the latest ‘retro’ revival of the 1950s among collectors and in popular culture, in which the period has been re-imagined through fashion, period television and film pieces, advertising, and through the consumption of postwar and reproduction ‘mid-century modern’ designed objects. Today ball-and-rod furnishings are much-sought-after ‘retro’ commodities in Britain, quickly snapped up by consumers eager to insert them into new twenty-first-century home lives. They are ubiquitous in vintage markets and online platforms for the consumption of second-hand commodities. They dot the domestic interiors of both committed collectors of postwar furnishings and those with a casual affection for ‘retro’ home accessories alike. A 2014 article entitled ‘Let’s Get Spherical’ in the UK-based *Vintage Explorer* magazine announced the

¹ It is difficult to specify exactly when ball-and-rod furnishings emerged as second-hand commodities in recent years, due to the ephemeral nature of forums for their exchange such as car boot fairs, temporary ‘retro’ markets and online shopping sites such as eBay (for which a publicly accessible archive of past exchanges does not exist). My dating of the re-emergence of ball-and-rod furnishings as commodities to approximately 2008 is based on queries made to ‘retro’ and vintage dealers, sellers and enthusiasts during the course of oral interviews carried out for this research (see Appendices for details on interviews) and further informal conversations with proprietors of ‘retro’ and vintage shops in London, Margate and Brighton. The estimate of 2008 for the beginning of the recent notable rise of ball-and-rod furnishings in Britain’s ‘retro’ market also corresponds to evidence of their return to the high-end auction circuit a year later with the appearance of Nelson’s ball clock in a 2009 catalogue for the Christie’s auction house. Christie’s South Kensington Ltd, *Twentieth Century Decorative Art and Design* (London: Christie’s South Kensington, 25 March 2009).

predominance of these objects as emblems of the most recent revival, proclaiming, ‘the design world [...] is again awash with atomic balls!’².

This chapter resumes the biography of postwar ball-and-rod furnishings in their current life as ‘retro’ commodities in Britain. It continues part two’s biography of these objects, which examines their shifting status and significance throughout their long history of use. I will argue that today, the resonance of postwar ball-and-rod furnishings with consumers is greater than it was in the period of their production. An aspect of their current resonance is their link with science today. This chapter shows that strong associations with postwar science, which are not evident in postwar sources, emerge only through their current use. Consumers and mediators identify ball-and-rod objects as ‘atomic’ and ‘molecular’, and as archetypes of the era of their production.

Key to their current status and significance as second-hand objects is the relationship of ball-and-rod furnishings to popular narratives of postwar history. I argue that as ‘retro’ commodities, ball-and-rod furnishings are embedded in the current popular memory of the postwar past and its science. The realm of popular memory consists in the beliefs about the past that circulate among publics beyond that of academic cultures of history research (although professional historians are not necessarily excluded from the realm of the ‘public’ of course). It typically contains numerous competing narratives about the past³. By historical ‘narrative’, I refer not to past events themselves, but their representation⁴.

This study is underpinned by the idea, as communication theorist Paul Cobley writes, that the creation of a narrative is ‘embedded in a network of relations’⁵. The popular narratives associated with ball-and-rod furnishings that

² Colin Pill, ‘Let’s Get Spherical’, *Vintage Explorer*, February/March 2014, 38-40 (p. 40).

³ On this conception of popular memory see Lucy Noakes, ‘Popular Memory, Popular Culture: The War in the Postwar World’, in *The Cambridge History of the Second World War. Total War: Economy, Society and Culture*, ed. by M. Geyer and A. Tooze (Cambridge University Press, Cambridge, 2015), pp. 675-697; Jerome de Groot, *Consuming History: Historians and Heritage in Contemporary Popular Culture* (Oxon: Routledge, 2009); Malcolm Smith, *Britain and 1940: History, Myth and Popular Memory* (Oxon: Routledge, 2000); *Realms of Memory: The Construction of the French Past*, ed. by Pierre Nora (New York: Columbia University Press, 1997); Raphael Samuel, *Theatres of Memory* (London: Verso, 1994).

⁴ On the distinction between the past and its representations through narratives, communication theorist Paul Cobley writes, ‘narrative ‘chooses’ to present some events and not others’. Paul Cobley, *Narrative* (London: Routledge, 2001), p. 6.

⁵ Cobley, p. 2.

circulate in British 'retro' culture are indeed shaped and solidified by numerous social relations. These include those shaping current mechanisms of second-hand commodity exchange, generational dynamics, and the interaction of popular memory with features of the current state of science in British culture.

This chapter argues that ball-and-rod objects are agents of the history of science, and of the postwar history of molecular structure research in particular. It shows that associations between postwar design and X-ray crystallography are more resonant and significant today – across popular memory and academic historiography – than in the postwar period. I will contend that today ball-and-rod objects are part of the history of the use and significance of postwar crystallographic visualisation in British material culture. Therefore an important point generated by this study is that popular material culture is a potential subject area for historians of science. It reveals 'retro' consumption as a site for the mediation of historical narratives about science, a subject that has not previously seen research.

The first two parts of this chapter investigate ways in which 'retro' consumption generates and solidifies historical narratives associated with ball-and-rod objects. They also explore the character of these narratives. This investigation focuses firstly on the display and exchange of postwar ball-and-rod furnishings on the online auction and shopping site eBay.co.uk, currently the most significant forum for 'retro' exchange. I argue that eBay is an agent in the construction of the historical narratives associated with these objects today. This chapter shows that it consolidates associations between ball-and-rod objects and science through the action of its software.

The second part of this chapter explores the meaning of ball-and-rod objects for those who live with, collect and/or sell them today. This analysis is based on oral interviews with consumers and sellers of 'retro' objects. It shows that the current elevated status, resonance and significance of ball-and-rod furnishings for 'retro' consumers is underpinned by present-day conditions. This point corresponds to a larger argument of this chapter: the past that is mediated by these objects today is inflected by the interests and concerns of the present.

The third section of the chapter expands beyond the specific focus on 'retro' consumption today. It explores the ways in which 'retro' consumption

intersects with the historiography on ball-and-rod objects and on postwar X-ray crystallography. I contend that the narratives associated with ball-and-rod objects in their current 'retro' commodity lives inflect their current historiography (introduced at the beginning of part two). This prompts questions concerning the relationship between so-called 'popular' or 'public' history (of which 'retro' consumption is a part) and academic history practice. Through these discussions, this chapter concludes the historiographical investigation that runs through part two.

'Retro' consumption as public history

In this chapter, the term 'retro' refers to the revival specifically of postwar styles (those of a 'long' 1950s, encompassing the late 1940s through the early 1960s)⁶. 'Retro' sometimes overlaps with the term 'vintage', but the latter is less tightly bound to 1950s period styles⁷. Within British collecting cultures, 'mid-century modern' also refers to designed objects of the 1950s and 1960s. It therefore overlaps with 'retro', but the term sometimes refers specifically to the work of named modernist designers⁸. All of these terms are, however, ambiguous in their use in the 'retro' culture described here, and all of them have been applied to ball-and-rod objects during their lives as second-hand commodities.

Most of this chapter focuses on narratives about the postwar past created and perpetuated today not through historians' texts, but through 'retro' culture and consumption. I describe 'retro' culture and consumption in this chapter as a site for the production and consumption of 'public history'. As scholars of public history observe, history is 'made' (or 'written' in a metaphorical sense of the word) through many activities and forms of cultural production, not limited to the penning of texts by historians working in academia⁹. The designation 'public

⁶ This is one of many meanings of the term 'retro' in operation in second-hand cultures and consumption today. Other senses of the term include its denotation of additional twentieth-century period styles. 'Retro' objects are distinct from 'antiques', which are usually more than 100 years old, but this designation is also unfixed. C. Eddie Palmer and Craig J. Forsyth, 'Antiques, Auctions, and Action: Interpreting and Creating Economic Value', *The Journal of Popular Culture*, 39 (2) (2006), 234-259 (p. 236).

⁷ Guffey, p. 9.

⁸ Baker, *Retro Style*.

⁹ *The Public History Reader*, ed. by Hilda Kean and Paul Martin (London: Routledge, 2013); Hilda Kean, 'People, Historians, and Public History: Demystifying the Process of History

history' encompasses history texts written for non-academic audiences (or 'popular' texts), public presentations of history through museum display, documentaries and films, historical re-enactment, and the 'making' of history by non-professional historians (those working outside of academic discourses). It also includes forms of consumption activities, such as the consumption of history through second-hand objects (the focus of this chapter)¹⁰. The term is more expansive than 'popular history' (which is conventionally associated primarily with texts and film media for a mass audience), and therefore suitable to the engagement with history discussed in this chapter¹¹.

Although applications of the term 'public history' include communication by 'professional' historians to passive lay audiences, I am primarily concerned here with public history created by non-professionals — a kind of bottom-up public history 'making'¹². Social historian and champion of public history Raphael Samuel wrote that if history was viewed 'as an activity rather than a profession, then the number of its practitioners would be legion'¹³. Samuel's sentiment underpins this chapter's examination. It locates the production of historical narratives in the activities of numerous people who do not identify as historians, such as 'retro' consumers, enthusiasts, dealers and online 'sellers'.

Implicit in the notion of bottom-up history production is a philosophy of history that conceives of it as narratives that are constructed and fluid. This take on historical narrative construction is aligned with postmodernist theory on history, in particular the work of historian Hayden White. His postmodern approach to history involved treating it as a subject of literary criticism open to analysis as other narratives might be. Viewed as such, White writes, professional historians 'have no exclusive claim over the study of the way in which the past

Making', *The Public Historian*, 32 (3) (2010), 25-38; de Groot; Samuel; Michael Frisch, *A Shared Authority: Essays on the Craft and Meaning of Oral and Public History* (Albany: State University of New York Press, 1990).

¹⁰ On the forms public history can take, see Kean, 'People, Historians, and Public History'; de Groot; Peter J. Fowler, *The Past in Contemporary Society: Then, Now* (London: Routledge, 1992); Ludmilla Jordanova, *History in Practice* (London: Arnold, 2000); Guffey; Samuel.

¹¹ The term 'public history' is also used more frequently in recent scholarship in an effort to leave behind the connotations of low status implied in the name 'popular history', reflecting the relative increase in the value placed on public history by some historians today.

¹² On public history made by non-professionals see Kean, 'People, Historians, and Public History'; Roy Rosenzweig and David Thelen, *The Presence of the Past: Popular Uses of History in American Life* (New York: Columbia University Press, 1998); Samuel; Frisch.

¹³ Samuel, p. 17.

and the present may be brought together in a comprehensive vision of historical reality'¹⁴.

The notion that 'retro' consumption and exchange are activities through which public history is produced underpins this chapter's methodology and arguments. It is an important way in which those who are not professional historians engage with history – and even develop narratives about the past. Samuel established this idea in 1994 when he suggested that 'retrochic', as he termed it, was one of the 'extra-curricular sources of knowledge', which sometimes 'create alternative histories of their own'¹⁵.

In addition to scholarship on public history, I draw upon key studies of 'retro' consumption and culture¹⁶. Sarah Elsie Baker's recent ethnographic study of 'retro' consumption in contemporary Britain is especially relevant due to its geographical and historical correspondences to my analysis¹⁷. My methodology is aligned with the conviction of such studies from social sciences that see consumption as a site for the making of the meaning of second-hand objects¹⁸.

Methodology and sources

This chapter's investigation of the consumption of ball-and-rod objects today proceeds from two principal angles: their online exchange and their social lives in the offline world. The first half of this chapter draws on research into the display of 'atomic' furnishings on eBay's UK site. The methodology for this part

¹⁴ Hayden White, *The Fiction of Narrative: Essays on History, Literature, and Theory, 1957-2007*, ed. by Robert Doran (Baltimore: Johns Hopkins University, 2010), p. x.

¹⁵ Samuel, p. 15. More recently historian Jerome de Groot has also made convincing claims for the role of activities such as 'retro' collecting as a form of public history. He observes the increasing role of what he calls the 'consumption of history' as a 'leisure' pursuit in popular culture since the 1990s (through activities including collecting and consuming films and historical fiction novels). See also Guffey's cultural history of 'retro' in which she writes that 'retro embodies a communal memory of the recent past'. de Groot, p. 2; Guffey, p. 26.

¹⁶ Most scholarship on 'retro' cultures and consumption emanates from social science research (with the exception of Elizabeth Guffey's cultural history of 'retro'). Key texts in this area include Baker, *Retro Style*; Sarah Elsie Baker, 'Retailing Retro: Class, Cultural Capital and the Material Practices of the (Re)valuation of Style', *European Journal of Cultural Studies*, 15 (5) (2012), pp. 621-641; Guffey; Angela McRobbie, 'Second-Hand Dresses and the Role of the Ragmarket', in *Zoot Suits and Second-Hand Dresses: An Anthology of Fashion and Music*, ed. by Angela McRobbie (Hampshire: Macmillan, 1989), pp. 23-49. I also draw upon Gregson and Crewe's ethnographic research on second-hand consumption (Gregson and Crewe, *Second-hand Cultures*).

¹⁷ Baker, *Retro Style*.

¹⁸ Baker, *Retro Style*; Baker, 'Retailing Retro'; Gregson and Crewe.

of the study reflects the fact that user interactions and the display of objects on eBay are driven by keywords (as I explain below). I focus on the operation of keywords in relation to ball-and-rod objects on the site, exploring the verbal tags sellers attach to ball-and-rod items and the categories in which they are indexed. My keyword analysis included a quantitative element: I studied the frequency of ball-and-rod objects in the results pages of searches using the keyword ‘atomic’ (gathering data weekly for a three month period) in order to derive a clear sense of the link between the term and these furnishings on eBay¹⁹. This is inspired by keyword analysis methodologies used within linguistics and computer science fields to conduct discourse analyses of social media²⁰.

The second section is based on oral interviews conducted in September 2013 with seven people who sell or have purchased postwar ‘atomic’ ball-and-rod furnishings²¹. They were contacted through networks of ‘retro’ consumers on Twitter and eBay, and in the case of a shop owner, in person. As an outsider to ‘retro’ culture, online methods of securing interviewees were most efficient and successful. Therefore my data largely reflects the experiences of ‘retro’ enthusiasts who participate in online consumption²². Although I do not claim it is wholly representative of the experiences of participants in British ‘retro’ culture, this aspect of my data corresponds to the character of much British ‘retro’ consumption today. Recent research on the topic suggests that online modes of participation are widespread²³. Additionally, the interview data is also largely reflective of modes of ‘retro’ consumption centring on cheaper (under £100), anonymously-designed ‘ordinary’ objects, rather than high-end objects of modernist designers, because this is where most consumption of ball-and-rod furnishings is situated.

¹⁹ This data is provided in Appendix 4.

²⁰ This research is, however, by necessity a smaller-scale study than such research that employs software for gathering and aiding interpretation of large data-sets. Ruth Page, David Barton, Johann Wolfgang Unger and Michele Zappavigna, *Researching Language and Social Media* (Oxon: Routledge, 2014); Paul Baker, ‘Corpus Methods in Linguistics’, in *Research Methods in Linguistics*, ed. by Lia Litosseliti (London: Continuum, 2010), pp. 93-114.

²¹ Further information on these interviews and on individual interviewees is provided in Appendices 1-3.

²² A more detailed introduction to the individual interviewees and their mode of participation in the exchange of retro commodities is included in the second section of this chapter.

²³ Baker, *Retro Style*.

1. Browser window shopping: eBay's 'atomic' narrative

Recently the centres for the exchange of 'retro' commodities have shifted from the car boot fair and the vintage or antique market to the Internet, where eBay looms larger than any other online marketplace in the UK²⁴. eBay's UK site, ebay.co.uk, on which this research focuses, has altered the way 'retro' objects are consumed in Britain. eBay has contracted geographies, provided a database of current prices for myriad objects, and, as I explain below, it has changed how sellers describe and categorise objects²⁵.

As a vast database of artefacts from the past accessible by almost anyone with an Internet connection, I argue in this section that eBay constitutes an important forum outside professional history practice for the production of historical narratives (although it has not been widely acknowledged as such)²⁶. eBay's historical narratives do not constitute history-writing in the traditional

²⁴ Baker, *Retro Style*. Launched in 1995 (originally as 'AuctionWeb'), the US-based eBay company was quickly established as a well-known site for the trade in collectibles (although its scope has since expanded). ebay.co.uk was established in 1999. Much of the site is devoted to the exchange of objects from the past. This is reflected by the fact that the eBay.co.uk menu of categories within which a user might search includes 'vintage/retro' under the parent category 'collectibles'. It is a platform for two kinds of exchange: objects are sold through auctions or through a fixed-price 'buy it now' option introduced in 2000. Overall, eBay has 128 million active users, and ebay.co.uk, which launched in 1999, accounts for 14 million of them. Andrew Cave, 'PayPal Fends Off Calls for Demerge From eBay', *The Telegraph*, 1 February 2014. Available at <http://www.telegraph.co.uk/finance/newsbysector/supportservices/10612216/PayPal-fends-off-calls-for-demerge-from-eBay.html>. Accessed 2 March 2014; 'eBay UK Facts and Figures', *eBay.co.uk*, Available at pages.ebay.co.uk/aboutebay/thecompany/companyoverview.html. Accessed 2 March 2014; Adam Cohen, *The Perfect Store: Inside Ebay* (London: Piatkus, 2002).

²⁵ Baker, *Retro Style*; Rebecca M. Ellis and Anna Haywood, 'Virtual_radiophile (163*): eBay and the Changing Collecting Practices of the U.K. Vintage Radio Community', in *Everyday eBay: Culture, Collecting, and Desire*, ed. by Ken Hillis, Michael Petit and Nathan Scott Epley (London: Routledge, 2006), pp. 45-61. In current 'retro' culture in Britain, even those who do not buy or sell on eBay use the site, as Baker points out. My research echoes this finding of Baker's ethnographic study of 'retro' consumption in Britain. Many of my interviewees were contacted through online platforms, so it is perhaps not surprising that in addition to buying and selling on eBay, my interviewees indicated that they also go to the site for information about 'atomic' objects. However, even a dealer I interviewed who does not engage in online commerce said he nevertheless uses eBay as a price guide, which indicates its significance in the 'retro' economy.

²⁶ eBay has seen very little scholarly attention as a potential influence on historical narratives. Although de Groot acknowledges the changing state of public history online and briefly acknowledges users' search patterns as sources of data on how publics engage with historical knowledge, he mentions eBay only in passing as one site for the collecting of objects from the past, noting that 'Auction websites such as eBay make the past easily purchasable' (de Groot, p. 67). The only research concerned with the construction of narratives on eBay is literary scholar Zoe Trodd's examination of historical narratives on eBay through analysis items' description fields (which is different type of narrativisation to the kind I will identify in this chapter). Zoe Trodd, 'Reading eBay: Hidden Stores, Subjective Stories, and a People's History of the Archive', in *Everyday eBay: Culture, Collecting, and Desire*, pp. 77- 90.

sense of the prose text or any other linear format. Nor do they represent a deliberate attempt to construct history. The narratives I identify on eBay are not linear, have no story arc, very few human historical actors (eBay of course being a universe populated mostly by inanimate objects), and no individual authorial voice. Instead, I argue, the historical narratives of ball-and-rod objects on eBay emerge from the interaction between the site and its users (buyers, browsers and sellers). eBay's identity as an archive that is also a computer application, a software for e-commerce, is crucial to understanding the way in which historical narratives are mediated on the site. Below I describe the narrative of the postwar period in which ball-and-rod objects are embedded on eBay, showing that they are mediated on the site as representatives of postwar science and as archetypes of postwar material culture. I demonstrate that the solidification of these aspects of the ball-and-rod object's narrative on eBay emerges from the way eBay functions as a technology that categorises and indexes them.

Solidifying scientific reference

Early in my research into postwar ball-and-rod furnishings, frustrated by their general absence in conventional archives and initially puzzled by their lack of scientific associations in postwar sources, I turned to the 'unofficial' archive that is eBay. I typed 'atomic' into the bar at the top of the webpage and clicked the blue 'Search' button. When the results flickered into view, I was faced with an abundance of coloured balls and thin metal rods shaped into magazine racks, coat hooks, rubbish bins, plant stands and other furnishings – the very objects that were so resistant to the word 'atomic' in period sources, and which were largely absent from conventional archives (Figure 1).





	Vintage Retro Magazine Rack 1950's White, Red Atomic Feet, Original Condition	2d 6h left Saturday, 20:18	£18.00 0 bids £25.50 <i>Buy It Now</i> + £8.00 postage
	Vintage Retro Atomic Atom Age 1950s Black Wire Magazine Newspaper Vinyl Rack		£27.99 <i>Buy It Now</i> + £5.49 postage
	Vintage 1950S/60S Atomic Sputnik Wall Mounted Coat Hooks	2d 7h left Saturday, 21:33	£35.00 0 bids + £5.50 postage
	Vintage 50s 60s Mid Century Atomic Mod Yellow Ceramic UFO Flying Saucer Egg Cups		£11.99 <i>Buy It Now</i> + £3.10 postage

Figure 1 Screenshot from first page of results of a search using the keyword 'atomic' on ebay.co.uk.

Whereas postwar sources reveal a lack of association between these objects and terms alluding to science, on eBay they are almost universally identified with the term 'atomic'. The results of searches for the term 'atomic' across the whole site or in the 'vintage/retro' category indicate this: nearly half of the items in the first 100 results for any search of the keyword 'atomic' are ball-and-rod objects, which constitute a larger proportion of the results than any other single type of objects in these sets of results²⁷.

The word 'atomic' has two meanings on eBay. On one hand, it is shorthand for the period itself, referencing the 'Atomic Age'. The category of

²⁷ As a result of eBay search experiments carried out between 2013 and 2015 testing the relationship between ball-and-rod objects and a number of keywords, I hypothesized that they are most strongly linked to the keyword 'atomic'. Between May and July 2015 I analysed the frequency with which ball-and-rod objects appear in results lists summoned by searches using the term 'atomic' through data gathered weekly throughout this three-month period. See Appendix 4.

objects revealed by searches using the keyword ‘atomic’ on eBay includes not only ball-and-rod objects (which, as noted above, are most prevalent), but also other now-archetypal 1950s and 1960s home furnishings. These include kidney-shaped coffee tables, glassware with starburst patterns, and furnishings with thin splayed legs. On the other hand, ‘atomic’ describes the ball-and-rod style specifically, and ball-feet are often singled out as ‘atomic’ (or ‘atomic feet’ as in the listing pictured in figure 2) themselves.

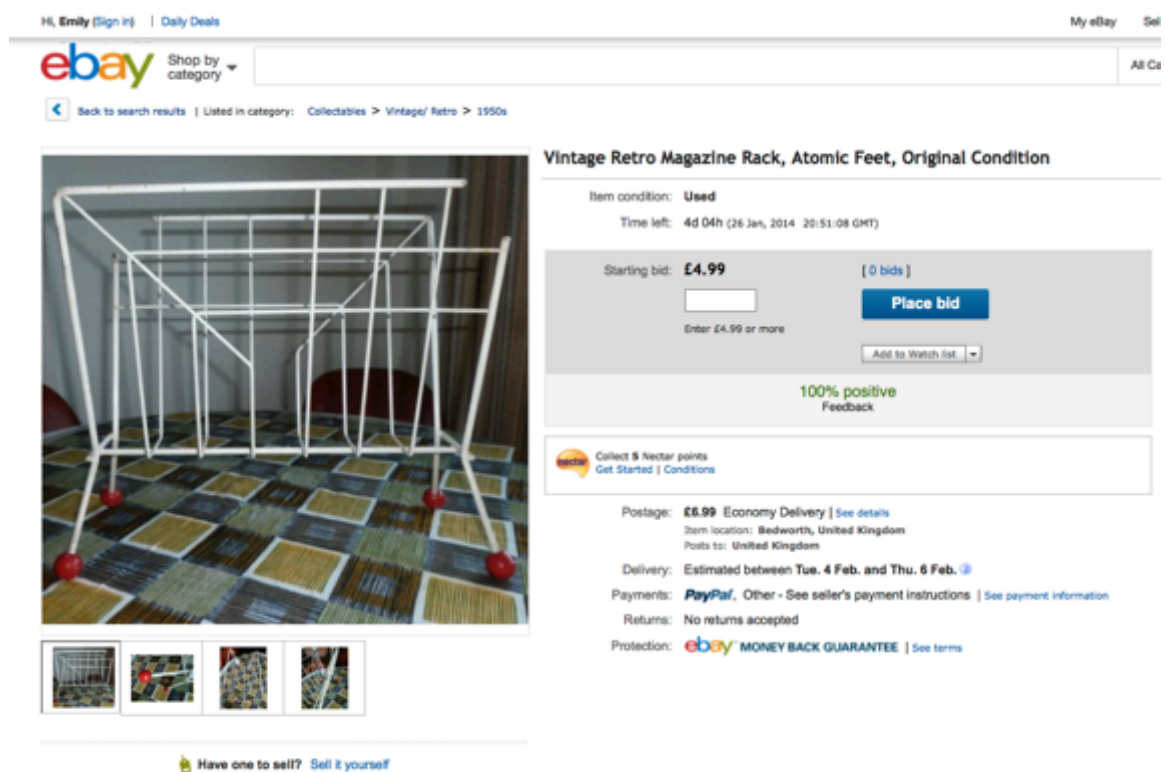


Figure 2 Screenshot of listing for ‘Vintage Retro Magazine Rack, Atomic Feet, Original Condition’ on ebay.co.uk.

Ball-and-rod objects have re-emerged as commodities before, during previous ‘retro’ revivals (in the mid-1970s, mid-1980s and late 1990s)²⁸. But they were not as indelibly attached to the appellation ‘atomic’ during these revivals as they are today. In the 1970s, for example, ball-and-rod objects had

²⁸ ‘Retro’ cultures of the 1970s, 1980s and 1990s included ball-and-rod furnishings among their ranks of 1950s artefacts as collectors’ guides and related texts intended at least in part for a popular audience indicate: see Marsh, *Collecting the 1950s*; Paul Rennie, *Miller’s 20th-Century Design Buyers Guide* (Kent: Miller’s, 2003); Madeleine Marsh, *Miller’s Collecting the 1950s* (London: Miller’s, 1997); Pearce; Greenberg; Horn; Hillier, *The Style of the Century*; Hillier, *Austerity/Binge*.

not yet been married to the adjective ‘atomic’. They were, instead, identified by the term ‘cocktail cherry’²⁹. There were nevertheless some suggestions in this decade that their form was related to molecular and nuclear science: the British critic Bevis Hillier surmised in 1975 that the ball-and-rod style referenced the ‘breaking-down of matter into atoms and molecules’, which he said were ‘often imaged by ‘cocktail cherry’ type models’³⁰. The following year, *A Tonic To the Nation*, the catalogue for an exhibition marking the twentieth-fifth anniversary of the 1951 Festival, contained William Feaver’s comment (quoted in chapter three) that ‘the molecule’ was an element of ‘Festival Style’, perhaps referring to ball-and-rod furniture³¹. This marks a change from the way the Festival was remembered even earlier that decade. In *Design*’s 1970 review of the Festival the FPG was noted as the source of ‘the snow crystal decorations produced by the CoID’³². This was the sole mention in the 1970 review of scientific form used in design at the event. Although scientific references emerged in association with ball-and-rod furnishings in the 1970s, textual evidence suggests that they were not strongly embedded in terminology for these objects at this time.

‘Atomic’ appears as an adjective for ball-and-rod objects in some collectors’ guides published in the 1980s. The term surfaces in Cara Greenberg’s influential collector’s guide, *Mid-Century Modern* (1984), in the caption to a 1950 ball-footed table lamp designed by U.S. designer James Harvey Crate, described as an instance of ‘early atomic design’³³. The following year design critic Richard Horn wrote that Nelson’s Ball Clock ‘recalls classroom models of molecules’³⁴.

Collectors’ guides published in the 1990s and early 2000s evidence similar scientific associations, but still do not see the strong solidification of a definitive term for ball-and-rod furnishings³⁵. ‘Cocktail cherry’ and ‘swizzle stick’ still described the motif in the 1990s, perhaps due to the use of the term in

²⁹ Hillier, *Austerity/Binge*, p. 159.

³⁰ Ibid.

³¹ Feaver, p. 54.

³² ‘Late 40s: Messages’, *Design*, January 1970, 56-59 (p. 56). This article also mentions ‘those thin lamp stands with little round blobs for feet’, referencing ball-and-rod lamps without any hint of scientific association (p. 56).

³³ Greenberg, p. 45.

³⁴ Horn, p. 98.

³⁵ Rennie, *Miller’s 20th-Century Design Buyers Guide*; Marsh, *Miller’s Collecting the 1950s*, pp. 35, 78; Christopher Pearce, p. 135.

Hillier's 1975 book, which is well known within British 'retro' culture³⁶. The 2003 *Miller's* buyer's guide, in some ways a precursor to eBay as a source for the current value of collectibles, uses no specific terminology at all for the style³⁷.

The link between the term 'atomic' and ball-and-rod objects on eBay today is stronger than in collectors' guides published during previous 'retro' revivals. This may be due in part to the way in which eBay has altered the mediation of 'retro' commodities. Baker argues that 'the way sellers describe objects on eBay and the search terms they choose change how retro objects and styles are categorized both on eBay and in a wider context'³⁸. She points out that 'brand' names, such as 'Eames', are used in a fluid fashion within 'retro' consumption today in a way, and with a frequency, that they had not been previously in collecting cultures³⁹. I argue that 'atomic' is one of these descriptors. It is deployed as though it is a 'brand' to denote a category of object. Indeed, an attachment of ball-and-rod furnishings to the word 'atomic' is evident in the most recent culture of 'retro' revival in Britain outside eBay as well, as evidenced by vintage and retro culture publications such as *Vintage Explorer* magazine (Figure 3), and collectors' guides (a 2009 *Miller's* guide references 'the rod and ball atomic-style', for example⁴⁰). Additionally, among the 'retro' collectors and sellers interviewed for this research (who are discussed further in the next section) the term 'atomic' was universally understood to refer to these objects. In fact, I found that I had to use this word in most cases to be understood as referring to ball-and-rod objects, as the phrase 'ball-and-rod' is my own term (devised in order to strip away present-day associations of these objects for the purpose of historical study).

³⁶ Marsh, *Miller's Collecting the 1950s*, pp. 35, 78; Pearce, p. 135.

³⁷ Rennie, *Miller's 20th-Century Design Buyers Guide*.

³⁸ Baker, *Retro Style*, p. 101.

³⁹ *Ibid.*

⁴⁰ Judith Miller, *Miller's 20th Century Design: The Definitive Illustrated Sourcebook* (London: Miller's, 2009), p. 146.



Figure 3 Cover of a 2014 issue of *Vintage Explorer* magazine announcing an article inside on 'Atomic homeware', represented by an image of Nelson's ball clock.

It is impossible to prove with certainty that eBay is solely responsible for the strong attachment between ball-and-rod furnishings and the appellation 'atomic' today, but it is clear that eBay's design facilitates and solidifies such strong linkages. This is due to the function of metadata on the site. Media scholars often glibly define metadata as 'data about data'⁴¹. It is the information

⁴¹ Lev Manovich, 'Metadating' the Image', in *Making Art of Databases*, ed. by Joke Brouwer and Arjen Mulder (Rotterdam: V2_ Institute for the Unstable Media, 2003), pp. 13-27 (p. 13).

attached to data online – images, websites, videos – that makes it searchable. Metadata emerges at the intersection of human and computer language. It must be readable by software, and the algorithms governing how metadata is searched determine what we see online when searching or browsing. The keyword ‘atomic’ is a piece of metadata, attached to ball-and-rod objects on eBay by sellers and used by the site to organise and categorise items, as I explain below.

Like any kind of marketplace, eBay has its own systems and conventions for displaying goods. Central to this is the way metadata operates in its database. eBay is largely software for handling metadata. This software indexes, searches and displays items based on tags, keywords, descriptions, price and geographical data entered by users so potential buyers can more easily locate desired objects. Not all metadata online is immediately visible to Internet users (such as the linguistic tags or format information attached to an image file accompanying a news article, for instance), but on eBay some metadata is in plain sight. This includes the titles accompanying items. The tag ‘atomic’ is this kind of metadata. It indexes items for use in searches. All the listings summoned by my search appeared because they had the word ‘atomic’ in their listing titles. eBay’s search engine trawls keywords in titles, rather than words in item descriptions⁴². These tags double as a tool for communication between sellers and potential buyers. Communicative tagging is an important element of the display strategy used by sellers, whose laconic burst (‘ATOMIC’; ‘GENUINE’) represent eager pleas to float items to the top of a results list and to catch the eye of the user faced with pages of auctions and myriad ‘Buy it now’ options⁴³.

Within this framework, a vocabulary of keywords has congealed around ebay.co.uk’s ball-and-rod furnishings. Most have many-barrelled titles, which reflect sellers’ attempts to squeeze in multiple tags (Figure 4). The following are examples of titles for ball-and-rod items: ‘Vintage Retro Magazine Rack, Atomic Feet, Original Condition’; ‘ATOMIC LAMP FINIAL MID CENTURY MODERN STYLE SPACE NEEDLE’; ‘Original 1950s Festival of Britain style

⁴² Michael Miller, *Tricks of the eBay Business Masters* (Indianapolis, Indiana: Que Publishing, 2008).

⁴³ According to advice published in the advice book *eBay.co.uk for Dummies*, ‘The most valuable space on eBay is the 45-character title of your item. Most buyers find what they want by doing a title search’. Marsha Collier, Jane Hoskyn, and Steve Hill, *eBay.co.uk for Dummies* (Chichester: John Wiley & Sons, Ltd, 2007), p. 192.

shop mirror 24"x14" molecular'. 'Atomic' is the most prevalent tag, appearing in the title of almost every ball-and-rod object. Other tags orbit the term including 'sputnik', 'retro', 'modernist', 'Eames', '1950s', '1960s', occasionally 'kitsch' or 'molecular', and terms advertising historical authenticity such as 'genuine'. Many of these tags reference notions of 1950s and 1960s period style (this is discussed further later).

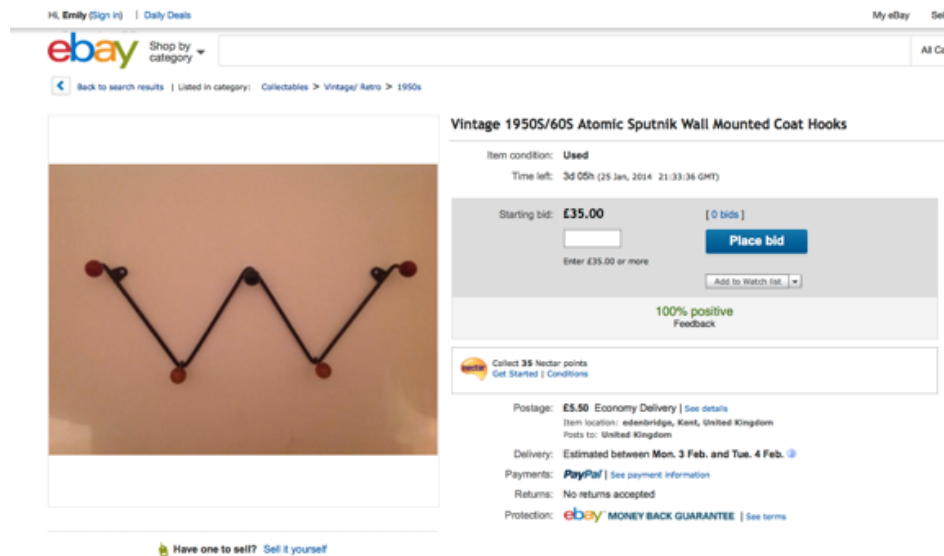


Figure 4 Screenshot of listing 'Vintage 1950S/1960S Atomic Sputnik Wall Mounted Coat Hooks'.

The preponderance of terms in the titles of ball-and-rod objects that evoke science advertises the notion that ball-and-rod objects manifest science-inflected ornament. The terms used also position ball-and-rod objects within an optimistic narrative of postwar science that is present in popular memory of the period today. Aspects of this narrative are mediated through the period's artefacts, such as the comic *The Eagle* that saw the intrepid space adventurer Dan Dare travel the universe with the aid of futuristic technologies⁴⁴. Here, period style is tethered to an analogous notion of what might be understood as 'period science'. Just as design histories based on notions of period style understand objects through a progression of styles indelibly linked with period more than

⁴⁴ On the popular forms and memory of postwar imaginings of a bright future of scientific and technological innovation see Barry Curtis, 'The Future', *Prova: Royal College of Art Humanities Research Forum Journal* (1) (October 2013), 102-111; Sean Topham, *Where's My Space Age?* (London: Prestel, 2003).

anything else (such as social or other historical factors), ball-and-rod objects on eBay are categorised and understood by a notion of period science – nuclear, molecular and space sciences – as heroic and optimistic. Titles such as ‘Gumball Atomic Space Age Magazine Rack’, suggest a golden age of technological and scientific discovery stripped of any inkling of danger or destruction that the ‘atomic’ might otherwise connote. In this case, scientific reference is instead accompanied by the happy-go-lucky ‘gumball’, another metaphorical descriptor for the ball-feet.

Literary critic Fredric Jameson wrote of a kind of popular memory of the postwar past (in the context of reflections on the postmodern condition as he saw it in the early 1990s) that is relevant here. He pointed out the distinction between ‘the realities of the 1950s’ and ‘the representation of that rather different thing, the “fifties”’, which operates in popular memory of the 1950s⁴⁵. Descriptions of ball-and-rod objects on eBay evidence what Jameson, in his observations of the nostalgic popular imagination of the ‘fifties’, called the period’s ‘own representation of itself’, which surfaces in popular memory⁴⁶. The eBay titles discussed above mirror the use of the word ‘atomic’ in postwar advertisements for mundane or trivial items (such as the advertisement for draught sealers presented in chapter three). The optimistic anodyne image of science in eBay’s titles for ball-and-rod objects also echoes features of postwar public exhibitions of science in Britain, such as those of the 1951 Festival. Specifically, as Forgan has shown, these exhibitions focused on science as safe and omitted references to its destructive applications. In this period, she writes, ‘Official institutions such as the Science Museum eschewed all mention of the bomb’ in discussions of atomic physics⁴⁷. The current uses of the term ‘atomic’ on eBay mirrors the tenor of period mediations of science in their presentation of postwar science as optimistic and safe. This usage is rooted in the nostalgia for an imagined past (such as the ‘fifties’) that suffuses many forms of popular memory. But the online display of ball-and-rod furnishings also corresponds to David Edgerton’s

⁴⁵ Jameson, p. 280.

⁴⁶ Ibid.

⁴⁷ Forgan, ‘Atoms in Wonderland’, p. 11.

observation of the history of technology that the ‘boosterism of the past has too often been turned into the history of our material world’⁴⁸.

The above discussion suggests that although metadata serves a practical purpose on eBay, it also has a narrative power. By carefully titling their auctions, sellers use metadata to limn backstories to objects. Literary scholar Zoe Trodd claims that the historical ‘narrativizing of objects’ is central to the eBay seller’s appeal to the buyer⁴⁹. Trodd’s essay on the exchange of *cartes-de-visite* on eBay focuses on the prose narratives written in the description fields for these items. Beyond individual item descriptions, however, and even without them, I contend that eBay exerts a narrative power by virtue of its operation as indexing and categorising software. Most ball-and-rod objects on eBay do not have extensive item descriptions detailing their history. But they are nevertheless narrativised, as sellers deploy narrative tools related to eBay’s function as an online marketplace. Tags such as ‘atomic’ serve as a fulcrum between seller and buyer. Guides to using eBay advise sellers to anticipate buyers’ search terms in their titles; conversely, an effective search involves anticipating sellers’ tags⁵⁰. This cycle in which sellers and potential buyers anticipate each other’s terminology serves to universalise the tags used. It also enlists consumers in the use of the language of mediators, such as the eBay site. This process engenders the wider circulation and recognition of terms such as ‘atomic’. It is an example of the phenomenon technology journalist Thomas Vander Wal originally described as a ‘folksonomy’. A portmanteau of ‘folk’ and ‘taxonomy’, the term refers to the language that develops around a piece of data online through repeated, collective user tagging⁵¹.

The language assigned to ball-and-rod objects on eBay thus articulates narratives in a way that simply was not possible in previous kinds of markets for second-hand items that were not word-searchable, such as vintage shops and car boot fairs. This leads to the universalisation and solidification of terminology for these artefacts, principally, the tag ‘atomic’. Today, scientific reference is resolutely embedded in their name, which was not the case in previous eras. This

⁴⁸ Edgerton, *The Shock of the Old*, p. 4.

⁴⁹ Trodd, p. 83.

⁵⁰ Miller, *Tricks of the eBay Business Masters*.

⁵¹ Isabella Peters, *Folksonomies: Indexing and Retrieval in Web 2.0* (Berlin: Walter de Gruyter GmbH, 2009).

association travels with objects as their images circulate online, and as I contend in this chapter, offline as well. The solidification of terminology on eBay, designed to lubricate commerce on the site, has in this case, also solidified ball-and-rod objects' associations with science.

Archetype and abundance

In addition to forging strong links between ball-and-rod objects and the 'atomic', eBay's categorisation and display of these furnishings presents them as archetypes of 1950s design and generates a sense of their ubiquity and abundance in the postwar period. These aspects of the historical narrativisation of ball-and-rod objects on eBay occurs through the site's indexing function, which results in the creation of lists – that is, the search results summoned by a given keyword.

As a mode of writing that rarely accesses the communicative powers of sentence structure, the list is easily dismissed as empty of argument or story. But the list is far from rhetorically innocent. Historians of science James Delbourgo and Staffan Müller-Wille reveal list-making as a practice of writing that is bound up with the organisation and creation of knowledge: 'The logic of the list is not that of prose or flowing speech. It does not derive from sentences composed of subjects, objects, and predicates'⁵². Instead, they write, 'its logic is spatial'⁵³.

On eBay, where history itself has become a commodity, a visitor need not even purchase any items in order to enjoy the sensation of consuming the past while navigating the results list and engaging with its 'spatial' narrative. Intended to be more than just a shop, eBay is designed as an 'experience', casting consumption as a form of pleasure or entertainment in the style of today's industries of the 'experience economy'⁵⁴. A user's interaction with the site through the action of scrolling brings one into contact with the materiality of the eBay experience. Scrolling (like strolling by window displays) involves a

⁵² James Delbourgo and Staffan Müller-Wille, 'Listmania', *Isis*, 103 (4) (December 2012), 710-715 (p. 711).

⁵³ *Ibid.*

⁵⁴ Ken Hillis, Michael Petit and Nathan Scott Epley, 'Introducing Everyday eBay', in *Everyday eBay: Culture, Collecting, and Desire* ed. by Ken Hillis, Michael Petit and Nathan Scott Epley (London: Routledge, 2006), pp. 1- 17 (p. 2).

constant imagining of consuming the objects glimpsed, of transferring them, filled out in three-dimensions to one's own living space⁵⁵. And it is not only the ball-and-rod umbrella stand or coat rack a buyer potentially consumes, but also an idea of the period in which it was produced, and its social life in that period.

A defining feature of the display of ball-and-rod 'atomic' furnishings on eBay, apparent when a user scrolls through the seemingly endless results list of objects, is their abundance. An eBay search of the 1950s 'Vintage/ Retro' category using the keyword 'atomic' yields hundreds of items, many of which are ball-and-rod furnishings, especially in the first several pages of results. The current prices of these items on eBay (which sets the standard for their price offline), compared to their cost in the late 1990s, suggests that they are more abundant on the 'retro' market today generally. Magazine racks are usually sold for between fifteen and forty pounds for instance, and wall mounted coat racks for between twenty-five and forty pounds. The 1997 *Miller's* guide prices a similar anonymously-designed coat rack at seventy to eighty pounds, indicating their price has dropped significantly⁵⁶.

The profusion of ball-and-rod furnishings on eBay generates a retrospective sense of their popularity in the postwar era, linking them indelibly to the era itself. Their abundance speaks less to their postwar popularity, however, than it does to the mechanisms through which they arrive on eBay. Social scientists Nicky Gregson and Louise Crewe argue that second-hand consumption 'includes the work of 'casting out' and giving away' as much as it involves purchasing objects⁵⁷. Such activities contribute to the way in which second-hand objects mediate the past. In this case, the generation that originally consumed ball-and-rod objects in the postwar period is passing away (a twenty-five-year-old in 1958, the height of the ball-and-rod 'boom', would be eighty-

⁵⁵ This aspect of online shopping is acknowledged explicitly by another online retailer, Amazon.com, which offers an 'in a room' viewing option for items in their fine art category to aid the browsing user's imagination of ownership. This function allows the user to see a given artwork for sale positioned in a domestic interior over a sofa or coffee table. 'Fine Art', amazon.com. Available at http://www.amazon.com/Art/b/ref=topnav_storetab_art_col?ie=UTF8&node=6685269011. Accessed 5 May 2015.

⁵⁶ Marsh, *Miller's Collecting the 1950s*, p. 78.

⁵⁷ Gregson and Crewe, p. 6.

two years old in 2015, one year older than the UK's average life expectancy⁵⁸). These marginal furnishings are rarely treasured as heirlooms or keepsakes. Instead they are shipped off to the charity shop or sold on eBay, where they join a collection of others just like them, their numbers generating a picture of their postwar popularity. As Trodd writes, on eBay, 'junk becomes a counterhistory'⁵⁹. This is past as what consumers from the period have discarded.

Another aspect of eBay's 'counterhistory' of ball-and-rod objects is their place in a vision of postwar material culture defined by its novelties. Scrolling through eBay's 'atomic' category represents a mode of engagement with history that differs greatly from encountering a ball-footed object in the home of a postwar consumer, such as my grandmother-in-law's magazine rack, which was surrounded by much older wooden furniture. It also differs from the space of the boot fair, where objects from different eras might share space. On eBay, as they drift upwards on the screen, ball-and-rod objects are cut off from the contexts that might have defined them in the past, and inserted into the broader constellation of items that sketch an image of the 'Atomic Age'. Instead of the heavy Victorian sideboard that might have once towered over a Woolworths magazine rack, on eBay the vertical repetition of balls and wire is more likely to be punctuated by other now-archetypical objects, such as a pineapple-shaped ice bucket (Figure 5). This is a picture of the past in which its own past is invisible; the artefacts of the 'atomic' category suggest the most unlikely of postwar homes, one in which everything is new.

⁵⁸ Office for National Statistics, *National Life Tables, United Kingdom, 2012–2014*, 23 September 2015. Available at http://www.ons.gov.uk/ons/dcp171778_416983.pdf. Accessed 26 September 2015.

⁵⁹ Trodd, p. 88.




	Vintage Atomic Coat Hook Rack / Hanger. 1950s/60s Plastic Balls Retro Gum Ball	1d 22m left Wednesday, 15:00	£10.00 6 bids + £6.00 postage
	Fantastic Vintage Retro Atomic 50s 60s Cocktail Drinks Cabinet Home Bar		£295.00 <i>Buy It Now</i> Courier
	Vintage Atomic Coat Hook Rack / Hanger. 1950s/60s Plastic Balls Retro Gum Ball	1d 22h left Wednesday, 15:00	£1.04 2 bids + £6.00 postage

Figure 5 Screenshot of part of a results list from an ebay.co.uk search using keyword 'atomic'. The middle image pictures a bar with a pineapple-shaped ice bucket on it.

Item photographs are key to the vertically-flowing narrative conveyed by the keyword 'atomic'. The photographic style demanded by eBay is rather banal; objects must be unaccompanied by 'background clutter'⁶⁰. But subtle set dressing is deployed at times, which in the case of ball-and-rod objects often involves signals of an imagined 1950s domesticity when it appears. Take for instance the paper doily placed beneath a ball-and-rod coat rack (Figure 6). The inclusion of signifiers of domesticity in eBay's images of ball-and-rod furnishings emanates from what Baker identifies as the 'increase in the value of domestic practices associated with the mid-century housewife within [British] popular culture'⁶¹. Here, this imagination of 'fifties' domesticity, a component of 1950s period style in 'retro' culture today, is woven into the display of the 'atomic' objects. As postwar archetypes on eBay today, 'atomic' furnishings thus subsume the domesticity of an imagined 1950s matter-of-factly with scientific reference.

⁶⁰ 'Take Photos of Your Item', *eBay.co.uk*. Available at <http://sellercentre.ebay.co.uk/take-photos-your-item>. Accessed 23 January 2014.

⁶¹ Baker, *Retro Style*.

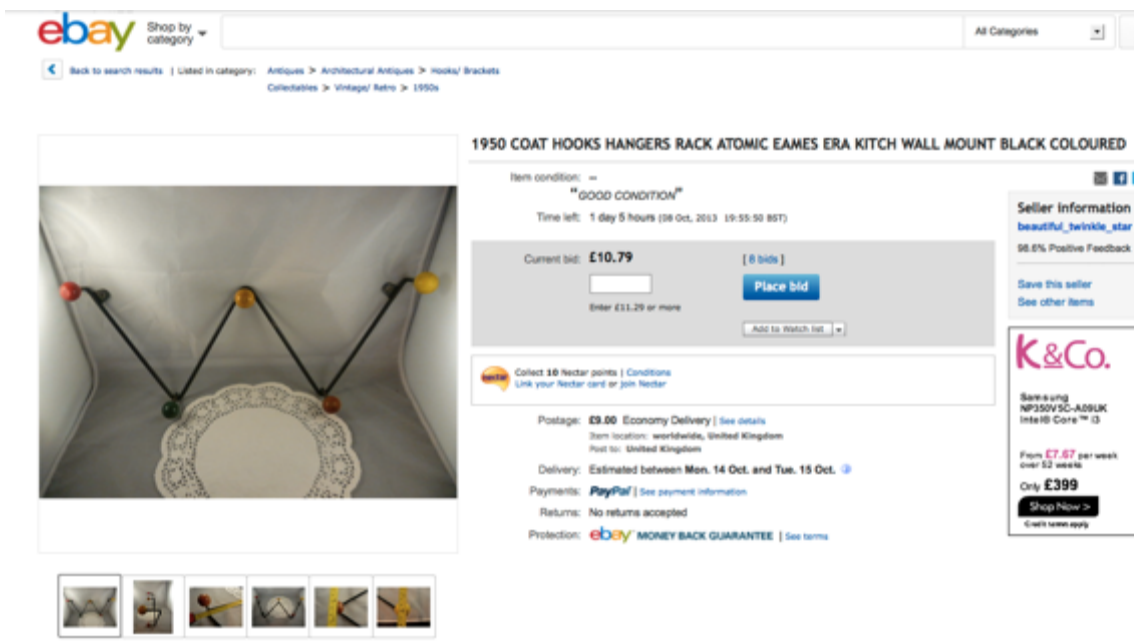


Figure 6 Screenshot of eBay listing for a wall-mountable coat rack. Accessed 7 October 2013.

The easy marriage of signifiers of domesticity with those of postwar science in eBay's narrativisation of ball-and-rod objects differs substantially from the narratives of postwar science in previous 'retro' revivals. In the 'retro' culture of the 1970s and 1980s, evocation of science focused on the atomic bomb, as part of a postmodern critique of the positivism and optimism of the 1950s, often juxtaposed ironically against saccharine images of domesticity and consumption derived from the postwar era's own advertising. Design historian Elizabeth Guffey presents an illustrative example: the English punk band The Clash's record cover design for their 1979 *London Calling* single pictures a young couple dressed in 1950s fashions and drawn in the style of postwar advertising illustration. They lounge in a pile of records (symbolising mass consumption) backlit by the atomic glow of a swelling mushroom cloud to which they are blissfully oblivious⁶².

Science – the nuclear atomic specifically – played the role of ironic foil in the visual design of 'retro' revivals of the 1970s and 1980s. If the flippant references to the bomb in the immediate aftermath of the war (noted in chapter three) veiled deep anxieties, the ironic stance of early 'retro' cultures intended to

⁶² Guffey.

unearth them. ‘Retrochic began life as an anti-fashion’, writes Samuel of this era of British 1950s ‘retro’, ‘winning a cult following by allowing for a return of the repressed’⁶³. The period’s scientific applications and innovations were positioned against signifiers of consumerism and domesticity from the period, in contrast to their matter-of-fact coupling on eBay today.

In sum, the above sections show that on eBay, ball-and-rod furnishings mediate a narrative of the postwar period that indicates a great shift in their status and significance. On eBay they are archetypes of postwar design, universally and indelibly tied to the descriptor ‘atomic’. Through the metadata to which these objects are tethered, their representation in photographs on the site, and the vertically-flowing narrative of the results lists in which they appear, on eBay ball-and-rod furnishings marry notions of period science (nuclear, molecular and space) with period style.

It may seem at first glance as though eBay’s laconic narrativisation of objects through keyword indexing and tagging results in the loss of a sense of the history of such objects. Baker suggests that on eBay, ‘it becomes harder to experience the past lives of goods’. She writes:

Although descriptions and images on eBay attempt to do this work, they are much more likely to be influenced by the conventions of marketing and advertising and mediated by the market than are face-to-face encounters in other spaces.⁶⁴

The contextualisation of objects on eBay is conditioned by the way marketing operates on the site, as I have demonstrated. The effect of eBay’s indexing and categorisation, however, is not to erase history. Instead, it generates a different kind of historical narrative from the more nuanced form of memory to which Baker refers when she writes of ‘the past lives of goods’. This corresponds to Paul Cobley’s observation, noted at the beginning of this chapter, that narrative is a form of representation ‘embedded in a network of relations’⁶⁵. On eBay, these relations are conditioned by the site’s lubrication of commodity exchange -

⁶³ Samuel, p. 91.

⁶⁴ Baker, *Retro Style*, p. 105.

⁶⁵ Cobley, p. 2.

by the dynamics of indexing, tagging and cataloguing that undergird the site's functioning. These dynamics enlist sellers, browsers and buyers in the mutual solidification of historical categories. As in the museum, on eBay the social lives of historical artefacts involves their submission to modes of categorisation that affect the kinds of narratives about the past in which they are embedded⁶⁶.

This is not to say, however, that the historical categories that ball-and-rod objects populate on eBay are not problematic. eBay classifies ball-and-rod objects by way of taxonomies such as 'atomic' (through the functioning of metadata's folksonomies) and '1950s' (one of the sub-categories of 'Vintage/Retro'). History through period style is enforced on eBay through the dynamics of the site's operation. As described in the introduction to this thesis, notions of period style constitute a limited lens for understanding an artifact. It relies on monolithic historical categories and excludes numerous historical contingencies (such as the social lives of objects).

Although eBay represents a significant forum (and force) in 'retro' culture, it cannot offer the full picture of the current meaning and social lives of ball-and-rod objects. Examining the narratives of ball-and-rod objects that are visible on eBay leaves open further questions about the social lives of these furnishings today. For example, the above analyses show that scientific reference is now indelibly attached to these furnishings through the tag 'atomic', which labels them both online and in the world beyond the Internet. But what does this word mean to the people who buy, sell and live with these objects today? Does it in fact evoke scientific associations, and if so, what kind? The next section reports on research into these questions, examining more deeply the significance of these furnishings for 'retro' consumers and enthusiasts today.

2. The loved object

This section explores the current status and meaning of ball-and-rod furnishings for enthusiasts, collectors and sellers of these objects today. It is based on oral interview research. While many aspects of the narrative of ball-and-rod objects

⁶⁶ For instance, in museums, historian of science Samuel J. M. M. Alberti writes, taxonomies and institutional systems of classification impact the 'exhibitionary narrative'. Alberti, p. 568.

purveyed on eBay are found here, I argue that in their social lives outside the Internet these objects are embedded in a more nuanced history of postwar Britain and the period's science. This section first explores the status of ball-and-rod objects as postwar archetypes for consumers today. It then discusses the nature of scientific reference perceived by consumers to be made by these objects. In particular, I interrogate the associations of ball-and-rod furnishings with period research on molecular structure, and current cultural conditions underpinning this association.

The seven interviewees whose voices shape this section represent several modes of participation in 'retro' culture and exchange, including those who run small online business, casual collectors and very committed collectors. Many straddle roles of 'collector' and 'dealer'/'seller'. This is because for interviewees who operate small businesses, online or otherwise, there is a fine line between their personal interest in collecting and their business selling objects. Additionally, for many collectors, selling a given item (on eBay for instance) that has been in one's home for a few months is a way of making space and funds available to collect new objects⁶⁷.

Archetypes of affluence and austerity

In the homes and everyday lives of 'retro' enthusiasts today, ball-and-rod objects function as contemporary archetypes of postwar material culture. This section describes how they mediate a picture of the period that accommodates notions of the era as both affluent and austere. This reveals the operation of generational dynamics and contemporary British cultural and economic conditions in the construction of narratives associated with ball-and-rod objects by their twenty-first century consumers.

Whereas postwar consumers interviewed for this research were almost universally unmoved by ball-and-rod furnishings, today their consumers are passionate about these objects. For example, describing searching for what she calls 'atomic items' at auctions and car boot sales, Melanie, a collector and online seller of 'retro' objects, said, 'I get really excited when I come across

⁶⁷ See Appendices 1 and 2 for further information on the interviews conducted for this research.

them. My heart skips a beat'⁶⁸. This is a type of passion for an object that Baudrillard describes as particular to the collection: 'the passionate pursuit of possession finds fulfilment and the everyday prose of objects is transformed into poetry'⁶⁹. Today they are *loved* objects.

The 'atomic' object's elevation in status is reflected by its physical placement in consumers' homes. More often than not interviewees' 'atomic' furnishings were smaller, peripheral, anonymous ones, such as the ball-footed Woolworths magazine rack pictured earlier (which was nearly ubiquitous), but they were rarely relegated to the shadowy peripheries of their contemporary consumers' homes. When I visited my interviewees in person or viewed photographs they sent me of their homes, I found 'atomic' objects on display. This is, in fact, how Christine (another collector and online seller) described the orchestration of 'atomic' furnishings in her house. She explained that although she uses them, they are also perpetually 'on display' (Figure 7). At the home of another interviewee, Ms Pink (her chosen pseudonym), who collects 1950s, 1960s and 1970s housewares as a hobby, a ball-footed magazine rack was located in the focal point of her living room next to the fireplace. Mary has been collecting 1950s objects and clothing since childhood, and has transformed her home (which she rents out for film, television and photo shoots) in accordance with her vision of the era. The ball-and-rod motif is also on display in her home; a large yellow-ball-footed plant pot greets visitors upon entering her house. This kind of placement and use within collectors' homes corresponds to what Gregson and Crewe have described as the 'transformative rituals' through which consumers exert agency in the revision of the status and value of second-hand items⁷⁰.

⁶⁸ Interview with Melanie, 6 September 2013.

⁶⁹ Jean Baudrillard, *The System of Objects*, trans. by James Benedict (London: Verso, 1996), p. 87.

⁷⁰ Gregson and Crewe, p. 145.

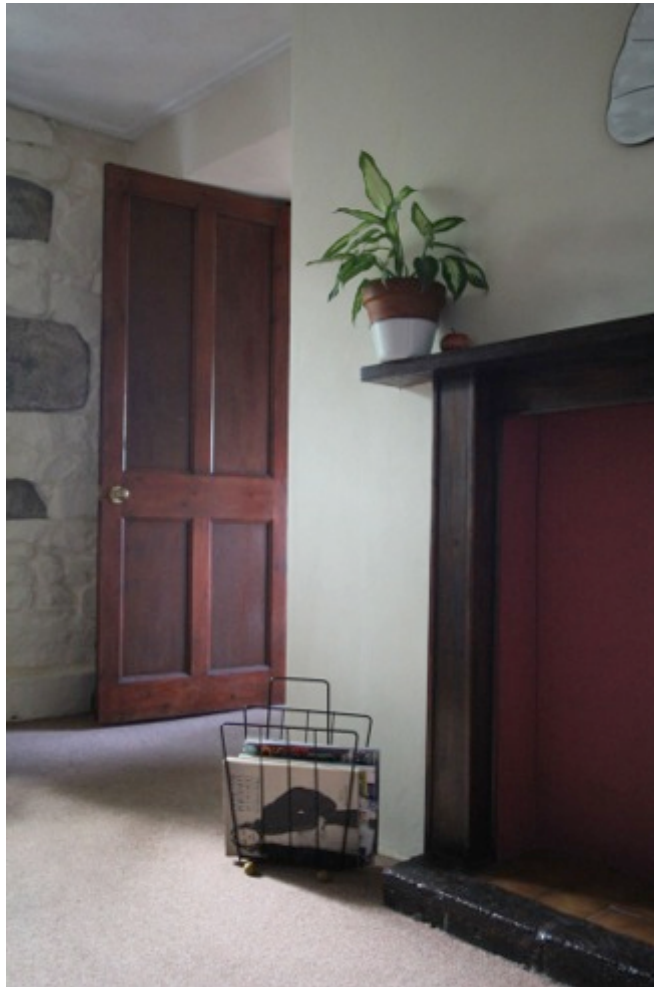


Figure 7 Magazine rack in Christine's home.

Ball-and-rod furnishings are a component of the imagined 1950s period interior. For Melanie, 'When you think of the 50s you think of those [ball-and-rod] items [...] The Eames style white room with palm trees and the odd thing like a clock or magazine rack. The odd hint of it here and there'⁷¹. Mary regards the ball-and-rod furnishing style as necessary to the creation of the totalised 'fifties' home that she not only lives in, but markets as an image for use in fashion spreads, films, album covers and commercials (most recently for Dairylea and Onken yoghurt, in which her English Rose kitchen advertised a form of 'fifties' domesticity). Transforming the semi-detached house in Watford in accordance with her favourite features of 1950s design and architecture took great effort. Every corner of her home/set must signal 'the fifties'. Mary remarked that the ball-and-rod motif 'plays a part everywhere. It's not

⁷¹ Interview with Melanie, 6 September 2013.

overpowering but it's there', she explained. 'It's incorporated into every aspect of décor'⁷².

At first glance, ball-and-rod furnishings mediate an imagination of an optimistic period shaped by an excitement in the *new*, as in the Atomic Age tableau presented on eBay. These objects operate as shorthand for the period in a similar way (Melanie even invoked the name 'Eames' in eBay's indexical style in the quote above). Ball-and-rod furnishings signify optimism for many consumers interviewed for this research; several interviewees described them as 'refreshing', 'futuristic', and signalling a bright era of scientific and technological discovery after the war. They also symbolise an imagined affluence of the 'fifties'. Our conversation about 'atomic' furnishings prompted Christine to look back to a time when she imagines 'everything was a bit new. Things were changing... You can imagine a guy or a family sat there in a real smoke filled house, him enjoying his cigar and they have all this amazing furniture around them'⁷³.

In this sense ball-and-rod furnishings appear to function as nostalgic objects. The quotes above manifest a longing for an imagined, better past, similar to what literary scholar Svetlana Boym describes as nostalgia's 'desires to obliterate history and turn it into private or collective mythology, to revisit time like space'⁷⁴. This kind of 'restorative nostalgia', as Boym terms it, is also at times associated with the collector⁷⁵. It speaks to Baudrillard's characterisation of the urge to collect objects from the past as regressive, as 'escape in time [...] as escape into one's own childhood'⁷⁶.

This does not fully describe the significance ball-and-rod objects hold for collectors today, however. My interviewees' reception of these furnishings as period artefacts is more complex, accommodating not only the imagination of a 'better' past, but also one marked by material deprivation. Several interviewees held onto multiple historical narratives at once. They followed descriptions of the mythology of the 'fifties' with acknowledgement that it is, as one interviewee

⁷² Interview with Mary, 17 September 2013.

⁷³ Interview with Christine, 6 September 2013.

⁷⁴ Svetlana Boym, *The Future of Nostalgia* (New York: Basic Books, 2001), p. xv.

⁷⁵ Boym, p. xvii.

⁷⁶ Baudrillard, *The System of Objects*, p. 80.

commented, an ‘idealised idea of what the 50s was like’⁷⁷. ‘I kind of think in real life it wasn’t like that at all’, pointed out another⁷⁸. They cited the austerity and poverty that marked everyday life for many in postwar Britain: ‘Poorer people would not have experienced the things you see in flashy magazines or movies or television. They’d be living in poverty, because it would be after the war, so people would not have been having much fun probably’⁷⁹.

For some interviewees, ball-and-rod furnishings therefore materialise the notion of postwar economic austerity in Britain. Ms Pink views her ball-and-rod magazine rack (which resembles the model sold by Woolworths in the late 1950s and early 1960s) as a reflection of the 1950s as an ‘austere time’, as she put it (Figure 8). ‘It looks very strict. I suppose the colours only nod to fun. I suppose they could be playful but I don’t see it as playful because it’s so heavy and black and metal’⁸⁰.



Figure 8 Ms Pink’s ball-and-rod magazine rack (she had moved it onto the table from its prominent place by the fireplace for the photograph).

⁷⁷ Interview with Robert, 13 September 2013.

⁷⁸ Interview with Charlotte, 12 September 2013.

⁷⁹ Ibid.

⁸⁰ Interview with Ms Pink, 20 September 2013.

Mary also sees ball-and-rod objects as the product of postwar austerity in Britain. She contrasted these objects, and the narrative of postwar economic hardship, with an imagination of the postwar US:

We've got friends who have done retro in different ways. We have friends who have done the American things and friends who have very British houses. In the British houses you see a lot more of that atomic stuff. Maybe because we had less. That was the main design thing. Because we had less money and everything was more watered down from the American all singing and dancing⁸¹.

In this context, Mary noted the entanglement of British and American references in 'retro' style, but noted, 'I associate the actual black wire with the balls with Britain' (due to its relationship to postwar Britain's economic conditions in her view)⁸². Thus in addition to contributing to an exuberant period interior, for some collectors the ball-and-rod form, somewhat paradoxically, also speaks to the economic austerity of postwar Britain.

In Mary and Ms Pink's association of ball-and-rod objects with austerity, their visions of the past mirror conditions of the present: following the 2008 debt crisis, Prime Minister David Cameron announced Conservative plans to implement a new 'age of austerity' in a 2009 speech⁸³. The word 'austerity' has since come to describe the state of Britain under the conditions of economic recession, in an echo of the postwar 'age of austerity'⁸⁴. Cultural studies scholar Rebecca Bramall identifies an 'austerity culture' in contemporary British popular culture and consumption – one that thrives on 'an analogy to be drawn between our post-recessionary, deficit-cutting times and Britain in an earlier age of austerity'⁸⁵. The evidence above indicates that in 'retro' culture, ball-and-rod furnishings are at times tied to the dual identification in British popular culture today with austerity of the present and the postwar past. Indeed the beginning of

⁸¹ Interview with Mary, 17 September 2013.

⁸² Ibid.

⁸³ Deborah Summers, 'David Cameron Warns of 'New Age of Austerity'', *Guardian*, 26 April 2009. Available at <http://www.theguardian.com/politics/2009/apr/26/david-cameron-conservative-economic-policy1>. Accessed 5 May 2015.

⁸⁴ Rebecca Bramall, *The Cultural Politics of Austerity: Past and Present in Austere Times* (Basingstoke: Palgrave Macmillan, 2013).

⁸⁵ Ibid, p. 37.

the ball-and-rod object's recent rise as a 'retro' commodity is coincident with the 2008 debt crisis.

The nuanced historical narrative described above, which accommodates both the mythology of the 'fifties' and the spectre of austerity, is informed by a generational dynamic as well. All the interviewees for this research are relatively young (in their twenties, thirties or forties). But their parents and grandparents provide reminders of a postwar memory that differs from that of the imagined 'fifties'. 'My mum said, our house in the 50s was nothing like this. And I said, well that's good because I'm not trying to recreate your house', remarked Mary⁸⁶. But like many interviewees, Mary is fully aware of the contrast between the experience of the 1950s she imagines in her home and the one her parents lived through. Several interviewees were also aware of the distaste that many of the postwar generation had for these objects, through their discussions about postwar home furnishings with older family members. 'My mum would hate this', said Mary's partner, also a 'retro' enthusiast who joined our conversation, 'It would remind her of her youth and Woolworths. She would say it was naff'⁸⁷. Charlotte, a 'retro' collector and eBay seller, echoed this: 'My parents – they were there [the 1950s]! They think it's rubbish. They think it's tat'⁸⁸. On this subject, 'retro' consumers possess knowledge of the postwar social history of ball-and-rod objects that does not appear in their historiography: postwar consumers' ambivalence towards (or outright distaste for) these objects, outlined in chapter three, was readily acknowledged by many of the 'retro' consumers interviewed for this research.

This section has described the shift in status of ball-and-rod furnishings that is evident in their social lives with 'retro' consumers today. They are objects with multi-layered meaning; the historical narratives of the postwar period in which they are embedded, and which they help to mediate, are inflected by current political and economic conditions, 'retro' fantasies of the 'fifties', and the generational dynamics affecting postwar popular memory. This nuanced engagement with the past through 'retro' consumption departs from the

⁸⁶ Interview with Mary, 17 September 2013.

⁸⁷ Ibid.

⁸⁸ Interview with Charlotte, 12 September 2013.

characterisations of ‘retro’ cultures advanced by much previous scholarship. In the narratives about the past that emerged from this research, we do not find the ironic stance towards the 1950s that Guffey describes as marking previous iterations of ‘retro’⁸⁹. This research also does not correspond to the elements of postmodern views of ‘retro’ advanced by Jean Baudrillard and Fredric Jameson that see ‘retro’ as draining historical meaning from artefacts through the perceived empty deployment of signs (in ‘retro’, Baudrillard wrote, ‘everything is equivalent and is mixed indiscriminately in the same morose and funereal exaltation’)⁹⁰. On this point, my research is in agreement with other consumption-focused work, such as that of Baker and Gregson and Crewe who see ‘retro’ and second-hand consumption as potential sites for the production of meaning⁹¹. The next section continues the excavation of the complex significance of ball-and-rod objects today, exploring their scientific reference.

Molecular memory

In contrast to the postwar consumers interviewed for chapter three, many ‘retro’ consumers interviewed for this research associate ball-and-rod objects with science. This section discusses the nature of these associations, focusing specifically on molecular themes that emerged in interview data. This aspect of the contemporary narrativisation of ball-and-rod furnishings comes in for detailed discussion below as it yields reflections pertinent to the overall explorations of this thesis concerning the uses of postwar crystallographic visualisation in material culture. I will argue that specific conditions of science in contemporary British culture underpin current links between ball-and-rod furnishings and science, and molecular structure particularly, in ‘retro’ culture.

This research approaches the contemporary ‘retro’ enthusiasts interviewed for this research as ‘active consumers’ of science who, as noted in

⁸⁹ Guffey.

⁹⁰ Jean Baudrillard, ‘History: A Retro Scenario’, in *Simulacra and Simulation*, trans. by Sheila Faria Glaser (Ann Arbor, Michigan: University of Michigan, 1994 [1981]), pp. 43-48 (p. 44); Fredric Jameson, *Postmodernism, or, The Cultural Logic of Late Capitalism* (Durham: Duke University Press, 1991).

⁹¹ Baker, *Retro Style*; Baker, ‘Retailing Retro’; Gregson and Crewe.

chapter three, might negotiate scientific knowledge in ways that would be perceived as inaccurate by scientific elites. Katherine Pandora writes,

Encounters with science in the everyday world can be multifarious, miscellaneous, overlapping, partial, and contradictory — in fact, *undisciplined*; so, too, experiences of technology, medicine, and science come mixed together in disparate ways as everyday matters⁹².

A relatively ‘*undisciplined*’ pool of postwar ‘period sciences’, much like that identified in my analysis of the display of ball-and-rod objects on eBay, marks their lives beyond the Internet as well. As it concerns the scientific associations with ball-and-rod objects that emerged in interviews, the boundary between space exploration, nuclear physics and molecular structure was at times fluid (like in the historiography noted in the introduction to part two, nuclear and molecular science are often conflated here too).

Within discussions of scientific topics that frequently manifested the ‘overlapping, partial, and contradictory’ qualities that might attend ‘science in the everyday world’⁹³, it is notable that several ‘retro’ enthusiasts interviewed for this research brought up molecular themes specifically in connection with ball-and-rod furnishings. Melanie said, ‘The ball feet are inspired by science – molecules and the rest of it’⁹⁴. Christine also noted associations with molecular models that were evoked for her by ‘atomic’ furnishings:

Definitely the whole atomic word is to do with atoms and they remind me of science lessons when you’re making the atomic balls. You had the tiny little balls and the little straight bits you had to connect to them⁹⁵.

Mary pointed to an iron ball-and-rod room divider in her home (a reproduction ‘retro’ object), noting it ‘has the molecular theme’⁹⁶. Robert, the owner of an East London mid-century furniture boutique said he has always associated ball-and-rod furniture with molecular form, and tied it to the postwar history of science.

⁹² Katherine Pandora, ‘Popular Science in National and Transnational Perspective: Suggestions from the American Context’, *Isis*, 100 (2009), 346-358 (p. 347).

⁹³ *Ibid.*

⁹⁴ Interview with Melanie, 6 September 2013.

⁹⁵ Interview with Christine, 6 September 2013.

⁹⁶ Interview with Mary, 17 September 2013.

He described ball-and-rod furnishings in terms of postwar research into the structure of matter:

I always think of it during the twentieth century when everybody discovered the atom and they were completely fascinated with just the way things were made on a miniscule level, and then it translated into the design later on in the 40s and 50s. I always think of little spindly legs with balls on the feet⁹⁷.

In addition to furniture, Robert also collects molecular models: ‘Actually they [the molecular models] look almost exactly the same as the little zigzag thing’, he said, referring to a ball-and-rod wall-mountable coat rack for sale in his shop.

DNA specifically emerged as an association with ball-and-rod objects in some interviews. When I asked Mary about the difference between ‘atomic’ and ‘sputnik’ (a descriptor sometimes used interchangeably with ‘atomic’ in relation to ball-and-rod objects), she explained, ‘Sputnik is space travel and atomic’s science – molecular, genes, technology’⁹⁸. By listing ‘molecular, genes’, Mary appears to reference DNA. On the topic of ‘atomic’ furnishings, Charlotte said, ‘The reason people might associate them with atomic things is that they look like the DNA structure in some ways’⁹⁹.

The evocations of molecular models and DNA structure point to the first of two ways in which the position of science in contemporary popular culture is a factor in the greater attachment of these objects to scientific forms today. This point concerns the contemporary status of the DNA structure. Art historian Martin Kemp includes the DNA double helix in his 2012 study of visual cultural ‘icons’, writing that the double helix is ‘the most reproduced image from any science at any period’¹⁰⁰. As discussed in chapter three, however, this mediation of the DNA double helix in popular culture was not coincident with the DNA’s structure’s 1953 discovery. DNA’s present iconic status largely developed in the decades after the 1950s. A factor in its current status is the fiftieth anniversary commemoration of the elucidation of the DNA structure, which took place in

⁹⁷ Interview with Robert, 13 September 2013.

⁹⁸ Interview with Mary, 17 September 2013.

⁹⁹ Interview with Charlotte, 12 September 2013.

¹⁰⁰ Kemp, *Christ to Coke*, p. 280. See also Anker and Nelkin, *The Molecular Gaze*; Harmke Kamminga and Soraya de Chadarevian, *Representations of the Double Helix* (Cambridge: Whipple Museum of the History of Science, 2002).

2003. Its prominence as what de Chadarevian calls ‘the most celebrated of all molecules’ was reaffirmed in Spring 2003 when the commemoration of the structure’s determination saw the heavy circulation of images of the structure in the press¹⁰¹. The current associations of ball-and-rod furnishings with postwar science reflect the effects of the commemoration of past scientific discovery (and the continued relevance of DNA to contemporary genetics research) more than they do the position of molecular structure research in popular British culture in the postwar period.

Whereas postwar science was a subject for critique in some previous iterations of ‘retro’ revival (outlined earlier in the chapter), interviewees for this research described a largely optimistic picture of postwar scientific discovery. An optimistic vision of postwar science was, for some interviewees, set in contrast with their perceptions of the current position of science and technology in society. For Charlotte, ‘atomic’ objects bring to mind incongruities between what she imagines was public optimism for technological innovation in the past and the current state of its development: ‘When people used to think about the future and they imagined what people would be doing now, everything’s advanced not as much as they thought it would’¹⁰². Similarly, Robert views the antique molecular models he collects as ‘a piece of naïve art. You can see the optimism in it. In a funny way there’s a little bit of sadness that goes with it as well’; ‘The good thing is that it was also just pure excitement about discovery. The bad thing is I think a lot of it was, maybe they created historically a lot more problems than they knew that they were going to create’¹⁰³.

This corresponds to the second way in which conditions of the present might inflect current narratives of postwar science in which ball-and-rod objects are embedded today. Interviewees’ statements echo a narrative about science in British society today found in anxious public conversations surrounding the state of scientific innovation in Britain. The past five years have seen a constant

¹⁰¹ Soraya de Chadarevian, ‘Portrait of a Discovery: Watson, Crick, and the Double Helix’, *Isis*, 94, (1) (2003), 90-105, p. 97; ‘The Art of DNA: Back to Bases’, *The Economist*, 24 April 2003. ‘The Art of DNA: Back to Bases’, *The Economist*, 24 April 2003. Available at <http://www.economist.com/node/1730781>. Accessed 5 May 2015; Martin Kemp, ‘Time Will Tell’, *Nature*, 422 (6930) (27 March 2003), 380.

¹⁰² Interview with Charlotte, 12 September 2013.

¹⁰³ Interview with Robert, 13 September 2013.

stream of headlines in the British press warning of the possibility of slow economic growth due to a shortage of skills in and workers available to fill jobs in science, technology, engineering and mathematics (or, ‘STEM’) fields¹⁰⁴. Holly Else, author of a recent *Times Higher Education* article on the subject, observed, ‘anyone who follows the news would think that calamity is just around the corner’¹⁰⁵. ‘Retro’ enthusiasts who contrasted postwar innovation with a present sense of decline or disappointment evidence a particular contemporary use of the past: that is, its use as a vehicle for introspection about the present and the future. Concerning this particular use of the past, Svetlana Boym writes of a ‘tradition of critical reflection on the modern condition’ in which nostalgia is a tool for reflection¹⁰⁶. ‘Reflective nostalgia’, Boym writes, ‘reveals that longing and critical thinking are not opposed to one another’¹⁰⁷. It accommodates contradictions and sets past and present in dialogue.

Wider mainstream manifestations of ‘retro’ culture and consumption in contemporary British popular culture also evidence associations between postwar design and the period’s investigations of the molecular world. Lifestyle media has in recent years played a significant role in disseminating ‘mid-century

¹⁰⁴ A 2011 report for the Department of Business, Innovation and Skills investigated what it called the ‘leakage’ of graduates of STEM subjects from the ‘pipeline’ into STEM jobs amidst what it reported was a high demand for STEM skills in the workforce. (Robin Mellors-Bourne, Helen Connor and Charles Jackson, ‘STEM Graduates in Non STEM Jobs’, Department for Business, Innovation and Skills, March 2011 p. 13). Examples of articles from British news sources reporting on related warnings of skills shortages since 2010 include Josie Gurney-Read, ‘STEM Skills Should Be ‘Integrated Across the Curriculum’’, *Telegraph*, 18 March 2014. Available at <http://www.telegraph.co.uk/education/educationnews/10706162/STEM-skills-should-be-integrated-across-the-curriculum.html>. Accessed 20 September 2015; Graeme Paton, ‘STEM Awards: Businesses Facing Major ‘Skills Shortage’’, *Telegraph*, 14 March 2014. Available at <http://www.telegraph.co.uk/news/science/science-news/10696388/STEM-Awards-businesses-facing-major-skills-shortage.html>. Accessed 20 September 2015; Josephine Moulds, ‘Shortage of Science Graduates Will Thwart Manufacturing-based Recovery’, *The Guardian*, 18 March 2013. Available at <http://www.theguardian.com/business/2013/mar/18/recovery-manufacturing-science-technology-graduates>. Accessed 20 September 2015; Hannah Richardson, ‘Warning Over Shortage Of Engineering Graduates’, *BBC News*, 1 October 2012. Available at <http://www.bbc.co.uk/news/education-19760351>. Accessed 20 September 2015; Anna Bawden, ‘Skills Shortage is Getting Worse, Bosses Warn’, *Guardian*, 18 May 2010. Available at <http://www.theguardian.com/education/2010/may/18/skills-shortage-worsens>. Accessed 20 September 2015.

¹⁰⁵ Holly Else, ‘Does the UK Really Need More Engineers?’, 6 March 2014. *Times Higher Education*. Available at <https://www.timeshighereducation.com/features/does-the-uk-really-need-more-engineers/2011723.article>. Accessed 20 September 2015.

¹⁰⁶ Boym, p. xvi.

¹⁰⁷ *Ibid.*, p. 49.

modern' style beyond subcultures of 'retro'¹⁰⁸. This includes mainstream popular guides to home decorating, such as the website *BBC Home*. The '1950s' page for *BBC Home*'s guide to 'period style' lists four key 'influences' upon the era's design. They include 'America', 'modernism', 'surrealism' and 'scientific research — the structure of DNA was discovered in 1953'¹⁰⁹. To adopt the 'look' of the 1950s readers are advised to 'look for accessories in black, white and red plastic coated wire, which usually have ball feet. Typical items include coat and plant stands, and magazine racks'¹¹⁰.

The link forged between postwar British designed objects and crystallographic visualisations in 'retro' consumption today is apparent also in the current status of the FPG. Although the mediation and commercial production of FPG objects was very limited in the postwar period, today they are well known and loved among 'retro' aficionados in Britain. FPG objects themselves are extremely rare (as so few were produced), so the group's patterns circulate primarily online as images. They surface on websites such as Tumblr and Pinterest. On these online platforms, users register and display their interests and tastes by posting images sourced from the web and from other users' caches of images (Figure 9).

In 2012 during the current cycle of 'retro' consumption, the textile firm Warner's, which had participated as a member of the FPG in 1951, put one of their FPG wallpapers into commercial production¹¹¹. This wallpaper pattern, based on the structure of nylon, featured prominently in promotion for the 2012 television series *The House the 50s Built*, broadcast on Channel Four (Figure 10). It positioned postwar 'molecular' design within a narrative inflected by a nostalgic celebration of postwar innovation. The programme promised to reveal the 'ingenuity and life-changing technology behind the 1950s inventions that

¹⁰⁸ Baker, *Retro Style*.

¹⁰⁹ 'Period Style: 1950s', *BBC Homes*, updated October 2007. Available at http://www.bbc.co.uk/homes/design/period_1950s.shtml. Accessed 16 February 2014.

¹¹⁰ Ibid.

¹¹¹ 'Warner Textile Archive release Marianne Straub wallpaper', *Cover Magazine*, 16 July 2012. Available at <http://cover-magazine.com/blog/2012/07/16/warner-textile-archive-release-marianne-straub-wallpaper/>. Accessed 19 May 2015.

launched drab, black-and-white postwar Britain into a Technicolor-drenched world of the future'¹¹².

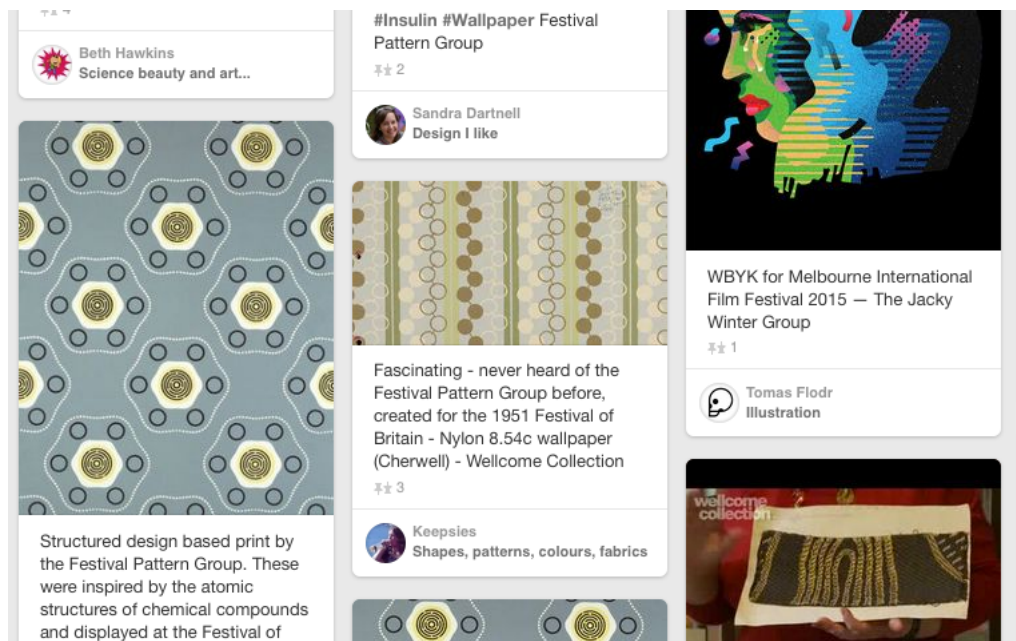


Figure 9 Screenshot of a page on the website Pinterest showing results of a search for users' posts based on keywords 'Festival Pattern Group'.



Figure 10 Publicity image accompanying Channel 4's description of the programme *The House the 50s Built* featuring presenter Brendan Walker in front of Warner's FPG wallpaper pattern.

¹¹² 'The House the 50s Built, Episode Guides: Series 1 Summary', *Channel Four*. Available at <http://www.channel4.com/programmes/the-house-the-50s-built/episode-guide/series-1/episode-1>. Accessed 17 September 2015.

The popularity of the FPG patterns and strong associations between postwar design and molecular structure in ‘retro’ culture may be due in part to another recent commemoration: the 2008 ‘From Atoms to Patterns’ exhibition at London’s Wellcome Collection curated by Lesley Jackson¹¹³. The exhibition and accompanying book, *From Atoms To Patterns*, introduced the FPG prototypes to a contemporary British audience¹¹⁴. The ease of the FPG’s subsequent marriage with the enthusiasm for postwar designed objects in contemporary ‘retro’ culture is exemplified by a review of the 2008 exhibition in the contemporary art magazine *Frieze*. The exhibition’s reviewer immediately saw the contemporary resonance of the FPG patterns with the burgeoning ‘retro’ commodity cycle:

Given the current taste for pattern in interior design and the resurgence of interest in all things ‘mid-century modern’, the exhibition seemed particularly timely, if not overdue¹¹⁵.

The reviewer observed that the exhibition’s displays were ‘Set against a suitably retro exhibition design (which included funky insulin wallpaper)’¹¹⁶. The ‘funky’ wallpaper, part of the ‘retro exhibition design’, was in fact FPG wallpaper designed in the postwar period; it is not clear from the review whether the author was aware of this, or whether she mistook the FPG pattern for reproduction ‘retro’ wallpaper devised as part of the exhibition design. What is clear is that it shows how easily the FPG’s patterns merged with the contemporary ‘retro’ landscape. This commemoration of the FPG and the subsequent circulation of images of the group’s patterns comprise a route through which the scientific associations (particularly related to crystallography’s research into molecular structures) of postwar designed objects have been strengthened in popular memory tied to ‘retro’ culture.

This section shows that scientific subjects associated with postwar X-ray crystallography research are remembered through postwar designed objects in contemporary ‘retro’ culture. Through their consumption and mediation today,

¹¹³ ‘From Atoms To Patterns’

¹¹⁴ Jackson, *From Atoms To Patterns*.

¹¹⁵ Ann Coxon, ‘From Atoms to Patterns’, *Frieze*, September 2008. Available at http://www.frieze.com/issue/review/from_atoms_to_patterns/. Accessed 7 November 2013.

¹¹⁶ *Ibid.*

ball-and-rod furnishings are a part of the long history of the use and significance of postwar crystallographic visualisation in British material culture. While the relationship of ball-and-rod objects to the circulation of scientific knowledge in publics outside of scientific research in the postwar period is largely described by absence, their current resonance as scientific and ‘molecular’ speaks to conditions of science in British culture today: the current iconic status of the DNA double helix and anxieties about science in British society.

The question about cultural transmission between crystallographic visualisation and postwar ball-and-rod objects investigated in this part of the thesis led me to their current social life because, as this analysis demonstrates, associations between ball-and-rod furnishings and scientific forms only emerge through their use and consumption today. As this chapter has demonstrated, it is in the present, rather than in the postwar period, that the significance of ball-and-rod objects corresponds to that depicted in the historiography. The next section explores what this means for the broader historiographical investigation of the biography of ball-and-rod furnishings in this thesis.

3. Encounters between academic and public histories

This examination of ball-and-rod objects as ‘retro’ commodities today prompts questions concerning relationships between public history (of which ‘retro’ consumption is a form) and academic history. As is no doubt clear by this point, most features of the historical narratives associated with ball-and-rod furnishings in ‘retro’ culture today misrepresent the postwar history of these objects revealed by the period sources in chapter three. So aside from what the social lives of ball-and-rod furnishings in contemporary ‘retro’ culture reveals about their shifting status throughout their biography as commodities, why should a historian working in an academic context be concerned about ball-and-rod furnishings’ consumption and associated role in public history today?

Exploring this question brings us into encounter with issues related to the complexity of current relationships between public and academic history. Debates about public history among historians situated in academic contexts, scholars working in the discipline of public history, and museum curators

concern the politics of knowledge and the role of academic historians and curators in relation to other publics. Most of the time, historians working in academia dismiss public history altogether, primarily by ignoring it, in the interest of policing the boundaries of their profession and due to suspicions about the quality of public history¹¹⁷. Some scholars take a different view, however, pointing to the value of public history in potentially providing perspectives on the past that ‘official’ histories might miss; this position shares conceptual affinities with social and oral history’s ‘history from below’. For example, Raphael Samuel described public history as ‘a social form of knowledge’ that can rectify the imbalance of agency enacted in the hierarchical notion that ‘knowledge filters downwards’ from the professionals¹¹⁸. Others judge such a notion of public history as overly romantic. Oral historian Michael Frisch advocates a ‘shared authority’, writing that while the ‘hegemony of scholarly authority indeed must be challenged’, the ‘insights of scholarship’ should not be summarily dismissed, and ‘the power of populist self-empowerment through public history can be as easily and romantically exaggerated’¹¹⁹.

The rise of online media adds new complexities to these questions, as it has increased access to the tools for making and consuming history beyond academic forums, and brought new technologies into the process of ‘making’ history¹²⁰. Indeed as this research on the social life of ball-and-rod objects in contemporary ‘retro’ culture indicates, the historical narratives mediated online on eBay both have the potential for wide circulation and influence on the reception of objects, and they are, in some ways, problematic narratives.

This leads to the following question: what happens when the public history is wrong? I argue that although the public history narratives circulating in ‘retro’ culture largely constitute a misleading guide to the postwar lives of ball-and-rod objects, this is not a reason to assume the conventional position of the academic historian (which is to ignore them). Historians working in academic contexts can benefit from understanding the operation of what historian Ludmilla

¹¹⁷ De Groot observes this as emerging from an implicit ‘critique of the popular’ among some historians. de Groot, p. 4.

¹¹⁸ Samuel, pp. 8, 4.

¹¹⁹ Frisch, p. xxi.

¹²⁰ Meg Foster, ‘Online and Plugged In?: Public History and Historians in the Digital Age’, *Public History Review*, 21 (2014), 1-19; de Groot.

Jordanova terms popular ‘myths’ about the past¹²¹. This is due to their power in the present. She writes:

‘Myth’ suggests an invented story, a narrative devised to achieve certain ends that are usually assumed to have a strong emotional component. Sometimes we use the word myth to imply that an account has been made up, that it lacks any basis, however appealing it may appear [...] When we talk about historical myths, we are not so much contesting what happened as drawing attention to the intense affect that surrounds certain views of the past, so intense that they resist debate and modification¹²².

Jordanova sees the understanding of such myths as key to the social responsibility of the historian who elects to act in the world beyond the proverbial ‘ivory tower’ through communication with publics outside of academia. The case explored in this chapter, however, reveals another important reason for historians to understand the operation of historical myths. I argue that such understanding is not only key to the practice of historians concerned with the wider ramifications of their work, but also necessary for the academic work itself. Historians are also part of the ‘public’ and as such are of course not automatically excluded from the audience for public histories. This becomes palpable in the case explored in part two of this thesis. The ‘myths’ described in this chapter concerning the historical memory of ball-and-rod furnishings in contemporary public history are widely resonant and entrenched in the way Jordanova describes – so much so, that they inflect the historiography on the subject.

Historians’ characterisations of ball-and-rod objects (noted in the part two introduction and throughout chapter three) are marked by the public history narratives on the subject. This includes the treatment of ball-and-rod objects by historians working in academic contexts¹²³. They mirror the associations between

¹²¹ Ludmilla Jordanova, ‘How History Matters Now’, *History & Policy*, 27 November 2008. Available at <http://www.historyandpolicy.org/policy-papers/papers/how-history-matters-now>. Accessed 5 May 2015.

¹²² Jordanova, *History in Practice*, p. 103.

¹²³ These include Kirkham and Weber; Anne Massey, *Chair* (London: Reaktion, 2011); Woodham, *Twentieth-Century Ornament*; Conway.

designed objects and science presented in ‘retro’ culture, collectors’ guides and other ‘retro’ mediators¹²⁴.

This indicates the urgency for academic historians to examine their relationships to public history. Both design historians and historians of science can learn from this study. Regarding design history practice, this analysis shows that design historians must be aware of the operation of ‘myths’ about the past within the discipline’s academic discourse. This comes down to basic, and well-trodden, issues facing the academic discipline of design history. Academic design historians have worked for decades to move on from the modernist production-focus and influence of connoisseurial approaches, and have in many respects succeeded at this endeavour. This research attests, however, to the enduring relevance of critically examining the field’s traditional links — and sometimes-blurred boundary — with cultures of collecting and connoisseurship, including new ones¹²⁵. In fact, subjects such as cross-field relationships between design and science that have seen little detailed empirical examination might be particularly affected by these lingering traditions simply because they have seen little research under more recent frameworks of design history research.

This call for the examination of popular narratives is not only aimed at ultimately distancing academic history from these narratives however. In some ways, academic histories might benefit from deeper engagement with public history. In this case, there is one sense in which popular narratives about ball-and-rod objects actually reflect postwar social experience in a way that design history narratives of these objects do not. Several ‘retro’ collectors interviewed for this research were in fact aware of the postwar consumer’s distaste for and lack of identification with ball-and-rod objects. Their knowledge echoed my empirical research on the postwar consumption of these furnishings presented in

¹²⁴ In addition to the affect of public history on academic history at work here (it is more likely that academic history texts are shaped in part by popular memory than the other way around given the limited readership for academic history texts), there is also a feedback loop across different genres involved. This results from the wider circulation of many texts on the subject that straddle the genre of the collectors’ guide (aimed at a broad audience) and the conventions of academic history-writing and research (such as the texts by Jackson and Hillier noted earlier), and their effect on public history.

¹²⁵ Design history texts discussing this issue since the early self-styling of design history as an academic discipline more than three decades ago include, but are by no means limited to Fallan, *Design History*; Lees-Maffei, ‘The Production – Consumption – Mediation Paradigm’; *Utility Reassessed*; Hannah and Putnam.

chapter three. This experience of the postwar consumer is not represented in the published histories on these furnishings, which usually reflect the object-as-period-archetype narrative. This points to the benefits of a relationship between public and academic history resembling that of Michael Frisch's 'shared authority' noted earlier¹²⁶. A model of 'shared authority' has been explored recently through the work of the Public History Department of London's Science Museum through its experiments in 'co-curation'. Science Museum curators collaborated in the making of an exhibition on the history of electronic music with people who had first-hand experience in its creation and cultures¹²⁷. The results showed the potential of this method of 'shared authority' to generate narratives that challenged the museum's typical approach (which focuses on chronology and key figures). The electronic music 'enthusiasts' with whom curators collaborated were less concerned with the technical aspects of electronic music than they were with 'human endeavour, creativity and perseverance', which brought aspects of social experience to the historical narrative¹²⁸. Similarly, in the case of ball-and-rod objects, 'retro' enthusiasts, through their insights on the generational dynamics acting upon the shift in status of ball-and-rod objects since the postwar period, bring layers pertaining to the postwar social life of these objects to their narratives.

For historians of science, a key point emerging from this study is that postwar designed objects (both ball-and-rod furnishings and FPG objects) participate in the public mediation of the postwar history of science. 'Retro' consumption is a channel through which the history of science enters popular culture. It is, however, not widely acknowledged by historians of science as such. In this case, the public histories of ball-and-rod objects contributes to an innovation-focused narrative of the history of twentieth-century science that already dominates the public histories of science mediated elsewhere, notably in science museums. Such innovation-centred historical narratives eclipse other understandings of science and scientific practice, and can present a teleological,

¹²⁶ Frisch, p. xxi.

¹²⁷ Tim Boon, Merel van der Vaart and Katy Price, 'Oramics to Electronica: Investigating Lay Understandings of the History of Technology Through a Participatory Project', *Science Museum Journal*, 2 (2014), pp. 1-44.

¹²⁸ Boon, van der Vaart and Price, 'Oramics to Electronica', pp. 13-14.

positivistic history of scientific progress¹²⁹. Particularly for historians of science concerned with public history, understanding the narratives about the past that are circulated with and through period designed artefacts is crucial to effectively communicating an alternate narrative. Jordanova emphasises that for historians who aim ‘to communicate their ideas to non-specialist groups, they need to comprehend the obstacles that lie in their path’, and lack of understanding of existing ‘myths’ about the past is a central obstacle¹³⁰.

Historians of science might benefit from examination of the inflection of popular narratives about ball-and-rod furnishings and the FPG in the discipline’s discourse as well. This is because the public history narratives identified in this chapter also inflect histories of science. The Science Museum’s recent ‘Hidden Structures’ exhibition of X-ray crystallographers’ models, erected for the 100th anniversary of the field’s inception, is an example. Beside a glass case containing a variety of crystallographic models, from ball-and-spoke molecular models to a bumpy round virus model, images of the FPG patterns and Race’s Antelope chair flickered in rotation on an interactive screen. Information on the Science Museum website’s blog about the exhibition states,

perhaps the most surprising thing about X-ray crystallography is that it has played an important part in the story of modern design. At the 1951 Festival of Britain – an event famed for its colourful and innovative look – one of the main visual motifs was atomic structure¹³¹.

The status of the designed objects (FPG patterns and ball-and-rod furnishings) as influential in their time and tightly bound to scientific reference mirrors their current status in popular culture, and suggests the need for histories of science to approach design as a more complex subject. De Chadarevian’s history of the postwar development of molecular biology in Cambridge (noted earlier as a key academic text on postwar X-ray crystallography) is also an example of the sense in which X-ray crystallography’s postwar history is in part remembered through

¹²⁹ Edgerton, *The Shock of the Old*.

¹³⁰ Jordanova, ‘How History Matters Now’.

¹³¹ Boris Jardine, ‘X-ray Crystallography at 100’, *Stories from the Stores: Blog about the Science Museum’s Collections*. Available at <http://blog.sciencemuseum.org.uk/collections/tag/hidden-structures/>. Accessed 23 June 2015.

postwar design¹³². Images of FPG patterns are the first thing a reader sees when picking up the book, because it shares a cover image with *The Souvenir Book of Crystal Designs* published for the FPG's presentation at the 1951 Festival (Figure 11). The FPG is not a focus of this book; it is mentioned briefly in the context of science 'as a fashion setter' in design at the Festival¹³³. As with the design histories on the topic, in the history of science X-ray crystallography's reach and influence outside the scientific community through design is somewhat inflated by emphases on the FPG and Antelope chair.

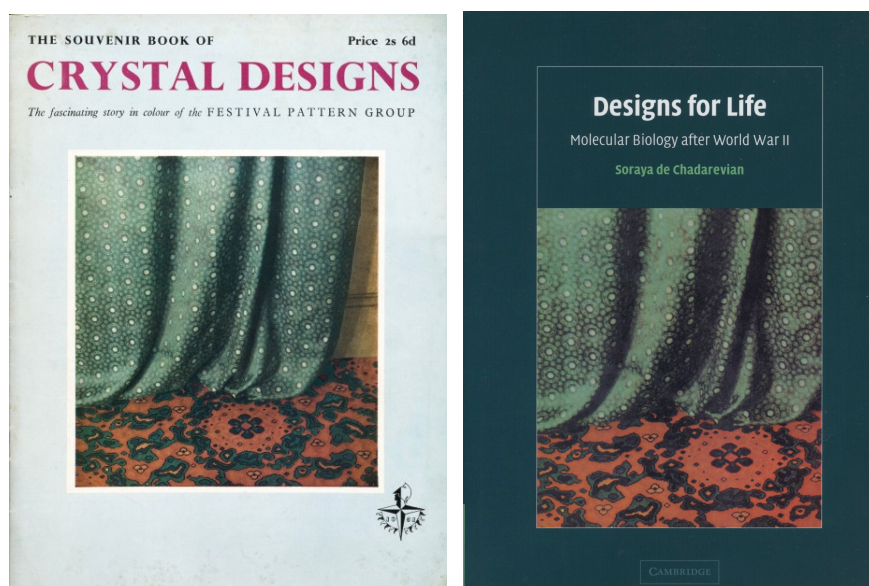


Figure 11 The cover of the 1951 *Souvenir Book of Crystal Designs* published for the Festival display of the FPG prototypes (left) and cover of de Chadarevian, *Designs for Life* (right).

This analysis points to the potential benefits of academic historians' examination of their relationships to public history, both in terms of how public history narratives inflect academic histories, and in terms of the role academic historians wish to play in publics outside of their professional networks. The historiography on ball-and-rod objects — and to an extent, the FPG — indicates a lack of such examination in these topic areas. Such examination is necessary both to distinguishing academic history from public histories in critical ways, and to identifying how public histories can contribute to academic research about the past. This confirms the need, which Jordanova articulated in 2000, for

¹³² de Chadarevian, *Designs for Life*.

¹³³ *Ibid.*, p. 44.

‘coherent positions on the relationships between academic history, the media, institutions such as museums, and popular culture’¹³⁴. This historiographical examination shows that this job remains unfinished.

Conclusion

This chapter concludes this thesis’s biography of ball-and-rod furnishings, demonstrating the great shift in their status and significance across the period of their production and today, in which they are more resonant with and loved by their consumers than in the period of their production. A key aspect of the shift in their significance today pertains to their character as science-inflected design and as containers of narratives about postwar science. This chapter investigated the social mechanisms impinging upon the contemporary construction, solidification and circulation of narratives of ball-and-rod objects. These include processes of exchange (with emphasis on eBay’s operation as a tool for e-commerce), current political and cultural responses to Britain’s economic conditions, generational dynamics, and features of the current status of science in British culture.

This chapter also completed an examination, begun at the beginning of part two, into the current status and significance of postwar ball-and-rod furnishings for historians today, which this chapter shows is intertwined with the public history narratives on the subject. The topic of science-inflected design includes elements that represent unfamiliar territory for both historians of science and design, so recourse to the historical categories of public histories is perhaps further hastened by this fact. This research suggests the potential productivity of examining relationships between academic histories and popular memory particularly in cases of subjects, such as science-inflected design, that sit between disciplines.

This chapter demonstrated that an important aspect of the current use of ball-and-rod furnishings is their use in history; that is, their function as mediators of popular memory about the postwar past: both for ‘retro’ enthusiasts and historians working across different genres today. This is a significant point for

¹³⁴ Jordanova, *History in Practice*, p. 149.

the overall historiographical exploration of this thesis, for this study revealed that the marriage of X-ray crystallography and design is in many ways a more pronounced feature of the present – in public and academic histories – than it was of the postwar past.

Conclusion

The preceding four chapters have traced the forms and uses of crystallographic visualisation across cases concerning the production and circulation of postwar scientific and designed objects in Britain. Together they reveal the multiple and shifting meanings, uses and functions of postwar crystallographic visualisation, and its adaptations and associations across these different contexts. This thesis has explored the ways in which these meanings, uses and functions are contingent upon design and scientific practices, modernist ideologies, the character of X-ray crystallography in culture (in postwar and present-day Britain), commodity cycles, and the dynamics of popular memory and history-writing today. The research resulted in several historical, methodological and historiographical findings. Below I review these and the lessons they offer historians.

Cultural transmissions: Complexity and absence

A key contribution of this thesis is its identification of ways in which crystallographic visualisations were received, renegotiated and recast in terms of their physical form and meaning among actors situated outside scientific practice. These actors include those aligned with design practice and policy, and the mediators and consumers of designed objects. This question parallels those asked by historians of science in culture concerning the circulation and reception of scientific knowledge beyond the domain of scientific elites. In this thesis it is a question of interdisciplinary scope. It is about the history of X-ray crystallography in British culture as well as the history of postwar British science-inflected design. It is about communication and transmission between fields and even, ultimately, historical memory.

Chapter two's analysis of the FPG reflected on this topic in important ways. This chapter showed that the circulation and reception of scientific visualisations among different constituencies is central to an understanding of the complex mechanisms of cultural transmission between fields that underpinned the FPG. This corresponds to a methodological point developed throughout the

thesis: studying cultural transmissions between science and design entails examining more than just final products. In the case of the FPG, practices, interests and material artefacts of actors involved are crucial. This chapter traced the shifting reception of crystallographic diagrams across discipline borders. It identified the specific interests, practices, aesthetic ideologies and even bureaucratic aims that conditioned their circulation and reception throughout a network of actors.

This demonstrated the importance of considering specific ‘publics’ for science when studying relationships between science and design, including figures in art and design fields. The history of X-ray crystallography in culture is not only about large public displays such as the 1951 Festival. It is also about the exchange through the post of a scientist’s drawings among design and art circles, for instance, an architect’s identification of his aesthetic ideals in a crystal structure diagram, or an artist’s observation of parallels between a virus model pictured in the newspaper and Buckminster Fuller’s geodesic domes. This research draws attention to the scientist’s role in such exchange. Chapter two reveals the centrality of Megaw’s production of ‘decorative’ diagrams to the renegotiation of crystallographic visualisation performed within the FPG. This challenges assumptions in design historiography that agency in the production of science-inflected design lies solely with designers. Similarly, chapter one sees Klug and Caspar as active agents in cross-disciplinary exchange, importing a modelling tool from Buckminster Fuller’s practice and literally bending it to suit their own research needs.

Part two contributes further to the study of transmissions and associations between X-ray crystallography and industrial design. Firstly, it made a methodological proposal. It explored postwar ball-and-rod furnishings as a possible case of the production and circulation of science in culture. Chapter three argued for the productive potential of expanding the conventional remit of histories of science in culture to include serious examinations of design practice and the consumption of designed objects. It offered methodological insights for the history of design as well, building on the notion developed in chapter two that studying science-inflected design should not be limited to historical investigation of the production of a designed object. This chapter argued for the

importance in such studies of empirical research into consumers' receptions of such objects and their mediation by retailers, advertisers, design promoters and popular magazines.

Secondly, chapter three challenged historians' assumptions that ball-and-rod objects manifested science-inflected ornament in the postwar period. This case showed that an important part of the story of cultural transmission between postwar science and design are instances of its absence. The identification of conditions that *precluded* transmission in the case of the postwar production, mediation and consumption of ball-and-rod objects contributes to a richer understanding of transmissions between postwar British science and design.

Chapter four revealed time as a variable operating in the relationship between science and design explored in this thesis. Postwar 'molecular' design is, somewhat paradoxically, not solely a product of the postwar period. This became clear through a study of artefacts from the angle of their 'use-based history' (drawing upon the notion described by David Edgerton)¹. Chapter four identified the belated associations of ball-and-rod furnishings with science in their circulation and reception today.

The explorations of cultural transmission in this thesis revised existing understandings of the relationship between X-ray crystallography and design in postwar Britain. They also problematised several historical categories operating in the historiography. This thesis challenges science and design historians' easy recourse to the monolithic category of postwar 'molecular', 'atomic' or crystallography-inspired design. It revealed that the CoID and Festival frames that dominate existing historiography on the designed objects examined here are limiting. This thesis also de-essentialised the category of 'science' as it typically functions in design historical analyses; by emphasising the historical contingencies affecting practices of postwar X-ray crystallography (part one) and its circulation in postwar culture (part two), this thesis resulted in narratives that depart significantly from existing ones. It also pointed to the need for a more complex understanding of design within history of science research that encounters designed objects and practices.

¹ Edgerton, *The Shock of the Old*, p. xiii.

The history of postwar X-ray crystallography: Materials and practices

This thesis contributes to and reframes inquiries on postwar British crystallographic visualisation in ways additional to the points pertaining to cultural transmission above. Chapter one contributes to on-going efforts in the history and philosophy of science to explore the role of material representations in scientific knowledge generation. Noting that existing scholarship in this area stops short of in-depth analysis of materiality, chapter one put forth a methodological tool to address this. In reframing crystallographic visualisation as a craft process, it proposed a cross-disciplinary methodology for studying it, drawing upon craft scholarship from history of design discourse. This analysis also resulted in new empirical information on postwar X-ray crystallography visualisation practices, focusing on a detailed examination of the role of the materiality of Geodestix in virus modelling.

This thesis opened up inquiry into X-ray crystallographers' encounters with design practices, seeing the visualisation as a site for disciplinary exchange. Chapter two saw the practice of crystallographic visualisation outlined in chapter one hybridised by Megaw with methods of design drawing associated with the South Kensington system (and considered her work in the context of Bragg's encounters with design practices as well). This located a realm at the border of scientific and design practice, which took the study of scientific visualisation beyond its conventional historical examination within scientific research, communication or display contexts.

Chapter three contributes new information to the history of X-ray crystallography's circulation through television, print media and exhibitions in postwar Britain. This analysis shows that the wider mediation of crystallographic visualisations in public forums in postwar Britain occurred principally at the end of the 1950s, rather than maintaining a constant, strong presence in British culture throughout the decade. This thesis also explored how current conditions of the public reception of science inflect the popular memory of postwar science mediated in the material culture of 'retro' consumption.

This research sheds light on the work of scientists whose roles in the history of X-ray crystallography have been little-researched: Aaron Klug and

Helen Megaw. Klug is rarely considered in depth outside philosopher of science Gregory Morgan's work on early virus research, in which aspects of Klug's practice, training and position in the postwar culture of crystallography are not key focuses². Despite recent historical attention to female crystallographers (specifically Hodgkin, Franklin and Lonsdale) Megaw is only discussed at any length in histories of the FPG — and often briefly³. This thesis demonstrated, however, that studying Megaw's and Klug's work contributes to a fuller history of postwar X-ray crystallography practice and training. This research opened up questions regarding the effects on postwar crystallographic practice of training in other disciplines — design drawing in Megaw's case and mathematical physics in Klug's. Furthermore, Megaw and Klug were participants in postwar cross-disciplinary dialogues through networks linking crystallographers, artists and figures in the design world. Therefore their stories contribute to knowledge of the field's interdisciplinary history. The analyses of their practices in this thesis highlighted the role of visualisations in such cross-field conversations, and the materiality of the exchange that took place among these networks.

The history of postwar British design: New angles, fragmented categories

This research contributes to the history of postwar British design in key respects beyond the questions of cultural transmission already discussed above. Because it proceeds from the relatively unusual angle of science-inflected design, it encounters several well-trodden topics in academic design history from new, productive perspectives. It contributes to understandings of the production, mediation and consumption of postwar British modernist design. For example, chapter three advances a history of a class of objects, ball-and-rod furnishings,

² Morgan, 'Early Theories of Virus Structure'. See also Creager and Morgan's article 'After the Double Helix: Rosalind Franklin's Research On Tobacco Mosaic Virus'.

³ Historical attention to Hodgkin, Franklin and Lonsdale reflects interest in Nobel Prize winners (and in Franklin's case, reflects interest in her as a kind of tragic figure who many commentators believe should have received a Nobel because she contributed to a Nobel Prize winning piece of research, the elucidation of the structure of the DNA double helix, but died before it was awarded). The focus on Hodgkin and Lonsdale also reflects historical interest in female scientists who balanced work and family life (this is a theme of many publications on Lonsdale and Hodgkin). Megaw may be overlooked in part because her life does not necessarily appear to serve as an adequate lens for exploring these issues as she did not marry or have children. On Hodgkin, Franklin and Lonsdale, see Ferry, 'Women in Crystallography'; Gibbons; Baldwin; Creager and Morgan; Maddox; Ferry, *Dorothy Hodgkin*; Sayre.

which were promoted as ‘good design’ in the period, but which have been overlooked in studies on the subject. This case thus offers new evidence concerning the mediation and reception of modernist design in postwar Britain. Additionally, chapter three’s study of the pre- and postwar production of ball-and-rod lighting contributes a new empirical example of a phenomenon mentioned, often briefly, by historians of British design: the postwar resumption of prewar modernist designs and materialities in the furniture industry. The case study of ball-and-rod objects also moves beyond studies of the production, mediation and consumption of high-end furnishings in postwar Britain, thus contributing to the limited body of published research on ‘everyday’ objects and working class consumption in postwar Britain.

Chapters two and three add to research on the aesthetic ideologies operating in postwar British modernism in design both within the CoID and outside it, and explore the complex relationships between the two. In chapter two particularly, it becomes clear that at the level of individual Council members and designers consigned to carry out CoID policies, inscribing strict borders around the culture of the CoID is not fully possible. This represents a further sense in which this research problematises the CoID’s pervasiveness as a historical category in recent design histories of postwar Britain.

Another historical category complicated in this research is modernism itself. The varied and contested character of the term ‘modernism’ has been noted by scholars, although it is still used in some design history discourse in an imprecise manner⁴. This thesis contributes to the picture of modernism’s multiplicity, laying bare numerous modernisms operating in postwar British design *and* science cultures. These include: the modernism of the postwar CoID-centred design establishment and their industry allies (which, as noted above, is by no means monolithic); the modernist ideologies devoted to proportion and ancient aesthetics operating in postwar architecture circles to which Hartland Thomas belonged; the differing modernist approaches of the St Ives constructivists and Independent Group that were in dialogue with design and science practices; and the pre-twentieth-century modernism of the South Kensington method (with its accomodation of industrialisation and

⁴ See Kjetil Fallan, ‘Modernism or Modern *ISMS*? Notes on an Epistemological Problem in Design History’, *Nordic Journal of Architectural Research*, 17 (4) (2004), 81-92.

standardisation by the designer) and, by extension, of Megaw's FPG diagrams. This research also encountered the modernist rhetoric adopted by scientists. It was visible in Klug's emphasis on distinctions between Platonic forms and the 'real object', which echoed Fuller's cosmology (in which he privileged materiality over the Platonic aesthetics he accorded to modernist architects); and in Lonsdale's description of molecular structure using the language of the continental modern movement in her 1949 SIA talk. Finally, this research also encounters further distinct modernisms in the memory of 'mid-century modern' in 'retro' consumption today.

Future research areas

Several historical topics were indicated but not pursued fully in this thesis, due to space and the research's remit. A number of these suggest areas for future research.

The necessarily limited focus on X-ray crystallography's public display leaves room for further investigation. I echo de Chadarevian's observation, regarding the public display of crystallographic models, that the 'rhetoric of presentation used for different audiences' requires further research⁵. I contend that such study must deploy methods allowing for serious examination of the visual and material forms of the crystallographic visualisations used in these forums and their role in the reception of such displays (aspects my brief survey highlighted). Further research might consider the relationship between the materialities of crystallographic display and contemporaneous approaches to science communication and exhibition or television display design.

The geographic focus of this research was largely limited to London and Cambridge. This research does little to correct the geographical imbalance of the historical literature and postwar commentary on modern design in which, Cheryl Buckley writes, "'English' regions, Northern Ireland and Wales [...] remained largely 'other'" to a London-centric picture of British design⁶. This research did, however, work with London differently from the literature Buckley assesses, as it advanced a social history of consumption rather than focusing only on elite

⁵ de Chadarevian, 'Models and Molecular Biology', p. 363 n30.

⁶ Buckley, p. 11.

modernist designers. There is room for further examination of the objects studied here that takes in a broader geographical scope. Such research will yield a greater understanding of postwar British modernist design, and of the production and circulation of crystallographic visualisations in the period.

Additionally, the research in chapter three focuses on the design and production of ball-and-rod objects in the UK, and does not explore the impact of American ball-and-rod furnishings and the American ‘good design’ movement on British designers and manufacturers. This transnational context is an area for further research.

The focus of chapter two’s FPG analysis precluded study of the group’s final pattern designs. There is room for interpretation of these designs, particularly from the perspective of the network approaches to the subject piloted in this thesis. Further research might take into account frameworks of design practice and the varied positions of the designer in industry at the time, for instance, that impinged upon the work of the FPG designers.

Finally, further examination of the postwar social networks linking practitioners in crystallography, design and art fields highlighted in this thesis would have required a different research remit (focusing for instance on art as much as industrial design). X-ray crystallography’s interdisciplinary history therefore represents a subject for further research. Outside of this thesis, the subject has seen little analysis beyond art historians’ discussions of Bernal’s relationships with constructivist artists⁷.

Methodologies for interdisciplinary subjects and researchers

Despite the current enthusiasm in humanities research for interdisciplinarity (described in more detail below), there is very little research exhibiting models

⁷ See Burstow; Barlow. Additionally Lonsdale is mentioned briefly as a collaborator in Richard Hamilton’s 1951 ‘Growth and Form’ exhibition at the ICA in some sources, such as Arthur I. Miller, *Colliding Worlds: How Cutting-Edge Science is Redefining Contemporary Art* (New York: W. W. Norton & Company, 2014). As mentioned in chapter two, however, more detailed research and interpretation of Lonsdale’s role in these networks represents an intriguing area for further research. The fact that room for interpretation remains in this area is in part due to an issue identified in the thesis introduction that affects many design histories contending with science. That is, evidence-based understandings of the science of X-ray crystallography involved in these exchanges, detailed study of cross-disciplinary networks, and flows of ideas, objects, etc. among practitioners in the fields involved are not part of most existing analyses (due largely to understandable disciplinary factors).

for exploring cross-field interactions between science and design in the past. This thesis begins to address this gap. The methods it deploys to do so include cross-disciplinary experiments (such as the application of approaches from design scholarship to crystallographic visualisation in chapter one), the use of network models (primarily in chapter two), and the object biography (throughout part two). The use of the latter two approaches is inspired by their deployment in studies of global cultural transmissions. As in studies of global exchange, in this thesis these methods aid detailed study of the flows of objects and knowledge, and reveal moments of their absence. The methodological experimentation in this research allowed me to pose new questions about the cultural transmission and artefacts studied in this thesis, such as: How did practices and consumption play a role in transmissions, exchange and associations between postwar science and design? Can crystallographic visualisation be studied as a craft process? How might design constitute a site for explorations of science in culture? And how and when did ball-and-rod objects become ‘scientific’?

The methods used in this research afford detailed study of the mechanisms of transmission, communication or association between fields that I argue are key to understanding science-inflected design. They foster study of complex dynamics of agency, as shown in the FPG example, and examination of factors beyond visual resemblance. Indeed the biography of ball-and-rod objects showed that observations of visual resemblance between scientific and designed objects can be deceiving.

This thesis represents the first in-depth, critical investigation of science-inflected ornament in postwar British design. The approaches to studying science-inflected design piloted here thus offer insights for design history research, the discipline within which much of the albeit-limited historiography on the subject exists (in addition to indicating new objects for history of science research, as discussed earlier). The methodology employed here is a productive alternative to the ‘influence’ model that pervades design history thinking about science-inflected design. Additionally, the approaches used allowed me to align the study of the designed objects in this thesis with frameworks of contemporary design history discourse, thus positioning them as topics for further research and conversation in the field.

The methods of this research, noted above, combined with a focus on practices and material culture, meant I worked in areas of overlap between history of science and design history methodologies. Their shared methods are rarely acknowledged (as dialogue between the fields is limited). These overlaps, however, suggest possible benefits to further cross-field dialogue and interdisciplinary research into artefacts that straddle or move between conventional remits of the history of science or design (such as Megaw's FPG diagrams or even ball-and-rod furnishings).

The most challenging aspect of this thesis's interdisciplinary project is its aim to speak to two disciplines simultaneously. The resultant text does not address both disciplines in the same way. Many questions and topics explored here might seem to be more clearly aligned with design history discourse. This is because many of the inquiries concerning cultural transmission emanate from the design history literature. Many of its contributions to the history of science are more subtle, several of them methodological, but the research nevertheless contributes to existing inquiries and assesses specific conventions of research in the field.

Desperately seeking science

This thesis traversed a disparate set of case studies. An effect of this is that the exploration's entry point, scientific research practice, is rather distinct from its culmination point, the popular memory of science in contemporary 'retro' culture. Each chapter is not intended to represent a neat meeting point of 'science and design'. The episodes explored are not restricted solely to moments and sites of connection, communication and interchange between crystallography and industrial design in the postwar period. This research was instead open to exploring circumstances that complicated and even obstructed transmission between the two, in order to gain a richer understanding of their relationship and its context within broader historical conditions.

A different approach shapes much existing historiography on the subjects explored in this research. This thesis has pointed to problematic assumptions and approaches in the historiography on science-inflected design particularly. One is

historians' expectations of strong, clear connections between science and design (such as crystallography's 'influence' on design). Chapter four examined specific reasons for this, highlighting the effect of current public history narratives on the way ball-and-rod objects have been interpreted by 'professional' historians, and aspects of the current state of science in culture that underpin these narratives. It is productive at this point, from a perspective that takes in the whole of this thesis, to discuss an even broader factor that has shaped the way historians interpret relationships between postwar British science and design in much historiography on the FPG, ball-and-rod furnishings, and design and science at the 1951 Festival: the contemporary status of interdisciplinary relationships and research.

'Interdisciplinary' is currently a buzzword, invoked alternately as an object of celebration and disenchantment within academic research cultures and in media coverage of higher education and research in Britain today⁸. Notions of interdisciplinarity as a definitive *value* often shape efforts in arts and humanities research and the cultural sector in Britain today that endeavour to forge or study links between science, art and design or their histories. This is evident in recent research interest in relationships between histories of science and art (which accounts for a larger body of scholarship than histories on science and design)⁹. It is embodied also by the work of institutions, such as the Wellcome Collection,

⁸ A survey of articles on interdisciplinary research in the *Guardian* published in the last three years presents wildly different takes on the subject. For example, a February 2014 article declared it a 'risky route' (due to reports that interdisciplinary research is not valued at 'higher levels' of academia such as in 'high impact journals' and the Research Excellence Framework [REF]) while a December 2014 article announced interdisciplinary research 'may benefit you in the REF'. Tim Hall, 'Why Working Across Subject Areas May Benefit You in the REF', the *Guardian*, 2 December 2014. Available at <http://www.theguardian.com/higher-education-network/2014/dec/02/research-excellence-framework-interdisciplinary-university>. Accessed 20 September 2015; Sarah Byrne, 'Interdisciplinary Research: Why It's Seen As a Risky Route', the *Guardian*, 19 February 2014. Available at <http://www.theguardian.com/higher-education-network/blog/2014/feb/19/interdisciplinary-research-universities-academic-careers>. Accessed 20 September 2015. See also the introduction to social historian Harvey J. Graff's *Undisciplining Knowledge: Interdisciplinarity in the Twentieth Century* (Baltimore: Johns Hopkins University Press, 2015) for a summary of recent perspectives on interdisciplinarity within Anglo-American academic cultures.

⁹ In 2002 Jordanova identified the research attempting to bridge histories of art and science being published at the time as part of a broader cultural engagement with 'art and science' as a 'trendy topic'. Ludmilla Jordanova, 'And?', *British Journal for the History of Science*, 35 (126) (2002), 341-345 (p. 341). Concerning the interest in this area of research in recent decades, see work by art historians Martin Kemp and Arthur I. Miller. Miller's recent *Colliding Worlds* largely reflects the spirit that Miller ascribes to some artists today who seek 'a way to unite art, science and technology' (p. xxi); Martin Kemp, *Seen/Unseen: Art, Science, and Intuition from Leonardo to the Hubble Telescope* (Oxford: Oxford University Press, 2006).

a museum and gallery that opened in London in 2007¹⁰. The Wellcome is devoted to the ‘connections between medicine, life and art in the past, present and future’¹¹. One of the first exhibitions presented at the Wellcome was Jackson’s 2008 ‘From Atoms to Patterns’ exhibition on the FPG. In this way, one of the only instances of interaction between science and design explored in depth so far within design history, the FPG, was mediated through the frame of the current interest in ‘connections’ between science and art.

Writing in 2002 about the academic fashion for historical studies of ‘art and science’, Ludmilla Jordanova proposed that a factor in the increased value placed upon excavations of interdisciplinary connections of this kind was a particular condition of the present. In the impulse to bring the sciences and the arts together was an anxiety about their separation, or, as Jordanova wrote, ‘a general anxiety about and interest in the so-called two cultures issue’¹². The label ‘the two cultures’ has taken on a contemporary meaning that is in many ways distinct from its significance in C.P. Snow’s 1959 lecture in which it originated. It signifies concern over the increasing specialisation of disciplines that signals the potential incommensurability of the sciences and others. In addition to the intellectual curiosity driving interdisciplinary research, the current celebration of interdisciplinary relationships may be buttressed more recently by an immediate practical factor. Changes made in the last five years to higher education funding in the UK have ensured more state funding for teaching for science, technology, engineering and mathematics (STEM) disciplines than for the arts and humanities¹³. This has caused anxiety among some academics in the arts and humanities, who work in an area that is also allocated less research funding than

¹⁰ Other institutional embodiments of this value include the University of the Arts London’s MA Art and Science course in which students explore ‘the creative relationships between art and science and how to communicate them’. ‘MA Art and Science’, *University of the Arts London*. Available at <http://www.arts.ac.uk/csm/courses/postgraduate/ma-art-and-science/>. Accessed 21 September 2015.

¹¹ ‘About Wellcome Collection’, *The Wellcome Collection*. Available at <http://wellcomecollection.org/what-we-do/about-wellcome-collection>. Accessed 21 September 2015.

¹² Jordanova, ‘And?’, p. 341.

¹³ For example, following the 2010 review by Lord Browne of ‘higher education funding and student finance’ (known as the Browne Report), the government cut public funding to the humanities, causing anxiety about the future of humanities research and education. John Browne, ‘Securing a Sustainable Future for Higher Education: An Independent Review of Higher Education Funding and Student Finance’, 12 October 2010. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/422565/bis-10-1208-securing-sustainable-higher-education-browne-report.pdf. Accessed 21 September 2015.

STEM subjects¹⁴. In this environment, tethering the arts and humanities to science can make the former appear more ‘practical’ and therefore worthy of support.

The current enthusiasm for interdisciplinarity has much productive potential in supporting research that crosses discipline boundaries, which, as I have noted throughout this thesis, can contribute to the histories of both science and design. As this research demonstrates, however, its unconscious, unquestioned projection onto approaches to cross-field relationships in the past is problematic. The impulse to celebrate interdisciplinary connections, collaboration and exchange can obscure the more complex aspects of encounters between disciplines and difficult questions (many of which this research confronted) concerning historical subjects that straddle disciplines. It also obscures questions about how exactly to operate as a historian bridging disciplines. The contemporary ease with which many in the humanities communicate about (and celebrate) interdisciplinary connections might conceal the full extent of the questions, complexities and challenges contained within the very concept of interdisciplinarity.

The histories of design and science: Practice in the present and future

This research’s conception of history as a practice involves self-reflective methodological experimentation, as described in the thesis introduction. Additionally, history as a practice, in the context of this research, might also involve thinking about the ways in which historical research can inform conversations about current and future relationships between science and design.

A growing contingent of designers are working in collaboration with scientists or engaging with scientific practices in fields such as synthetic biology

¹⁴ For example, for 2015-16 the resource allocation to the UK’s Arts and Humanities Research Council is 98.3 million, compared to 351.2 million for the Biotechnology and Biological Sciences Research Council, and 793.5 million for the Engineering and Physical Sciences Research Council. Department for Business, Innovation and Skills, ‘The Allocation of Science and Research Funding 2015/16’, May 2014. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332767/bis-14-750-science-research-funding-allocations-2015-2016-corrected.pdf. Accessed 21 September 2015.

and bio-digital research, for instance¹⁵. Much public discourse on contemporary relationships between science and design is dominated by boosterism for such interdisciplinary working and its products, and critical academic discourse on it is extremely limited¹⁶. Historians' contributions have the potential to stimulate and enrich the discussions about interactions between science and design today. This thesis has introduced questions regarding cross-disciplinary relationships in postwar Britain that might also contribute to conversations about current and future interactions between scientists and designers, and exchange between their respective practices, interests and ideologies. Such questions concern, for instance, the values that underpin impulses towards cross-field exchange itself; the way different social practices and cultural interests affect the shape of such interactions; and the ramifications of the products of relationships between science and design as they circulate and are consumed within broader public spheres.

The methodologies, frameworks and questions shaping historical research affect the ways in which history can act in the present. This thesis identified and experimented with ways in which historians can examine cross-field

¹⁵ For example, the designer Veronica Ranner is currently a Visiting Scientist at Tufts University's SilkLab, exploring the bio-digital possibilities of silk (that is, to embed digital capabilities in the material). The artist and design Alexandra Daisy Ginsberg's work has opened up new territory and generated interactions at the intersection of design, art and synthetic biology. On recent interdisciplinary work between scientists and designers in synthetic biology see *Synthetic Aesthetics: Investigating Synthetic Biology's Designs On Nature*, ed. by Alexandra Daisy Ginsberg (Cambridge, Massachusetts: MIT Press, 2014). Further examples of sites for interdisciplinary relationships between science and design include but are by no means limited to: SymbioticA Laboratory at the University of Western Australia hosts collaborations between scientists, artists and designers in the life sciences (<http://www.symbiotica.uwa.edu.au/welcome>); the MIT Media Lab, perhaps the most well known site for such interdisciplinary working has housed interactions between science, engineering, design and art practices for decades. Veronica Ranner, 'UISilk: Towards Interfacing the Body', Proceedings of the Second International Workshop on Smart Material Interfaces: Another Step to a Material Future, Sydney, Australia, 9-13 December 2013, pp. 13-18. See also the catalogue for the 2008 Museum of Modern Art exhibition 'Design and the Elastic Mind', which presented examples of interactions between design and science: *Design and the Elastic Mind*, ed. by Paola Antonelli (New York: Museum of Modern Art, 2008).

¹⁶ Academic research in this area comprises a small body of literature from the area of design research scholarship focusing primarily on practical questions about collaboration between practitioners in science and design fields and comparisons between the disciplines. Carlos Peralta and James Moultrie, 'Collaboration Between Designers And Scientists In The Context Of Scientific Research: A Literature Review', International Design Conference - Design 2010, Dubrovnik - Croatia, 17 - 20 May 2010, pp. 1-10. A key critical source on design-science relationships comes from one of the designers involved: see Alexandra Daisy Ginsberg's essay 'Design as the Machines Come to Life', which reflects on the ramifications for what 'design' means in the context of interdisciplinary work in synthetic biology. Alexandra Daisy Ginsberg, 'Design as the Machines Come to Life', *Synthetic Aesthetics*, pp. 39-70.

relationships between science and design, and study artefacts that challenge the conventional boundaries of research in the histories of science and design. I have aimed to position interdisciplinary scholarship in this area such that it can best contribute to on-going inquiries within the history of science and design history, and explore new questions that arise within the interdisciplinary domain this thesis has defined. In doing so, I hope that this research also lays a foundation for approaches that will allow historians working in this area to contribute to conversations about the interactions taking place between science and design today and in the future.

Appendices

Appendix 1: Introduction to Oral Interviews

This section introduces the oral interviews conducted for this research. It is followed by information on the interviewees (Appendix 2) and transcripts (Appendix 3).

Oral interviews conducted for this research fall into three categories. The first category comprises interviews with figures aligned to the postwar production, and in one case, retail, of objects. It includes interviews with the LMB technician Mike Fuller, X-ray crystallographer Michael Glazer, and keeper of the Woolworths unofficial archive, Paul Seaton. The second category comprises oral interviews with postwar consumers about their reception and consumption of ball-and-rod objects in the past, as part of the research into these objects discussed in chapter three. The third category consists in oral interviews with contemporary ‘retro’ consumers and sellers about the reception and consumption of postwar ball-and-rod objects today.

Interviewing methods permit access to narratives and perspectives not represented elsewhere, such as in textual sources or dominant historical accounts¹. This project used oral interviews to gain information and perspectives on several topics that were otherwise under-represented or absent in the sources. These topics include the material production of postwar X-ray crystallographic visualisations and the consumption of ball-and-rod furnishings. As Linda Sandino, a design historian specialising in oral history, points out, interviewing methods can complement the design historical attention upon consumption that has developed in recent decades². Interviews are indeed key to this project’s contribution to research on the consumption of modernist design in postwar Britain. This research area has rarely incorporated postwar consumers’ own perspectives, something oral interviews provide in this thesis.

Sandino distinguishes between oral interviewing and oral history techniques. The former is used for ‘eliciting information about objects’, she

¹ *The Oral History Reader*, ed. by Robert Perks and Alistair Thomson (Oxon: Routledge, 2006); Paul Atkinson, ‘Man in a Briefcase: The Social Construction of the Laptop Computer and the Emergence of Type Form’, *Journal of Design History*, 18 (2) (Summer, 2005), pp. 191-205.

² Linda Sandino, ‘Oral Histories and Design: Objects and Subjects’, *Journal of Design History*, 19 (4) (Winter 2006), 275-282.

writes, whereas oral history ‘focuses on people in order to understand them as subjects in the socio-historical contexts of the immediate past or the present’³. In this research, interviews primarily served an information-gathering function, and therefore fall generally into the category of ‘oral interviews’. But some elements common to oral history are also involved. Indeed it is difficult to separate the two; the production, consumption and circulation of objects in this thesis are intertwined with the social and historical contexts of the people with whom they interact. For instance, in interviews with the LMB laboratory technician Mike Fuller and crystallographer Michael Glazer, I sought both information about the production of scientific objects as well as aspects of the social practice of technician and scientist (which is reflected in interview questions about training and social interaction).

An element of oral history and ethnographic interviewing techniques that marked my interviewing method to a degree was that of interactivity in the interviewer-interviewee dynamic⁴. All interviews were semistructured, meaning they combined open-ended, flexible conversation with more directed questions intended to elicit specific information⁵. I allowed myself follow-up questions on details brought up by interviewees in areas relevant to the research, and permitted interviews to move in directions dictated by interviewees when I deemed such digression relevant. For example, in many cases postwar consumers were moved to talk about postwar objects other than the furnishings at the centre of my research, which was significant for this research as it displayed a lack of interest in these objects.

The relative weight of open-ended questions versus more directed ones varied according to the type of interview. For instance, the purpose of my interview with Paul Seaton was to gain information about Woolworths’ production and retail of ball-and-rod objects, and it therefore focused heavily on information about these details. Interviews with Glazer and Fuller, for example,

³ Sandino, p. 275.

⁴ Valerie Yow, ‘Do I Like Them Too Much?’: Effects of the Oral History Interview on the Interviewer and Vice-Versa’, in *The Oral History Reader*, ed. by Robert Perks and Alistair Thomson (Oxon: Routledge, 2006), pp. 54-72.

⁵ The term ‘semistructured’ to describe a type of interviewing is rooted in ethnographic methods in which it refers to interviews that ‘combine the flexibility of the unstructured, open-ended interview with the directionality and agenda of the survey instrument’. Stephen L. Schensul, Jean J. Schensul and Margaret D. LeCompte, *Essential Ethnographic Methods* (Walnut Creek, California: AltaMira, 1999), p.149.

sought open-ended responses to questions about the postwar construction of models and diagrams, but also involved more directed questions concerning periodisation or technical details about particular objects.

A central aim of my interviews with postwar and contemporary consumers was to develop an understanding of the significance of ball-and-rod objects in the past and the present, which is an open-ended inquiry. Therefore individual interviews with consumers began in an open-ended manner. Interviews with postwar consumers began with an open-ended question simply about their lives in the postwar period. This established the conversation as being not only about the objects themselves but other period contexts (home life in the period, for example) of which the objects might have been a part. Then came open-ended questions about ball-and-rod objects, using images of the objects as a prompt (drawing on similar techniques used in some oral history methods to prompt discussion⁶). In addition to open-ended questions about ball-and-rod objects, interviews with contemporary 'retro' consumers included questions about their lives and homes. Interviews with consumers also served the research question about whether or not ball-and-rod objects were received as scientific, 'molecular' or 'atomic', and for postwar consumers, whether or not they liked the ball-and-rod style.

Interviewing was undertaken in accordance with research ethics for interviewing published by the British Oral History Society⁷. The interviewing component of this research also received approval by the RCA Research Ethics Committee.

Postwar consumers

I conducted interviews with postwar consumers primarily in London in 2013-2014. This set of interviews included five individual interviews, one interview with a couple, and three group interviews. I made contact with interviewees primarily through community groups, and in one case, a care home (these are listed in the interviewee information provided in Appendix 2). Additionally, I contacted two interviewees through museums to which they had donated postwar

⁶ Ken Howarth, *Oral History* (Gloucestershire: Sutton, 1999).

⁷ British Oral History Society, 'Ethics', <http://www.oralhistory.org.uk/ethics.php>.

household objects. Individual interviews took place in interviewees' homes, and in the case of the museum donors, over the phone (they did not live in London).

Group interviews took place at the community centres where the organisations through which I arranged the interviews held events for old-age pensioners. The decision to speak with groups was dictated in part by practicalities. Community organisations were more willing to allow me to conduct an interview during a group's regularly scheduled, supervised meeting time, than to furnish me with individuals' contact information (with which I might have organised individual interviews).

A significant feature of interviews with more than one interviewee is that typically a member or a few members of a group will speak more than others in a discussion⁸. This was the case with the group interviews conducted for this research (out of ten attendees, for instance, three or four people might speak the most).

As mentioned in chapter three, interviewees' class backgrounds were identified based on their postwar occupations or that of their parents (this information is listed in Appendix 2). The nature of the group interviews presented some difficulties in terms of identifying some interviewees' class backgrounds with certainty, however. On recordings of group interviews it is not always clear which interviewee is speaking at a given time. Additionally, for some participants of the group interviews, information about their class background was not available.

Community group organisers, through whom I organised the group interviews, were wary of their members simply serving as research subjects, and required that the session offer the interviewees something as well. Therefore, in order to gain access to the groups who participated in the group interviews, I offered a short talk about postwar Britain. In order to mitigate the extent to which this would influence interview responses, I kept my own speaking to a minimum, showing slides and asking the group to respond to the images, somewhat in the style of the image prompts used in the interview (relevant excerpts from this part of the sessions are included in transcripts).

⁸ Mary Kay Quinlan, 'The Dynamics of Interviewing', in *The Oxford Handbook of Oral History*, ed. by Donald A. Ritchie (Oxford: Oxford University Press, 2011), pp. 23-36.

It is inevitable in interviewing that aspects of the interviewer-interviewee relationship impact responses⁹. This became apparent in two individual interviews on the subject of questions about my interviewees' taste in ball-and-rod objects. I became aware in these two interviews that my interviewees had the impression that I was asking about ball-and-rod objects because I liked them, which may have made them feel pressure to expound more positively on them than they otherwise might have. In these two interviews, the interviewees gave conflicting responses to the objects (one so much so that the interview was inconclusive and this is noted in her transcript), which may be the result of this impact of our interaction.

Contemporary 'retro' consumers and sellers

Research into the contemporary commodity lives of postwar ball-and-rod objects involved seven interviews with 'retro' consumers and sellers about the reception and consumption of these objects today. As noted in chapter four, many of these interviewees were both 'retro' consumers and sellers; the particular relationship of each to the 'retro' economy is noted in the interviewee information below.

Also as noted in chapter four, most interviewees were contacted online through channels of 'retro' culture and consumption. This affected the geographic distribution of interviewees: most live in southeast England, although the East Midlands and Cornwall are also represented. Those located in the southeast were interviewed in person. The other interviews took place over Skype. All of the contemporary 'retro' interviewees are in their twenties, thirties or forties, which reflects the age range and generational identification of those who are interested in 'atomic' objects.

⁹ Yow.

Appendix 2: Interviewee Information

Production/retailing of objects:

Mike Fuller

Role: Laboratory Technician, Laboratory Manager, MRC LMB, 1952-2012

Interview date: 19 April 2012

Interview location: MRC LMB, Cambridge

Michael Glazer

Role: X-ray crystallographer. Professor Emeritus of Physics, Jesus College, Oxford (2010-current); Vice President of the International Union of Crystallography (2014-current); lecturer in Physics at the University of Oxford and Official Fellow and Tutor in physics at Jesus College Oxford (1976-2010); postdoctoral assistant to Helen Megaw and subsequently the Director of the Wolfson Unit for the Study of Dielectric Materials, Cavendish Laboratory, Cambridge (1969-1976); PhD, University College London, 1968, supervised by Kathleen Lonsdale.

Interview dates: 6 November 2013; 29 May 2015

Interview location: Jesus College, Oxford (for the 2013 face-to-face interview); 2015 interview by telephone

Paul Seaton

Role: Keeper of the unofficial archive of Woolworths, author of a history of the company entitled *A Sixpenny Romance: Celebrating a Century of Value at Woolworths* (London: 3D and 6D Pictures Ltd, 2009), and employee of Woolworths in managerial and IT roles since the 1980s.

Interview date: 2 July 2014

Interview location: Paul Seaton's home, Surrey

Postwar consumption:

Those interviewed for research on postwar and contemporary consumption are identified here, in interview transcripts, and in the thesis text by pseudonyms.

Individual interviews:

Susan (donor of Antelope chair to V&A)

Age: mid-80s

Occupation in postwar period: primary school teacher

Location in postwar period: London

Interview date: 29 July 2013

Interview by telephone

William (donor of assorted postwar furnishings to the Geffrye Museum)

Age: 79

Occupation in postwar period: boarding school during the war; then sold furniture working for Heal's and John Lewis

Location in postwar period: London

Interview date: 10 June 2013
 Interview by telephone

Valerie (Neighbours in Poplar)
 Age: Approximately 80
 Occupation in postwar period: sewing machinist
 Interview date: 14 February 2013
 Interview location: Valerie's home in Poplar

Sam (Neighbours in Poplar)
 Age: 82
 Occupation in postwar period: carpenter
 Interview date: 26 February 2013
 Interview location: Sam's home in Poplar

Frank (Neighbours in Poplar)
 Age: 74
 Occupation in postwar period: worked in a brewery, and later a paper recycling company
 Interview date: 20 February 2013
 Interview location: Frank's home in Poplar

Peter (Highgate Care Home)
 Age: 81
 Occupation in postwar period: PhD student; historian
 Interview date: 21 November 2013
 Interview location: Highgate Care Home

Linda (joined interview with Peter)
 Age: 88
 Occupation in postwar period: worked for government social surveys and Mass Observation; social worker
 Interview date: 21 November 2013
 Interview location: Highgate Care Home

Group interviews:

Positive Age Centre (Open Age)
 Interview date: 3 June 2013
 Interview location: Positive Age Centre, North Kensington London
 Number of attendees: 10
 Occupations of interviewees: Of those who participated in the discussion, one woman mentioned she was in boarding school in the early 1950s, another's father was in the military, and another interviewee was a chemist working in industry.

Warwick Open Age
 Interview date: 12 Aug 2013
 Interview location: Warwick Community Centre, Maida Hill, West London
 Number of attendees: 9

Occupations of interviewees in postwar period: Those who provided this information indicated the following occupations: British Airways stewardess; two were nurses; wife of an engineer; boarding school then worked for foreign broadcasting arm of the BBC; banking; office work

Community Time Camden

Interview date: 9 July 2013

Interview location: Abbey Community Centre, Camden, London

Number of attendees: 6

Occupations of interviewees in postwar period: For this interview, this occupation information is not included on the recording due to a technical error. I noted on the day of the interview that the group represented lower-middle and middle class backgrounds. In the interview transcript, one of the interviewees mentions her job as an 'office girl' in Holborn, another says she worked for an architect.

Contemporary 'retro' consumption:

Mary

Age: 41

Role in 'retro' exchange: owner of 1950s-themed film location, props and models business; collector of 1950s objects, clothing and cars

Interview date: 17 September 2013

Interview location: Her home in Watford

Christine

Age: 20s

Role in 'retro' exchange: owner of online shop of vintage objects from several decades; collector

Occupation (additional to above): Exhibition designer

Interview date: 6 September 2013

Interview location: Skype (she lives in Lincoln)

Melanie

Age: 28

Role in 'retro' exchange: online seller (primarily Etsy), runs website on 'Cornwall's Vintage Scene'

Interview date: 6 September 2013

Interview location: Skype (she lives in Cornwall)

Ms Pink

Age: 46

Role in 'retro' exchange: Collector

Occupation: runs a furniture up-cycling business

Interview date: 20 September 2013

Interview location: her home in London

Robert

Age: not specified

Role in 'retro' exchange: dealer, owner of high-end mid-century furniture shop in East London

Interview date: 13 September 2013

Interview location: his shop in London

Charlotte

Age: 33

Role in 'retro' exchange: Sells on eBay; collector

Occupation (additional to above): pharmacist

Interview date: 12 September 2013

Interview location: coffee shop in Margate (she lives in Margate)

Nick

Age: 20s

Role in 'retro' exchange: Online seller (eBay)

Interview date: 6 September 2013

Interview location: Skype (he lives in Derby)

Appendix 3: Interview Transcripts

Interviews regarding production/retailing of objects

Interview with Mike Fuller

Laboratory Technician, Laboratory Manager, MRC LMB, 1952-?

19 April 2012

MRC LMB, Cambridge

E: [I explain my research topic, and we began talking before I began with my predetermined questions] ...I'll be interested in what you have to say about modelling in the 1950s and 1960s.

M: The big thing you just have to get in the mindset of is that there were just no computer graphics or no three-dimensional model-making full stop. So one just had to improvise.

On thing I thought of: the DNA model [referring to an image I brought along from a BBC programme]. It was set up by a BBC film crew who wanted to shoot through the ball and spoke model to give sort of an abstract moving image. We had Hugh Weldon and Raymond Baxter come. Most of it was done on the landing outside the canteen, out in the open. It was a sunny day. If not we did it just in the model room, which was just above the workshop.

E: Did they come just that once or...?

M: We had almost weekly a film crew from somewhere in the world. Too many to actually remember. BBC used to come quite a bit. Shell had a very good film crew in the early days. Shell did much the scientific films, and then they faded out and BBC took over. Lots of independents. We had quite a few foreign, you know, American film crews who wanted to target one particular subject. There's a very good one by - not Progressive films - it's a documentary company. Providence films...they did a very good one on almost everything. They do one on how the Sphinx was built. They do one on film 21, the original one that Rosalind Franklin did.

E: Could you please introduce yourself and explain your role here?

M: My name is Michael Fuller. I started out as a technician in 1951. I was the only sort of technician in the lab. To work on the X-ray generators. Then I graduated up to become the lab manager, so I've been involved with all the aspects of the lab since then. Even retired I still come in and help and do jobs. Structural studies always played a major part in the lab from the early days. Now the emphasis is switching more toward cell biology and structural biology and neurobiology. Initially $\frac{3}{4}$ of the effort was on structural biology. This is where the model making came in.

E: How did you get the job?

M: Oh very interesting - When I left school - I went to a technical grammar school here in Cambridge. I'd always wanted to work at the Cavendish

Laboratory. I got very interested in physics mostly because the school secretary used to live in the same road as I did and we used to cycle to school together and he gave me a couple of books on the Cavendish Laboratory. So I wrote to the Cavendish at 15 and said I want to come and work. I got a very nice letter back from Dr Perutz who was the director of the unit inviting me to come along for an interview. I was interviewed in a very small room by four people. Our knees were touching. There was Max Perutz, John Kendrew, Francis Crick and Tony Broad, who was the engineer I was going to work. Simple sort of questions: *What is sodium chloride?* Salt you know. You've got the job! It was as simple as that. I may not have been very bright but there was a lot of enthusiasm there anyway! The Cavendish was a very good training ground, because being a department of physics, you were taught how to do everything, from glass blowing to repairing engines and design and manufacture. So it was really a hands on laboratory. We were all treated - we were a MRC unit in the university department of physics. So we were the oddballs in the lab because the rest of them were physicists full stop and here we were doing biological material. We had white lab coats whereas everybody else in the Cavendish had khaki lab coats. On the whole we merged very well. We kept very much to ourselves. We were quite well funded in the early days. Well, we were always well funded in that we were able to obtain supplies as and when we wanted. But in the early days of course it was very hard to get a hold of absolutely anything because just after the war there was not much around so you had to improvise a lot. That was very good training. You never threw anything away. You used whatever you can. Still a hoarder now I think. When you see something like that you think, ah that might be interesting to use for such and such. That's how it all works.

E: What parts of the model building process were you involved in in the late 50s, early 60s or even before that?

M: It's really a major culture change from the early days. In those early days everyone was encouraged to do their own thing. Although there was the main workshop - they were very heavily involved in manufacturing large pieces of equipment for the nuclear physics groups. There was a students' workshop, which was lathes, milling machines all the other equipment, which anybody could go and use. Now with health and safety that's almost impossible to do. One was always encourage to do your own thing. I got involved, because being the youngest, to go out and source different things, you know, pipe cleaners, or sheets of cardboard to help model building. The DNA model was initially made out of cardboard, sheets of card which we got from Heffer's, the local stationers in Cambridge, and pipe-cleaners. Well pipe cleaners - then found because they were just soft wire they bend and the whole thing collapsed, so that wasn't very good. The next thought was to make it out of metal. I was seconded to go in to the workshop, because the workshop was very busy, and to cut out all the base plates for the model and solder some of the side-arms on. So I helped make most of the bits and pieces with one of the chaps in the workshop. Then the scientists as such, and it's been a tradition ever since then, that they will actually build the model. They never relied on anybody else. Even Dr Perutz, Francis Crick, any of them, John Kendrew, they all did, hands-on, did the model themselves. That's been - even today - that's still encouraged. We've never used any professional model maker or advice in that respect. It's all been done in-house.

E: So you were involved in some stages of the process...

M: Yeah absolutely. 'We want to do this, what could we use?' and so on. When you look at the virus models, you see a very good example. You can look at a picture of the virus and it shows patterns of five dots around a circle. So how do we translate that two-dimensional picture into a three-dimensional model? So you work with scientists and say, well what about those bottle tops there, together with those crocodile clips. That looks like it. Oh yeah that's it! There we go. Work closely with them. They then put the model together and that's it.

E: Was there a part of the process you enjoyed particularly?

M: I think I enjoyed all of it to be honest. The model-making was just one section of it. It was quite impressive to see the models but really the rest of it was so exciting because there was so much happening every day.

E: Did you have previous experience building things?

M: No, none at all. It was just the training at the Cavendish, in that you were encouraged to do everything. You were a jack of all trades, so you could blow glass, you could pull glass fibres, you could stick this you could solder that. Anything you could do. You were not a specialist in any field. Good experience to do anything and everything.

E: Which models were you involved in working on? Demonstration or research models?

M: All the demonstration models really came about after the initial model. They were just used to tidy it up and then for lectures. The model building started and immediately you were working on a project because it's the only way you could translate that information on that piece of paper into a three-dimensional shape.

E: How does that happen? Do you remember maybe a specific instance?

M: The very first models we made - the very first model was John Kendrew's myoglobin. The small one...

E: The two angstrom model? [the 1957 'sausage' model]

M: Exactly. That was made of Plasticine. There's a wooden base, so the first thing to do was get a sheet of paper like that and drill a set of holes and then just use skewers, wooden skewers, and then build up the Plasticine. We used Plasticine for everything. I mean now it's almost impossible to buy, but at the time, Plasticine was the only model-making thing you could get.

E: Where would you source it from?

M: Model shop. Or any of the toy shops. The secret is, none of the lab supply houses sold this sort of thing. You would have to go to either the hobby shop in

Cambridge or one of the toy shops and just get it. Anything you could lay your hands on. It was literally a matter of laying your hands on something or other.

E: Do you remember how the idea came about to use Plasticine?

M: Plasticine was the number one modelling tool of children. Before I started work, you'd make small little people, or anything out of Plasticine. It was the only thing. You didn't use anything else. It's harmless, its pretty innocuous material, and so you just used it. You could buy it in any colour you like, and just make anything out of it. It wasn't till much later that some of the more exotic kits became available in the shops, you know, the straw ones with – so you could build up. There was Meccano, which was the metal one, but now you can buy the straw ones with the rubber adapters to build models. That sort of thing didn't come out until 20 years later. I think this was the thing - no one had ever made a three-dimensional model of a protein. There just wasn't a need for it!

Once the small model is made and photographed, which we did in the lab, and John Kendrew used to take that around on lecture tours, we then made the very big one which was used – I think it was made for either the Brussels World fair or the Seattle World Fair.

E: Is that the one that appears in the *Shapes of Life* episode?

M: That's the one.

E: That was in '58.

M: So it was definitely Brussels. That was made – it was very simple. All it was made of was a wire frame bent round. It was made by John Kendrew and his postdoc student, scientist with help from different people in the workshop. They bent wire around and then chicken wire which is bent round all the way round so as to get the shape then filled with straw packing material, because remember in those days - now if you buy anything it comes with little polystyrene chips – but everything came with straw packing, which was just wood fibres. So all you did was got wood fibre and packed it in the wire netting and that was mixed then with plaster of Paris. So we made up buckets of plaster of Paris with straw – messy – then patted it all around, then once it was done, smoothed it off with a little plaster on the outside then a coat of white emulsion paint. And that's it. It's as simple as that. Then that model was taken to Brussels, then we installed that in the main entrance of the lab and it was suspended and it was the first model the queen saw and everybody else who came into the building since '62. It was a very simple thing to do. Basically that was the only material you could use. We could have made it out of wood. But then it would involve skilled craftsmen to shape it, and it would be so heavy you couldn't move it. Something very simple, you could lay your hands on.

The other big one which we made of myoglobin was the large skeletal model. Now that was in a way a nightmare of a model. We had one large room, about twice the size of this room here and it was basically large sheets of plywood with a pattern of holes which we had to drill by hand and then put one eighth – about

four millimetre diameter rods – steel rods in. One, steel was difficult to get a hold of, so we had to get a special licence to get it. They were all covered in thick grease, so they all had to be cleaned and then put in upright. John Kendrew did all the work himself, with his postdocs, just building the model up. The problem is, if you slipped, you jabbed yourself. It was really quite dangerous. We all got stabbed one time or another. Once it was built you couldn't really move it. We broke up a quarter of it. The scale was too big. He felt he needed that large scale as the only way he could actually get all the information on the bonds. Then of course we started reducing them. You've seen small case of – well the sketches from the back of envelopes. We made those in the workshop, but then the workshop got so loaded with other work, it was put out to a local firm who did mass production who could mass produce them for us then they've been sold worldwide. We gave that whole design to the company, the company sold it worldwide but we never patented it. We never bothered about getting it back. It was a different era. One didn't talk about commercial things in those days. I think the same went on for the DNA model. Francis and Jim Watson were both mavericks. They were both – I wouldn't say oddballs but they had their own way of doing things. They got very excited about the model. The first models were made of cardboard and pipe cleaners. But it just collapsed. It wasn't very good. So it was then decided to use the same metal tin plate, base plates cut out in the workshop, with the side-arms soldered on, then using John Kendrew's wire frames to build the model. It was just what we had on hand. The centre core is just an odd bit of rod with lab clamps out. Now one would use much more professional things. But at that time, what did we have on hand? Full stop. After that big model was made, I together with Tony Broad, made a small one, which is in a Perspex case, which Annette [the LMB archivist] has, a round tube. That's the original model after the big one. That one was used purely for Jim and Francis to take world wide. Very simple. Just cut out small pieces, small bonds and we just soldered them together. But one of the things it demonstrated - we made it with a central mandrel - but when you took the mandrel out you could hold the model, compress it, twist it but it always came back to shape.

E: Why was it so springy?

M: Just because that's how we made it. The side bonds were all soldered on. It's not a screw on at all. I always remember them saying, the model must be right because physically, it's strong. You can do anything with it and it doesn't break. That's travelled round the world so many times.

E: What is the metal part made of?

M: That's made of Inconel, which was a nickel iron. Just a soft - but you could spot weld it. You spot welded the wires onto the base plates. We just sort of zigzagged and put them on there.

E: Had they wanted it to move or was that a side effect?

M: It was a side effect. Look at that! You could do that with it and it still comes back to its original shape. Now you can buy DNA models made by every company in the world from paper, origami to the most exotic ones. The biggest

one was made by Mr Barker for the Seattle World Fair and that was about 20 feet high. Since then we did one for the DNA conference [in 2002].

E: Were there any early stages with the myoglobin before the Plasticine?

M: No because the only thing you could use was Plasticine, and it was the only thing available at the time.

One just used anything that you could lay your hands on. At the Cavendish, the number one department of physics in the UK in the '50s right up until we left [1962], it was impossible to lay your hands on electronic components or pieces of metal. Even handles for a drawer! Once a month we had an ex-army radar truck, which was just a huge van on the back of a lorry come and it was parked in the middle of the courtyard and everybody could dive in and help themselves to resistors, meters, anything that was there, and reuse them. That was the whole attitude of what was going on. I think that was amazing really. You became very resourceful. The same thing as in some of those third world countries. You look at Cuba. How do they keep those old cars running?

E: How would you communicate with the scientists when you were making the models?

M: Just went and spoke to them. That's the one great thing with this laboratory. The ethos of the lab is that everybody is treated as equals. You were one of the team. You were one of the helpers and you did it. At the Cavendish at the time there were three tearooms – one for scientists, one for the administrators – the secretaries - and one for the technicians. Nobody was allowed to go into the scientists' tearoom, even to leave a message during coffee time. The secretaries were even worse! There was definitely that you are down there and they're up there. But the MRC group – under Kendrew, Perutz – treated everybody as equal. Even if you were a junior technician you were still part of the team. You know, 'Would you go and do this for me?' You're not *told* to go and do it. That was the – that still goes on today. Here everybody's treated as equal. There's no them and us situation. You just felt as part of the team. What do we need? Well let's just use this. You're working closely all the time of them. Still very good friends with most of them, actually over the years. Still now they come back and so on and so on.

E: Was there a specific model you worked on that stands out in your mind?

M: The big myoglobin model was an enormous feat. Here was the whole myoglobin and it filled a room. The forest of rods. Now you think, how stupid of us using all that material. But how else could you do it? There wasn't any computer graphics. The girls did the Fourier maps and showed where the contours were and the only way to transfer those contours was to make a model. And small models – although small models gave the overall shape – you couldn't see all the bonds.

E: What was the environment for making models?

M: Just basic moving around and so on. It dictates to whatever space you've got. There were no hard and fast rules. Nowadays a model maker would have it all set out with plenty of room. No it doesn't work that way. The most recent development that happened was the development of the confocal microscope, which has been the biggest development in microscopy, which was done here, with a laser and a computer which will take sections of a sample, so you can build up a complete image. A couple of scientists thought we ought to be able to do this. It involved the workshop. We just had a bit of bench. Space has always been a difficult problem. What can we use? So we went down and got a photograph enlarger because it was a bit base plate and a little bit of bench next store - that was where the computer was and another bit of bench, that's where the laser was. Later when it was sold commercially they compacted it and turned it into an industrial design. But you put it on a bench and do it with whatever you've got.

E: Would a lot of the work take place in a workshop?

M: Half and half really. Most of the model making was done in the lab or on the desk. The workshops really were just involved in manufacturing the components or drilling holes or that sort of thing. At the Cavendish there was always a workshop - and in fact here in the early days - a workshop where anybody in the lab could go and make things or drill holes or do anything you like. But all the model making was done in the lab or on the desk or on the bench. It's only more recently where we made demonstration models where we made it in the workshop using newer materials and computer graphics machines.

E: Did you produce balls for the ball-and-spoke models?

M: The very first ones were made of wood. We bought those in. The very first ones were made by Crystal Structures Ltd, Dr Wooster's unit, who made them purely for inorganic crystallography like sodium chloride. He never looked at any of the biological material at all even though we are just down the road and he was a very good crystallographer and so on. He never became involved in biological ones until he made demonstration models and sold them.

We got to know how a lot of the ball-and-spoke ones were built - really was Mr Barker. He was the workshop superintendent of the department of engineering. The department of engineering had a big workshop because they provided all the workshop facilities for the university. The Cavendish had their own little workshop. But if you wanted anything big done they were heavily involved with nuclear physics at the time and they couldn't cope so you went across to the engineering lab and said could you make 50 of these or 10 of that. Mr Barker was very interested in these. He was the superintendent but he was a classic do it yourself man. He could turn his hand to anything. I believe he took this up as a hobby - the crystal models. I don't think he ever - he certainly didn't do it to make money out of it. He did virtually all the building of models in his garage. Full stop. As a hobby. It was up the scientists, up to Francis Crick, just to give him the coordinates and he just put it together. He drilled the holes, he bought the balls, he assembled it. Virtually all the ball-and-spoke models we have here are

his, made by him in his garage. I got to know him very well but I never actually helped him make a model. He did all of those on his own.

E: Did he decide on the size of demonstration models, or was that ordered in a way?

M: That's a difficult one actually. I would imagine he was commissioned on that. In theory all of them were commissioned. They were all used initially as a scientific tool. They were not used for demonstrations. Then when the papers were published and people wanted to see them, then other companies started making them. From then on other companies started making them.

E: Was he associated with Cambridge Repetition Engineers?

M: No that's a different company. A small company - Mr Albert Welsh was the managing director - that had automatic lathes and milling machines and they made things for all sorts of companies around Cambridge. They were set up purely to make 10,000 of those. Nothing else. They did the model parts.

E: Did Barker have training in crystallography?

M: No he was just given the information and did it himself.

E: Do you know anything about John Ernest's work on the virus models?

M: The TMV? John Ernest – that was all done in Birkbeck College. Nothing to do with the lab here. Really we shouldn't really claim it. It's just been an icon in the lab. We've got the polio model in store. That's just big polystyrene balls. We've got photographs showing the model being build. I'm not certain whether John was a member of the lab or whether he was a professional model maker or artist.

E: I think he was a sculptor.

M: Ah that's the sort of thing you see. Because it was a Birkbeck College they probably meet somebody in the tearoom. That's how it all worked. You know he'd be sitting there talking. I'm certain he would not have been commissioned to make it because there wasn't that sort of money available. It would be done almost certainly on a friendly basis – of this is an interesting project. It was always being changed. If you look at it the model has a core. I remember Aaron telling me they got the rotation wrong – the TMV – and they had to chop some of the model off to get it right. They went straight in to the big one. There's no small model. As far as I know they never did unless there's one at Birkbeck somewhere. It never came here.

E: Was Polystyrene a common material for this kind of thing?

M: We never had any Polystyrene at all prior to that. Probably they got to know that through the sculpture. I think it was initially manufactured as an insulating material. I imagine he must have – being a sculptor – gotten to know the

material. You can cut it with a razor blade or a hot wire tool. It came in during the 60s. I remember the workshop having a hot wire tool, like a cheese cutter, which is hot. That's how you cut polystyrene. That was used for all sorts of things – packing. One of those things you used. It's strong and it was used purely as a packing material.

E: I notice that smaller virus models were made of ping-pong balls.

M: Where can you get balls that size? Ping-pong balls. What is available at the time? Ping Pong balls! There you are. What is available at the time in the shops. Now you see you can scan scientific warehouse on the computer and obtain any supply worldwide almost next day. You couldn't then. None of the scientific warehouses had anything for model building.

E: I had some questions about the television programmes. Did you have much communication with the BBC staff?

M: We often used to get calls from the props department – please can we borrow some of your models we've got a film? We used to loan them to them no charge. There's a film with Gregory Peck, *The China Syndrome* I think [1979]. They wanted a whole load of models there was a scientific lab I think. He was a scientist and I think something had gone wrong, they were drilling a hole through the world. One thing always happened with the filming crew – they always sprayed the models matte.

E: On several programmes from the late '50s, early '60s there's a DNA model rotating.

M: The first time it happened it was a BBC crew, it was the small 3 foot model. The cameraman said we'd like to turn it round. We had an old gramophone turntable and we brought that along with speed control and set it up. He got just what he wanted. We had it on hand. From then on when it happened, we said why not do it. They said oh yeah fantastic. The large model that's on the landing that's almost 6 foot tall would be impossible to turn round. We put it in a little box to hide the turntable. Within an hour, made it up.

The one big thing of course is that it's the most photogenic model. That's why even today, everybody goes for it. It looks good at any shape or angle. Myoglobin – ugly proteins. I think now it's the accepted symbol for bioscience worldwide.

E: Did they ask for a moving model?

M: No – this is what the director wants, we would just talk about it.

E: Was the turntable used in the lab?

M: You did all sorts of weird things. That was used in the X-rays to slow rotate a crystal at one time. Because there it was – a motor with a variable control. You can easily adapt that.

First interview with Michael Glazer

X-ray crystallographer

6 November 2013

Jesus College, Oxford

E: Can you introduce yourself and what you do?

M: I started being interested in crystals when I was 7 years old. I found my first mineral and that set me off. I started as a chemist. I did a PhD in London, UCL. My supervisor was Kathleen Lonsdale. I was invited by Helen Megaw to come to the Cavendish [1969]. I worked on organic materials at the time. But I went to Cambridge to work on inorganic materials. I worked as a postdoc for her until she retired. In Cambridge the crystallography laboratory was started by W.L. Bragg. I ended up running that lab. Then in '76 I was appointed here [Oxford] as a lecturer in physics.

E: When did you become aware of crystallography?

M: I was walking home, about seven years old and I picked up a round pebble and threw it down and it cracked into two. I looked inside it had all these colours. My mother bought me a book about geology and I started reading it. By the time I was ten I knew how to index the shapes of crystals, I knew the name Bragg and so on. I used to go to the RI to listen to Bragg talking on various subjects. From about the age of nine or ten I used to go down to the Geological Museum at South Kensington.

E: What structures have you worked on?

M: Really the first research I did was on organic crystals in Kathleen Lonsdale's lab. I was looking at a molecule called phenazine. I did my PhD on that. Then when I went to Cambridge I worked on a material called sodium niobate, something Helen had been working on for years, part of the perovskite family. They are a very important class of materials because they have a very simple structure in principle at high temperature, but there are small changes you can make in the structure that change the properties. The structure consists of octahedra joined at all directions, a framework of octahedra. One of the questions Helen was interested in was, what happens when you take an octahedron and you tilt it? When you tilt it, what happens to the others? What happens to the rest of them? I found 23 different ways of doing it and that was my most famous paper. It led to a particular notation to describe all these complicated structures. I wrote the paper up and sent it in to *Acta Cryst* and got back the referees report – 12 pages of closely typed criticisms. I was so angry. I showed it to Helen and she said there are some good points here and I'll help you to sort it out. I learnt later on Helen had been the referee!

E: What was the nature of the research process for the perovskite investigation?

M: Models. I'll show you the models over there. Physical models were really the way. If you imagine octahedra all joined in a plane if you tilt this one this way, this one must go the opposite way. All the others must follow in the plane. What

about the next layer? It can go either this way or that way. That was done on paper and with models as well. Where models come into it, they were there all the time in this field. Now we don't use them so much because you can do such a lot on the computer. I still think a good physical model you can hold in your hand will sometimes reveals things you will miss on the computer.

E: In what way?

M: One of the materials we worked on here KTP – potassium titanyl phosphate – rather complicated structure. It's known to be an ionic conductor - the potassium ion can move through the structure and has electrical properties. How does the potassium move through this complicated structure? The only way we found to solve that – we had a model. We bought the model from Edinburgh, a company from Beavers (had one made by them). We looked at it and suddenly discovered a channel through which the potassium could move. At that time, it would have been difficult – we had computer programs but very rough. I still think having that physical model made it easier to crack that problem.

E: Did you find some materials for modelling more useful than others in the past?

M: Most of the models we would use would use balls. There was a company in Cambridge that used to manufacture models like that [Crystal Structures Limited]. Then there was Beavers who made the little tiny balls. He employed handicapped people to drill the holes. Beavers miniature models. You could order a particular model. Also we used to make our own. You'd buy the balls in from somewhere. One of the models I've got is made by Lawrence Bragg out of ping-pong balls. He cut them and put them together to show van der Waals...

E: Was he using those because the modelling components weren't available yet?

M: They weren't available. Because what he's trying to show – van der Waals models - they intersect so you don't have spheres. There's nothing you can buy to do that. I made models like that out of cork balls when I was a student. By cutting them and gluing them together and painting them. I could show you one or two of them as well. That was a very useful thing to show how the molecules in this case pack together to form the crystal structure. That was one of the tricks we used. People used all kinds of things. Helen had a load of Plasticine she was using and straws. There's even a model you should see in Edinburgh made by Crumb, a rather eccentric person, made of knitting balls. This model consists of two colours. It's the sodium chloride structure made before the sodium chloride structure was known. No one knows how he got this. I have a theory about this. At the time he was working with William Barlow. Barlow published some papers back in the nineteenth century and in one of those papers he proposed his idea of sodium chloride the same year Crumb produced his model. I suspect they were in touch. It's a crude model. It's become quite famous now. We don't know if he realised it was sodium chloride.

[Glazer shows me some models in his office]

There are models used to explain the subject and there are more serious models for the research process.

E: Can I ask you a bit about the role of models in Lonsdale's research? I have an image...[photographs of Lonsdale working with a model at the laboratory bench]

M: These are research models. Benzene. That's actually in the lab downstairs in the basement. That's where I worked. She was very keen on model building, as was Helen. That's typical of her. She has the X-ray apparatus in the back. I'll show you more models like this.

E: Is there a particular structure Lonsdale worked on in which models were particularly important?

M: Her first major work was on hexamethylbenzene. She had the model of that in the lab when I was there. I imagine she used that. When I joined the lab she was working on a particular problem - photo oxide of anthracene. If you left it to its own devices it would gradually transform to a different structure without breaking up. At that time, that was not well understood. She had the model of that to help her. She had the model of the original photo oxide of anthracene and the product. By using the two models she could see how they related to one another. How would you go from there to there. I did a similar thing when I went to Harvard. We had a model of the starting material and a model of the product and we saw how it went from that to that. [Explains further details of this project].

E: For Lonsdale working in this way, with the photo oxide of anthracene for instance, would there have been calculations in between or...?

M: No I don't think there would have been much in the way of calculations. It would have been mainly visual. She didn't use computers or anything like that - it was after her time really. She would have literally had that model and that model and working out the rationale for this. She also had the X-ray photographs which give information also for how that happened. The product has come out oriented in a particular way.

E: Would it have been possible to take photographs in any intermediate stage between the starting material and the product?

M: They took X-rays all the way through. In that case from what I remember it was just the starting product and the end product.

She was very keen on model building, as was Helen, as was I.

Lonsdale was also very interested in disorder in crystals, because crystals are actually not regular and this leads to extra scattering in the diffraction pattern called diffuse pattern. Diffuse scattering has come back as an important area. Again, models there not so much, except computer models.

E: Bernal worked with disordered structures too...

M: He was working on a lot of things with water. He did an interesting modelling experiment. He took a load of ping-pong balls and dropped in paint. Where the balls were in contact there was no paint...a radial distribution function. It fitted very well. Bernal was very creative like that. He's the Nobel Prize winner that never was. And he was a great friend of Kathleen Lonsdale. When Bernal was dying, she used to go to see him and she used to give the nurses hell for not looking after him properly.

E: You mentioned Helen Megaw used Plasticine.

M: Helen used plasticine, straws, anything you could get. The earliest one I've got is one she did with Dorothy Hodgkin on hydrargallite. 1934.

E: Is there anything that defines X-ray crystallography in the 50s and 60s?

M: It's prior to computers really. Up to late 1950s crystallography had to be done using calculators, drawing and models. Then computers came and you didn't need models so much. Today you go to most crystallography departments and they don't use models. It's still used. It's just that they put their crystal on the diffractometer, press the button and out comes the structure. We had to learn how to orient a crystal in an X-ray beam. Some of the techniques we learned were handed down by word of mouth and never published. They'll die. But then people don't need it any more.

E: When did you notice that shift happening?

M: The late 1960s and 70s. It really gets underway with the beginning of personal computers. If you look at a collection of models, they'll be built up until the '60s. Crystal structures stopped. Beavers still exists. I suspect they sell to schools more than anything. Long time since I heard of any research person ordering from them.

E: What did modelling offer that other methods didn't?

M: It was the only way you could do it. You couldn't draw structures - unless you were very gifted. Lawrence Bragg was very gifted at drawing crystal structures. So was Helen. Helen was amazing. I could go to Helen and say, Helen, what does the crystal structure of quartz look like down the 1-1-3 direction? She'd take out a piece of paper and she'd draw it. She could turn the model around in her head. One of the things she found which is famous in the mineralogy field - feldspar - very complicated structure. She discovered what she called the crankshaft, which is very important to understanding the properties of feldspar. I can't even understand it. She probably looked at models of feldspar and worked it out. That would have been very difficult to do by computer because no matter what you do you have a two-dimensional view. You've got to stand inside thing, look around to spot these things. She was very gifted at visualising things in her head and putting it on paper.

Second interview with Michael Glazer

29 May 2015

Interview by telephone

E: [As a follow-up question to our previous conversation] I was wondering how modelling techniques were passed down to students?

M: Modelling goes back well beyond the Braggs. You can go back to Kepler who was putting spheres together to understand ordered arrangements.

E: Were the Braggs drawing on those traditions?

M: Indirectly. When Lawrence Bragg started in 1912 to try to understand the zinc sulphide structure, the first one he looked at, he did consult mineralogists like Pope in Cambridge and William Barlow. These people had been playing around with trying to think of models for structures before anyone knew what the structures were. They were thinking in terms of packing spheres together to see different sorts of arrangements to try to work out a likely structure. For example if you take the famous structure sodium chloride, with its alternating atoms, Barlow in 1892 had that in one of his papers, as a possible model for it. They were playing around with these ideas. Lawrence Bragg, because he was in Cambridge, he had the opportunity to talk to Pope and others and learn. He didn't know anything about crystals beforehand. By the way, sodium chloride was interesting because Alexander Crum Brown [produced the wool model with the same structure] That's dated 1892 and I have a suspicion that he and Barlow must have been in contact, but we don't know.

You can go back further. You've got models of macroscopic structures going back to the sixteenth century of the external shapes of crystals. They were used a lot to understand the shapes...

If you go back to the Braggs, having done the structure of sodium chloride then diamond, they very quickly had models made of those and they're in the Royal Institution.

E: Were those demonstration models?

M: Probably more for demonstration. They are fairly simple structures. Its only when you start to get more complicated structures that models become important for research. Unless you were particularly gifted at doing it all in your head – and there were some individuals who could do that - you needed to have a physical model, to look at it from all different directions and spot all kinds of things like passageways and contacts between atoms.

E: How did you learn the modelling techniques that you used?

M: When I started there were commercial companies making models. The ones that made the large models with wooden spheres - that was Crystal Structures. I even made my own models out of cork balls at one stage. I was working on a molecule and I wanted to make a van der Waals shape. Imagine the atoms are

large spheres and the spheres intersect one another so you don't see them as independent spheres. This is where you think about the packing of molecules and thinking of the space. There was nothing available easily at the time. There were some of the chemical models that get close to it. So I had to actually buy lots of cork and cut them up myself. Very much in the way that Bragg did in the 1930s.

E: Did you learn that from anyone?

M: I made it up myself.

E: When working with models would you work with workshop technicians at all?

M: Sometimes. Sometimes I did it myself. I was fortunate in when I went to Cambridge we were able to use the workshop ourselves.

E: How about at UCL?

M: Not so much. [At UCL] that tended to be you did it quietly in a corner somewhere with a saw. You could buy all the balls from CSL or Beevers and I made several models using them.

E: When you were Lonsdale's PhD student was modelling part of your training?

M: I don't think I was ever trained as such. So many things you just sort of - models were around. You could see what they were. You pick it up as you go along. I can look at some of our old models from the 1930s, things Dorothy Hodgkin and Helen Megaw were making. They were made with sealing wax and plastic straws. They served a purpose. It became more commercialised as people like CSL came in and they started producing them. There were always the chemical ones. They weren't crystal structures as such.

E: Were diagrams used as part of the research processes of working out structures too?

M: Absolutely. They illustrate certain points. Before they had computers for complex things they had to have a model and then copy it. That's what I did.

E: Were they after-the-fact illustrations or part of the research process?

M: They could be either way. A good illustration of it is Lonsdale's paper on hexamethylbenzene from 1929. You can see her thought processes in trying to determine the structure when they knew very little. There are drawings where she's trying to work out where the diffraction pattern comes from and so on. You can see that drawing structures was part of the process of solving it.

E: Megaw has diagrams in her research notebooks on tracing paper meant to be superposed on one another. What sort of purpose might that serve?

M: I used to use tracing paper, put one thing on top of another, to look for patterns between different projections of a structure. That was quite common. Today no one uses tracing paper.

Helen was one of those unique people who could visualise structures in her mind without writing anything down. It enabled her to spot things before the age of computers that no one else could spot in a structure. An example of that is the mineral feldspar. She spotted a particular arrangement called a crankshaft running through the structure. She did it entirely out of her head. She came up with the idea and drew it out. In those days at the Cavendish you used to get the drawings done professionally [afterwards for publication] so there were a group of Polish women in huts in front of the Austin wing, whose sole purpose was to draw diagrams for the scientists. That was the same here in Oxford for a while when I came in 1976. Professional people with draughtsmanship skills. They had pen and ink and would draw them on tracing paper. Helen was very good at design because she had that ability to think of structures in 3D. She had a keen eye for detail. There was sometimes so much detail in her papers that they become difficult to read. That was the way her mind worked. She wasn't good at simplifying in that way.

When I was a student of Lonsdale's she sent us to Birkbeck in the evenings to go to their lectures as part of our education. We didn't take any exams. We went each evening. Alan Mackay gave a course of lectures on how to draw crystals – in perspective and so on. We learned how to do that kind of old fashioned thing. How to draw crystals themselves: octahedra, stereographic projections and things. It turned out to be useful. A lot of people never learned it at all. We were very fortunate.

E: Did you also learn how to build instruments?

M: Yes I did a glass-blowing course and a machine shop course. I used to build my own equipment. That was standard in those days. It's not like today. You can buy most stuff off the shelf today. I built my own crystal-growing rig at UCL.

E: Were you aware of any practices of modelling in the physics departments at Cambridge (Hartree, for example)?

M: Probably more theoretical actually. But it's hard to know for sure. Hartree was a friend of Bragg actually. They knew each other in Manchester. It's difficult to know what people were using or not using. I remember in Cavendish physics labs, they were not crystallographers but you could go in their labs and see a crystal structure on their desks. It happened to be of the material they were studying for say its electronic properties and they would want to know where the atoms were and they would often have a model of it. Solid state physicists generally. There were always models around.

Interview with Paul Seaton

Keeper of the unofficial archive of Woolworths

2 July 2014

Paul Seaton's home, Surrey

P: My name's Paul Seaton. I worked for Woolworths for 25 years from 1983 until the company went bust in 2008. I joined the company from university, a history graduate. At the time when I studied history the 2 choices of career path, were either you went into academia somewhere or it was thought to be a very good management discipline, particularly in shops. [talks about why history suits management] I started as a trainee manager, so basically you spend some time learning every discipline of the business. I spent a year managing stores over London where the managers had been sacked, and two years after I started I got a store of my own. I managed stores in Teddington, Middlesex, and from there to Camberley in Surrey. [talks about management structure and his path to assistant regional manager, then to working in IT]

The company had a great oral tradition that had never been written down. I thought when I was at head office I'd ask to see the archives. I was very disappointed to find that there were none. When the company had been taken over in the 80s the stuff had just been thrown away. If they had known better they would have known there was a business records council where they could say I no longer want these documents. Somewhere in these papers you've got details of who the suppliers were, all this sort of thing. What I've done since, I made it my mission to get the stuff back. I asked my bosses – they were scared of me. They found it hard to imagine how it is that someone had such in depth knowledge of how the company works. I started by collecting a lot of this stuff from places like eBay and writing in the company newspaper I was doing this. That started the oral history. Quite often four generations of a family had worked for Woolworths. [more on the development of his archive]

E: [I introduce my research] I'm interested in these small household items with the ball-feet, and who produced them in the 50s and 60s.

P: It might be useful to talk to you about Homemaker for a minute. From the Woolworths point of view, Woolworths buyers were gods. Until the 80s every single person in the organisation had started the way I had – everybody had started at the bottom and worked their way through. They had a number of people they called merchandise men. They would be coordinating the store's supplies of stock before computers. Eight merchandise men, one would end up E.O. representative, actually sat at headquarters. That person, their career path would be to go into buying. They would be invited to be assistant buyer at first. When you became an assistant buyer you had no training about product selection at all. You might have displayed a particular interest in one of the ranges Woolworths sold during a long career of your store selling it. [On how Frank Woolworth didn't delegate buying, and he invented the Woolworths accounting system procedure] Once you've got the kernel of a product then using your organisation to know very rapidly what's selling and what's not then going back to suppliers and saying can we have more of it, how quickly can we have it. This isn't selling well and therefore we need to take some sort of clearance action to

go get rid of it. And that process was very good from a – once you've got an established range going, and keeping that range going. What it doesn't do is get you new things, particularly new ranges. In practice what they would do is they built a network of suppliers who were making things. Being a Woolworths supplier was like having a license to print money from the 1930s onwards. Things that look valuable that are cheap to make, and that are of moderate quality. They also explained to their suppliers that they paid on time or ahead of time. They would pay a supplier to retool to make whatever they wanted to be made. In exchange for that they expected loyalty and expected the supplier to be doing product development. If you were a supplier who made vases for Woolworth, glassware. They buyer would visit that supplier, something between once a month and once a year and sometimes the supplier would be called into the office to go through all the figures. Sometimes the buyer would get into his Rolls Royce, because buyer could buy a street of houses on the strength of his bonus for the year, they'd go to the supplier. The buyer understood the production process of every product they had. They would go to the factory, they would see the machines that made it and so on, and talk about which bits of the process worked and which didn't. The Woolworths way was to help the supplier to produce cheaply and to use the knowledge base of the company to do that. The supplier would be taking them into a room and saying these are our ideas for next year's range. Where would the suppliers get those ideas from? Sometimes from the makers of machines. There's an example of that in Homemaker's story. They might be looking to competition. They'd be going to trade shows. If you imagine, most of the buyers were good at negotiating and managing suppliers but knew nothing about the product ranges. [But] Because one buyer managed glassware for Woolworths for 35 years by the end of it he knew a great deal more about glassware. The buyer is god, but of course at board level there is a buying director and the board is interested in what sells and what doesn't sell. Until the 1950s and 60s, which is the real change time, there were only about eight buyers altogether. [1950s and 60s] Lots more departments, lots more buyers, lots less assistant buyers. Buying offices in the Far East. Less experience in the people doing the thing. 80-85% of the stuff was made in the UK in the 50s. By the end of the 60s it was down to 60%.

E: You mentioned Readers that might have made wire-ware [in an earlier email]?

P: One of the wonderful things about Readers and Harrison is that they have survived and prospered. Readers continue to make bathroom-ware sold by a lot of department stores. Harrison Beacon started as Beacon. They've merged with ailing British companies. Beacon brushes were a Woolworths supplier in 1909. Harrison drape made curtain tracks for Woolworths in 1909. Today Harrison Beacon makes own-brand boring DIY stuff like screws and nuts and bolts. You very rarely see the name on anything. One of the things retailers do today is direct profitability. For every item that's on display on their stores they want to know how much profit it makes for every amount of shelf space it takes up. [more detail on this- necessity to pack as much as possible into a shipping container from overseas supplier] At the end of all those calculations there are a few products that don't make sense to supply from anywhere but the UK. Wire-ware, basket-ware are light and you can't put things inside them. The product ranges you're talking about are made in the UK.

E: I'm interested in the production methods for these items. Do you know what sorts of things Readers would have been producing the 50s?

P: At one end of the spectrum, plastics, best selling toilet brushes. Exactly same manufacturing process used to make Christmas trees.

E: Were they producing things in metal as well?

P: Die stamped metal. What changed in the 1950s was the idea of encasing metal objects in a plastic coating. [Talks about Bakelite at Woolworths in an earlier period]. After the war with the restrictions that were about us paying off our debts to the USA meant no new import licenses were issued but how ever many pieces were you able to bring in before the war, you were able to bring in after the war. Before the war Woolworth was bringing in buttons from Japan and after the war they were buying jewellery made in Bohemia and selling those pieces for seven shillings and six pence. Imagine you've gone from everything in your shop being six pence to some of the items costing close to a pound. Then you have this explosion of revenue coming through the till, while your cost base takes a while to escalate. They invested the money to make the stores much bigger. Going into the war. With the exception of a few city centre stores. What they did was start making them 10 or 12 times larger all in one go. In the world where they're moving from personal service to self service, from flat displays with one tier to having the kinds of displays we have today the inventory levels went up to 10 or 12 times. The reality is, although some of the things sold quite well, some didn't sell at all. They had success with some things and boasted about that, Homemaker being one of that. But others didn't. More got stolen than got sold.

E: Coming back to the wire-ware, with the ball-feet, do you know how well that might have sold in the 50s and 60s?

P: I think that the trouble is that it's important to you but it wasn't important to Woolworth at all. Woolworth were – one of the things they were good at in the 1950s was they were good at being aspirational. What Enid Seeney did was she made her vision of what a modern home would look like, not by making pictures of things that existed but by letting her imagination run wild. People started asking, well, where do you get these things? What they had to learn in the 1950s – you decided you would sell a plate rack, you chose one and you sold it. One. It was metal or Bakelite. All of a sudden consumers wanted a choice. I think the ball feet would just be a style of what one of these looked like. The majority of the items that were sold in metal started out in plastic.

E: The entire object?

P: I'm just picturing in my head a wire plastic coated rack with ball feet to stand on your draining board. I can remember two styles. One had a white plastic coating. A 12 inch record would be in a D-shaped... There was another version which was I think for singles which was finished in a gold hammer metal finish with bright red ball feet and was much squarer. All-Metal Smallwears, they'd be making metal things. Enamel saucepans and nonenamel saucepans came from

All-Metal Smallwear who were based in Birmingham and then knocked down and replaced by a motorway. That was the cut off point when things started coming in from overseas. Really good sales in the 1950s, tailed off in the early 60s and a lot of the suppliers vanished from the Woolworths list between 1965, 1970, something like that.

Interviews with postwar consumers

Interview with Susan (donor of Antelope chair to V&A)

29 July 2013

Interview by telephone

E: Can I begin by asking where you lived after the war?

S: Where I lived after the war was Kennington.

E: What were you doing at the time?

S: I had just started teaching. My husband was still at college.

E: What was your housing arrangement?

S: Pretty awful. Two up two down they were called. No indoor lavatory. My husband brought in the water. There was nowhere after the war. Such a shortage of places to live. You accepted anything. I was considered quite lucky that my husband and I started independent and not in furnished accommodation. A pretty awful place. We lived there for six years while we waited to save enough money.

E: Where did you move after that?

S: After six and a bit years we moved to a rather nice flat in a Victorian house and we stayed there for six years. While we were there because it was a larger place than the tiny house we'd left, we saved some money and bought some furniture. Most of it was what we called Utility furniture. Which was pretty good basic design and I still have 4 of the chairs which I used regularly. Pretty basic, but it was just after the war and things weren't very good. There was a table which has long since gone. Then a furniture came along called Meredew. Had a very good basic design. I've still got the wardrobe, the bookcase, the dressing table which is a chest of drawers. We bought that about 1957.

E: Did you buy any other household objects around that time?

S: Yes, I've still got the lamp, it's by the side of me. It's a rather nice, very nice very modern at the time plain beech stem on a round base with a flexible top so you can read by it.

E: I understand that you bought an Antelope chair. How did you acquire it?

S: They were selling off the stuff after the Festival. Living in Kennington we lived quite close to the South Bank, and although we hadn't got enough money to pay to go in many times we could walk there in the evening where it was sometimes cheaper to go in and sometimes it was free. My husband and I absolutely loved it. The new designs, the Dome of Discovery, it was a revelation to us after the war. When we saw that there was some kind of sale on, it was my half term so I said to my husband, can we afford to buy something? We had so little money. We reckoned we could spend £2. So to save money I walked to the

Festival site from Kennington, I bought the chair for £2, and then I realised, how was I going to get it home? In those days there were trams. I stood at the tram stop and I asked the man if I could get on and he said, 'of course you can dear'. Not only did I get one but the driver of the tram sat on my seat all the way until I got to my stop. It was wonderful because it was a real sight. Everyone was laughing and thought it was fun. I took it home. Into this tiny little two up two down where the only furniture we had was left over from my grandmother who was a very poor person so it was very basic. We had bought ourselves a small armchair each. That was the only real luxury we had. And somebody gave us a carpet for our wedding present. Once the Race chair came in it didn't go with anything at all. But we didn't care. We just loved it. We loved the design and it reminded us of the South Bank. That's how we got the Race chair. I kept it. No matter where I went I took the chair with me.

E: What did you like about the South Bank?

S: It was nothing that we'd – never seen anything like that before. There was a lot of bombing in London as you know. Bomb sites were ugly things around. A lot of really nice buildings had gone. This was suddenly like a bolt out of the blue. I wasn't too fond of concrete but even the Festival Hall was ok at the time. There were things like the Skylon, this lovely pointed thing. The Dome of Discovery - it was lovely. My husband and I were young, only in our early 20s. We'd missed out on lots of things through the war. We thought the whole place was beautiful. We loved it.

E: Were you interested in science?

S: Only vaguely. Only as a primary school teacher. I was interested in art.

I never got tired of that chair. It stood by the side of my bed. I used to put my clothes on it every night. When I wake up in the morning now I still miss it. The point is you see I'm pretty old now and I was so worried in case, when I die - I know they will look after stuff and so on but no one knows how - not valuable - but how dear the chair is. So I offered it to the V&A. I feel so much happier that it's there now and someone's looking after it.

E: It moved into bedroom?

S: It moved from the living room into my bedroom. It wasn't going with the rest of the furniture we had at the time [in the living room]. After we had a bit more money we bought some Danish furniture which was very nice. Still got that. Slim legs, rather nice shaped.

E: Where did you buy that?

S: We bought that in Heal's. What we used to do, because we only had teachers' salaries, we'd save up our money and buy something that was good rather than two cheap things. We never regretted that. I still use the Danish table, we've still got the chairs.

E: Was the Race chair comfortable?

S: Not very. No, it was all right for the time being. You wouldn't want to spend a whole evening in it. At one point I made some cushions to put on the top but they used to flip off frequently.

I just loved the look of it. I just loved the whole thing. And of course, memories.

E: What did you think of the balls on the feet?

S: I bought myself a newspaper rack with balls on the feet which unfortunately I haven't got any more. It was all part and parcel of the design. I don't know if I'd like it on furniture now. It suited that particular shaped chair very well indeed.

E: What attracted you to things with ball feet?

S: Design. Always design. Design is the main thing, and if you can, quality.

E: Where was newspaper rack from?

S: That was something fairly common in those days. I also bought some coat pegs similar with the round balls on. That's long since gone.

E: Do you remember where you bought it?

S: No. The magazine rack and that they were all over the place. They were very easy to buy.

E: Would they have been cheap or expensive?

S: They weren't very expensive. It was just part and parcel of the fashion of the day.

E: Did you think it looked scientific?

I didn't mind. I thought it went. It was part of its time it was part of the furniture. If it had had the thin legs that it had it would have penetrated the floor whereas the ball is sort of practical as well as attractive.

E: What did the word atomic mean to you at the time?

S: Atomic? I'm a disarmament person. So atomic means to me atomic bomb, so I don't like it very much.

E: Did any design at the time look scientific to you?

S: No not really. Not that it had that effect on me. I'm more arty than scientific. Any kind of art, drawing, painting. I did a lot of pottery at one time.

E: You kept a lot of furniture from the postwar decades. The things with the ball feet, like the newspaper rack you had – when did you get rid of them?

S: They were cheap. They weren't very expensive. I bought them because they went with what I had at the time. There was also a standing up lamp with ball feet. I don't know what happened to that. They weren't very precious to me.

E: What sorts of things did you think the ball-footed furniture went with (you mentioned they went with your furniture)?

S: Just with modern furniture. We just had the Meredew stuff which was very plain. It wasn't expensive. It was the kind of thing that people like us with limited money could buy that we liked the design of. We eventually bought some Danish furniture.

It was in the 1950s/60s – that's a hell of a time ago. It obviously wasn't very important to me otherwise I would have remembered. I might even have well have given them to someone.

Interview with William (donor of assorted postwar furnishings to the Geffrye Museum)

10 June 2013

Interview by telephone

E: Can you introduce yourself and where you were born?

W: I was born in Battersea London. I spent my early years Streatham. We were evacuated to Wales. I was at boarding school and in the holidays we rented a house in Buckinghamshire to get away from the bombing. I was there until the end of the war. I emigrated at the age of 22 to the States. [Grew up with his parents in a] suburban detached house built in 1935. My parents' interest in interior design was limited. They liked to some extent art deco - a curious mix. Where my interest in more modern furniture came from I have no idea but I had it from a very early age. I started buying *House and Garden* magazines. I was about 14, 15. I left school at 16 and I started working with my father who was in automatic machines. At that time I wanted to have a career in interior design. Difficult field to get into. I was told it was not a bad idea to get into selling furnishings. I found myself a job selling soft furnishings in Peter Jones. I picked it up as I went along. Then moved to Heals in Tottenham Court Road and spent about a year there and then back to John Lewis Partnership, working to John Lewis' main store in Oxford Street. Britain wasn't recovering rapidly from the war. [Describes his father having contacts with US.] I moved to America in 1956. Rather than stay in the interior design world I'd like to be able to get home cheaply. I went into the travel industry. I got drafted into the American army. I had two of the best years of my life in the American Army. I had so many anecdotes I wrote a book about it.

E: You were still in London in 1951 when the Festival of Britain was held...

C: I worked in the Festival of Britain. My father had the amusement arcade in the Festival Pleasure Gardens. I was working with him. There's a page in *Tonic for the Nation* showing my father's arcade with his car parked outside. I thought the whole set-up was fascinating, both in the main site but particularly in the Festival Pleasure Gardens. What I remember best of the gardens is that they constructed a tree walk lit up at night all along the Thames waterfront in Battersea Park, and you would climb up and walk through the trees at night. That was absolutely delightful.

E: Do you remember the Waterloo screen?

W: Yes. I remember the emphasis on the discovery of atoms and all the design around that sort of thing. But I personally never actually liked that side of the design world. The use of atoms. I thought it was a bit overdone in textiles and so on. It got a bit tiring. One thing I did like out of it was the ball feet on a lot of the furniture.

E: At the time did you think of it as atomic?

W: I knew the link with the atomic world, yes. But as far as I was concerned it became merely a decorative feature. I didn't see the relevance as we see it today, the importance of that particular link.

Well many of the articles that were being published at the time made that link. It was true of course with textile design as well. Jacqueline Groag drew a lot on that sort of theme.

E: What sort of articles did you read at the time where you heard about that link?

W: I don't think I was sufficiently interested in reading about science except for the atomic bomb which everybody was reading about. I think we all lived under that fear of the bomb at the time. I was never that interested in science per se. The interest in atomic fission was very limited for me.

I remember very clearly on buildings on the Festival site. Particularly the Skylon. I was disappointed when they tore that down for political reasons. I thought the Skylon was a genuine icon for London. It would have been a status symbol as strong as Nelson's column. It floated in space and there was this fascination – with how did they design it, how did they build it. You could stand underneath and look directly up into it. It was a characteristic of the city at that time. Any pictures you saw of the Festival it always had the Skylon in.

E: The Antelope chair – do you remember your impression of it?

W: I loved it. I thought it was great. I thought it was totally original. It was comfortable. It looked light. The ideal café chair I thought.

E: Did you ever own one?

W: I never did because I was much more taken with the Robin Day recliner. I first saw it in some of the *House and Garden* magazines...Robin Day designed that with a beech armrest. Beech isn't the best wood.

E: I'm looking at a photo you sent.

W: The one with the fireplace is in Streatham London [his photo]. My mother said I could do anything I wanted in that room. Everything else in the house was very 30s. I built my own brick fireplace. It is very typical of the kind of fireplace popular in design magazines. Brick with a wooden surround. The one thing from the 30s is an Art Deco carpet.

The cabinet on the wall I built myself. Typical of furniture popular at the time. The lamp I think that was a Merchant Venturers lamp. That was a popular design of its day. Expensive at the time. 21 shillings I think. The candlesticks were made by Terrence Conran.

E: What drew you to modern furnishings at the time?

W: From looking at house and garden magazines I got a sense of what was new and different at the time. There is a wall plant on the wall that was typical of the time, with the wire. That was so typical of the day. In fact you have a lamp in your pictures with a base and the base is identical to my wall planter. Troughton and Young lamp with an identical V-shaped base. Triangles were a major feature.

E: What were your favourite magazines?

W: *House and Garden* was by far the best. I did buy the *Ideal Home*. What was important about *House and Garden* was how they led people in terms of colour. Contrasting colour.

I remember the use of plastic was coming in. I generally considered it very poor taste.

That period – we now think of it as a period when modern design in furniture was taking off, but it was actually a very limited demand and there were only a handful of shops that specialised in that.

E: Do you remember what people called the ball and stick style?

W: I don't recall any specific name for it but I do remember it featured strongly in furnishing articles at the time, and it was considered fairly sharp in comparison to other imitation stuff. However it was rather overproduced and although there were some good leading designs there were a lot of copies that were very far from well-designed stuff and it lost its edge rather quickly.

A particular example I remember well is the umbrella stand. It would be considered a reasonably good design for any good middle class family to have in the hallway. On the other hand, you got a lot of imitation rather plasticky looking jobs, lamps.

There were a handful of good lighting designers: Troughton and Young and Forrest Modern, which were designs by John and Sylvia Reed.

E: Where were the imitations sold?

W: Almost anywhere in the suburbs. Times Furniture was the leading company. They might dabble with one or two pieces like that.

E: Did it seem to you that the ones sold in John Lewis and Heal's were different in terms of material?

W: I was involved in soft furnishings. My interest was in the fabrics.

John Lewis actually did – was in the forefront of design in furnishing fabrics at the time. Of course Heal's had commissioned people like Lucienne Day to produce Calyx which became famous.

E: That motif of the ball and stick was in fabrics too. Did you have any sort of word for it at the time?

W: It's the first time anyone's asked me that. I can't think of any way I would call it by a single term. I think we just talked about it as four foot furniture, furniture with balls on. I don't know that there was a term used as a generic term for that kind of furniture.

E: Today it's called atomic....

W: We certainly didn't use that term then.

E: I was wondering if people saw it as scientific. And the fabrics as well by Whitehead or Day.

W: I think certainly at the time we didn't make that connection strongly. I think there was a vague undercurrent of feeling this was all coming out of design houses because there was a link there with development of atomic energy. It wasn't a big feature at the time. It certainly wasn't anything I thought of as any importance when I was buying the fabric or selling it. You could easily say a lot of it comes from the natural world. It seems like Calyx comes from micro-organisms.

What was popular then was chintzes. Traditional fabrics. The market in London was still very much geared to the furnishing from before the war. When people did let me recommend things, I would go for the designs I like.

E: Were you interested in lighting?

W: I think we began to recognise the importance of rather than having blinding lights from the middle of the ceiling to having a range of softer lighting throughout the house in different positions.

There was a greater interest in good design table lamps, good design standard lamps, rather than a blinding light in the middle of the ceiling.

E: Do you remember a lighting firm called Hiscock and Appleby?

W: Yes! That was another leading company. Beyond the name I can't remember much about the company. I do remember they featured prominently in *Ideal Home* and *House and Garden* magazines. A name you'd conjure up in thinking about modern lighting. They were very good. They used good designers.

Wireworms were coming in as a means of enhancing the market for this kind of ball and wire lamp. They were popular. I think they were relatively cheap compared to the better design jobs. They tended to be popular. Certainly they were going for a cheaper end of the market. They crop up most often in junk shops today. I don't think they ever were considered cutting edge design. Because they were emulating the lead designers (Troughton and Young). I think the Wireworm came in later copying those.

[commenting on an image I sent him] The Stuart Contemporary coal bucket is a classic example of emulating modern furnishing but doing it badly. I call it faux contemporary. It's got the ball feet but the bucket looks like it was designed 50 years earlier. But it was something people who weren't particularly knowledgeable or sensitive about good modern design would say oh there's a lovely contemporary bucket lets get it for the house. The word Contemporary came in almost as a term of denigration in the end – they'd make jokes about it on television and radio. They'd say, Let's get some contemptuous furniture. You gave me other examples of badly designed things. The table lamp - Modip. You get a sense of what's good design and what's bad design. It depends upon your experience and knowledge. You refine your taste over time. Some become classic and are recognised as great pieces.

E: What did you think of the homemaker tableware?

W: I do remember it chiefly because it has my Robin Day recliner chair. I always thought it was rather nice. It's a nice pattern but it isn't something you want to eat your food off of. It's too fussy really. I think it's considered iconic today because its typical of its period.

I never had it because I never like the design. Most of my friends felt as I did about it.

I tended to think good design didn't have to depend on the scientific reproductions. I was rather more into abstract art at that time.

E: Do you remember other people's appraisals of science at the time? The atomic etc?

W: Honestly I didn't meet anybody where this ever came up in conversation. There was very little interest in science generally or certainly in the design of things based on science. Although we talked about furnishing fabrics a lot when I was working in retailers that issue never arose.

Interview with Valerie (Neighbours in Poplar)

Occupation in postwar period: sewing machinist

14 February 2013

Valerie's home in Poplar

[This interview is inconclusive on the issue of her taste in ball-and-rod furnishings as her responses conflict considerably]

E: Can you introduce yourself?

V: I was born in Limehouse. I went to St Annes School, also St Annes Church. This is where I was born. Of course the war came along...I lived with my auntie most of the time. I went to Cyril Jackson school. Then to St Pauls Way. We moved to Blackwell Tunnel. Then when Lansbury Estate was built my auntie moved over the road in East India Dock Road. Then I started work.

E: How old were you when you started work?

V: I was 14. I was doing tailoring and then I became a machinist. Then I got older, got married and had my daughter. Then I lived in St Vincent estate. My daughter was about six.

E: When was that?

V: Well my daughter was born in '56. When she was ten we moved up into there [gesturing to the estate]. I moved [frequently] because my husband wasn't there. My auntie used to have my daughter when I was at work. As we moved from different places so the furniture's been different. When I lived on the St Vincent estate, we had them oval chairs made with like a plastic. I had a bar in the corner. Mind you they were all second hand. The furniture was a bit different to today. It was white and cream furniture with furry seats. Really old fashioned for them times. Then we had little music centre, put the batteries in; threw them out when you moved. The beds were different. Even the bedroom suites are different to what you get today. They're stronger. I got some pillowcases upstairs from the war! Still going. In fact it's got a man's name on it because when we used to be down the shelter so you didn't mix your bedclothes up you used to mark it. It said 'P. Robinson'.

E: Where did you live just after the war?

V: I was living with my auntie in Blackwall Tunnel. We got bombed out wherever we went. It followed us. Me and my auntie got buried in the shelter over there in the causeway over the road. Had to dig us out. We shifted from place to place and Hitler followed us. It was called Poplar Dwellings. Then the bomb came down, it come through the flat I remember the caretaker and his daughter got killed. They were called Saunders. Now it is called Saunders Close.

Used to be a piano in the front room didn't it? That was lovely, the music. The children used to learn to play because it was in the front room. The accordion. They were all to do with your entertainment. Everything was clean. The tables were more or less white wood. They used to scrub them every night.

The utility furniture. You used to have a flat leafed table. And a sewing machine with a treadle I used to have one of them. Even baby's prams were lovely then. I remember my daughter having a big pram.

When I first got married, you had what people gave you. My auntie gave me some chairs. I went to Canning Town market, bought the material, a leatherette. Took the middle out of the chair, you put the stuff round it tacked it all in and put it back in the chair. Like new nearly again.

I remember my aunt had the most beautiful bedroom with a big wardrobe with a mirror in the middle, a sideboard and bed and they all matched. They were so lovely. We used to have like oilcloth on the floor. You had a big square mat in the room. No fitted carpets then. Just a big square.

We used to have curtains at the door. Knit. Pink.

E: When was that?

V: That was the 1950s.

During the war people used to have the barrage balloons in the sky. They would make clothes. They would make clothes out of curtains.

E: Do you remember buying things for the flat in the 1950s?

V: Not a lot. A lot of second hand stuff really. It was hard going.

I used to have tallboys, all the drawers. When my granny had children, do you know where they slept? In the bottom drawer.

E: Do you remember how you lit the flat?

V: We had gaslight. You had a gas mantle.

E: After the war as well?

V: No. If they hadn't bombed out the place we wouldn't have moved on. Then we had electric.

All your windows used to steam up and freeze in the night.

E: I brought some pictures. Do you remember seeing anything like this [ball-and-rod wall-mountable coat hooks]?

V: For hanging your clothes up in the hall. Of course you do. In the '50s, '60s you had bright colours. Yellow, mauve. I remember going to my friend Cindy's down in Dagenham. When I walked in she's got a mauve wall. It was happy colours. It was lively. You know when you go somewhere and see a clown and

the clown is all colours. I walked in and thought, this is different. This is when it was all coming out and she got it in the walls.

E: Did you see anything like this [the picture]?

V: I saw it in a school. Not my school, the grandson's school, St Edmunds. They put there name there and children hang their coat there with their name [recently].

E: Here's another one [magazine rack].

V: For putting books in. I got one of them. You put all your books inside, your magazines.

E: I have this same one actually. It has the white wire...

V: Plastic?

E: It's actually metal. And the red balls on the bottom. Did you have anything that had these balls?

V: Well they all had them, that sort of, balls on them.

E: What did you think of them at the time?

V: At the time? Nice. Not me.

E: Not for you?

V: No. Too much hanging about, like it is here at the moment. Now it's modern to have nothing hardly. We used to have all the ornaments.

E: This would be too much in the way of ornaments back then?

V: Not then. I had them.

E: When you first had this sort of thing what did you think?

V: At the time it was lovely because it was in fashion, all flowered curtains, big flowers on them!

E: This is another magazine rack.

V: I seen that in the doctors surgery. They had it on the table, on the desk, to put the files in.

E: Things with the balls on them...

V: Yeah I had them. It wasn't so much in the 1950s. It was the 1960s. [starts talking about dresses]. You had a sewing machine that dropped down into a cabinet.

E: Were you concerned with things matching each other?

V: You still tried to match things. Your colours. When the mauve and oranges came out...Cup and saucer and teapot and wallpaper.

[I show a picture of the Antelope chair]

V: I remember them. They were wooden seats. You see them in cafeterias. They use them in little cabs.

E: Were they comfortable?

V: It was comfortable for them times. These are not really soft. They'd put a cushion on them and sit on the cushion. People had them in kitchens.

E: Oh did you know anyone who had them in their kitchen?

V: No. I can't say they did. I know they had them...

E: What did this look make you think of, with balls and sticks, very thin?

V: Strong things. Nothing will last today.

E: Did it look like anything to you?

V: A chair.

E: Do you remember the first time you saw something like this?

V: No.

[I show a picture of a ball-footed bin]

V: That must have been in the '60s. The late '50s, early '60s. It was what did they call it. It wasn't utility. The flower people then them sort of times...

E: Would it have been called contemporary?

V: Contemporary, yeah I think that's what it was. This is all like wire. Once again that heavy wire. You couldn't bend that. More like steel.

E: When you saw it did you think it would last a long time?

V: I think you more or less bought it because that was the time. When you're younger you don't buy things you think will last. You think I like that. It's yellow, it's light.

E: Is this the kind of thing you would have given as a gift?

V: I would have kept all this.

E: How did this kind of thing make you feel?

V: It was lovely because didn't have a lot of money, something fashionable. If you like something nice, you like to make it look nice. All this is second hand in here. Even the furniture, the three piece, my cousin gave it to me. Something like that, the bookcase, is from the undertakers...I remember them. Not until you show it, then it comes back into my head. But the furniture I put on was wood. We had a wooden table. Could pull it out and make it a long table and then push it back, make it into a square again. You were glad of anything then.

E: Would stuff like this [the pictures I show] have matched your older furniture?

V: These sort of things would match anyway. You can change them to another colour.

You could buy them loose you know, the balls.

E: Where?

V: They used to have haberdashery shops. That would be in a hardware shop.

E: Did you ever buy them there?

V: I had ...been....some things myself. When you're on your own you do electric, and you do decorating. You do because you got to. You can't afford to pay somebody so you do it yourself.

If you want to change your colour, you change your knobs. Or else you buy something that will match everything you got. It's like red nose day. It's that sort of thing. More like wooden things.

[talks about how her grandson's girlfriend has second hand objects, maybe ball-and-rod ones]

Dark furniture wasn't it. I got dark in there. I just can't throw it away. It comes lighter now.

E: This is from an old catalogue [Heal's lighting].

V: A wax paper, folding in like waves. You can make lampshades yourself.

This was more for a writing cabinet, for reading that sort of thing. These were called reading lamps. I had [a reading lamp] on my bar...I used to light it up at night...nice warm glow. Early 60s.

You like those! [indicating my pictures of object with the ball-feet] You can buy those.

E: Do you remember ever seeing anything like this? [molecular models]

V: What is this? A design?

E: It's made by scientists actually. This is a model of the molecule of vitamin B12. There's another one [picture of Kathleen Lonsdale's ball-and-spoke ice model].

V: Maybe I saw something like that. They used to do it with a little hammer. Medical...Where did you find that?

E: At the Science Museum.

V: I could have gone to Shoreditch Technical for art if I passed to go onto further education. All my friends went on to work. I was so disappointed. At the time, everyone's got money. I wanted money. I went to the machining factory. I've always liked colours. I love colours. [talks about the colour scheme in her bathroom]

Interview with Sam (Neighbours in Poplar)

26 February 2013

Sam's home in Poplar

E: Can you introduce yourself and where you were born?

S: I'm a native of Poplar, born and bred, the last 82 years. Now my occupation is OAP.

E: Were you around Poplar during the war?

S: On and off. I was evacuated during the war. When war broke out I was nine and a half. I was evacuated for safety because nobody knew what the war was going to fetch. I think the worst thing everyone was imagining was the use of gas, and that really frightened people.

At the end of the war I was just about to start work. I thought I had a light in front of me, and I became an apprentice joiner and carpenter, thinking of the future. But after a short while, the rules of the apprenticeship were quite stiff. At that time it came out that when you became 18 you were eligible for National Service. In the case of being an apprentice you could apply for a deferment, so I could have finished my apprenticeship and then I would have sat for a City & Guild, and that would have been, I would have been about 22 maybe 23 before I went into the forces. After service I wouldn't start life until 25, 26. So I decided to do my service and go into the forces as a carpenter. Unfortunately, the army had so many people they just put you where they wanted you to go and I ended up away from carpentry. So that side of it – I'd made a mistake. When I came out of the army, if I'd been in the army after my apprenticeship I would have caught 3 things – either the Suez crisis, the Malaysian crisis or Korea. So I could have caught quite some time in the army. I'd only done two years. In one way it was a good thing. In one way it was a bad thing. From there I started off. Two years after I came out of the army I was married.

E: When was that?

S: I got married in 1954. I was no longer a youth, so that was it. That was the next step in life. We started a family. I had two daughters, and my wife and I were married...we were into our 51st anniversary when she died. We'd just had our golden anniversary. I was dumbfounded. Being individuals, all individuals in cases of being left without your other half, you adopt different ways. One of the things they tell you is death is only part of life and life carries on. Very hard to understand at that time, but actually as time wears on it's absolutely the truth. After becoming a widow I started a new life – all the old age pensioners!

E: Could we go back to 1954, 55? Where were you living?

S: I was living in Poplar, just off West India Dock Road. We were due for slum clearance. During the war the building got shattered.

E: How did you furnish your flat around that time when you were married?

S: We couldn't get a place. In those days you put your name down and there was a waiting list. I was better off waiting for slum clearance than on the local borough council. We waited five years. What we had was two rooms in my mother's house. That was ok. Furniture-wise, we only had two rooms. We didn't bother buying a gas stove or anything like that, because there was one already there which we used. Of course, bedroom suite. My eldest daughter, when she was born you had to buy pram, cradle, bath and all that. Until we moved...this was our house, our first and only home. That's why I don't want to move out. Too many memories. We were married nearly six years before we moved in here. Really in one respect it seemed like a long time. Some of the stories you hear today, really it's not. When we moved in it was fabulous living. One, we had an inside toilet, two, we had a bathroom. It was fantastic. Of course the beginning of the 50s was not too great. We still had rationing up until about 1954. We still had identity cards. You didn't have the money to spend on that many clothes. When I was courting my wife I did buy her a pair of nylon stockings which in those days I paid 25 shillings, which was quite a lot of money in those days.

E: And hard to come by?

S: I won't say how I got them but you're quite right, they were difficult to come by! [Laughs] Being close to the docks, things were slightly different. I won't say no more than that.

E: I'm going to show you some pictures. You can tell me if you saw things like this around the time you were married or when you moved in here, and maybe what you would have thought of them.

S: A coat rack – we had one of those. It was on the wall by the radiator.

E: Do you remember seeing things like this with so many colours?

S: No. Just wrought iron, jet black.

E: Here's another thing. [picture of ball-and-rod magazine rack]

S: That looks like a paper rack. That looks posh. Rather posh. Probably John Lewis.

E: What would you have thought if you saw this in someone's house?

S: No we don't need it. It's an accessory we don't need. Being that when we first came here we only had the one girl and after a couple of years we had another girl, that was a fireplace, open fireplace. So mind you my eldest daughter was five. The first thing I bought was a wire fireguard for safety reasons. That [magazine rack] would have been out of the question. Modern. John Lewis. But certainly not in this area.

E: What would you have thought of these things?

S: Oh, no. I was a carpenter and joiner. I liked wood.

E: What kinds of things did you do as a carpenter?

S: I was in the building industry.

E: Did you ever see these? [image of Antelope chairs]

S: Yes they were the first modern chairs. They never looked comfortable. I think they were a bit of a flash in the pan. They didn't really catch on. Chairs today are something more solid.

E: Do you remember where you first saw these?

S: Middle '50s or a bit later. Some of the trendy coffee bars. Somewhere else. Certainly not here. Not even in the milk bars [in Poplar].

E: Did you ever sit in one?

S: I think it was in a milk bar. Not comfortable. It was solid enough. It didn't look solid – that sort of put you off.

E: Do you remember seeing things with the balls on the ends?

S: That was quite common. When I say common – that was the new thing. The circular ball instead of the normal flat foot. That was modern.

E: What did you think of them?

S: That never caught my eye. That was something you would've seen it in John Lewis. But in your own area...

E: What was your taste?

S: Something more - if it was wood. If it was pine. What we did have was a sideboard. To me there's nothing better than a polished piece of wood.

E: There are some pictures of lamps.

S: I've always meant to get a standard lamp. [talks about seeing a tripod lamp in John Lewis last year]. John Lewis is expensive.

E: Did any of the things we looked at here look scientific to you in the '50s and '60s?

S: No.

[I show images of models]

S: This is what you call a molecule isn't it? The molecule of the common cold, they put it on television. That's how I know.

E: When was that?

S: Twenty, twenty-five years ago.

E: Did you see these in the '60s?

S: No I wouldn't have known what a molecule was in the '60s.

E: Some of these are from television programmes in the late '50s.

S: The television was for entertainment and that type of thing wouldn't have been entertainment. I saw something like that – like an electric current going through something.

Raymond Baxter. Him I remember. A nice deep voice. I'm sure he did the – what used to be Earl's Court, the forces, military tattoo. He gave the commentary.

E: Did you go to the Festival of Britain?

S: Yes.

The most impressive thing at the Festival of Britain was the pregnant woman. [describes a cut-away model of a pregnant woman]

We were having our own part of the Festival of Britain here. The Lansbury site is – North Street was all the Festival of Britain.

E: What could you see going on?

S: All the building going on. Chrisp Street market had just been cleared. That was more like a bombsite after the war.

E: So you went to the South Bank as well.

S: Where that's where it was. I thought it was fantastic. We were going into an age that was totally different.

E: In what way?

S: The building trade for a start. Inside toilet! Ah fantastic! And a bathroom? Oh, luxury. Because you had – I don't think in this area you could say you had three classes, really. You had two maybe. The middle class and the lower class. And the lower class were – it was absolutely nothing. In Poplar High Street, the Will Crooks Estate, opposite there, there used to be the work house. After the war, we had the National Health, which made a big difference. During the war a lot of the women went to work and had their own income as it were. Even after the war,

there was joint income. People started to go on holidays and things like that. It was a changing time all together.

E: What did you think of the other buildings on the South Bank? The Skylon and dome?

S: The Dome of Discovery. I can't remember a lot about it. The most impressive thing was the pregnant woman.

Interview with Frank (Neighbours in Poplar)

20 February 2013

Frank's home in Poplar

F: Can I show you this before we get into the...[interview]? [Shows me catalogues of collectibles from the 1950s and 1960s]. This is...what's his name, Conrad?

E: Conran?

F: Yes, this is all '50s, '60s. If you're searching you can...charity shops.

E: [I point to a ball-footed lamp in one of his catalogues] Have you ever been interested in anything like this?

F: It's weird. You can take bits off of it. Like the little balls on the bottom.

E: Where would you get them?

F: You could pick them up in an art shop.

E: Did you ever do that?

F: I've got some weird legs for the lamp you see [inaudible].

E: What about like this one? [referring to the ball-footed lamp]

F: No, we never went in for that. When you're talking about the '50s, you're talking about the wages were only seven pound a week. We had a family, a boy and a girl. We couldn't buy things.

E: Let's get started. Can you introduce yourself, and when you were born?

F: I was born in 1939 at Mile End. Air raids was in September. I was born in the cellar because of the bombs. We stayed in Maplin Street for 19 years. Then we stayed in Grove Road through the 1960s until I got married in '64. I didn't have a great childhood. Very strict parents. I had a funny life really because my family was a supervisor at the television exchange. He was born in 1910 so he was Georgian, and they are strict people. I never sat with a meal with my father. He had his meal on his own in the front room. In the kitchen mother would say go and get his plate. My brother would scamper with me into the room and get his plate because he'd always leave a potato or something on the plate and we'd eat that. Literally because we were starving. We were poor.

E: You were quite young when the war ended. You were about six.

F: Yes. When you look around this room, this is more than my father achieved in his lifetime. His early life was in the West India Dock. He was a telly clerk.

E: When did you start work?

F: I was 15. I started in a brewery. My family has never moved more than 3 miles since 1740.

E: When did you start working as a policeman?

F: In 1988. I had a stroke in 2001. I still had four years to go before I retired.

E: When you got married in '64 how did you furnish the house?

F: It was partly furnished. It was dilapidated. [He describes gradually getting rid of it and bringing in furniture]. It was five guineas a week. That was a lot. I was only on 11 pound 50. I was working at the recycled paper company. We used to turn recycled paper into cardboard.

You could get your rent reduced if you went in front of a panel. I said I have one daughter and my wife's pregnant now. They said we need to find you a place, but in the meantime we will reduce your rent to three pounds, three shillings.

E: So you got rid of the old furniture in the flat and brought in more... Where did you get your furniture?

F: We bought it in the shop then. A pull-down pantry with metal top. An old grey gas stove. A shilling in the meter.

E: I will show you some pictures I brought. Maybe you can tell me if you recognise them, and what you thought of them.

F: A coat hanger I've seen that. That was modern wasn't it.

E: Would you have like this?

F: Yeah that was good. They folded up.

E: What about the balls on things. You mentioned earlier you didn't really buy anything like that?

F: We had tables and you screwed the four legs on with little gold pads on the bottom. Utility was the name wasn't it.

E: If you were going to buy something like this with the coloured balls where would you go?

F: Woolworths had that. British Home Stores.

E: This is a magazine rack.

F: I've got two things in there. They call them a clothes horse.

E: What would you have thought of these back then, when they came out?

F: Always for use. The first thing we've always been taught, if I buy it do I really want it? Where am I going to put it? If you ask yourself those questions you won't fill up your place with rubbish.

E: If you saw something like this [magazine rack]..

F: Then? Ooh 'smart'.

E: What would you have thought of it?

F: Yeah I would have bought a magazine rack. But then, do I really want it? I can put magazines on the table or something. Posh people had them.

E: Where would you have seen them?

F: You'd have seen them in vicars' houses, clergymen's houses, doctors' houses. People - professionals would have something that in the drawing rooms and whatever. But the ordinary people, no.

E: Have you ever seen these [I show image of Antelope chairs]?

F: Yes. It didn't cost much to make them. You had to weld them. My wife worked at one metal company. She used to do silk screening and she used to do welding. It was in Aldgate. I can't remember the name of it. Would you buy them today? It wouldn't look in place.

E: What would you have thought of this in the 50s?

F: It looks like a garden seat. Again the balls.

E: Yes. What did you think of the balls?

F: Yeah I liked it.

E: But that was only for posh people you said?

F: Of course it was!

E: Where would you have seen the balls?

F: Mostly smaller things, it was always on the smaller things. I haven't got nothing with those balls on them now. I used to have a beautiful Welsh dresser. But it got too expensive to keep. Prices went up and up and up. It didn't suit the flat.

E: You were 12 years old when the Festival of Britain happened. Do you remember it?

F: Oh yeah on the South Bank, yeah. There's still one in Chrisp Street called the Festival Inn. I wanted to go to the Dome of Discovery. That was science. Then in '69 they were on the moon. People didn't believe that. We never even went to the dome here [Millennium Dome]. A lot of people in this area, Poplar, said it wasn't for us.

E: These are some lamps.

F: I still see the bases in charity shops. These were papery.

Most of the homes had nothing. We were the first home in my street to get television in 1950. It was a little 9-inch screen. Every one would look through the window. People were very late in getting things. You never even seen cars.

These shades never lasted. They were paper. Like a fan. They wouldn't last.

[I show a picture of a bin with ball feet]

F: Would it have appealed to me? No, not really.

E: Would it have looked scientific?

F: No. You'd want to take the balls off, turn it upside down and use it as a lamp.

[I show a picture of molecular models]

F: This one looks like molecules.

E: When would you have first seen molecules?

F: At the Science Museum.

E: How old were you?

F: Nine or 10. I remember. They used to fascinate me. How would they know – building a metal structure – how would they know how to do it. Still...I watch the bone detectives. He's digging up bones and telling you how they died.

You looked at it and thought these are clever men. I have to believe that this is what it is. Were they fooling us? I don't know.

I think that's how they got the idea with the balls on the furniture.

E: Did you think that at the time.

F: No! I thought of that just now.

E: You had a television since the '50s so I thought I'd ask if you've seen any of these programmes. This one is from 1958. It was a programme called Eye on Research. It was hosted by Raymond Baxter.

F: I remember Raymond [from other programmes apparently; talks about an archaeology programme].

E: Did you ever see the DNA model on television?

F: No.

E: What did science mean to you?

F: I had a phase when I was young, 14, 15 – chemistry. I did learn a lot of formulas.

E: Did you use those models with the balls on them?

F: We never used them in them days. It was all blowing and making bombs in the class. Explosions. Saltpetre and sulphur. We had a blue...copper sulphate. You could put in in iron filings. You could put it in a beaker and put water in there, and the iron filings would turn copper.

Interview with Peter and Linda (Highgate Care Home)

21 November 2013

Highgate Care Home

[When the interview began, only Peter was present]

E: Can you introduce yourself and where you were born?

P: I was born in Burton-on-Trent. I was three in 1935. My father was appointed headmaster in Wolverton then. It's part of Milton Keynes now. My father remained as headmaster there for 30 years. I was in his school until I was 16, I had two years in a Quaker school in Reading then I went straight to Cambridge and did a history degree. I finished my PhD in 1958. Then I taught in various universities in Britain. I worked in London at interesting research institutes – international affairs. I used to broadcast on the radio and write articles on current European affairs. For nearly 20 years now I've been retired. I've lived in London off and on but I taught at University of Wales and Sussex and later I was visiting professor at LSE.

E: So most of the 50s were spent in Cambridge?

P: I spent about half the time in Germany and Holland researching.

E: When did you get married?

P: The first time around was in 1957. My former wife and I had four children very quickly all in four years. It didn't in the end work out. My second marriage was in 1988.

E: I brought along some pictures of things from the 1950s. [I show the wall-mounted coat hooks]

P: A thing for hanging clothes on the wall. I'd seen them but I don't think I ever owned one of those.

E: Even with different coloured balls?

P: I don't remember. I think when I saw that kind of thing it was more one coloured but not multi-coloured.

E: Would it have been a bright colour?

P: Subdued, functional coloured. I don't think I saw one that was kind of ornamental or sparkling.

[I show an image of a magazine rack]

P: That's for magazines. I think we all had something like that. My parents had one that was like a wooden box. But that kind with a dividing thing in the middle...

E: This is a bit like the last image in that it has coloured balls and a wire frame. Would you have seen that?

P: What I'm more aware of is the kind my parents had which is like a box. You'd realise when you try to cram another magazine in that the thing was full. I recognise that immediately but not because of having had one.

E: Where would you have seen this kind of thing?

P: I was going in and out of the houses of colleagues. It would have been my academic colleagues or neighbours.

E: Would you have liked this particular style with the colours and the wire?

P: Not sure about that. Probably one reason was that we had small children. You would have wanted on that size for kid's clothes [referring to the coat rack]...But I don't remember needing or getting something like that.

What comes to mind is that we had a simple wooden plank with simple pegs on it with intervals. But nothing - not that I was aware of seeing them with the multi-coloured-

[Peter's wife, Linda, arrives. I introduce myself and the research. Then I show her the first picture of the wall rack]

L: It is a typical 1950s thing isn't it. Molecular models. Balls on stems. I don't know the term for the ball or the stem it goes on.

P: Did you ever have one of those?

L: I didn't. I remember when I was working in Bethnal Green, people having curtains with that design. More elaborate than that. I was working in a very deprived area as a social worker. You would also see it in shops on display.

E: You mentioned molecular models when you saw it just now. At the time, in the '50s or '60s, did you think it looked scientific?

L: No I just thought it was modern. I ought to have thought it was scientific. I was doing chemistry at the university! But it wasn't how I associated it. I thought it was modern.

My husband then was a student. We lived in fairly working class lodgings. That was the sort of thing I saw. I never bought anything like that. I didn't think it was that interesting.

E: When were you a student?

L: I was a student from 1943 to 46 at University of London.

E: Studying chemistry?

L: And zoology.

E: Where were you living in the 1950s?

L: 1951, I lived in London on top of an old rectory and then moved into a flat with my husband. That was in a working class area, the rectory.

E: [addressing Peter] Would you have thought this looked scientific in the 50s?

P: I can see the argument. It's got sort of angles. You could make something that shape with Meccano. I began to think, where have I seen – no, I don't think the idea of it being scientific came to my mind.

L: If it's a thing for hanging clothes on I don't think you would think that because you wouldn't see the lines. You'd just think it was a modern distribution of pegs as opposed to things that were curved or shiny wood. Very simple. I wouldn't have minded having a clotheshorse like that. My thought went immediately to fabrics. Plastic. I don't think it was plastic in those days but artificial materials sometimes. That kind of colouring. Upholstery. There was an exhibition at Imperial War Museum of the home in the '50s. People lived in very small houses, they had Utility furniture with Formica tops. If they had plastic-type upholstery on their chairs it was likely to look like that.

E: Did you like that sort of pattern?

L: I would have liked to see that in John Spencer Square. Wouldn't you?

P: Our little house down the road.

E: Another similar item. [I show a ball-and-rod magazine rack]

L: That's still with us isn't it? It's for books, magazines.

E: It has a similar motif with the coloured balls and wire.

P: I think as far as I've owned a magazine rack it's been the wooden box kind.

E: What sort of style did you like in the 1950s?

L: I doubt if I thought much about it. I liked going to second hand shops, and did get some very nice things. Not magazine racks.

P: There was Utility during the war. Then there was another word, austerity furniture, that implied there was nothing too elaborate. I think in the 50s we probably went for fairly simple things. Things like Heal's came along a bit later I would say. Not that they're not simple. The style, quality and class of manufacture was higher than what we were used to in the 50s I would say.

L: There was the money thing. The people who bought those – I don't think I would have ever bought those. [Looking at a picture of Antelope chairs]

E: Do you recognise these [referring to picture of Antelope chairs]?

L: Yes.

P: They would stack up in a pile. They are almost garden furniture.

E: Where did you see them?

L: Around, in shops and things. Never in a private home. In a concert hall maybe. Curvy without necessarily being comfortable. They've got the backs. They've tried.

Some of the *Vogue* type journals, Home-and-something.

E: They were used at the Festival of Britain.

P: We both visited that. Separately of course, but we were there. I don't remember anything about furniture or decoration.

L: I was working for the government social survey and spent quite a lot of time at the Festival. Most of it was observations of people going up to the top floor of the Dome of Discovery. I gather they were trying to find out about people's behaviour in galleries with a view to the best possible picture hanging. So we watched what they did as they came into the compartment. There were all these mini-rooms. We watched as they went to the left or right or forward or sideways. In our off hours we would go off everywhere else. And it was all spindly. I would have called that picture - if I tried to describe the pattern I have in mind I would say spindly but straight lines not curvy.

E: What was your favourite part of the Festival?

L: It was the English eccentrics or something. It was a wonderful hall of fantasy with a model of a horse and a [inaudible] falling off it. It was English wit, the style that we liked.

P: There were some things, the Emmett steam engine. Some of it was in Battersea Park. I remember the statues you're talking about though.

L: There were fountains and things like that. The shot tower.

P: The lead turned into round bullets on the way down – that's why it was called the shot tower.

L: And then they built the Skylon. Nowadays they would have kept it.

E: What did you think of the Dome of Discovery?

L: I just enjoyed it. I must have seen all the things on the way up. The inventions. [Returning to the topic of furnishings] What people were choosing - we were emerging from a frozen time. It was Edwardian. It must have been the '60s. I remember a textile company doing a survey for Mass Observation about the saleability of sun-resistant curtains. I was responsible for coding all the answers. When it came to colours it was very difficult because there was an awful lot of – do you know what damask is? - there was any number of colour combinations. The crucial question there was, would you pay more? [discusses some more details of her survey; much is difficult to decipher] By today's standards there was a very low level of decision-making [regarding household objects]. People said I don't like to pay too much for curtains.

E: What did you think when you heard the word 'atomic' in the '50s?

P: I probably did hear it mainly in connection with the atomic bomb. In the 1951 election the *Mirror* had a picture of Churchill looking belligerent saying, do you want his finger, it probably said on the atomic button or something like that. We knew there was something called atomic energy in general. But it mainly would have been the atomic bomb.

L: My children were born in the 50s. In the 60s they were afraid of the atomic bomb. I think every generation has a scary thing like that.

E: What would you have called this sort of design in the '50s? If you came home and wanted to tell someone you've seen it.

L: I would have said 'modern'.

E: If you had to describe it to someone how would you have described it?

L: ...It looks like an atomic model. That was one of the images that did become... you might have been late teens at university.

P: But I wasn't a scientist and I wouldn't have - somebody would have had to say to me, that's like an atomic model. I wouldn't have spontaneously used the word.

L: I think something that would have been atomic would have been a drink.

E: I actually have some pictures of models.

L: I wasn't a very enthusiastic scientist. Not on the laboratory side.

E: Did you see things like this? [I show an image of a molecular model of vitamin B12]

L: Not unlike your - the college hospital. The atrium.

P: The Macmillan cancer at UC hospital. There's a huge open atrium and there's an immense collection of super mobile – it's plastic beach toys. It gives the same

impression as this. Lots of things attached to branches. They did have mobiles in the '60s. But hanging from the ceiling.

E: I also had some images of science television programmes from the 1950s.

P: We got ours in '63.

L: I know I didn't see any of those programmes. I got a television much later than you.

E: What was your work in the '50s?

L: I worked for a government social survey. Then I worked for the International Planned Parenthood Federation.

P: You worked for Mass Observation too.

P: Yes I went on to Mass Observation when the Tory government abolished the central office.

Positive Age Centre (Open Age)

3 June 2013

Positive Age Centre, North Kensington London

E: How many of you remember the war?

Woman 1: I was 7 when it ended

Woman 2: I was 5.

Woman 3: I was born in the war. I was 3 when it ended.

E: Can you introduce yourselves and what you were doing after the war or in the 1950s?

Catherine: 1947 was a very foggy year. In 1953 I was in boarding school in Germany.

E: When did you return to England?

Catherine: When I was 14. My father was in the army. We were mostly in York when I came back. A stint in Africa as well.

Joe: I was born in '37 so I would have been about 7 or 8 at the end of the war. I was born in Leeds, lived in Halifax. In 1950 I moved up to Sunderland and went to school in Newcastle. My parents collected odd bits of furniture. I got married in 1960. And I was collecting odd bits of furniture at that time. The trouble with furniture is you buy it and you never get rid of it. In 1960 I was a chemist. Manufacturing chemicals.

[...]

E: This was a screen put up on Waterloo Bridge during the Festival.

Woman's voice: Are they balloons?

Joe: There were a lot of stone sculptures that are now in Kew from the Festival.

E: This was shown there. [I show image of A.B. Read ball-and-rod Troughton & Young lamp]

Woman's voice: Horrible isn't it.

Woman's voice: I remember all those things.

E: What did you think of them at the time?

Woman's voice: Grotesque isn't it?

Woman's voice: I hate all those legs. Everything had wooden legs or metal legs. It was all Utility.

Woman's voice: We were young at the time.

Woman's voice: You just put up with what was there.

Joe: One of the worst aspects were the buildings. The buildings were terrible that were erected at that time. We did have prefabs. The other buildings were terribly monotonous. Even the Festival was just slabs of concrete, which is still there.

Woman's voice: But concrete was big. I think because we had this influence from Russia. This left-wing influence that came in after the war.

[I show a picture of the Dome of Discovery]

Woman's voice: I maybe remember seeing stuff. We were quite big on science after the war. The boys did quite a lot of science in the grammar schools.

[I show a picture of the Antelope chair]

Woman's voice: It's a horrible thing that. Kitchen chair.

E: Does anyone recognise it?

Woman's voice: Not really. Looks uncomfortable.

E: Do you remember things like this? [I show a picture of a ball-and-rod umbrella stand]

Woman's voice: Umbrella stand.

E: What did you think of things with the knobs?

Woman's voice: Quite pleasing?

W: I don't think so.

Man's voice: No. I don't think we had an umbrella.

Woman's voice: We had umbrella stands but not like that.

Woman's voice: In those days that was the only design.

Woman's voice: That kind of thing might have been expensive. We didn't have a lot of money after the war. Not for that kind of thing.

Catherine: There were a lot of knobs around.

[I show an image of an 'anonymously' designed ball-and-rod lamp]

Woman's voice: Its highly designed. I don't think people could have afforded that kind of high design.

Woman's voice: In the toff's house not in the ordinary house.

[I show an image of Homemaker tableware]

Woman's voice: We did always have nice china. My mum always had nice tea service.

Woman's voice: I remember in the '70s my husband bought a set of that particular design from Portobello.

Woman's voice: What is on there? Furniture?

Woman's voice: Most people had flowers on theirs.

E: Do you think the furniture with knobs look scientific?

Woman's voice: I didn't even think about those.

[silence]

Woman's voice: Not really.

E: What would you have called them?

Woman's voice: Knobs.

Joe: They were using those sort of things to construct atoms weren't they?

E: Did you think of that at the time?

Joe: No.

E: What did the word atomic mean to you?

Women in unison: The bomb.

Woman's voice: I never pondered that.

Woman's voice: We were closeted from all the news.

E: Do you remember hearing about this or seeing this? [I show an image of a DNA model]

No [all around]

[I show images of science television; no one remembers them]

Warwick Open Age

12 August 2013

Warwick Community Centre, Maida Hill, West London

[I introduce myself and begin a slide show and talk on postwar Britain and some introductory images of designed objects. At a few points I asked them about slides, and their responses are included below. A (relatively young) staff member from the centre was present as well, who spoke at times. She is identified as WOAC]

E: Does anyone remember seeing this? [I show an image of the Abacus screen]

[some 'no'; faint 'yes' from a few voices]

E: What did you think of it?

Bea: I was about 15. It was just something you looked at that was there because so many things were all happening. I was just getting married so I should remember seeing it.

Patricia: Basically, I saw it a few times but since I was starting school I had other things on my mind.

[I show A.B. Read's ball-footed Troughton & Young lamp shown at the Festival of Britain]

Woman's voice: That's probably a collectible now.

WOAC: It does look scientific doesn't it. It's like a flying saucer.

Woman's voice: It looks like it's going to take off for Mars.

E: Do you remember what you might have thought of it at the time in the '50s?

Bea: It was there. The point was there wasn't a lot of choice at that time. What you saw was what you got.

Woman's voice: I don't remember seeing anything like that at my parents' house.

Patricia: No. My mum took one look and said that's too expensive. We can't afford it.

Bea: Those knobs used to come off. Yeah they weren't very good. I remember knobs. There were other things like that. I remember these bright red knobs falling off in my house.

E: Were they wooden, rubber, plastic?

Bea: Wooden.

E: What sort of things were they on?

Bea: On lamps. And my mother had some bookends. They were supposed to move along but they all came off. That's because there were kids around.

E: Does this look familiar to you? [I show slide of the Antelope chair]

[No one answers in the affirmative]

Woman's voice: Is that plastic?

[I describe the chair]

Bea: I don't remember that particular design.

[I ask the group to introduce themselves]

Sunil: I came here in the 1960s from Bangladesh. 1961. I started working.

Lucy: I don't think I can help you actually because I flew, I was a British Airways air stewardess in the 1950s. I didn't have any furniture or anything. My head was in the air, literally. I didn't really take much notice of things. I would fly nights.

WOAC: There was probably lots of design on the plane you were on.

Lucy: It just looked like the inside of a plane.

E: You might have seen things in hotels?

Lucy: I'm so people-orientated. When I'm looking after them flying, I didn't take much notice of anything.

Helen: I was actually born in Wales in 1948 but I came to London in the late 1960s to do nursing. I'm from a farming community, a really rural area in southwest Wales.

Rebecca: I was still in Australia. The only impact television made on me was every Saturday my brothers and sisters and I went to a television shop to watch 77 Sunset Strip. Every Saturday night we would all queue up.

Ruth: I grew up in Stockport near Manchester and came to London in the late 60s

James: I came here from southern Ireland late 1950s, early 1960s. I lived in Ireland in a fishing village. One of my distinct memories when the train arrived in Paddington the biggest shock was I nearly fell over my suitcase because a man passed me and he was a black man and I'd never seen a black man. That was the

starting pistol of my cultural shock. The culture was completely different. Everything was new to me.

Bea: I've lived all my whole life in this area, within a mile of this spot. I was in my 20s and 30s in 1950s and 1960s. Newly married. We had televisions as soon as they were around because my husband was an engineer. Industrial engineer. He was in the cinema industry. He made cinema screens. He designed the first home cinema screen. Newly married, I was enjoying myself. We didn't have comparisons like you do now. You didn't know what else there was. So we were more content. We didn't have that choice.

Elena: I came from Malta in the early 1970s. I was working, nursing.

Hazel: I was born in London. I went to boarding school in Scotland. I spent some time in the Middle East, Far East and South America teaching children then I came back and worked for the BBC looking after all the arrangements for foreign broadcasters. I was at the BBC when BBC2 started. I joined BBC in 1966.

Barbara: I lived in Wimbledon. I was married in 1953. I worked in the city. I'd been to university. I was in banking all my life. I don't think I've much to offer you. I think as a young girl I was more interested in fashion. Mary Quant. That was much more important to me than furnishing.

Patricia: Born in London, in Kensington, just off Kensington High Street just after V day. When I was 3 days old a bomb fell on the nurses home and blew out windows in the maternity ward. The babies got sent home early. I grew up in Chelsea. I knew the Kings Road well, especially in the 60s. I'd be going past on the way to work. I started working in 1962. Office jobs. My father died when I was six so being an only child my mother had to work hard to keep me. We couldn't afford a television. We used to go to the variety theatre every week. When I was at school we saw the film of the coronation at the cinema.

[another woman introduces herself but she was far away from the recording device and it is inaudible]

E: Thank you for introducing yourselves. I'm going to show you a few more pictures.

E: Does anyone remember these? [I show slide ball-and-rod umbrella stand]

Some voice/s: Yes.

Patricia: Vaguely. Vaguely.

E: What did you think of ball feet on things?

[no one answers]

Rebecca: Back in Australia, one of the girls I used to work with left. We did a big collection for her and we bought her one of those clocks because it was very

in at the time. I went home 18 months ago and she's still got it. I laughed when I went in. I said you've still got this horrible bloody clock!

E: Why do you think it's horrible?

Woman's voice: You either like it or you don't, don't you.

Patricia: We don't all have the same taste do we.

James: A particular item in the kitchen. A small cover with glass doors and a flap that came down. I asked well where's the Welsh dresser? Back where I came from every house had a Welsh dresser. Heavy. Carved. Looked after. You didn't kick it, bang it? I said, well is there no dresser? No she said, not in England. This is what they have here? This thing? I took an instant hatred to it. It was a cupboard kind of thing with a flap that came down with two glass doors at the top and it was covered in plastic. Even in my young age I took a hatred to it.

Bea: We just got into the hygienics. That could be wiped down.

Woman's voice: My mum's still got my grandmother's Welsh dresser.

Bea: At our campsite in Croydon we've got one.

[they discuss Welsh dressers and cupboards further. Many conversations at once.]

E: [Addressing Bea] You said you remember the ball-feet on metal objects like this. Do you remember what you thought of it at the time?

Bea: To me it was just something that was there. I liked practicality. If it was what I wanted and if I could do with it what I wanted. I really wasn't one for design or comparisons. We all like something new – young people did. But if you haven't gotten money. I remember that chair. If you were lucky enough to have the new thing, it didn't matter much what it looked like to me.

There's loads of repros.

[I show Homemaker tableware]

James: You haven't shown us one of our favourite possessions yet – a record player!

[applause]

James: We all had one... That was a prized possession.

E: Where would you store your records?

James: Racks.

Bea: I've still got some now. I still have got records now. The player, I left it.

James: The record player eventually moved into a large piece of player.

[They discuss sound quality]

Woman's voice: Remember His Master's Voice?

[More conversations about record player]

E: Can I ask you one more question about the ball-and-wire style. When you saw things like this in the past would you have thought they looked scientific?

Several voices: No.

James: No, no, no.

Hazel: If I'm honest I don't like it, the balls.

Patricia: Uncomfortable. Those chairs.

E: [Addressing Hazel] Is that how you felt about it in the past?

Hazel: I never thought about it in the past. To be honest, looking at it now it doesn't appeal to me at all. It looks cheap dare I say.

WOAC: I like them.

Woman's voice: You're young!!

Helen: I like them more now. What are they, '50s? I didn't really like them. I think now I like them.

E: Why didn't you like them in the past?

Sarah: They looked flimsy. I was used to more like solid wood. I think we were quite innovative and I like it now. I wasn't keen. I like it now more.

E: Why do you like it now?

Hazel: You change a bit. It's lighter in some way. I've gone off the heavy stuff now. Clean lines. Minimalistic.

Bea: We didn't have such an obsession with change either. You kept something for years and years because you were using it. You didn't see something new and think I'll have that. It just didn't happen. You kept something to use it. There wasn't a choice of just wanting it because it was there. Not in my...

Patricia: We used to have a saying. Use it up, wear it out, make it do or do without. Make do and mend. Waste not, want not. And don't buy anything on the spur of the moment. Make sure you get your money's worth.

E: These are molecular models. I was wondering if you recognise this?

James: Is that DNA?

[Then I show Lonsdale's ice models]

Woman's voice: I've never actually seen that before.

Bea: There are similar things for the elements. Each one had their own.

[I show images from postwar science programmes]

E: Does anyone recognise this?

[Voices say the name Raymond Baxter; no one seems to remember the science programming]

Community Time Camden

9 July 2013

Abbey Community Centre, Camden, London

[Due to a technical error, the introductions to the interviewees are missing from the recording]

E: I'm going to begin by showing you some pictures. [Piccadilly Circus, VE day]

Man's voice: I wasn't in the country.

E: Where were you?

Man's voice: Argentina. But I returned in 1946.

E: Does anyone recognise this furniture [showing image of Utility furniture]

Woman: Yeah.

E: In the early '50s, there was the Festival of Britain.

Woman 1: I visited it.

Woman 2: I went with the school. It was not only on the South Bank. It was in Battersea Park as well. I went to a fancy dress thing there in a grass skirt.

Woman 1: They had a big statue called the Family of Man. It was a big statue of a man and a woman and a baby.

Woman 1: Then there was the Skylon.

Man's voice: I remember the Skylon.

Woman's voice: I remember the Skylon very well because I worked for an architect at the time. One of the architects entered the competition for the design of the Skylon. He happened to be a Polish ex-army fellow and they allowed them to have university educations. This architect entered the competition.

Woman's voice: It's before my time, but my Dad told me that he made a few odds and ends for the exhibition. They were tools like carpentry tools and he had to mould hands to hold them.

Woman's voice: It was exciting just to go.

Man's voice: The Skylon they said represented the British economy. It had no visible means of support. It was pointing upwards and it wasn't going anywhere.

Woman's voice: Everything seemed to be ultra modern. The Festival Hall I remember it being tested for sound. I was still at school and my music teacher at school and they filled it up on Saturday or something and they played music and

you had to stay there all the afternoon and the trains were going by and they were testing the soundproofing. It worked.

E: This was a screen put up on Waterloo bridge.

Woman's voice: I don't remember that.

[no one remembers]

Woman's voice: Wasn't there an interfaith pavilion of the different religions? I think I remember.

E: Do you remember seeing this? [I show an image of the Antelope chair].

General: No

Woman's voice: Doesn't mean anything to me.

[...]

E: Do you remember seeing ball and wire furniture, with ball feet?

Woman's voice: It was quite a common thing.

Woman 1: I remember a newspaper rack kind of thing.

Man's voice: Yes a newspaper rack.

E: Did you have those in your home or do you remember seeing them somewhere else?

Man's voice: Home I think but I couldn't be sure. I've seen them.

Woman 1: It's not the sort of thing my parents had.

E: Do you remember what you thought of it at the time?

Woman's voice: I think it was something that was new.

Man's voice: I think it was the clean lines that it had. The simplicity. We came from an era when everything was chunky so it was quite a change from that. And using different types of material. It wasn't just sort of wood.

E: Do the balls remind you of anything?

Man's voice: It's balls.

[laughter]

Man's voice: Solar system.

Woman 1: Molecules or atoms. Some sort of scientific diagram. Lots of things whizzing round.

Woman 2: Like the Emmett wheel.

Woman 1: I remember seeing diagrams like that years ago. I don't know what they were.

E: Did you think that at the time?

Woman 1: I just thought it was modern. New modern.

Man's voice: I'm not sure whether there might have been a greater interest in the solar system. Wasn't there something about it in the Festival of Britain?

Woman's voice: That was the beginning of people's interest.

Man's voice: Being more aware of the universe.

Woman 2: Just thought life was getting a little jollier. [Talks about Battersea Pleasure Gardens]

[I show a John Lewis advertisement with lamp with ball feet]

Woman's voice: My friend in New York would die for a room like that.

Man's voice: What's interesting is the way the advertisement is done. A lot of advertisements were line drawings with a very banal typeface.

Woman's voice: I think we were all under the impression these designs were from Scandinavia. Very exciting.

[I show Homemaker tableware]

Woman's voice: I got mine in Woolworths. Holborn Woolworths. It would have been about 1961.

E: Do you remember the cost of it?

Woman's voice: I earned £3 a week then. I worked at Her Majesty's Theatre. I was the office girl. My rent was 2 pounds 45 a week or something like that.

E: What did you like about the Homemaker plates?

Woman's voice: At that point, I was working in Holborn, I was opposite Woolworths and it was cheap. I think everything I owned came from Woolworths.

E: Did it matter to you if things matched?

Woman's voice: Not then. It was just what you could get a hold of.

E: Do any of you remember seeing things like this [slide of molecular model].

Woman's voice: Not at that time.

E: What did the word science mean to you in the 50s and 60s?

Woman's voice: I suppose new inventions. Things to do with making life and babies.

E: What would have the word 'atomic' meant?

Woman's voice: Frightened us to death.

Man: I think the tests were well-covered. There seemed to be regular testing of the atomic bomb.

The changes in aircraft design and propulsion.

Interviews with contemporary 'retro' enthusiasts:

Interview with Mary

17 September 2013

Mary's home in Watford

E: Can you please introduce yourself and what you do?

M: I run a vintage 'retro' agency for films and photoshoots. The agency is all encompassing. Everything 'retro' – mainly mid-century. I rent out the house, bikes, props, wardrobe and people for film and photoshoot work. Vintage has become huge in recent years. There's always calls from all aspects of the media. I always had that stuff around me and that's how I built up the agency. I already had all this around me. I collected my cars and bikes over 20 years. I thought, try and make them work for themselves. The house has been in *Vogue*... the kitchen has been popular in TV adverts – Dairy Lea. I've had pop videos shot here. I had Russian TV here last Thursday. I had a comedy sketch filmed here. I work with a location manager. I've had a lot of interest from all areas. It shows that there is a commercial need or want for this style of stuff. I'm also a motoring journalist. I work on car and bike magazines.

E: How did you choose the name [which contains the word Sputnik]?

M: The name came from my cat Sputnik. The name popped into my head a long time ago when I was doing freelance journalism. [...] When I started renting out the house for film work I thought there's so much more than just the house, that's when the name... the Sputnik thing totally encompasses so much of what the 50s were about – space exploration, science, new frontiers. I was offering everything you could possibly want about the 50s – the cars, the bikes, the clothes. It was important to have a really strong image.

E: What keywords do you use on your site and social media?

M: Vintage, 'retro', 50s, sputnik, sputnick.

M: So your 50s interior predates the business.

M: My husband and I did it. We bought it [the house] and pulled it apart. We did it all ourselves.

E: How would you describe it?

M: What we tried to do was we loved mid-century modern American architecture but we were never going to afford to live in the real thing so we tried to recreate it. We've open planned it. Not a single wall is where it was when we moved in. It's very American. It would have been very fresh and modern at the time but not always very comfortable.

E: What are the definitive mid-century objects in here?

M: The English Rose kitchen. The sofa and chair we shipped from California. The room divider came from Antwerp. It's French apparently.

E: Are there three keywords that spring to mind to describe the 50s?

M: Colour. It's difficult to say because the American and British 50s are very different. My preference is the American 50s. Colour, optimism and opportunity I think. From a consumer point of view it was a wonderful time. America was a very wealthy country. They hadn't had the hell bombed out of them. In America it seemed to have been a bright, breezy, cheerful, optimistic time. But I know there was also an awful lot of darkness in the 50s as well – politically, socially, civil rights. But from a consumer point of view it must have been a pretty exciting time.

We had some amazing stuff going on here [Britain]. Some of the stuff I find a bit poor. For instance this is an American dinette – it's big, bold, lots of chrome. No skimping on the production. In England it would be a little square with maybe some red formica. Some little stick legs. Perhaps the ostentatiousness of the American stuff appeals to me more. Unless you were quite wealthy in the 50s you could only afford a few bits and pieces. I think people found it tough.

E: When did you become interested in mid-century styles?

M: When I was a kid. My dad took me to see *Grease*. I was born in 1972 so I was 6 or 7. I fell in love with the colours, the excitement and the style. I wanted those clothes, those cars. I wanted to listen to that music. It represented so much of what life wasn't. All my childhood I loved the past. I would read Enid Blyton books set in boarding schools. Dreaming about other things. The whole 50s thing was much stronger for me.

I've got some of the first things I collected as a kid here. The whole idea was always to create our own little life [that's like the 50s].

E: The atomic things with the balls and wire – how do they fit in?

M: If you look around they play a strong theme here. We've got the fabric on the sofa. We've got the sputnik design here which is space and molecular structure. The crockery – Franciscan starburst (shipped from America).

E: Do you like the ball and wire furniture, like the magazine rack?

M: Yes, they're light and airy. They're not heavy and clunky. The magazine rack didn't have any feet [she added wooden balls]. I've got coat hooks with the balls on them. I'll repaint them to match the colour scheme on the porch. The room divider has the molecular theme. It plays a part everywhere. It's not overpowering but it's there. The tripod plant stands. It's incorporated into every aspect of décor.

E: How does it make you feel to live with them?

M: It's pleasing to the eye. And they're practical. Light and airy – the whole idea was to get things off the floor. All these stick legs meant you could see to the ends of the room. I'm quite clumsy. I'm not good at delicately going round things when I'm hovering.

It suits my eye. It's not a big house, so it makes the most of what little space I've got.

John [her partner, walking in]: It's not the British house from the 50s. It tends to be used for filming in a more kitsch cartoon way.

E: Are you concerned with historical accuracy?

M: It's more what I like. I've got bits and pieces from Ikea and Heals. But I like it and it suits my house. If someone wanted absolutely period accuracy from 1957 I could make it accurate. People are usually so overwhelmed by it all that they don't usually care if something's from Ikea. It's not a museum. It's a used home.

E: Do atomic items influence how you think about the 50s?

J: It's a bit like – now everybody's got it. It's all part of that look but it can get a little bit kitsch because it's everywhere.

E: Would you call the coat rack atomic?

M: I'd call that atomic.

E: Is there a difference between sputnik and atomic items?

Sputnik is space travel and atomic's science – molecular, genes, technology. It all happened because of the war. Science and technology and transportation went to the space age because of the necessities of the war. It's all part of the optimism of the age, when culture and science squeezed so much into such a short period. It's taken an inspiration and incorporated that. Using it in more subtle ways.

J: It's practical as well. We see that round ball in stuff that's atomic at the time. We don't know who did it first.

M: It filters down to the people and the high street and it represents to them a bright new age.

E: Is that what it represents to you?

M: I'm sure at the time I would have looked to it as the future. Now I look at it as the optimism of the past that was a very special time. It's quaint now how old fashioned it is because we've moved so far beyond that in technology and design. It must have been incredible.

J: the explosion of colours is the other thing – because of manufacturing processes and plastics.

M: Now we think of plastic as throwaway rubbish but in the 50s it was so the latest thing.

E: Is that optimism different from feelings today?

M: I don't think so because it was the first of the real consumerism. I think that was the initial push. It's still happening today. People still want the latest advances..

S: It was the beginning of the end in some ways. People wanted more and more and society has now imploded. But the optimism? I don't know now. We're making incredible advances in medicine but science has always got that dark side. The whole atomic thing was not a very positive thing really – look at the destruction it caused! There is that optimism but also that fear that it can be abused. That's as real today – look at Syria – as when we bombed the hell out of Japan. From a design point of view I just think it's beautiful but when you actually think about it, discovering the atom, going deeper and deeper into the science of the there was a hideous side to that.

E: Do you associate the ball and wire things with a specific designer?

M: You've got the big names like the Days and the Eames. So many people were using that both at the high end and the high street.

E: Do you associate that atomic style with American or British design?

M: We looked to America for a lot of things. So I suppose its American but I associate the actual black wire with the balls with Britain. The American maybe it was more jazzy. I actually think of the whole wire...European as well. I see a lot of French and German.

E: Do these remind you of anything from your own past?

J: My mum would hate this. It would remind her of her youth and Woolworths. She would say it is naff.

M: My mum said, our house in the 50s was nothing like this. And I said, well that's good because I'm not trying to recreate your house.

Enough people do get it.

J: I grew up in the 70s and I don't like the 70s.

M: My mum and dad were married in the 60s so their home when I was born was very 60s. So they didn't have much 50s stuff.

E: How definitive is the atomic stuff for your friends who are doing the whole 50s thing today?

J: Homemaker is definitive.

M: We've got friends who have done 'retro' in different ways. We have friends who have done the American things and friends who have very British houses. In the British houses you see a lot more of that atomic stuff. Maybe because we had less. That [ball-footed objects] was the main design thing. Because we had less money and everything was more watered down from the American all singing and dancing.

Interview with Christine

6 September 2013

Interview by Skype

E: Can you please introduce yourself and what you do?

C: I do two things. I'm an exhibition designer by trade and I also now sell vintage home décor and objects items online.

E: How would you describe the things you sell?

C: Several [periods]. I prefer mid-century design. That's what I've always been interested in. I have the odd bits from the 1930s. I go from the 1900s. But the majority of my items are 40s 50s 60s.

E: When did you start being interested in objects from the 50s?

C: I've always had the odd bits and pieces passed down from family members. But I really started getting into it in 2010. I was doing a project for a big jeans company and we had to source some props for them and that's when I really started to getting in vintage items.

E: What do you like about them?

C: Mid-century – it's just the form of them. The shapes, the unusual shapes, especially the atomic. I find them quite cheeky, especially like the legs on atomic furniture. They're just unusual. They're just something you don't often find in furniture these days. Reproductions aren't the same.

E: What do you mean by atomic furniture?

C: It's the coat racks with the colourful balls. You can get them in all different ranges and shapes – sometimes they're pointy cone shapes, sometimes they're balls. It's those items. Like the magazine racks with the balls on the ends.

There are all sorts. It comes within the shape as well. It's things which are pointy, rectangular shapes as well. It's all to do with the atomic shaped legs I suppose. The legs which are pointy or have metal feet, adjustable feet or a metal cap on the end.

E: What do you mean by 'cheeky'?

C: I think when you see atomic items – they are quite hard to come by, originals anyway – it's always exciting. You spot them. You're looking in a junk shop and see a little cheeky atomic leg – it's exciting when you find it. I find them quite cheeky, it is just the shape of them.

E: Like a little bit comical?

C: Yeah maybe.

E: Are you interested in history?

C: Probably more than I used to be. Obviously at school I loved art and design. History wasn't overly one of them. I am more and more interested in history now and finding out about certain objects and a bit more about their past.

E: If you had to describe the 50s in one sentence, or three keywords how would you describe it?

C: Exciting and new for people of the 50s. Everything was a bit new. Things were changing. So yeah, change.

E: Is that one thing attracting you to the furniture?

C: If you look at 30s, early 40s furniture, it's quite clunky. For people of late 40s, 50s everything was exciting and new for them. The new forms and shapes. Some people probably didn't know what to think of them to begin with. For people of that era it was all change, exciting and new.

E: How do these atomic objects fit into the overall group of items that you sell?

C: I'd like to sell more but then but the original stuff is becoming harder and harder to find. I don't have as many atomic items in my shop as I would like. In my head it's a major thing but they're really difficult to get hold of.

E: Who buys them?

C: Mostly people in their 20s to 30s. I don't know the age of my buyers. It's younger people. Younger people realising there's more to vintage than you might think. There's a lot of people who throw things out - The older generation they chuck it out. They think of it as junk. Not a lot of older people are buying things. They look back at it as nostalgic.

All sorts – the 60s, the 70s, even the 'retro' stuff, the bright orange kitchen ware. It's all being chucked out by one generation and being collected by another.

E: What age group are you in?

C: 20s

E: What words do you use to describe these things?

C: I think people use 'vintage' more. For me 'retro' is 60s 70s. Mid-century is more the late 40s, 50s, going into the 60s.

E: Do you personally own any atomic items?

C: Yes. My first piece I picked up was a magazine rack. You've probably seen them. They're generally black with the red balls on them. My nan had one when

I was younger. She doesn't have it any longer. Chucked out. Probably sent to a charity shop. 4 or 5 years ago I got it on eBay. But mines white with yellow balls. That was more to fit in with my décor. I have all sorts. Coat racks, the usual coat rack with the black and the balls on the end, colourful balls. The wooden ones, so they're early atomic. The plastic ones fit in later. There's one on my site I'm selling. It's a white one with more pastel-y colours, and they're plastic so they fit in later so late 50s, early 60s.

E: How does living with these atomic objects make you feel?

C: I love them. It adds a bit of interest to our home. They're quite simplistic as well. They don't clutter up your space. They can fit in with most rooms. Even if your room was a bit modern, and you had a modern couch. For instance if you had your magazine rack next to it, it doesn't clutter up the space. I think they fit in quite effortlessly.

E: In your own home is most of your furniture from that period?

C: The majority of my furniture is vintage. It's 50s 60s. Apart from our bed and my desk, everything I own furniture-wise is from that era.

E: Where do you often find atomic objects when you source them?

C: Car boots, charity shops, eBay and antique centres.

E: Do you ever find them in places that sell more expensive stuff or not?

C: I think it depends on the style shop. The atomic items generally fit into that genre so I think it depends. A coat rack can range anything from £20 to £50 so I think that's a tricky one. Maybe if you're looking at a higher end retail store like Heals, you'd probably find a coat rack in there which is quite pricey.

E: What does the design represent to you?

C: For me – my nan. For me its all about nostalgia and it fitting into my décor.

E: Nostalgia for what?

C: It's definitely for my nan's home; it's her magazine rack that always stood out to me. It's a strange one for a child probably. It attracts children. The colourful balls, its something you want to touch. And the clean lines. It's quite basic but it attracts you to them.

E: Do you see it as optimistic?

C: The whole atomic and sputnik era is all about the space race I suppose, like 50s, 60s. It's a new time after the war. People wanting to try something a bit new. Freshen up their lifestyle. I don't actually know the prices of these items back in the day. For people it's all about a new start.

E: Would it be possible to have a complete mid-century home today without them?

C: I think you could do it without these, specifically without the coat rack or magazine rack. It depends on your style – if you're more into Scandinavian design of that era you could do without them. British or American - if you aim for that style, I would say you need them in there.

[In her own home] I like a mix. I love Scandinavian design. All the furniture I have is British. Ercol, and G Plan. It's all from Britain. For me it does fit in definitely.

E: Do you associate them with a particular designer or not?

C: Never with one designer. I don't actually even know who designed them. When you look them up they're not easily found. You can't find a specific designer. All sorts of people manufactured them.

E: Do you see these objects as having to do with science?

C: Definitely the whole atomic word is to do with atoms and they remind me of science lessons when you're making the atomic balls. You had the tiny little balls and the little straight bits you had to connect to them. The balled items do represent science, for me.

E: When you think of atomic do you think of atoms or the atomic bomb?

C: I would say the molecular models, however it all stems from the atomic bomb. That's where it comes from.

E: Do you think the role of science in design and in everyday households has changed since the 50s?

C: I think it was unique in that aspect. You don't really see it in our designs at the moment.

E: Is there a difference between 'atomic' and 'sputnik'?

C: I would say they're interchangeable. Other people might have different opinions. The atomic – that's quite tricky. I would use both words, 'atomic' or 'sputnik'. I think it might also be – it depends on where you come from. I think Americans would say 'sputnik' but in the UK we would say 'atomic'.

E: Are their materials or how they are made important to you?

C: No - apart from wire and plastic coating I don't know how they're made. Generally most items of this era are metal, wire, plastic coating, or the plastic balls and the wooden balls.

E: Do you mind if something is worn?

C: It doesn't bother me actually. A missing part would bother me.

E: Are they 'kitsch'?

W: No definitely not kitsch. 'Kitsch' to me is like cute things. You know maybe like little ceramic deer, things from the 50s, 60s, little ceramics made in Japan they sometimes have big eyes. So it might be a ceramic cat.

E: So this is more serious.

C: Yes.

E: When you're buying this kind of thing is it important to you what country it came from?

C: No not at all. In fact I'm envious because in the States they have so much of it. It's a hell of a lot different to what we have here. So I'd love to get hold of more bits and bobs from the States but that's quite tricky.

E: Can you tell the difference between British and American atomic objects?

C: Yes but I don't know how I'd explain it! I think if you had them next to each other you can definitely tell the difference. There's a definite difference between the two. [British ones] I'd say they're a bit more organic even though they've got the straight lines they're a bit more organic, whereas the American ones, there's a lot more points in them. Rounded edges but the American atomic is just really nice. I like the UK stuff but the American stuff is really nice. There's lots of it, lots of different styles whereas in the UK there aren't as many.

E: Where do you think people bought them back then?

C: Heal's. Maybe places like Woolworths and Boots. Definitely Woolworths.

You've got the Homemaker range which was really nice crockery-ware which came from Woolworths and the patterns on that ware were all atomic. Woolworths was probably the place to shop.

E: Do they have historical value for you? Do you think of these things as connected to the past?

C: No it definitely does seem connected. Some of them they've got the wear to them. Some objects I look at them and think where have they been, where have they been used, how many hands have they passed especially with my coat rack. It's definitely got wear and age to it. I think where has it been – has it gone through one person to a junk shop to me? Has it passed through many hands?

I try and imagine people's homes. Some items you can tell the kind of home they might have come from. They might have a real smoky smell. You can imagine a guy or a family sat there in a real smoke filled house him enjoying his cigar and

they have all this amazing furniture around them and they don't realise how they will influence people in the future or how people will think about those items.

E: What does the 'atomic' object do for an interior today? What does it do that other 50s/60s vintage objects don't, if anything?

C: That probably depends. If you look at the Scandinavian sideboards everything is clean lines, straight lines. If you go back to the Atomic it's the whole idea of the angles. I go back to the feet. It is always the angles in the legs, for me it makes my room feel a bit clear. Our living room isn't exactly huge but a lot of the items we have in here have the small feet – we have the sofa, coffee table, foot rests – and they all have these angled feet. It makes the room feel that little bit more clearer. There's no items that go straight to the floor. There's always space between the floor and the item. It just lifts them up a bit. It makes the room a happier place. It makes the room more open and airy even in a smaller room.

E: When do you think the 50s started to become popular?

C: I'd say for collectors you've probably got people who've loved them for a long time, but there's people ...kept hold of them. The Red or Dead designers I know they're like a lover of those eras and Wayne Hemingway went and collected things his nan was throwing away. Some people realised it earlier on, but I've noticed it more in furniture in the last 5 years – there's aspects of the atomic age that have come back in.

E: Would you want to live in the 50s?

C: I'd like to go back there. I don't know if I'd like to live my whole life there. I'd see what people really felt about such items and see how their houses changed and their interior life. For curiosity reasons.

If you look back historically and even in films and things people seem to be happy. It was a happy time. The war was over. It was a new beginning. Lots of things were new. People were trying new things seeing new things, going abroad.

I wouldn't say it was a happier time than now. People were more optimistic then. So it was like people were living a new life. For them it was exciting. I don't know if it would be exactly happier than now but they were definitely happy.

E: Is that happiness one of the reasons you like atomic furniture?

C: I wouldn't necessarily say, no. I say it brings a bit of curiosity to my home. [talks about telling visitors about her objects] You talk about what era's its from...sometimes we have friends come here and they'll ask loads of questions instantly. It brings a lot of curiosity. My partner – he wasn't really into this but now he loves it. It's changed his vision on buying old and new furniture. He'd sway for the old.

For me it's – it's maybe a little addictive. Or not addictive...You kind of think differently in how you'd buy things. This furniture has been made to last. Where you nip down to Ikea get a book shelf and it's just not made the same way.

E: Speaking of how things are made, do you like a mass-produced look, in an 'atomic' object for example?

C: I don't really see them as mass-produced because now you don't see them very often. You don't see them in many people's homes. There's no one else I know who has the magazine rack in their home so for me it doesn't feel mass produced. If I was to go into someone's home and see the magazine rack, I'd be like oh it's something that's a bit different. I think back then probably everybody had these items in their home, but now they don't. I don't ever see them in that way.

Interview with Melanie

6 September 2013

Interview by Skype

E: Can you introduce yourself and what you do?

M: I run a little online shop on Etsy selling vintage 'retro' wares I find at car boot sales and auctions around Cornwall.

E: How would you describe the things you sell?

M: My preference personally is mid-century items ranging from the 50s up to the 70s. Atomic items. I found quite a few recently. You can spot them. They have the funky stars on them. They're futuristic. Very interesting items. I get really excited when I come across them. My heart skips a beat.

E: When did you start being interested in collecting objects from the 50s?

M: A few years ago. I'd always been interested in them and I'd just buy the odd thing for my room and that's it. I saw Etsy online and I thought oh there's no way I could ever sell anything on there. But I found more and more things at boot fairs. I thought I'll start up a shop and see what happens. Gradually it developed over the years. I've seen it really start to boom a little bit.

E: Are you interested in history or just interested in the way these objects look?

M: A mixture. I am interested in the history of them but I'm not a buff or anything. It's interesting how postwar items – the development of moulded plywood and new plastics allowed designers to create more exciting objects. It was a lot more about creating something new, far out stuff. Nowadays you can't find things like that. It's all quite static. Ironically you find people buying more stuff from the olden days because it's a lot better. The quality's better as well.

E: If you had to describe the 50s in 3 keywords what would they be?

M: Colourful, futuristic, and bold.

Everything suddenly became very bright then. People could afford to have things that were colourful. Rooms were full of colour, and the designs were bold. Designers were competing with each other to come up with the next best thing. It was like a race in a way. Almost like people were into futurism – people were looking ahead, imagining things they thought we'd be creating now, but we're not. It's quite boring nowadays.

E: Is that futurism something that attracts you to that atomic design?

M: Yes I think there was that optimism, that constantly looking ahead. They were designing things before they got to the point when they could actually make

those sort of futuristic items. So the objects look like things, look like rockets. The economy grew again. Things were mass produced.

E: Are the ball and wire furniture part of this futurism for you or not?

M: The ball feet are inspired by science – molecules and the rest of it. I love iron. I love the wirey objects. I have got in my dining room one of the atomic magazine racks with the ball feet, which I absolutely love. I don't know what it is that drives me crazy about those objects. I guess it's the simplicity as well. I love the ball clocks as well. I haven't found one of those yet.

E: How do those objects fit in with the overall kinds of items you sell?

M: I sell as many as I can find [of ball feet items]. I keep thing for myself that I can't let go of. At the end of the day it's how much stuff you can find in a particular area. Cornwall – I'm sure the atomic era really spread so far down here. There's stuff around.

E: How does living with atomic furniture make you feel?

M: It makes me feel quite happy actually. It's nice to know I have these objects from the past. It's great having objects from that time. They are so interesting to look at and well designed. I picked them up for 20p. It's fantastic knowing I can get them for cheap as well. They make a room – my dining room is set up in a 'retro' 50s style. Got an old cabinet and the LP cabinet and the magazine rack. It creates that feel. It's hard to describe. I love that style. You put your palm tree here. It looks very Eames. That's the style I really like – simplicity with hints of modern or optimism.

E: Does the optimism rub off on you when you look at or use these items?

M: To me it's more enjoying the historical background of the items. I wouldn't say they make me feel optimistic. They are a joy to look it. It's nice knowing I have that object preserved from the time.

E: Do you have any sense of who buys these atomic items?

M: I'd say about 40% of the stuff is bought from people in Sweden and Norway, New York and California. The other day I got someone buying something from Taiwan. Most are abroad. There is one woman from the UK who bought 3 or 4 items. They're all strange things. More 60s. She seems to be just filling her house with lots of old things – a jumble of 'retro' items. Whereas the other people – I imagine they have trendy apartments. I doubt they are collectors.

E: What do you think makes people want to buy atomic items?

M: Firstly because they're trendy at the moment. With vintage stuff you tend to get more collectors. With mid-century its people going for a specific look. Say you have a simple interior. An atomic rack or boldly coloured plastic item would

be a feature item, something to make the room more interesting. Something to talk about. A curiosity. I wish things would become more interesting again.

E: What do you think makes them interesting?

M: It's the wackiness. Some of these items when you look at them you think this is pretty crazy. It's a bizarreness I suppose. When you find something like that it's exciting. It's the fun of it all really.

E: Where do you have the atomic objects in your home?

M: They're kind of on display. The magazine rack – I use it. If I did find an atomic clock it would be that kind of I don't want to let go of it but I do want to make a profit. I'd probably keep it for a few months before I sell it. That's what I tend to do.

E: Does it matter to you if any of these objects look worn, scuffed ball feet or something?

M: The better condition they're in the better. At the same time the fact that they've survived this long is testament to the fact they are well made in the first place. I spend a lot of time cleaning these things up and trying to restore them. Which I really enjoy.

E: Do atomic items impact the way you think about the 50s?

M: I think in a way they define the 50s for me. When you think of the 50s you think of those items. For me it's more a case of furniture actually. I have an obsession with chairs. It's an image of colour – orange, yellows, reds. The Eames style white room with palm trees and the odd thing like a clock or magazine rack. The odd hint of it here and there.

E: Do these items remind you of anything from your own past?

M: I was born in 1985, but maybe slightly my English grandmother had the bizarre items in her house but I don't know if she had anything atomic. I wish I could say yes.

I feel nostalgic [anyway when looking at them]. I feel nostalgic for those times. I don't know if they were better times actually but the times when styles were like that. Clothes were interesting. There was an excitement about possessing something like that. I don't know how it worked back then. It's exciting now.

E: Do your objects satisfy your desire to go to the past?

M: Yes it definitely does. My dining room is my homage to the 50s. They do satisfy that nostalgia.

E: Could you do more to satisfy that desire?

M: Yes – buy more things! If I had more money I would have a completely ‘retro’ house.

E: Do you associate the ball feet items with a particular designer or not?

M: There is a particular designer – is it George Nelson? He did the clocks. I associate those with him. Who did the magazine racks. Do you know? I don’t know a great deal.

E: Do you think of ball and wire objects as having to do with science?

M: No I don’t. When I look at the items I don’t think of science. I guess you think of inventions in a way. I think of creativity. That’s how it was – people constantly trying to invent new things and new styles and by using all these different materials they had available to them. Inventing is looking further ahead, pushing further.

E: Do they still look futuristic to us today?

M: The space age items do. I wouldn’t say they look futuristic. They look space age. Futuristic nowadays is more about technology, more minimal.

Everything’s getting a bit see-through.

E: What is the difference between ‘atomic’ and ‘sputnik’?

M: I don’t have a clue. I never describe anything I have as ‘sputnik’ because I really don’t know what it’s referring to. I see it but I don’t know what it’s all about. It’s just another word people put into their search engines.

E: Do you describe your items as ‘atomic’?

M: I have a clock on there I described as ‘atomic’ because it does look quite space age. That kind of shape: an oval shape with a little stand and a silver rim.

E: Would you describe the magazine rack as ‘atomic’?

M: If I put it on there it’s mainly because I want someone to find it, but personally I wouldn’t describe it as atomic. I suppose yes I would, because of the ball feet I’d think space age. I would just think oh that’s cool, that’s simple.

E: How important are these items’ look of science to the 50s style.

M: It is pretty important. It defines a lot of the style. I guess because of what was going on at the time. It spread into design. I suppose everything with space exploration, pushing forward all the time. Of course it was very important. Everything at that time was about development and science was obviously a key part of it. Technology – that side of science is taking over our lives completely nowadays.

I assumed people were happy with it [science in the 50s]. I never thought about it.

I can't say I feel very optimistic now. It's just phone and ipad technology – a bit boring. Whereas in those days it was taken into everyday objects – clocks and lamps and that sort of thing. Today there isn't really a style as such. Nowadays it just seems bland.

E: Do you sell anything you'd consider kitsch?

M: Yes, I like kitsch. My mum always tells me off when I describe anything as kitsch because she thinks no one will want it. She grew up in communist Poland. Those items remind her of that time, cheap items. For me they're quite exciting. I've got a very kitsch 1940s plastic teddy bear moneybox. He's got those cutie pie eyes. Magazine racks – not kitsch. That's a design item. I don't know if it was at the time; I guess something can't be kitsch when it's current is it?

E: Do you like the look of something being mass-produced rather than individually handmade?

M: No I don't like handmade very much. I do quite like the mass-produced objects mainly because they're made of wire and plastic. Particularly with plastic I like the shapes that were created. They were much more experimental.

E: Can you tell what country an atomic item came from?

M: It doesn't matter to me. If it's made in China it might suggest it's not a real atomic item. I find a lot of things made in England and America.

E: When do you think this most recent revival of 50s items started?

M: It's hard to say. Over the last few years a lot of people haven't known about it. I've gotten away with buying things people didn't realise was cool. A gradual process of people becoming more aware – men at the local car boots who don't really know what 'retro' is now say I want this and that for it because it's 'retro'. For me it's annoying how people become more aware of it because they get more expensive.

Interview with Ms Pink

20 September 2013

Ms Pink's home in London

E: Please introduce yourself and what you do.

P: I'm 46 with 3 boys. For a long time had varied jobs, nothing worth mentioning. I've always had a real interest in colour and design. A few years ago I decided to start my own business. I've not got a formal education in design. A lot of people who are colleagues have had a more formal education in design. [Her business] originally started solely with furniture. Taking old furniture and reviving it. It's now been given a tag, upcycling. I had that tag. Then I thought it was better to go to some more mid-price items. Wallpaper and cushions.

E: You mentioned earlier that you're a collector.

P: I have a big collection of trays – 60s. I collect coloured glassware, some of it not necessarily from the 50s, coloured kitchenware. Kitschy items I like.

E: Is there something about that period that attracts you?

P: Colour. With the 50s especially, some of the atomic patterns are quite graphic. We've come full circle, There's a lot of graphic designs and companies that have based their designs on 50s patterns. They stand the test of time today. The simplicity. With the trays that are later – very simple. The designs are very simple.

E: When did you start collecting objects from the 50s?

P: About 15 years ago. My early 30s. Things started to sneak in. I can't remember a point. This thing with the baubles - that's a typical atomic thing. I moved to London when I was about 18 and I went to a car boot sale and I just picked that up because it was colourful. I didn't realise when I bought it that it was quite an old object. That must have been really – I suppose with the whole space and the worry of nuclear things happening. It's like the magazine rack. I picked it up from a car boot sale and it's just so simple but effective.

E: What sorts of things would you class as atomic?

P: I suppose I just know that these magazine racks are labelled – if you look on eBay – from the atomic period. Also these – there's one on eBay at the moment that's ridiculously expensive - £80.

E: Do consider anything else atomic or just the ball and wire?

P: That's just what springs to mind for me. I did have another magazine rack I gave away because this one is nicer. Rather than wire it was solid. It had the red balls as well.

E: How does it make you feel to live with them?

P: I only surround myself with things that make me happy. Especially when you work at home it's important to have things around that inspire you. I think there's a real resurgence at the moment. If you watch them on eBay the prices are going up and up.

E: Are you interested in history?

P: More objects to be honest not so much the history of them. More just the finished object.

E: Are there 3 keywords that spring to mind to describe the 50s?

P: I know more about the 60s and 70s. I don't really know much about the 50s. I associate that with the 60s [bauble object] but the magazine rack with the 50s. That just looks like more of a fun object and the 60s are starting to be fun. The 50s are more of an austere time. [Gestures to the magazine rack] The postwar sort of solid, very looks quite – it doesn't look like a happy object. It looks very strict. I suppose the colours only nod to fun. I suppose they could be playful but I don't see it as playful because it's so heavy and black and metal. Sturdy. Made to last. They come up quite often on eBay – the red and yellow balls. I haven't seen any others.

I regularly buy things on eBay. [She occasionally sells on there too] But car boot sales aren't the same as 20 years ago – people know how much...this 'retro' thing has gone mad.

E: Does atomic style influence your own design?

P: Slightly with the wallpaper, the simplicity of the graphic lines.

E: What do atomic items represent?

P: Good sturdy design. We didn't have any objects like that [growing up]. And my grandmother didn't have good taste. Although I suppose in the 50s that wasn't necessarily seen as what was good taste. It was just what was there.

E: Does it help you imagine the 50s?

P: I don't really connect it with the past. I can imagine that in the 50s would have been in a really different kind of home. I wouldn't be a design object, just a practical thing. Just a good old magazine rack.

E: Is it optimistic at all?

P: I never thought about that. Not especially. Do some people think it heralds a new dawn? I suppose in the 50s when people were imagining the future they were imagining it would be different than it turned out to be.

E: Do you associate it with any designer?

P: I think of Eames and Frank Lloyd Wright. I don't know who the actual person was who designed these. I've seen quite a lot of fabrics with that kind of thing on it. Diamonds with some lines. When I've seen Festival of Britain literature in a magazine.

E: Do you think of it as British?

P: I'd lean more toward American. Maybe that's because I didn't see a lot of it growing up. You know you had the Jetsons. Bewitched. Maybe they had these kinds of things in the home. Maybe they didn't and I'm just imagining them.

E: Do you see them as having anything to do with science?

P: I suppose when you're doing chemistry you've got bonds and you see a model with polystyrene balls. Molecules. I can see why they'd be associated with science. But for me there's no connection. [but the bauble one is more scientific to her] That one is kind of explosive like a bomb-like atomic bomb. I just know I like them.

E: What is the different between 'atomic' and 'sputnik'?

P: I always think of sputnik as more spacey things. I wouldn't class that magazine rack as sputnik. I think of spaceship-type objects. I never associate science --- I think of it as more factual whereas design can go anywhere. I don't associate them together.

E: Do you think 50s or 60s design was influenced by science?

P: Yeah because people were starting to worry about nuclear war. That's when the worry first came to the fore. I'm sure it did have an influence. I see a lot of design today with clean lines. I think their basis is in the simplicity of [the 50s]. People are looking to the past.

E: Do you like any current design?

P: Not really.

E: What attracts you about 50s and 60s design?

P: It's just attractive. I like a lot of clean lines.

E: Would you like to live in the 50s?

P: No. I don't necessarily think of the 50s as very colourful. I think of grey and a little yellow.

E: How do your atomic objects fit in with the other objects in your home?

P: I never think of something fitting in. If I like it I will have it. I personally think they [atomic items] look classy and give a sense of timeless design. Especially against white walls. A lot of people I know wouldn't know it was from the 50s. I moved down to London from Scotland in the early 80s and going to gigs and lived in a squat. The punk era was my era.

E: Do you prefer mass produced or handmade objects?

P: [On the magazine racks] I don't even think of them as being mass produced. There's a slight East German sturdy design about them.

E: What are some of your eBay search terms?

P: 'Retro' 60s, 'retro' 70s, woosterware, 'retro' tin, 'retro' tray, 70s tray... Most of them include the term 'retro' but it seems to be used a lot in eBay descriptions. [to find bauble object] I put in 'atomic bauble tree'.

Interview with Robert

13 September 2013

Interview in his shop in London

E: Please introduce yourself and what you do.

R: I trade in vintage furniture. All of it's old. There's nothing new that I sell and I've been doing it for about 16, 17 years now.

E: How would you describe the sort of things you sell?

R: There's so many things I've sold over the years I can't really generalise. I am not really a purist. I don't sell only one type of style. I like things that are fairly good quality, that function and that look nice to me to my opinion.

E: Is there a period you're most enthusiastic about?

R: Not really. I'm interested in the 1930s. Pre-war and slightly after that. I'm more interested in Scandinavian design pre-war because I think that was the time that it reflected what was going to happen in the 40s, 50s, 60s - to me.

E: When did you start collecting objects from the 50s?

R: I've always had 50s furniture. All my life. I don't actually collect it. I just use it, and I sell it. All through my adult life I've used 50s furniture. When I was a child there was 50s always furniture around as well.

E: Interested in history?

R: Vaguely interested. Yeah.

E: Are there 3 keywords that spring to mind to describe the 50s?

R: I find it hard to not complicate things because it depends what country. I think in the UK, it was a little bit about being optimistic, but it was also about saving money. I can't see that these things were that expensive to produce. Also I think mass production. Mass production, saving money and optimism.

E: Why is your shop named [with the word 'atomic' in it]?

R: I could see that that was going to be kind of - it describes a certain mid-century style. A style of furniture and furnishings that hadn't really been described before in a nutshell. It's a good all-encompassing word.

E: What is that style you think of as atomic?

R: I always think of it during the twentieth century when everybody discovered the atom and they were completely fascinated with just the way things were made on a miniscule level and then it translated into the design later on in the 40s

and 50s. I always think of little spindly legs with balls on the feet. I also think about – it also does refer to kind of a machine age as well.

E: As a child there were 50s items in your home?

R: Not a lot, but there was always something.

E: Any atomic ones? And would you have called them ‘atomic’?

R: No [atomic items]. They weren’t referred to as anything. Just little coffee tables that were obviously from the 50s. I don’t think we consciously took much notice of them or even bothered to describe much what they were.

E: Do you like the ball feet items?

R: Not en masse. The idea of having a whole household full of those pieces of furniture doesn’t appeal to me. But I can see - I do have one or two pieces you can actually use. The little coat hangers. An atomic coffee pot, which is quite nice.

E: Anything else?

R: I’ve got a lot of things at home. That’s it. At the minute. Things go in and out of my household. I’ve also got a couple of those garden chairs. [Antelope chairs]. A guy came into the shop and he used to be a vintage furniture dealer in the 1970s and he had a whole storage of furniture that he stopped dealing with in the 80s because he started working as something else. His storage was being developed so he had to get rid of everything in there. Vintage pieces that were being sold in the 70s and 80s are different from what’s being sold now. I bought two Antelope chairs off him in really bad condition. He had a lot of tubular pieces, 50s tubular. I’m not a big fan of chrome so I didn’t buy anything else.

E: How does living with atomic objects make you feel?

R: Yeah. It’s hard to describe. They’re nice. They’re quite colourful, they’re bright. They’re quite happy. Quite happy colours. Also they don’t take up too much space. Quite lightweight. They’re quite liveable objects. They’re not really heavy kind of Victorian pieces.

E: How about the Antelope chairs?

R: They’re the most uncomfortable chair in the world. They’re terrible chairs but they look nice.

E: What do you think makes people want to buy atomic furniture?

R: I’ve no idea. I don’t know if they do. [laughs] I think people tend to want to buy just something that’s just quite practical. There’s all sorts of different stories for people that are buying things [recording cuts off. Ran out of battery]

** recording resumes **

E: You were saying you can see a difference between American and British atomic design from the 50s.

R: There's a huge difference. Usually its got to do with money and I think the States had a lot more money knocking around compared to England and everything was really on a tight budget here and also the quality of 1950s objects isn't particularly good. Mass produced furniture is pretty shocking in the UK compared to the somewhere – I don't know that much with American furniture. I think the quality's slightly better.

E: Does it look different?

R: Yeah – the British stuff seems to be pared down to its absolute minimum amount of materials. A kitchen cabinet or table – what you'll have with the English furniture is just a thin layer of Formica, maybe some plywood and then a simple frame for a table but in America you'll have the Formica then a strip of chrome, quite a lot more details. The frame will be more complicated, a lot heavier. It will be that tubular metal. The British stuff will be simple cheap birch.

E: What about with the wire and wooden ball constructions. A difference there?

R: Probably. I'd say. I don't know because I don't – I'm not in the States so I can't tell. Probably the thickness of the wire would be slightly thicker. A lot less flimsy probably in the States.

E: Do you associate the style with a country?

R: Yeah I guess I do. I don't associate the atomic style with Scandinavian furniture of that time. They were more interested in craftsmanship and keeping their cabinet makers employed. In the UK they went full out for mass production. And in the States as well. A huge difference between furniture in the UK and America and between Scandinavia.

E: Do you mix Scandinavian with British in your home?

R: I do. I have more European furniture. To my mind it is a lot nicer. There's a lot more thought that's put into it. It's not mass produced. It's based on craftsmanship rather than manufacture.

E: Do you think of science when you see the atomic style – see it as scientific?

R: Yeah I do. I have a collection of - you know those little atomic models? I have a lot of them. They sit really well. Actually they look almost exactly the same as the little zig-zag thing [the atomic coat rack for the wall]. It's fairly obvious [the connection]. I guess at school... I've always noticed the connection. To me it was never a revelation.

E: What do you like about the atomic models?

R: They're quite eye catching. They're sort of three-dimensional so they're quite sculptural. And also they've got that nice kind of spider-webby, intricate, nature but there's something quite geometrical about them as well. They're quite sculptural, nice.

E: How many do you have?

R: About seven. But they're quite big ones. They're all wooden. There's no plastic.

[He collected them] over the years. If I see them I buy one. I don't do any of my buying on the internet, on eBay. It would all be from markets or people I know who sell that stuff.

E: Where do you keep them at home? Are they displayed prominently?

R: No. Maybe just on top of cupboards. They can just sit on top of cupboards really easily.

E: Does it remind you of modern science or is it representing a science from the past?

R: It does seem like a science form the past definitely. It's like what the future was going to be like. It doesn't seem like the future now.

E: What kind of future does it represent?

R: That science was going to help lots of things like there was atomic energy, medical optimism about science being able to cure lots of things. The good thing is that it was also just pure excitement about discovery. The bad thing is I think a lot of it was, maybe they created historically a lot more problems than they knew that they were going to create. It's like a piece of naïve art. You can see the optimism in it. In a funny way there's a little bit of sadness that goes with it as well.

E: Do you see that in the models and also in say a coat rack with ball hooks?

R: Maybe that's reading a little too much into it. I don't think about it that much. But definitely with the models. Also that someone painstakingly drilled holes into the wooden balls and connected them and it would be a model of what they thought the atoms was like.

E: Have you rearranged them or kept them in the construction they were in when you got them?

R: I don't touch them. They're all fixed anyway. They're like teaching aids so some of them you can take apart. But if you've got something like a carbon molecule, then it's not...

E: Is it definitive [the atomic items?] - Could you have 50s design without it?

R: You could have 50s design without it. To me it's like a really lazy symbol. You stick one on your wall and you get a... To me it's like a little 50s reference. I don't think it's necessary.

E: Are you personally interested in science?

R: Not really. I'm more interested in history I guess. History of design. The aesthetic look of each object. I love it when you can see the amount of work that's gone into each item as well.

[On the models] They're like a little dot painting in three dimensions. All of the black connections. Somebody's had to think about every single angle and put it all together. They are crafted in a sense.

E: Are there any comparable scientific forms today that you've been attracted to?

R: No I mean science has just moved on. It is pretty amazing what things are produced now especially with the advent of the microchip. I guess you can look at a microchip and just take the general idea of what it looks like and maybe that's a good reference to life now. I don't know what I'm talking about.

E: Does anything stand out for you today design-wise?

R: I think a lot of technology. Obviously MacBook and telephones. They kind of stand out as being really quite sign of the times right now. I think now as well people – there's less of a – there's just so many different things going on right now its hard to see what's going to be the big sign of the times from now. You need decades for things to filter through. There seem to be a lot more reproduction and references to the past than there used to be. It seems to be quite a lot more prevalent now.

E: Do you see the atomic items as a sign of the times of the 50s?

R: No I see it as just this idealised idea of what the 50s was like. You see a lot of people dressing up in the 40s and 50s and they all have their mobile phones. To me it seems like they're cheating. It's quite a superficial thing. They want the look but they don't actually want to live that way. I prefer to look forward rather than back. Although I'm dealing with old things, I really hate it when new designers reproduce what's come before them instead of looking forward.

E: Do you like any current design?

R: Some of it I like but I'm not interested in mass produced stuff. I'm more interested in handcrafted stuff. Things coming out of Africa and a lot of the tribal things are interesting to me. They're refreshing compared to the high street which is quite cynical, a lot of mass produced things.

E: Do you live with any new furniture in your own home?

R: New stuff? No. I don't really like new things that much.

E: Were you always like that?

R: Yeah.

Interview with Charlotte

12 September 2013

Interviewed in a coffee shop in Margate

E: Can you please introduce yourself and what you do?

C: I live in Cliftonville near Margate and I'm a dispensing assistant in a Chemist and I got a BA in Fine Art and I'm interested in mid-century modernist furniture which I've been interested in since I was about 17 when I moved out and started buying things for my house and decided how I wanted to furnish it. Partly to do with my budget and what I liked and where I went, like boot fairs, I started buying things that appealed to me. They were mostly things from the 50s and 60s. To do with the texture or colour mainly. I like brown things and furry things. Things that are brown and furry. I really like bright colours and I like orange and there seem to be a lot of orange things from that period as well. I think one of the reasons I went for that colour is I remember there's a picture of my mum holding me as a baby on this leatherette couch with bright orange cushions. I look happy and she looks happy. It's this brown wallpaper and this bright orange sofa. It seems like people used to furnish their houses so much more brightly and interestingly than they do now. I started buying things that reminded me of what I thought would have things back then.

E: I found you on eBay.

C: Yeah I was selling a hat stand.

E: Do you sell a lot on eBay?

C: I wouldn't say prolifically but occasionally. I sold a lot of old vintage style things mainly because they become more valuable over time and because I like to circulate. You have them in your house for a while and then they either fit in or they don't and you sort of move them on. You either sell them or give them away.

E: Do you consider yourself a collector?

C: A collector? I think selling is just something that's useful. It's good you get money and you get to have a turnover of things then. You don't feel like you want to have things always. You want to be able to buy new things. To have something you've got to get rid of something to allow that to happen.

E: What kinds or period of items are you most enthusiastic about?

C: I like curved things. I like that aspect of that era and I like bright things. I go for things just because I like them, not because they're particularly cool. Sometimes they are and sometimes they aren't. Sometimes people say that's hideous. I like things with balls on and things that are aspirational.

E: How do furniture and other items with ball feet or balls on the ends of hooks fit in to the overall kind of items you deal with?

C: They're kind of like the glitter or the cherries on a cake. The reason people might associate them with atomic things is that they look like the DNA structure in some ways. They're kind of like little cherries on cakes. Like the things you use to decorate things. The balls seem to be the thing that finishes it off. Like a regular hat stand would just be a hat stand but they have 'ding!' – really special. They put balls on it or bells on it or whatever. It's quite showy. It's like saying, 'look at this'. And it's useful because it doesn't mark your floor as much. Somebody said to me the atomic was designed with children in mind. Primary colours. But I hadn't really thought of that. It's adults buying it. It's something that children would remember, and maybe that's why some people collect it, because they remember it being around. It stays in somebody's memory. It's not that forgettable.

E: Are you interested in history?

C: No. I like documentaries. I only like history from this decade [I think she meant to say 'century'], the 20s onward. I don't like any history further back than that. Find it boring.

E: What attracts you to the 50s?

C: The glamour. The way women used to look. The winged eyeliner and the hair mainly. They used to put a lot of effort in. I just really like the fact that everyone looked so perfect. The dresses were beautiful and women made the most of their figures. Things were more precious. Nowadays things are quite casual and badly made. Back then things were carefully looked after and used. Women would make their own clothes. My mum used to make her own clothes. I always used to see her sewing and things. You don't see anyone sewing nowadays. I could never do it. I thought it was clever. It was interesting. I was interested in fashion also. I like the fashions of the time. The silhouette of ladies.

E: If you had to describe the 50s in 3 words, personally, what comes to mind?

C: Chic, fun and glamorous. But I do know – I kind of think in real life it wasn't like that at all. That's just the bits you look at. Because like film stars now. You know life's not like that for regular people. Poorer people would not have experienced the things you see in flashy magazines or movies or television. They'd be living in poverty, because it would be after the war, so people would not have been having much fun probably. The movies would have been a good way for people to look at things and aspire to. Maybe that's why they made it so flashy. So people had something to watch.

E: Do you have any atomic items?

C: I've got a magazine rack. Up until not long ago I had that hat stand.

E: Someone bought it?

C: Yeah they came up quite a long way to get it. They came all the way from Birmingham or Bristol. They came quite a long way. It went for like £20. I've got some smaller items as well. Plant holders. I don't know - It's not something you notice after a while because it's just things that you own. You take it for granted in a way. I have a few bits and pieces but they've circulated.

E: What makes you say, I'm tired of this one, it's time to circulate it out?

C: It's hard to say. You just don't know when something's finished. With a piece of art you don't know when it's finished. You just think one day, I fancy a change. Done with it.

E: How long did you have the coat stand?

C: Six months. I found it outside a shop front. I'd seen one recently in the old town going for 40 pounds. I realised that was in better condition. I thought oh I'll take that home and maybe I'll sell it. I used it for what it was for a while. I kept knocking the hats off it. They didn't stay on properly. The balls were not that practical. I have another hat stand that's better. It doesn't have balls on it.

E: How does living with one, seeing it everyday, using it make you feel?

C: Sometimes I think, why am I living like this? Sometimes you think it's cute because it's a little bit of something special from the past. They're not like other items of furniture from now. They don't feel the same. They have history. It's kind of like a more fun history. You can imagine it because it's not so far ago. Sometimes you have an item of furniture like a chair and it will be from before you were born and you can't identify with it but you can imagine your mum sitting in a 1950s chair or 60s chair, and I think times have changed so fast between then and now, a lot's happened so it seems both like a really long time ago and not that long ago. The way technology's speeded up. If you think about the speed things had gone before then, it's not so fast as it's been from the 50s or the 60s through the noughties, the invention of mobile phones and computers and everything. Inconceivable.

E: What makes something atomic?

C: I guess the balls makes it atomic.

E: When you look at them do you think about science?

C: No I don't really think about science when I look at them. I think more about art when I look at them. They look quite like a sculpture to me. You could say something like that hat stand looks like a flower stem. Like a little bud maybe.

E: You were talking about change in technology between then and now.

C: Yeah. They're like an innocent image of what - an innocent creation. Like someone's thought about the future, and made a version of the future, and now

we're in the future. So you got somebody's version of it then you're in the future. So it's kind of ironic that you've got futuristic stuff in your place.

E: Is the irony fun for you?

C: On some sublevel maybe. I don't really think about that. It is kind of cute. When people used to think about the future and they imagined what people would be doing now, everything's advanced not as much as they thought it would – but in different ways. They couldn't think of the internet. You wouldn't think that's such an incredibly life-changing thing but it is. And yet you can just say it in a sentence. It's not a flying car. But it's changed people. They're innocently optimistic.

I think in today's climate with the financial state I don't think they are. Anyone who's hopeful now is just a hopeful person. I think people who are depressed it doesn't help them much. I think people back then had a lot to look towards, because they had just come out of a nasty place. They were rushing to get away from it and looking that way whereas nowadays when people look towards the future it's probably with a little bit of worry because of wars and things. It feels kind of like a storm brewing.

People want to be happy. They want things that make them cheerful, that make them laugh.

E: Do the ball feet remind you of anything from your past?

C: On my nan's wall she had one in her house, but I never noticed it. It was the zig-zag. She died and they cleared things out of her house. Which was weird because she was not like that. She was born in like 1904 or 07. She wouldn't have been homemaking in that time probably. She would not have been like a trendy age. So it was unusual that they were there. But I didn't remember them. I didn't think about them. Then when they cleared the house out, I was like, oh that's weird. Maybe some part of my mind.

E: Do you feel like the ball items are necessary to making a 50s interior? How definitive are they for mid-century design?

C: I think they are, but only a little bit. I don't think you should have too many of them. Just the odd bit here and there. Like a cherry. If there were lots of cherries on a cake it wouldn't be as special.

[She describes a friend who had a lot of them] I don't know, she was a rockabilly. She had a rockabilly husband. She had a rockabilly home. Everything was about cars. It seemed like everything had a ball on the end of it and they were mostly yellow. She had a colour scheme of black and yellow. It sort of made them a bit less noticeable. Whereas if there was just one you might notice it more. Like a jewel.

E: Can you think of any one other kind of style or item that defines the 50s more?

C: I think maybe the chairs [makes a wiggle with her hands] Pantone. I often think about the table and chairs sets, you know the round table. You know *A Clockwork Orange*. Although I hadn't looked at it and though 'oh that' or 'that', I think about that film and some of the furnishings in that. I think the colour white and also things that things are made out of really make the item...like melamine. When a cup is made out of that. Bakelite and different sorts of plastics that people might not use nowadays. I don't think there's one item that defines that era. There's a few. You could have like 5: Those paintings of the women, things with balls on, brown things, you know the homemaker tableware. If someone was going to construct a stylised version. You see these things like advertised in the old magazines.

E: Do people tend to circulate other things or just atomic objects?

C: They might do it with other bits of furniture.

E: Did you ever come across the term 'contemporary' for that style?

C: Yes. It's an academic word. At uni or something. Not around here. It's quite vague as well.

E: Does it matter to you what something's made of?

C: It can make it more special if the things are made out of a material that you like. If you had something with plastic balls you might like the look of it but it wouldn't be as nice. It's better if it's made out of interesting materials.

E: Do you care if it's looking a bit worn?

C: No. We actually repainted some of the little balls so it didn't matter. You can redecorate some things but it's the essential design that's important, like the shape.

E: Would you call them kitsch?

C: Yeah.

E: What makes something kitsch?

C: Trendy in a specialist way. Something that's trendy to a certain demographic of people – among a group say the rockabilly people. It's hard to define the word 'kitsch' because it more brings up an image. Something pink and maybe made out of -like this tablecloth [plastic covered floral print]. Tacky but in a cool way.

E: Is the ball-footed stuff like that?

C: Maybe. But I don't know if people back then thought of it like that. Maybe some people didn't like it. Maybe it wasn't that trendy back then.

E: Some people saw it as mass-produced I think.

C: Now mass produced is a whole different ballgame. Compared to that, it's not that terrible.

E: Is it important to you where it came from?

C: No I don't care where it comes from. Sometimes it's nice to look up about it. Sometimes if you bought something that can add to it's interest. Essentially it's just the way it looks and whether you like it.

E: Do you think of atomic stuff as being British or American?

C: I think about images from magazines. There's a place in America called Palm Springs. I don't know much about it but it seems like it's got a lot of that stuff in it. I don't know if it's specifically British. I think some aspects of it are. Like the Festival of Britain. Some aspects are British but I don't think it necessarily...I haven't really researched...I think people of our generation don't really know. Unless you did research into the furniture business. Some of the people in the furniture shop might have a bit more insight. I know Danish stuff was really fashionable.

E: Would you want to live in the past?

C: No I wouldn't because I think modern medicine – you wouldn't want to give anything up for that. I always wouldn't mind living in the future rather than the past, just to see what happens. You don't know what's going to happen next. That's much more fascinating. It'd be nice to go back for a day trip.

E: Do you like movies or TV from the 50s?

C: I like films from then. I like Alfred Hitchcock films – Vertigo. I like Marilyn Monroe which is a cliché. Some musicals maybe because your parents would put them on TV. I like the fashion obviously. I used to collect some of the fashion. I sold it all.

When you think about the 1980s you think that was in my time then you think that was 30 years ago and that makes you feel really old. The 90s that was my teenage years. Now you hear people were born in 1995 and you think of things you can talk to them about and you can't.

It's strange when people collect this stuff and they have a nostalgia for it they don't own. It's like somebody else's nostalgia.

My parents – they were there [the 50s]! They think it's rubbish. They think it's tat. Then they go and buy something – new things – that I think is utter shite. To them – they don't get it.

Interview with Nick

6 September 2013

Interviewed by Skype

E: Can you introduce yourself and what you do?

N: I'm quite recently new to the business. I suppose you can call me an antiques dealer but it's not just antiques I deal with. I mainly work online.

E: How would you describe the things you sell?

N: I go for more unusual vintage pieces. I don't like modern things at all. I do period pieces mixed with unusual pieces. If it's something unusual and I don't know quite what it is I might go for that. Clocks, at the moment I've got an electrotherapy machine from the 30s, telephones.

E: When did you start being interested in collecting objects from the 50s?

N: My favourite period would be Art Nouveau just before Art Deco. I like Art Deco as well. I like Bakelite. I obviously also like my 'retro'. When I started my business I started with 'retro'. I decided to expand out to anything vintage. They're ['retro' items] always guaranteed to get money because they're so in at the moment.

E: What counts as 'retro'?

N: 'Retro' is between 50s and 60s. Some people would go as far as the 80s. Newer vintage. It goes 'retro' then vintage then antique. In my eyes the 'retro' era would be the 50s and 60s.

E: When did you get into collecting objects from the 50s and 60s?

N: About three years ago I started collecting vintage bits. Came across and got into GPO telephones. I bought a starburst clock, which was very atomic. The problem with the 'retro' era is that it's so popular. Everybody wants it. You don't have to know much about history to recognise a 'retro' piece. It's on tv all the time. Its *Toy Story* – that's completely 'retro' and atomic. It's hard to make a profit on it. That's probably why I don't sell as much of it as I used to. Everyone kind of knows it. They're even reproducing it. You can go to Asda and buy an atomic style clock. It's popular again.

E: Do you know when it started to become popular again?

N: In the last five years. We're going to be losing the 80s and we're going to go much more into the 50s, 60s 'retro'. It's always been popular but it's been more popular recently. At some point in the 90s or early 2000s it went into vintage and became collectable.

E: Are you interested in history?

N: It wasn't part of my education and upbringing. Now I'm an adult and in the last five years I've really shown an interest. I've had to learn so, so much [for the business]. I'm quite strong on Victorian and Edwardian and anything past that in the last 100 years. I definitely have an interest. I love learning about new things. It was brought into me with the birth of my business. Every time I come across something I research it. I've had hundreds of items in the last few years. Every single item – everything gets researched to find out when it was from, who manufactured it, if there was a manufacturer. It's much better than school.

E: How do you do the research?

N: I know how to use the internet, I can search things by images. I can tell approximately when things are from. You can look at the type of material it is. Google really. I have some books I use. A lot of people list things on the internet that's incorrect. As long as you're dedicated to spending six hours a day on a piece.

Without the internet not only would I not have the platform to sell from I wouldn't have the platform to learn from. I survive mostly from eBay sales.

E: If you had to describe the 50s in three keywords what would they be?

N: Futuristic. Definitely at the time it was very futuristic. One thing that's quite bad about that era: mass production. Telephones. Colourful and new and futuristic.

E: How do those objects [ball feet items] fit in with the overall kinds of items you sell? [I bring up ball and wire letter holder I saw in his eBay shop]

N: That was quite a generic piece. It wasn't something I knew would sell for a lot. I only paid a couple of pounds for it. But it was a period piece because it had its atomic legs. That's the kind of thing I go for. The balls at the tops – everybody goes for them. If you get that on a clock you are guaranteed 50 or 60 pounds for it. That's the main atomic symbol – with the balls coming out on a stick. Shooting out, like a shooting star, like an atom. It's very futuristic. You're coming out of the Art Deco period and everyone's craving something newer. Then the atomic bomb in the 40s. Craving something new coming away from the Art Deco period. Really futuristic, standing on the ball bearing kind of thing.

E: Do you like those ball and wire items personally?

N: Yeah definitely. Futuristic. If you look at the starburst clocks – that's what I think of when I think of the Atomic Era. In the 80s I had one and a couple of my neighbours had them as well. In the 50s/60s they were mass produced. The Chinese market was introduced. Mass produced objects like that – it just means there were a lot more on the market. Compare it to the Art Deco which was all British manufacturers. People liked it still because it was new. That's one bad thing about the 'retro' era. There were lots of things made. There's not a lot of all of it really, but that's when it was introduced. It probably started in America coming from the Space Age. It was all over the world. The whole world was craving for it, the atomic, 'retro' Space Age stuff. I always thought it was born in

the 50s and 60s. It was actually in the mid 40s when it was born. It was only small. It was from the actual nuclear bomb with the Cold War. That was introducing all these cravings for the new styles. It was the 50s when it became really big. That was today when I was looking for the atomic era. [that he found out about it having to do with the atomic bomb and not just the space age]. That's where it stems from. Nuclear War. That's what it is. The ball, the atom.

E: Did you always see the balls as atoms?

N: When I was first introduced to it I wouldn't have thought 'an atom' in that way. But if you were in the 50s when they were discovering all these and doing all these bits to do with nuclear war and it was all being discovered, it was all new then, therefore it would have been more recognisable when it was completely new to the scene. But now, it's one of those things we take for granted because we don't recognise what it's from. We just see it as a 'retro' piece. Something that was from the 50s, 60s. Back then it would have definitely been recognisable as an atom. It would have been talked about with your neighbour when you bought it. I didn't notice it was the atom until I was listing it and I started to do research. I was listing it as a 'retro' atomic sunburst. Then I learned the aspects of it and where it came from. Any diehard fan would know, who'd buy a clock now.

E: Does it look scientific to you now that you've dealt with it a little bit [listing the item on eBay recently]?

N: Yeah and I love it. There's not many fashions born from science. It was either Art Nouveau with naturalism and then Art Deco was all geometric. The 'retro' era comes in and the Atomic Era more so, which was the beginning of the 'retro' era. I always think of *Toy Story*. All of that is based around the Atomic style – the colours, the greens and the blues and the cars. The wallpapers and stuff. I wouldn't have noticed that when I was younger. Cars were another thing that was new and space age looking. I find it really extraordinary. It was all based around science. It's all really quite cool. It was much bigger in America. All of your plinths and columns. Especially considering it was an America that was visiting the moon.

E: What attracts people to atomic stuff today?

N: People remember it. There are people still alive from the 50s and 60s. Another thing is I think we're craving for a new style because we haven't had one since the 80s. When in 50 or 60 years I think we're going to revisit the 'retro' era or do something space-like. Me being interested in history, I think there's going to be people in the future interested in the space age.

E: What kind of future do you think people hoped for back then?

N: I don't think we are as forward as they would have thought then. I'm not disappointed for them in that way. I'm glad we didn't advance like that. I think they had an expectation everything was going to be futuristic from then on. That it would only get newer. But it didn't. Buildings like that still exist now that were

there 60 years ago. I think they had an expectation that it was going to grow and grow. Yes science has grown but we've kept hold of our architecture and our older buildings. I'm quite pleased we didn't [advance the way they thought]. Science is still evolving but the world isn't changing that dramatically.

I do sometimes think, 'you wish!' I think more I wish I was feeling that feeling of being optimistic. Because they would have had that optimism. *Wow we're gonna get bigger and...* We didn't in a way. The economy didn't grow. We haven't become a rich world. We're still living in wars. I think they hoped science was going to save us from all of these wars. That's probably what people would have been hopeful for. We're not as advanced in technology as many of them would have thought. It's probably for those reasons that it is classed as an era when people were welcoming the new into their homes.

E: How important is the atomic style to defining the 50s? Are there other things that define it more strongly?

N: The atomic style wasn't the only kind of style. If you think of the hippies. GPO telephones. A lot of it wasn't space age. A lot of it was just modern. The space age colours were subtle – a baby green and yellow. It had its competitors. If I think about it the 'retro' era was born in the 40s and lasted all the way through until the 70s. It was the longest fashionable era.

E: Do you personally own any atomic items?

N: Every once in a while I come across something like the clock and I'll hold onto it for a little while before I sell it. I sold a magazine rack. I've still got one in the loft. They're hard to make a profit on because everyone knows them.

E: How does living with atomic furniture make you feel?

N: I can picture how they would have felt back then. It's bright and minimal and it's also loud and it screams at you. It's new and refreshing and smiley. It gives me a sense of a positive feeling.

E: Do you have any sense of who buys these atomic items?

N: I wouldn't have imagined many of them were very young [but doesn't know the ages because sells online] but it is very in. Someone like me, I would want to buy one. The majority of them on eBay are London. Often they're American. A lot of London lifestyle – it's very popular in cities. They always live in big cities. It is still a modern thing.

E: Do atomic items remind you of anything from your own past?

N: When I was younger I remember having a starburst clock with atomic features. Because my mum lived through the 60s and 70s...I remember them. My mum still had them from her childhood. I think a lot of people born in the 80s would still remember them.

E: Where you do source them from?

N: I go to auctions, I go to sales. If you go to an auction and something is being sold as one lot, and a 'retro' atomic clock would be, then it would go for 20 or 30 pounds. They're always sold on their own because they're always money makers. I will buy anything atomic I can, like the letter rack.

E: Are their materials important to you?

N: They are because they're of their time. Wood was quite popular still. In the new 'retro' era it was teak and it was varnished and clean if they used wood. They wanted to use chrome, metal and new plastics. It looked new.

E: Would you describe them as kitsch?

N: I would but I wouldn't put it on my listing as 'kitsch'. But I would say kitsch is more fluorescent.

E: Does it matter to you what country the object comes from?

N: It's always good to find something made in Britain because it was rare back then. We lost of money in the wars. USA I come across sometimes. But they were probably the same as us. World War II came and production stopped.

E: What does an atomic object do for a home that other 50s/60s objects can't do?

N: I think it was futuristic. I think that's what people like about it. The new technology side of it. I think most people are glad we're not living with robots. We have cars with no emissions. I think we're going in the right direction; we're just a little late.

I think pollution probably soared in those eras [50s/60s]. People thought nuclear power stations were just going to get bigger. In some ways it's better things didn't happen because [they proceeded without regard for the environment]. As much as they evolved in science they didn't have the equipment to know how much we were damaging the earth.

E: Does this take away from your enjoyment of objects from the past?

N: No. They were optimistic. They just came out of the war. They were going through the Cold War. Moving away from something, moving into a new era. I love the 'retro' era.

E: What do you think of current design?

N: Crap.

I expect futuristic styles will come again. We're coming into another Space Age. We're learning about atoms again funnily enough. I think people are going to want to take a step in that direction.

E: Would you ever like to live in the past?

N: Yes definitely. Can I live in four? I would like to live in Art Deco New York. The others would be Art Nouveau England. I would like the Elizabethan era. And I'm definitely going to say the 'retro' era but I wouldn't usually because I kind of grew up with it. The space age, early 'retro' – I would have loved to share that feeling. We'd never left the earth before and we were going to experience the moon.

I think when I'm older, the wars going on and all this news about Syria – that's what we're going to think about.

Appendix 4: eBay Search Data

Date	Ball-and-rod items in first hundred results of 'atomic' keyword search in 'All Categories'	Ball-and-rod items in first hundred results of 'atomic' keyword search in 'Vintage/retro' category
5 May 2015	46	43
10 May 2015	45	54
17 May 2015	48	43
24 May 2015	47	51
31 May 2015	48	39
7 June 2015	39	50
14 June 2015	47	47
21 June 2015	47	47
28 June 2015	49	50
5 July 2015	36	35
13 July 2015	49	48
20 July 2015	46	47
27 July 2015	49	49
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