Aluminium Furniture, 1886–1986
The Changing Applications and Reception of a Modern Material

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This article examines the nature and role of aluminium in twentieth-century furniture making. The connection between aluminium as a modern material and the representation of modernity is examined to establish how 'new' material can rise from being a novelty to mainstream usage. The efforts of the aluminium industry, both in America and Europe, in developing furniture as an end-user market for its products are also explored. The promotion of the material often meant that non-traditional makers entered the furniture market. The issues that are concerned with materials and their relation to design, especially in matters of imitation, are considered here. Aluminium was used to represent modernity, on the one hand, but in other cases was hidden within another style. Therefore in the course of this article I draw together business history, technology and design history to explore some of the interactions that are focused around materials use.

Keywords: aluminium—business history—design history—furniture—imitation of materials—technology

Introduction: developments in the aluminium industry

The benefits of aluminium as a material, which were widely recognized during the twentieth century in many aspects of manufacturing, were its corrosion resistance, light weight, malleability, flexibility and resilience, and, not least, the silver-like finish. In addition, it could be relatively easily manipulated using all standard metalworking techniques including casting, rolling, extruding, forging and drawing, as well as spinning, blowing, stamping and fabricating. In the early 1880s, however, it was still a relatively expensive material. With the development of the Hall-Héroult electrolytic process from 1886, the manufacture of raw aluminium was much more efficient. The development of cheaper electricity was the crucial factor in reducing the cost of manufacturing aluminium and making it available on a larger scale. Its relative weakness was sometimes a disadvantage and much aluminium was alloyed. Indeed, the term light alloy is often preferred to aluminium (or magnesium) as a more accurate label. For example, the development of Duralumin in Duren (Germany), patented in 1910 and made from 95 per cent aluminium and magnesium, copper and manganese, created an alloy that age-hardened so that its tensile strength increased rapidly within a few days. This particular alloy was widely used for airships and later for aeroplanes.

In the early twentieth century, the decorative possibilities of aluminium were further developed and it was in Austria that some of the earliest applications of aluminium as furniture decoration appeared. One of the most innovative uses of the new material was by architect and designer Otto Wagner. His project for the Austrian Postal Savings Bank in Vienna c. 1906 was not only an advanced and bold design for a building, but the specially designed bentwood furnishings deliberately used an expensive and contrasting material, aluminium, for detailed effects on the legs, arms and 'bolts'. These details
echo the aluminium bolts that were used on the exterior of the building. It appears that the quantity of aluminium applied to the chairs varied in relation to the hierarchy of usage within the building [1]. This followed examples already set by the hierarchical nature of other materials, often relating to their value. In contrast, the material was also used c.1907 in a more traditional way as a decorative inlay in the doors of a cabinet made by Hans Christiansen.3 Despite these early precedents and the fact that aluminium had played an important part in the First World War, its application as a constructive and decorative material for furniture was only to be developed during the 1920s.

Initially aluminium was a 'solution looking for a problem'. Aluminium was not especially developed for particular end uses, but did eventually develop in an enormous variety of applications, some of which were to be appropriate for furniture. For most of its history, it was the prime converters who preached the aluminium gospel and developed markets for the material. Their reasons for this promotion are not hard to discover.

The particular nature of the aluminium industry has had a direct bearing on its development and relations with the production, design and distribution of end products.4 The physical process of raw aluminium production requires large amounts of bauxite from the tropics and vast quantities of electricity. The conversion of bauxite into aluminium therefore ideally has to be located near to extensive supplies of cheap electricity, such as hydro–electric power (as the process is continuous), but, conversely, the need to fabricate a wide and varied range of end products meant that the manufacturing bases were spread in a variety of metalworking centres.5 The supply chain is further segmented by finished-product manufacturers being supplied with the aluminium already converted into components by specialist wholesalers within the industry.6

It is therefore no surprise to find two economic developments that are linked: (i) the vertical integration of aluminium companies performing differing stages of the process, and (ii) the development of an oligopoly, based on cartels.7 The enormous set-up costs and the large energy requirements, in addition to extensive research and development needs, meant a limited entry to the field. Although it would appear that many Western countries established their own aluminium industries, the international nature of the business soon resulted in a few firms having hegemony over the supply and sale of the material, thus limiting the association of any notional concepts of national identity with it, although the firms did often identify themselves with their country of origin.8

In the first half of the twentieth century, the firms concentrated on production and the expansion of manufacturing. The textbook case is the development of Alcoa, the Aluminium Company of America. Established as the Pittsburgh Reduction Company in 1888 and known as Alcoa since 1907, it enjoyed a monopoly in North America until the end of the Second World War. After 1945, the anti-trust legislation allowed new entrants into the field (encouraged by sales of surplus wartime production facilities that excluded Alcoa). The Reynolds Metals Company and Henry Kaiser, a heavy construction and engineering business, developed their interest in aluminium around this time.

In the post-war period, the expanded world production facilities meant that aluminium producers were increasingly interested in developing further end uses, especially as raw aluminium prices had begun to fall. This often meant a change of emphasis

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Fig 1. Otto Wagner, Austrian Postal Savings Bank chair with aluminium detail, c.1906
in R & D from pure research on material production to the development of a wider range of applications for aluminium. This change was intended to expand the market by creating new products, making additional sales to existing customers, and encouraging new customers for existing products. However, the aluminium-producing firms were often not interested in fabrication as a business. They wanted to develop the market by encouraging others to use aluminium in their product ranges. Alcoa stated that ‘In end products . . . Alcoa simply hoped to stimulate demand for aluminium before leaving the finished manufacturing and distribution to others.’9 However, aluminium converters were acutely aware of the role of design and promotion in the process of market development. This market development was achieved by a variety of methods including an information service, detailed assistance for specific projects including prototyping, or direct collaboration between supplier and fabricator. Dennis Door- dan puts it succinctly when he says that ‘design departments’ of the three big American players ‘designed information not objects’.10 All three companies had established ‘design departments’. In 1950, Reynolds established their ‘Styling and Design’ department; in 1955, Alcoa set up a ‘Market Development’ department; and, in 1956, Kaiser took Franklin Hershey, Chief Stylist for Ford, and made him manager of their Industrial Design department.11 The worldwide aluminium industry was therefore set to develop further into a wide variety of applications, ranging from architectural elements to foil wrap; from table wares to wiring, and from automobile trim to aeroplanes. One of the hardest markets to crack would be furniture.

Furniture and aluminium

For many parts of the furniture industry in Europe and North America, the idea of employing innovative materials was anathema to their traditional reliance on wood and wood-based products, which, although now modified, continues in various degrees to this day. This was certainly the case in Britain. For example, John Gloag, writing in 1944, noted that steel tubing ‘was not regarded by the British furniture manufacturing trade as a material that promised new and stimulating economic possibilities.’12 He went on to define one of the issues that affected the furniture trade when new materials were introduced, namely a lost opportunity: ‘It is not surprising that the possibilities of a new material such as steel tubing should have been appreciated and exploited by firms outside the furniture industry.’13 The same could be said of aluminium. The reasons for this lack of interest are not hard to find. The furniture industry would have to be retooled to manufacture in metals, and would have to rethink the whole design and manufacturing process, which was rooted in woodworking practice. In addition, domestic furniture makers and their customers were not generally in the vanguard of new materials use, although institutional clients were often more receptive.14 According to Noel White, the well-known BA chair, which was introduced in 1946, was ‘designed to suit the professional buyer who is more objective in his criteria than the retail trade.’15 This distinction between markets exists partly because certain materials have often been considered appropriate for particular product groups. For a long time, metal furniture was widely associated with hospitals, institutions and the workplace, whilst wood products and upholstery were considered more homely. This may show that materials’ use may be related not just to suitability but also to a ‘common understanding’ of symbolic properties.16 This was noticed in a report published in the trade press in 1931: ‘However original and striking [aluminium furniture may be] when seen at exhibitions, [it] may seem incongruous and distasteful to many people in regard to ordinary use in the home.’17

When new materials have been introduced into furniture making it has often been as a branch of the prime converting or specialist business rather than the industry itself. The examples of cast iron and papier mâché in the nineteenth century, plastics and, to some extent, steel products in the twentieth century, reflect this phenomenon. The combination of aluminium’s flexibility of fabrication and regularity of supply could have been viewed as a potential blessing for furniture-makers who were used to working with timber—a material with considerable vagaries. Yet aluminium was not initially adopted by furniture makers and it was the prime suppliers who first developed markets for furniture.

Whilst it seems likely that furniture completely fabricated from aluminium was first exhibited in France in 1921,18 it was in fact American manufacturers who really developed the links between the
material and the furniture product. The attractions of light weight, durability, fire-proof qualities and slow depreciation were among the factors particularly considered by corporate furniture buyers. In 1924, Alcoa furnished Mellon Bank headquarters in Pittsburgh, and aluminium furniture was soon employed in the Free Library of Philadelphia, the Waldorf-Astoria Hotel and the New York Insurance Company. In the late 1920s, the ‘Alcraft’ Alcoa factory in Buffalo produced aluminium chairs for sale in European as well as home markets. Each weighing less than 81b, these chairs were sand-blasted, primed, spray-varnished and then coated twice with enamel colour. The standard colours were walnut, mahogany, oak and two varieties of green, as well as a ‘beautiful satiny silver’ finish ‘which will harmonize extremely well with all modernistic design and coloring.’

The research and development required for a new market for distinctive modern furniture was probably a small price to pay to create another outlet for manufacturers’ excess raw material production. The growing market for furniture generally, but especially the contract or architectural market, and the continual need for suppliers to innovate in design, meant that new materials were most likely to be of interest when presented as something ‘different’, or demonstrating an image of ‘modern’ and ‘contemporary’ styling. Nevertheless, even when the material was left in a natural state, the designs were often completely derivative.

Some examples of office chairs and aeroplane seating, however, combined a number of attractive features including ease of maintenance, light weight and an image of modernity reflecting the particular corporate identity. For example, in 1929, the material was used to make circular tables for the headquarters of a metal products company, A. O. Smith, in Milwaukee. These were imaginatively designed with ‘gear wheels’ for bases. On the other hand, designers such as Paul Frankl were designing furniture with exposed metal frames in chromed steel and aluminium, often based on French models.
The exciting possibilities of the new materials as a representation of modernity were made clear by the author of an article in *House and Garden*, who in 1930 wrote:

This season sees several artist-decorators in America offering programs of metal furniture—which seem to imply, steel for the skyscraper, why not for the table? Aluminium for airplanes, why not for chairs? Chromium for the motor lamp, why not for the bed? After all, designers of interior furnishings cannot live in this mechanistic age without feeling the presence of metal in the warp and woof of their lives, cannot ride about in shining motors and gaze up at the aluminium spandrels of a Chrysler building, or file by the slim beauty of an aluminium airplane or the spider web steel layers of a soaring skyscraper without thinking of the possibilities of these materials for the furnishings of our homes.25

The notion that developments in one particular field have a direct influence upon others of the same era is well demonstrated here. However, the emphasis seems to be on 'metals' as opposed to specific types. Further examples demonstrate how designers asserted aluminium as representative of the modern. Russell Wright was one American designer who espoused aluminium for a whole range of products, including an all-aluminium breakfast room, displayed at the 'Design for the Machine' exhibit at the Philadelphia Museum in 1932.26 Wright wrote about that era:

Aluminium known to me only as a material for kitchen utensils was beginning to be used in the infant aeronautics industry. Acquisition of a few tubes and sheets of aluminium was exciting for young designers who wanted to design everything and had only a workbench and a spinning lathe.27

The 1930s looked to aluminium as a symbol of progress, of streamlining and of modernity. In 1934, the Warren McArthur Corporation of Rome, NY produced a side table using aluminium, plastic laminate and plywood, and a year later manufactured an all-aluminium, show-framed upholstered easy chair. The architect Frank Lloyd Wright also used aluminium for a prototype range of typists' chairs and desks (made by the McArthur company with a patented fixing) for the Johnson Wax building in Racine.28 By 1935, aluminium appeared to be so ubiquitous in the contract market that it was said that 'almost every hotel that was built . . . had to have at least one public room in which aluminium furniture was the outstanding piece of decoration.'29 In the same year, a writer in the trade journal *The Iron Age* noted that:

part of the Buffalo works [of Alcoa] where aluminium automobile bodies were being made, was turned over to the furniture division. Production and sales organizations were assembled, jigs and tools were manufactured for a representative number of designs and a small stock was accumulated. As soon as regular production could be established, the prices of pieces dropped sharply.30

Similar developments occurred in Europe, especially in France. In 1930, the French designer René Herbst showed a tubular aluminium chair with a perforated seat.31 In 1933, Louis Sognot and Charlotte Alix produced a bed in polished Duralumin for the Maharajah of Indore [5], although it is revealing that the Maharani had a chrome steel bed frame, which may indicate a hierarchy of materials at this
time. In the same year, the Aluminium Company of France sponsored a ‘Concours international du meilleur siege en aluminium’, which attracted 209 designs for aluminium chairs. The well-known model 313 chaise longue, designed by Marcel Breuer and manufactured by the Swiss company, Embru, was a successful entry and won first prize. 32

Despite this impression of the development of a market for modern furniture in a modern material, growth was piecemeal, especially in the domestic market. As early as 1929, the critic John Gloag had condemned ‘polished aluminium . . . chairs and couches . . . which were strictly metallic in character, and were as efficient and about as interesting as modern sanitary fittings.’ 33 As if in confirmation of this comment, it was noticed in 1931 that (similar to the American experience) much aluminium furniture was manufactured and finished so that ‘[it] can be made to look like wood, being made in the same form and upholstered in leather or fabric in exactly the same manner as with wooden pieces.’ 34 A trade journal explained the benefits to customers of this arrangement: ‘Thus consumers had an opportunity of deciding between the two different types of furniture without the issue being complicated by the introduction of an altogether new style and appearance.’ 35 On the other hand, critics of this simulating process described furniture imitating other finishes as ‘a mongrel form, dishonest and unbeautiful’; 36 reflecting their acceptance of plain aluminium as representative of ‘modern’.

This ‘problem’ of imitation or innovation was a continual issue for all materials but especially for ‘new’ materials. Cast iron, plastics, etc. were all able to imitate existing, often luxury, finishes, or they could be used to develop new designs that took advantage of the special properties of the material in their own right. There is also a distinction to be drawn between using a ‘new’ material to imitate another, or using a ‘new’ material within a conventional structure. These distinctions were hinted at when the British trade press, in a review of the pre-war industry, noted that:

the earliest aluminium furniture was purely an attempt at imitating the conventional wooden designs. Chairs, for example, were produced as aluminium castings, fitted with a padded leather seat and painted or varnished to resemble polished wood. 37

Then, in 1948, the trade press published an article that explored the latest developments in aluminium applications in conjunction with conventional design and construction:

Wood veneers and plastic fabrics applied over dovetailed and bolted cast components, exposing only delicate projection or flush members as an integral part of the construction, will give a quality and refinement not yet attained in metal furniture. 38

Fig 5. Louis Sognot and Charlotte Alix, Duralumin bed frame for the Maharajah of Indore, c. 1933
Post-war responses in the United Kingdom

After the end of the Second World War, a revival of interest in aluminium as a consumer material was clearly a response to both the timber shortage and the over-capacity of the aluminium industry that had been created by wartime growth.39 A change of focus occurred in aluminium manufacturing after the Second World War from a ‘raw material’ point of view to a ‘consuming material’ view. Dennis Doordan has pointed out that the value of the raw material in relation to the value of finished goods declined over the pre-war period, and this decline increased during the Second World War. This resulted in end products taking a more important role in the aluminium industry’s planning.40 This was logical as, after the end of hostilities, there would be a
surplus of production, and an army of workers skilled in the fabrication of light alloys who would be available for work other than on war contracts. Indeed, in a paper given to the Royal Society of Arts in April 1944, E. C. Goldsworthy stated, on behalf of the aluminium industry, that:

Our primary concern is to find work for the immediate postwar years . . . and though we appreciate that the light alloy industry cannot let up on war production possibly for some time to come, it is essential that facilities be made available for experimentation and the production of prototype units so that we shall be lined up with the Allies in the great march of the world's future.41

These goals meant further market research, development and promotion [6].42 The example of the British experience is instructive in this case.

In Britain, promotion of aluminium for a wide range of end uses was considerable in the immediate postwar period. In fact in 1944, Goldsworthy suggested that the initial solution to the problem of over-capacity 'lies in the manufacture of articles which will be in instant demand and in the category of A.1 priority in the Government's postwar plan.'43 The trade had established the Aluminium Development Association (ADA) as its umbrella organization, specifically to promote the material and develop new outlets. Furniture was one such market. During the summer of 1945 an exhibition entitled 'Aluminium—from War to Peace' was displayed in the Exhibition Hall of Selfridges, the London department store, and nearby an 'aluminium house' was erected, complete with a range of aluminium home furnishings [7]. This exhibit showed an extensive range of aluminium applications from saucepans to operating tables, while the 'aluminium house' included a desk, chair, trolley and lamp, all in aluminium. The exhibition travelled around the country and was successfully displayed in other leading provincial department stores, e.g. Lewis's in Manchester and Fenwick's in Newcastle. In April 1946, the Modern Homes Exhibition in London's Dorland Hall displayed a range of aluminium products sponsored by the industry. Although little furniture was on show, the trade press particularly noticed the textured, coloured, alloy bedroom suite manufactured by Hunting Aviation and displayed by P. B. Cow Ltd. [8–9].45

Reinforced by its own market research, the aluminium industry was clearly aware that furniture products appeared to have some potential. In June 1946, the industry, through the ADA, requested an investigation into the future of aluminium, specifically as a furniture material. The research branch of the ADA—Aluminium Laboratories—published an internal paper that explored the existing and potential market for aluminium furniture.46 In this report the reasons for the use of aluminium were not surprisingly given as either its particular suitability for some products, or as a substitute for orthodox materials in others. Kitchen units and equipment fell into the first category and bedroom furniture into the second. The report considered that bedsteads, dressing tables, wardrobes, wall units, drying cupboards and a 'cupboard cum bookshelf' were the most likely furniture items to be developed, as the light weight of the metal was an advantage, 'provided it was not accompanied by flimsiness and metallic operation.'47 However, there was no attempt to develop new designs and the examples shown in the report were based on copies of existing models of either wooden Utility examples, metal office furniture or pre-war products of a nondescript nature [10]. Interestingly, the 1947 Utility furniture scheme catalogue did include single and double aluminium divan bed frames,48 and plans were made for a range of coloured aluminium-framed dining chairs c.1946–7.49

In October 1946, an extensive article appeared in
the pages of the journal *Light Metals*, entitled ‘The Light Metal Home’. This was a wide-ranging account of past and contemporary uses of aluminium in the home. Discussing furniture, the article suggested that:

Perhaps the main reason for the failure of attempts to popularise aluminium furniture is to be found in the complete lack of any really courageous scheme of design which suits the peculiar characteristics of aluminium and which, at the same time, fits in with the somewhat conservative tastes of the general public.

The dilemma was thus starkly expressed. The article then continued with a list of features of aluminium that were considered to be beneficial to the potential aluminium furniture customer. The points included fire-proof qualities, resistance to chipping, the ability to withstand ‘any amount of washing’, and the benefits of ‘hygienic furniture without joints or crevices to harbour insects’. Although these functional issues were important, consumers were also looking for other attributes in their furniture that aluminium did not possess. The article attempted some brief analysis of the problem: ‘for the average home [as compared with contract use] it is not quite right, being too cold and too ultra-modern and again it appears that aluminium has drawn a dead horse.’

This refers to a continual problem for aluminium use in furniture. All the sales features were there but retailers and, subsequently, consumers were reluctant to see the benefits.

During 1946, there were serious moves by the furniture industry to encourage the use of surplus aluminium from aircraft manufacture, and the British aluminium trade press was enthusiastic about ‘news of the proposed setting up in this country of an aluminium furniture industry on a large scale. However,
manufacturers also developed ranges of furniture and furnishings [11]. The marketing skills of these sorts of manufacturers were often limited to punning on the light metal image: ranges of furniture included Feathervayne, Superlite, Kumfylite and Flywate. The light weight of alloy furniture was also the main selling point for Premier Crafts’ ‘Floton’ beds, which were designed to be light enough to be lifted with one hand, thus responding to a perceived need for accessibility of cleaning. In the immediate post-war period aluminium furniture was also promoted at the 1946 ‘Britain Can Make It’ exhibition, and in the Ideal Home exhibitions. Despite these initiatives, British attitudes towards aluminium domestic furniture were generally slow to change, so there was again a redirection of focus from the domestic to the institutional market. It is probable that price was also a factor in the choice. Prices of aluminium bedroom furniture were considerably higher than their Utility

Gordon Russell, who was charged with investigating the feasibility of the idea, and probably had his own concepts of design and truth to materials, suggested it would only work if there was a complete timber shortage. This idea of a large-scale enterprise soon withered but there were others willing to experiment with aluminium furniture.

As in the USA, it was often non-traditional makers of furniture such as metal fabricators who took the lead in the ‘commercial market’. These initiatives were probably more to do with keeping the particular enterprise running than any real attempt to develop serious new markets for aluminium furniture. They included P. B. Cow’s bedroom suite [8-9], cast-aluminium chairs based on traditional styles, produced for Almin Ltd. by the Renfrew Foundry [7], and furniture products by engineering firms such as Air Containers, Henderson Safety Tank Co., International Plastics, Metal Products, Willaston Engineering and Crouch (Engineers). In addition, aircraft
equivalent; e.g. a 4ft wardrobe in the Basildon range was £74 7s. 10d., compared with a similar Utility model at £16 17s. 0d., and an aluminium tallboy was £43 14s. 2d., compared with a similar Utility model at £10 0s. 9d.60

The contract market had had pre-war experience of aluminium as a furniture and building material, so was receptive to new product developments in this field. One of the most famous British chairs of the period was the aluminium BA chair. Designed and manufactured by Ernest Race, its success can be seen in the fact that, between 1945 and 1969, approximately 250,000 chairs were produced. This chair and its associated tables and storage units are evidence of a new relationship between precision engineering and furniture manufacture that produced furniture at a reasonable cost [12].61 Wartime experience had shown that furniture makers could work to engineering tolerances. Designs for aluminium contract furniture were therefore developed for batch production. Gaby Schreiber designed hospital bedside cabinets in aluminium62 with the intention of ease of maintenance and hygiene. Kitchen units were made from aluminium and the ESAvian school chair and desk became standard examples of new school furniture from the late 1940s onward. Indeed, the ESAvian range was successfully imported into the USA by Knoll Associates [13].63

Apart from the obvious success of Race’s BA chair, there were other examples of aluminium use in British furniture. Clive Latimer’s cabinet designs for Heals in 194664 took ‘traditional’ models and completely changed their image through the choice of materials, as well as by design configuration. These designs used a casing of aluminium sheets, veneered on both sides with wood, a material that was based on
wartime aircraft-making experience [14]. The pro-
motional brochure explains the benefits:

the best qualities of wood are combined with those of
metal. The outer veneer displays the pleasing figure of
fine wood and gives warmth to touch so lacking in other
metal furniture, whilst the aluminium core and the metal
framework contribute strength and rigidity. No rivets or
bolts which so often mar the appearance of metal furni-
ture and give it an ugly engineering character.65

This material was known as Plymet by Heals and was
sold by Venesta as Vendura.66 This furniture demon-
strated the exciting possibilities of exposed new
materials combined with progressive designs that
still had the character of ‘real’ furniture. The opposite
result was demonstrated in 1949, when Parker Knoll used aluminium alloy in the frames of the traditionally shaped Toledo fireside wing chair. This model (PK707), which was based on a traditional armchair format, had its frame made by aluminium specialists High Duty Alloys, but was sprung and upholstered in the Parker Knoll factory in a relatively standard way. The frame was painted a wood colour and fitted with kapok-filled cushions and arm pads so that any modern connotations were hidden. Another example of manufacturers attempting to soften the metallic look was the Basildon range of bedroom furniture made by P. B. Cow Ltd., which was promoted by London retailers Frederick Lawrence. This range was based on pre-war models but was ‘veneered’ with impressed aluminium, which was finished in pastel colours for a purely decorative effect. The sales literature explained how the furniture was to be perceived:

This new interpretation of fine furniture is no makeshift substitute for wood nor does it pretend to make more orthodox furniture obsolete. It is an artistic and constructional development in tune with the times, but yet worthy of the greatest traditions in the making of fine furniture.

In contrast to these efforts, the upholstery company Christie-Tyler developed a method of chair seating that used an exposed aluminium alloy frame with a hammock cushion filled with rubberized hair. This chair was illustrated in Gordon Logie’s Furniture from Machines published in 1947 as a representation of a
new upholstery method but with no mention of the alloy frame [17]. In the November 1948 edition of *Aluminium News*, however, the chair is again used as an illustration for an article entitled ‘Aluminium makes itself at home’. Here the chair’s alloy frame was featured, but the flowered moquette upholstery and padded armrests made it a more usual domestic image than Logie’s.

Post-war responses in North America

Similar difficulties were faced by aluminium producers in the United States. There, the aluminium industry had grown by 600 per cent during wartime, and by 1945 it was clear that industry promotion of aluminium was necessary to use the increased capacity that in a post-war situation was, in fact, overcapacity. Writing in 1960, R. B. Wemyss of Reynolds Metal’s design department indicated the issues facing the post-war manufacturer. He saw that:

[our] talents . . . are directed towards advocating new uses and applications for aluminium in current markets and proposing new projects and design concepts for potential markets of the future. The purpose of our design efforts is to stimulate the thinking in other designers in industry towards a practical use of aluminium in their own particular design projects.

In addition, the manufacturing infrastructure was complete, so ‘the aluminium industry is in a good position to encourage inventiveness in design: it feels secure in its ability to shape almost any reasonable product concept’ [18].

The aircraft industry had been a major user of aluminium, so it is not surprising to find that the Cessna aircraft company, turning to contract furniture, albeit in a tried and tested style, as one way of expanding its customer base initially produced storage units with aluminium-lined drawers. By 1950, it was said that Cessna’s new all-aluminium contract furniture market had ‘proved so successful that the company sampled the commercial [retail] market by sales-testing a new line at the Marshall Fields store in Chicago.’ It was clearly successful as *Modern Metals* reported that Cessna Furniture was being ‘mass produced by assembly line techniques on a 3½ mile conveyor in the company’s Hutchinson, Kansas plant.’

The trade journal concluded its review of aluminium furniture by saying that ‘with proper design, quality workmanship, and intelligent promotion, aluminium fabricators might well establish a firm foothold in the profitable furniture business.’ The industry still believed that the furniture market might yet be conquered. Indeed, the three major manufacturers of aluminium made massive efforts and very effectively promoted the material. Ten years later, in 1960, Henry Dreyfuss commented on the producers’ success in promoting aluminium as a designer’s material: ‘They have spread the word about the design possibilities of their material, and have succeeded in establishing a connotation of modernity which older industries have reason to envy.’ But to what extent was this true of furniture design and manufacture?

As in England, American success stories were not always based on original design thinking. The market for aluminium furniture was again generally developed by metal fabricators rather than furniture-makers. One example was the ‘Airlume’ furniture range, developed in 1947. A prefabricated aluminium frame was upholstered to look like a traditional three-piece suite, thus satisfying the market at both ends of the scale, from raw material conversion to customer use. In 1950, cast-aluminium versions of

![Fig 17. Christie-Tyler easy chair with aluminium frame and ‘hammock’ upholstery, c.1948](image-url)
nineteenth-century cast-iron designs were being produced by Molla Inc. of New York City [19], and were packed flat for self-assembly, whilst another example, produced by Brown-Jordan of Pasadena, California, included decorative club chairs and accessories with cast-aluminium ornament [20]. By 1967, Brown-Jordan had developed the market to include 'bamboo'-style aluminium chairs and tables, manufactured in a range of twenty baked-on colours. One example that was an enormous success was the tubular-framed folding chair, which was derived from the structural framing used in aircraft during the Second World War. It's simple styling, light weight and portability gave it an appeal across many applications but especially for outdoor use, where stylistic conventions were less entrenched.

In 1946, the 'Design in Industry' exhibition at the National Gallery of Canada was a showcase for new ideas. The aluminium industry exhibited, amongst other items, a cantilever chair made by the Precision Tool and Supply Company. It was promoted as a corrosion-free alternative to cast-iron outdoor furniture. This again identified another, as then, little explored market that rapidly developed in the 1950s.

Despite all this effort, and although the strength, light weight and rigidity of the aluminium products should have been strong selling points, the public acceptance of aluminium furniture for indoor use did not develop at this time. In the same way as Plymax, for example, in the 1930s, aluminium for home
furnishings (with the notable exception of folding chairs, trolleys and trays) must have been just too far beyond the accepted image and price of domestic furniture for any real commercial success in the retail stores. On the other hand, the development of outdoor furniture and ranges designed for the contract trade grew apace. The aluminium manufacturers saw that the domestic market was less responsive to the material than the architecturally led commercial markets, so they tended to concentrate their efforts in this direction. This did not, however, mean the end of aluminium as a component in domestic furniture. The versatility of aluminium that allowed it to be used blatantly as a furniture material, or in a more restrained way as a cast, spun or fabricated component, meant that it could be adapted to a wide range of uses. It was particularly successful in supplying parts for trims, handles and other accessories.

Into the mainstream

Aluminium suppliers continued to promote the use of their material and during the 1950s they positively encouraged product development. There were plenty of designers willing to try aluminium. In England, Dennis Lennon used aluminium sheet for the shaped frame of an easy chair for the British Rayon Federation, Peter Moro used aluminium sheet pressed out for a dining chair, and Ernest Race used cast components for chairs and tables (see above). In 1953, the Cabinet Maker noted the international nature of this interest in aluminium: 'the most recent developments [in metal furniture] are in the field of pre-cast white metal alloys—chief among them aluminium . . . Pioneers of this type of furniture are Rosselino in Italy, Salterino and Porset in America, and Ernest Race in England.'

During the 1950s, designers continued to develop aluminium products for the domestic and contract markets, and promotion of the material by the suppliers continued apace. In 1957 Alcoa set aside $3 million to support design promotion in America. Amongst the designers were Alex Girard who produced shelving, Isamu Noguchi who designed an aluminium table, and Jean Deoze who contributed an 'aluminium crêpe' gown. In 1956, Charles and Ray Eames used aluminium for the base of the 670 chair and then, in 1958, developed an important and well-known range of chairs, called the 'Aluminium group', which were intended for indoor or outdoor use. The chairs' lightness was achieved by using the hammock-seating principle, in combination with an aluminium frame. Costs were high because of the sand-casting and hand-finishing processes, so they were most usually purchased for interior use; indeed, these chairs became desirable office furniture by the mid-1960s.

Similar promotion by the material suppliers occurred in Britain. In 1961, the British Aluminium Company sponsored a furniture design competition. The winning design was for a contract bed-frame and the second prize went to a design for an outdoor chair. The third prize was awarded for an aluminium swivel base for a chair.

This sort of promotion was not always successful. In 1963 the British Aluminium Co., the CoID and
the SIA collaborated in setting up the British Aluminium Design Awards with a £5,000 prize. 1500 manufacturers and designers were circulated but by May 1965 (closing date for notice of intent) only twelve designs had been entered. To make the awards viable, the company wanted at least one hundred entries. In the same month the journal Design pondered: ‘surely British industry can produce this number of award-worthy products using aluminium before the closing date later this month.’ In the event, thirty products were eventually entered for the award, ranging from Rotaflex lighting (first prize) to portable breathing apparatus. Interestingly, Race Furniture Ltd. won joint second prize for aluminium-framed stadium seating, designed by Leslie Smith.

The idea of component parts was further developed, since extruded tube, cast, or spun aluminium became recognized as an ideal material for a range of furniture fittings and swivel-chair bases. The example of the swivel dining chair by Eero Saarinen with its GRP body and curved lacquered aluminium base is famous, but many other examples exist. In addition, the material was widely used for aluminium extrusions that were applied to all sorts of furniture fittings, including ‘pole’ storage systems, office desk legs, swivel chair bases, trims and handles. The sophisticated use of a range of materials is found in Robert Heritage’s Q.E.II chair. Made from pre-formed plywood, with post-formed laminate facings, vinyl-covered polyurethane upholstery, and extruded aluminium legs and cast-aluminium feet, it won a Council of Industrial Design award in 1969.

The situation in America at this time was similar. In 1967, domestic furniture made from aluminium or aluminium parts included dinette frames, chair and table bases, modular units for kitchen and room divider use, and lawn or porch furniture. These various ranges used tube, sheet, extrusions, die castings, or welded aluminium, demonstrating the continuing attempts to penetrate or create new markets. At that time, however, it was still ‘commercial furniture for restaurants, offices and institutions which [used] cast and wrought aluminium [furniture] products extensively.’

By 1980, aluminium was again the topic of an article in Design magazine. This time the article was headlined with ‘aluminium has only begun to find the
commercial uses it deserves.91 The article is an unalloyed promotion of the benefits of the material for a wide range of product types, from earrings to car bodies.

The aluminium industry had succeeded in developing some of its markets to a point where the material was pervasive in a very wide range of products.92 The versatility of the material meant that it could be used as an innovative and modern design statement, or it could still be hidden within traditional models. Nevertheless, despite continual promotion and widespread applications in numerous fields of design, its acceptance as a 'proper' furniture material remained limited to particular markets and product sub-groups such as outdoor furniture and stacking chairs [21–22]. Ultimately, the aluminium furniture-makers were not able to engineer the cultural shift that would have usurped the hegemony of wood-based products.

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Notes


2 Other alloys were called S1S in the USA, Silmalec in the UK, Almasilium in France and Anticordal in Germany.

3 Ellensburg Schottisches Museum. C. R. Mackintosh also used aluminium inlay in the commission for Bassett-Lowke's guest bedroom furniture for Derngate c.1916.

4 Compare the plastics industry.

5 The large-scale aluminium industry developed through the combination of a rise in technology and applied science in conjunction with the development of corporate capitalism during the period of aluminium expansion. This is discussed in David Noble, America by Design, Oxford University Press, 1997.

6 These arrangements could include 'off the shelf' components as well as 'made to order' extrusions, castings, etc.


8 E.g. in France, the Pechiney company developed the Deville process in 1859. In Switzerland, the AIAG, later Alusuisse, developed Héroult's patent. In America, the Pittsburgh Reduction Company—later Alcoa—used the Hall patent, and, in England, the British Aluminium Company was established.

Aluminium Furniture, 1886–1986

Function: A Sourcebook for the History of Architecture and Design 1890–1939, Granada/Open University, 1975. Some seventeen years later the aluminium industry trade press were clearly aware of this perception. See note 47.

36 Bonney, op. cit., p. 142.
39 In the four years prior to the Second World War production doubled, and during the period 1939–45 it increased sixfold.
40 Doordan, op. cit., p. 159.
42 Figures 6, 7, 8, 9: every effort has been made to identify the copyright holders. If anyone claiming copyright to any of these illustrations contacts the Journal of Design History with details, a full acknowledgement will appear in a future issue.
43 Ibid., p. 233.
47 Ibid. These issues of flimsiness and metallic operation were clearly a cause for concern. ‘Basildon New Period Furniture’ was advertised as being ‘very solid in construction and entirely noiseless’ in an advertisement by Frederick Lawrence in F. R. Yerbury (ed.), Modern Homes Illustrated, Odhams, London, 1948, p. xxv.
49 Model 4303, Geffrye Museum, op. cit.
51 Ibid.
52 Ibid.
55 The example of the ‘gold’ colour aluminium-anodized tray and folding tea trolley manufactured by Woodmet Ltd. is one exception to this comment.
57 Gordon Russell, Designer’s Trade, Benn, 1968, p. 213.
58 The industry partly recognized this. A report by the Aluminium Laboratories in June 1946 stated that although kitchen furnishings might be a permanent market, bedroom furniture ‘may prove to be a short term application’.
59 Advertisement in Yerbury, op. cit., p. lxii.
60 Utility furniture catalogue, May 1946, Basildon furniture advertisement, Yerbury, op. cit.
63 Modern Metals, August 1949, pp. 18–19.
65 Heals Plymet publicity brochure, May 1947. My thanks to Emanuelle Morgan for this reference.
68 Regd. Design No. 853391.
69 See Modern Homes Illustrated, op. cit. It was also promoted at the Modern Homes Exhibition at Dorland Hall, London, and at the 1947 Ideal Home Exhibition. I am grateful to Emanuelle Morgan for this information.
70 P. B. Cow Ltd., Basildon range sales brochure, c.1947. I am grateful to Emanuelle Morgan for this information.
72 Ibid.
73 Interiors, 1949, p. 108.
75 Ibid.
76 Dreyfuss, op. cit., p. 56.
80 Plymax was a composite board made from plywood with steel, Monel metal or copper sheathing, used in the mid-1930s.
81 Doordan, op. cit.
85 Ibid., pp. 248–9.
87 Design, May 1965, p. 27.
89 White, op. cit., pp. 156–63.
92 Obvious examples include engineering, packaging, architectural applications and transport. See also Nichols, op. cit.