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Magic, science and masculinity: marketing toy chemistry sets

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ABSTRACT

At least since the late nineteenth century, toy chemistry sets have featured in standard scripts of the achievement of eminence in science, and they remain important in constructions of scientific identity. Using a selection of these toys manufactured in Britain and the United States, and with particular reference to the two dominant American brands, Gilbert and Chemcraft, this paper suggests that early twentieth-century chemistry sets were rooted in overlapping Victorian traditions of entertainment magic and scientific recreations. As chemistry set marketing copy gradually reoriented towards emphasising scientific modernity, citizenship, discipline and educational value, pre-twentieth-century traditions were subsumed within domestic—and specifically masculine—tropes. These developments in branding strategies point to transformations in both users' engagement with their chemistry sets and the role of scientific toys in domestic play. The chemistry set serves here as a useful tool for measuring cultural change and lay engagement with chemistry.

1. Introduction

Toy chemistry sets, simultaneously incorporated into projections of elite scientific identity and deliberations on childhood leisure, are imbued with considerable cultural resonance. In *English men of science: Their nature and nurture* (1874), Francis Galton identified the chemistry set as providing an initiating function or starting point to a scientific career, a conviction that has become engrained within standard scripts of the achievement of eminence in science.[1] Stephen Jay Gould once declared that scientists are 'generally poor communicators', and as children were probably most content 'sitting in their basements with chemistry sets'.[2] But chemistry sets have also provoked parental anxiety: surely, complained one concerned parent in a letter to *The Times* in 1903, 'the placing in the hands of young boys of such ingredients as chlorate of potash, sulphur, &c., must always be deprecated as a temptingly dangerous proceeding' (Leigh, 1903, p. 8). Conversely, the transformation and perceived decline of the chemistry set has also served as a measure of an increasingly litigious society (Sacks, 1999; Von Korff, 2006). These clichés remind us that chemistry sets, like all toys, are not just about play.[3] For Roland Barthes, 'toys *always mean something*, and this something is entirely socialized, constituted by the myths or the techniques of modern adult life' (Barthes, 2000, p. 53). The iconic—or, in Barthes's phraseology, 'mythological'—centrality of toy chemistry sets to modern scientific self-representation makes the limited attention they have received from historians of science surprising.[4] This oversight is all the more striking given the obvious value of chemistry sets as artefacts; their longevity as popular toys means that they are a potentially rich resource for studies seeking to explore lay engagement with science over time.

Chemistry sets have figured, however, in scholarship on the history and sociology of toys; museum exhibitions exploring popular

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[1] On Galton, see Gee (1989), p. 37. For chemistry sets in more recent scientific reminisces, see Brockman (2005), Hargittai, (2002), pp. 117–128; Schmidt (2000), Von Korff (2006).

[2] Quoted in Brehm (1999).

[3] For a classic study of the sociology of play, see Huizinga (1970); on the sociology of toys, see Ball (1967), p. 447.

[4] Cooter and Pumfrey's observation that 'our ignorance of both the low drama and the high art of science's diffusion and modes of popular production and reproduction', including chemistry sets, is 'staggering', remains true (Cooter & Pumfrey, 1994, p. 237). Brian Gee has examined the proliferation of chemical amusement chests in Victorian Britain in the context of the rise of the institutionalised research laboratory (see Gee, 1989, pp. 37–59).

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culture; and in corporate histories and biographies of individual toy manufacturers.[5] Like the nostalgic recollections of scientists, however, many of these accounts assume the existence of an immutable 'chemistry set' (in particular, see Cross, 1997, pp. 53, 64, 72). On the contrary, a relatively small sample of these toys manufactured in the United States and Britain from the early twentieth century to the late 1960s, in the collection of the Whipple Museum for the History of Science in Cambridge, suggests that such a generalisation is problematic. Manufacturers sold extensive ranges of these toys varying in design, content, size and price marketed for different consumers. This was equally characteristic of commercial chemistry set production in both Victorian Britain and twentieth-century America (Gee, 1989; see also Griffin, 1879, p. 565; Chemcraft, 1929).[6] Though portable laboratories and educational scientific apparatus were available in Britain and the United States since the mid-eighteenth century, chemical cabinets sold as commodities for children only took off from the 1830s (Gee, 1989; Turner, 1987, pp. 377–398; Warner, 1988, pp. 387–397). Justifying often expensive scientific apparatus as a juvenile recreation required manufacturers to market both chemistry and the objects themselves as suited to the burgeoning market for middle-class leisure in the second half of the nineteenth century.

This was equally true of chemistry sets sold by two large American toy companies, Gilbert and Porter Chemcraft, who dominated the scientific and educational toy industry in the United States from roughly 1915 until the late 1960s (Pursell, 1979, p. 253).[7] Chemcraft claimed in one post-war advertisement to have sold over five million chemistry sets since 1916 (Chemcraft, n.d., p. 3).[8] Gilbert and Chemcraft chemistry sets were among several American manufacturers to take advantage of a stagnating European toy industry from the onset of the First World War. The expansion of chemistry set production also coincided with the emergence of a burgeoning advertising industry ever more alert to design and visual effect, and exemplifies the formation of a consumer society—the creation of mass-markets for mass-produced products—in the United States in the decades around 1900.[9] The Gilbert Company increased spending on advertising from $14,000 in 1914 to almost $145,000 in 1916 (Gilbert & McClintock, 1954, pp. 132, 143). Gilbert and Chemcraft toys, available in abundance on internet auction websites, continue to attract interest from collectors and enthusiasts.[10] These brands' ubiquity has had an unparalleled influence on the shaping of the chemistry set icon.[11] This article situates Gilbert and Chemcraft marketing copy within broader advertising motifs of the most formative decades of American advertising, ca. 1920–ca. 1950, and explores the techniques manufacturers used to create thematized, meaningful commodities. Though Gilbert and Chemcraft were highly innovative in developing new and distinct marketing techniques for the American market, this article stresses that profound continuities nonetheless remained between chemistry sets advertised by these brands in twentieth-century America, and chemical recreations sold in Victorian Britain. In both contexts, it examines iconography-laden chemistry set ephemera: advertising, packaging (as point of sale advertising), themed experiment books and instruction manuals.

The historian of advertising Roland Marchand influentially posited that advertising does not act as a mirror of social realities, but as a 'Zerrspiegel, a distorting mirror that enhances some images at the expense of others' (Marchand, 1985, p. xvii). Twentieth-century toy chemistry sets, by virtue of their marketing copy, are indeed objects laden with visual and literary imagery that tell us much about how manufacturers have both responded to and manipulated historically contingent cultural values and popular interests: gender, magic and enthusiasm for science and technology. Studies of material culture have drawn attention to the appearance of new commodities from the late nineteenth century suited to a consumer regime structured around notions of the 'male breadwinner' and 'female domesticity' (for instance, de Grazia & Furlough, 1996, esp. pp. 251–274). Historians of technology have also shown how technological artefacts have become closely associated with gender and highlighted how retailers have historically exploited and reinforced gendered identities for their products and target consumers (see Lerman et al, 2003, pp. 1–12). Manufacturers' expectations and assumptions about masculinity are particularly apparent in chemistry set marketing copy in the United States in the twentieth century. In attempting to unravel these overlapping cultural threads, the discussion necessarily extends beyond the toys themselves. In particular, I assess the diverse range of handbooks devoted to scientific recreations, including chemistry, which also proliferated in the nineteenth and twentieth centuries.

This article stresses that the meaning of 'the chemistry set' has always been sensitive not only to the literary and visual cues with which they were marketed, but also to the contexts and spaces in which they (have) appear(ed). The mutability of these 'objects' is particularly apparent in the Harry Price Library of Magical Literature at the Senate House Library, University of London, ostensibly a collection of magical literature; in the context of this collection, their status as toys is problematised. In the first section, I use Price's library to assess the place of the 'toy chemistry set' within the wider culture of chemical amusements in the late nineteenth and twentieth centuries. The second section emphasises the rootedness of these toys in an enlightenment tradition of rational amusements, suggesting that the influence of 'natural magic' continued to shape the iconography and pedagogical function of chemistry sets well into the twentieth century (Stafford, 1994, esp. pp. 1–71). I explore the ways in which chemistry set manufacturers negotiated between science and magic in marketing copy. I suggest that manufacturers increasingly stressed the role of the chemistry set in creating a new generation of scientists at the expense of 'chemical magic' and the pedagogy of demystification by performance. The final section assesses chemistry set marketing in the context of wider trends in contemporary advertising. I link the view advanced by manufacturers that the chemistry set played an integral part in shaping a hi-tech, industrial future for the United States, with the promulgation of domestic and specifically masculine values through these toys.

2. Anglo-American chemical recreations in the Harry Price Library

In the vast collection of magical literature and apparatus deposited in the University of London Library by the controversial

[5] For more general considerations of Anglo-American toy industries, see Cross (1997), Pursell (1979). For museum exhibitions, see History in your home (n.d.). For biographies and corporate histories, see Gilbert & McClintock (1954), Watson (2002), Tyler (2003).

[6] This was generally true of educational toys available in Britain and the United States in the period 1920–1960. The Gilbert Company sold wireless telegraphy kits in the 1920s, atomic energy kits in the 1950s, and ecology kits in the 1970s (see Pursell, 1979, p. 253).

[7] Gilbert was the manufacturer, from 1913, of the successful 'Erector Set'. In 1961, Porter Chemcraft merged with another leading toy manufacturer, the Lionel Corporation, while the Gilbert Company folded in 1967 (Tyler, 2003, pp. 49–58; Watson, 2002, pp. 184–192).

[8] This is at odds, however, with John Tyler's estimate of one million Chemcraft sets sold in the near seventy year history of the company (Tyler, 2003, p. 59).

[9] See Cross (1997, 2000); on the rise of the advertising industry in this period, see Fox (1997), Laird (1998).

[10] Chemistry sets made by the Gilbert and Porter Chemcraft brands were routinely referred to as 'chemistry outfits'.

[11] In his recent study of contemporary advertising, Ernest Sternberg describes the icon as a 'commodity that has acquired added value through the commercial heightening of meaning' (Sternberg, 1999, p. 4).