

"THE DEVELOPMENT OF
TUBULAR STEEL FURNITURE"

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INTRODUCTION

A chair is more than just an object to sit in. It is an object in space, a visual experience. It may be used to fill an empty corner, brighten up a room, keep a table from looking unattended, organize space or simply used to impress people. For the owner, the chair may become a status symbol or it may be there to reinforce the image that they have of themselves, and even more important to them, the image that they would like the world to have of them.

A chair can also be artistic and a source of inspiration. Because of its close connections with architectural space, ease of manufacture and its potent symbolism, the chair can be an expression of the designers attitudes towards design, materials and technology.

This text traces the development of one such chair, the tubular steel chair, from its origins in the Bauhaus to the present day. It is not an encyclopaedia of tubular steel furniture but a look at the philosophies of the designers and the innovations brought about by the use of tubular steel for interior design.

HISTORICAL BACKGROUND

Furniture design has not always been the task of the industrial designer. Before the emergence of the profession in the 1930's, and even since then, the problem has been tackled by individuals from related areas - architecture, craft and the fine arts.

Certain designers of the mid 19th Century, particularly in England, believed in returning to craft, hoping to recapture its lost excellence. In opposition to them were others who were ready to design for industry and convinced that the needs and means of the time, together with an appreciative understanding of past styles of architecture and design, would lead to suitable furnishings for their day. Both these groups, the aesthetic designers that supplied English industry from the 1870's and the arts and crafts designers who, opposed to industry, followed them in the 1880's - produced chairs of good quality and of interesting, although forced, style. Arts and crafts furniture was widely accepted in the United States where it became heavier and plainer than in England.

At the turn of the century, Belgium, France and Germany led Europe in a movement towards original design. This movement was Art Nouveau. Through the use of sinuous outlines and vegetal forms

the movement created chairs, and other pieces of furniture of great visual interest. But despite the frequent use of vegetal forms, some of the best designs were wholly abstract. Art Nouveau was an original style of design and succeeded in uniting progressive efforts in all the applied visual arts. Before World War I Art Nouveau had flowered and died, weakened by its attachment to the fine arts. The arts and craft movement, an older design trend, survived better, having broken away from its medieval heritage.

After World War I, European modern designers turned in new directions. The French launched the Cubist style at the 1925 exposition of 'Arts Decoratifs'. At the Bauhaus school in Germany and through publications, such as *l'Esprit Nouveau* in Paris and '*De Stijl*' in the Netherlands, other Europeans were searching more rigorously for a new style. This new style was established with the development of tubular steel furniture. Severe geometry governed the forms, slick finishes and contrasting colours characterized the surfaces of this furniture. This tubular-steel furniture was intended to appeal to and satisfy the needs of the mass public, but originally and in several later revivals, the style remained a speciality, like the Art Nouveau it replaced.

The philosophy of the machine style was probably more influential than its furniture. Its architects turned to the design of chairs as a symbolic expression of architectural principles. In many cases, architects of the Modern Movement designed chairs to furnish specific buildings they had been commissioned to build and decorate. The construction of the radically new Dessau Bauhaus buildings, completed in 1925, including the main public areas, (auditorium, refectory, workshops, etc.) and student accommodation, along with the masters houses required furniture and fittings to be designed and manufactured during the period 1925 to 1927.

Before we look at these designs, and the development of the tubular-steel chair, we should establish some of the pre-history of industrialized furniture in Europe.

THONET BENTWOOD CHAIRS

The manufacture of cheap wooden furniture had been industrialized since early in the nineteenth century. Chair makers would work, sometimes in the forest, with relatively simple mechanical equipment producing identical chair-legs, seats and backs to standard designs. These pieces could be glued and screwed together in the wholesaler's or retailers premises. The area around High Wycombe, in Britain, for instance, has specialized in this kind of work for well over a century and a half. Later, further mechanization allowed less of the work to be done by hand. But because few improvements were possible with the given materials, the same kind of product was produced.

One improvement which was introduced around 1830 in Germany was the work of Michel Thonet (1796-1871). He experimented with simple techniques for bending lengths of beech wood into structurally rigid forms with the use of steam baths and jigs. In 1842, he was called to Vienna where he designed a range of light, gilt bentwood chairs for the Liechtenstein Palace. In 1849, Thonet Brothers was formed as a going concern. They immediately set about designing a wide range of furniture at varying prices and degrees of complexity. All of their designs used the bentwood principle, for which they obtained a legal patent for on the 10th of July 1856. The Thonet chairs were exhibited in the

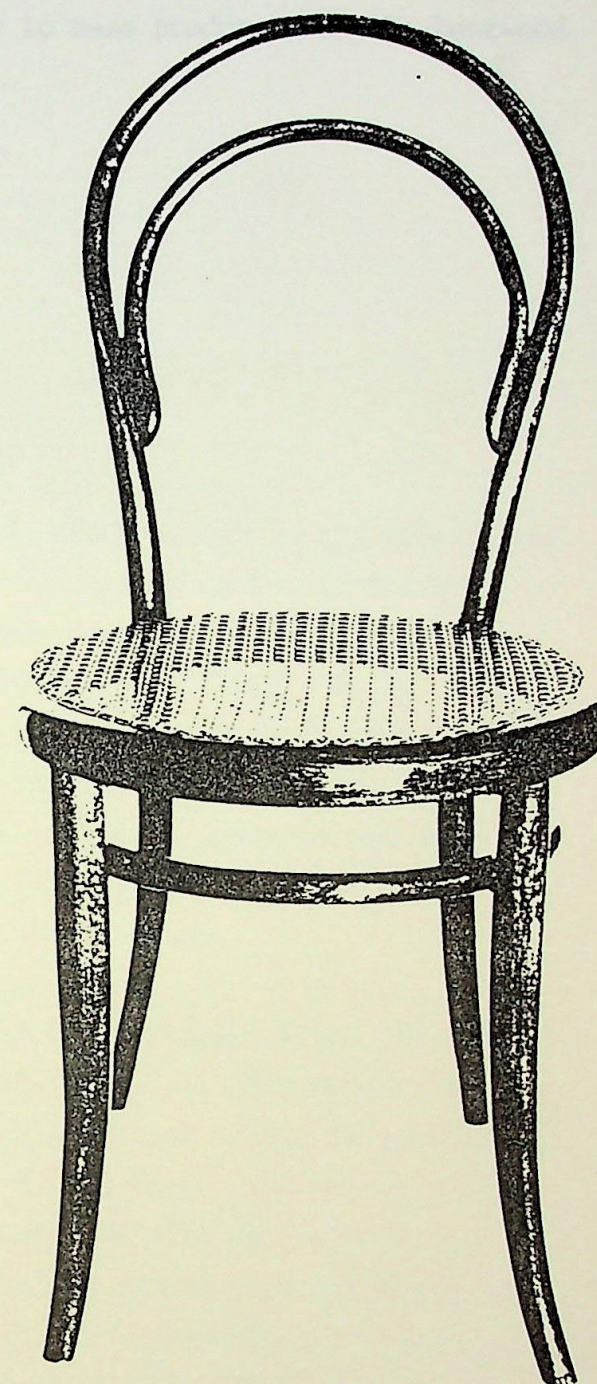
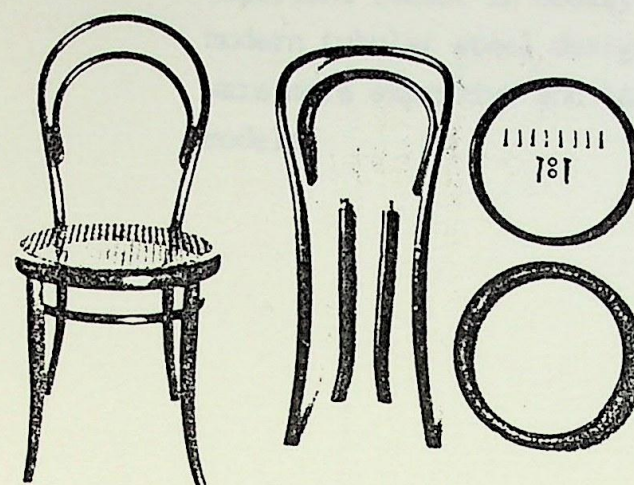
Great Exhibition of 1851 and were awarded a medal of merit.

By 1875, or so, the Thonet manufacturing company was the largest in the furniture making world. Chair 'No. 14' [Fig. 1] which was one of the most successful cheap chairs of the nineteenth century, sold about 50 million copies from the time of its design in 1859 to 1910.

When the original Thonet patent lapsed in 1869 the principle of bentwood was used by many of the furniture manufacturers throughout Europe. In 1901 there were 52 companies in 60 factories all over Europe employing 35,000 workers on furniture produced according to the Thonet patents. Many more designs were added to these which exploited the use of material and ease of transportation and assembly to the fullest. Chair 'No. 14' for instance, can be packed flat and assembled very simply, with only a few screwed and glued joints. Chairs of this kind were, and are, in use in public meeting places and private houses all over the world.

The significance of the Thonet bentwood furniture is twofold. Firstly, it set the standard of industrial production and distribution by which any subsequent efforts to design mass produced furniture must be judged. Secondly, the architects of the Modern Movement were sufficiently aware of the importance of Thonet's achievements to pick on Thonet bentwood chairs in the furnishing of thier architectural commissions. The Thonet chairs became something of a cult in the 1920's and the Thonet firm responded by being among the first to commission and produce the new designs for metal and wooden furniture. Furthermore, Thonet continued to design and produce bentwood furniture throughout the 1920's and 1930's. Some of the designs, like Ferdinand Kramer's dining chair and arm chair [Fig. 2], look heavy and ungainly compared with some of the more elegant Thonet designs. But Kramer had great experience of industrial production and of German popular taste and his chairs seem to have been very cheap as well as commercially successful.

FIG. 1



MODERNE STUHL
aus gebogenem Holze

die Weltmarke

Gebrüder Thonet A.-G.
Berlin W S
Kronenstrasse 61-63

Frankfurt a. M.	München
Hamburg	Köln
Düsseldorf	Breslau
London	Paris
Wien	Prag
New York	Amsterdam
Madrid	Mailand
Kopenhagen	usw.

Katalog Nr. 3294-350

FIG 2

In the Weissenhof Exhibition in Stuttgart in 1927, Thonet chairs of various designs were on view side by side with the tubular steel furniture of the Bauhaus circle. This was probably an important factor in modifying the enthusiasm for the ultra-modern tubular steel designs, since it could be shown that they were more expensive and less easy to mass produce than the bentwood models.

The credit for the most influential breakthrough in the development of contemporary furniture must be attributed to Marcel Breuer. It was immediately after the Bauhaus moved to Dessau in March 1925 that Breuer designed his first tubular steel chair. Being impressed by the lightweight and durability of tubular steel, he began to experiment with the possibilities of the material in the fabrication of modern furniture. His first experiments with tubular steel were not successful, but he persisted and finally, in 1926, he designed the first successful tubular steel chair.

Breuer had chosen the club armchair to experiment with. He felt disappointed with the first attempt (Fig. 37). The welding of the pre-bent plates gave the chair very stiff, and he had no real sense of quality he considered essential for comfort. The metal-plate finish was found to be unsatisfactory and also very expensive. Finally, the relatively lightweight but welded tubular steel was better and difficult to work. Because of these setbacks, Breuer continued working until he arrived at what he thought was the final design of the chair (Fig. 41). The tubular structure was constructed of nine plates of steel bent at 90° and bolted together. The screws took the stresses from sitting.

TUBULAR STEEL AND THE BAUHAUS

The credit for the most influential breakthrough in the development of contemporary furniture must be attributed to Marcel Breuer. It was immediately after the Bauhaus moved to Dessau in March 1925 that Breuer designed his first tubular-steel chair. Being impressed at the lightweight and durability of tubular-steel in the manufacture of bicycles, he saw the potential of the material in the fabrication of interior furniture. He first experimented with aluminium but because of its high price and the difficulty in welding it was soon abandoned for tubular steel.

Breuer had chosen the club armchair to experiment with. He felt disappointed with his first attempt, [Fig. 3]. The welding of the pre-bent pieces made the chair very stiff and it had no resilience, a quality he considered essential for comfort. The nickel-plate finish was found to be unsatisfactory and also very expensive. Finally, the relatively lightweight but welded skeletal chair was bulky and difficult to store. Despite these setbacks, Breuer continued working until he arrived at what he thought was the final design of the chair, [Fig. 4]. The second prototype was constructed of nine pieces of steel tubing, bent and bolted together. The screws made the frames less rigid.

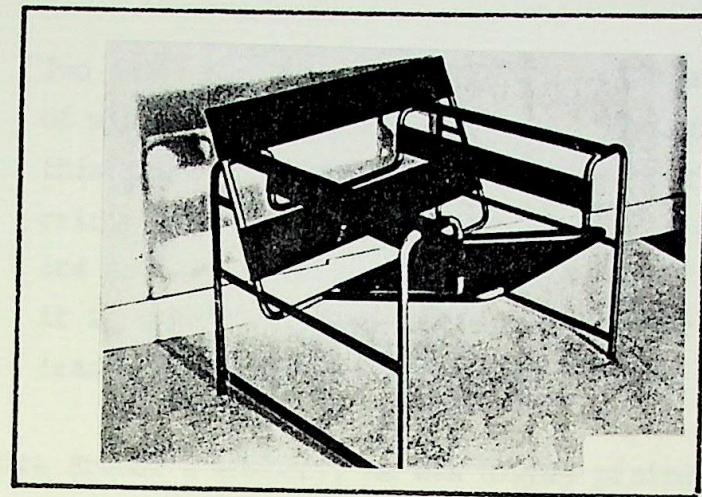


FIG. 3

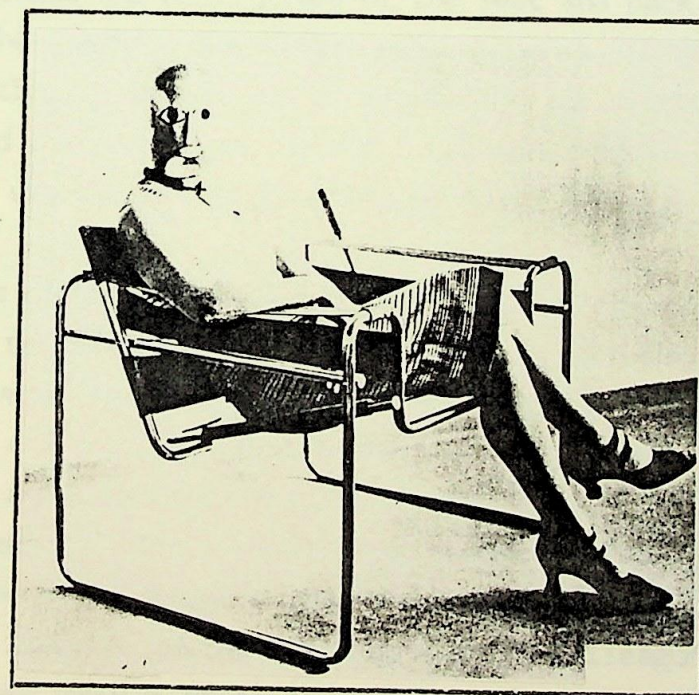


FIG. 4

Breuer was extremely nervous about his new metal chair. In 1927 he wrote:-

"Two years ago when I saw the finished version of my first steel club armchair, I thought that this out of all my work would bring me the most criticism. It is my most extreme work, both in its outward appearance and in the use of materials; it is the least artistic, the most logical, the least "cosy" and the most mechanical".

But despite Breuer's anxiety, he was highly praised for his efforts. Bearing on its design were all the influences that he had encountered at the Bauhaus; the boxy shape from the Cubists, the composition of intersecting planes from the de stijl, and the exposed and complicated skeletal framework from the Constructivists. Like Rietveld's 'Blue-Red' chair, [Fig. 5], Breuer's club armchair is a somewhat awkward design. The angling of the seat and back recalls the Rietveld design. A crucial difference between the two, however, is the sense the chair gives of the seat and back being suspended above the ground. The sitter never touches the steel framework of the chair. The notion of suspending the sitter in space remained a constant one in his furniture. Breuer's idea of seating was the sitter floating on 'resilient' air columns.

Breuer's club armchair was not the first piece of furniture using tubular metal. In 1851, R.G. Winfield of Birmingham invented the cantilivered rocker in tubular iron, [Fig. 6]. These iron based rockers and metal children's beds existed from the mid-nineteenth century and soon after the Mannesmann Steel Works developed the first seamless tubular steel rod in 1886, tubular steel hospital beds were manufactured. But Breuer had specified the material for general interior use and both he and his colleagues instantly recognised tubular steel as symbolic of modern technology.



FIG. 5

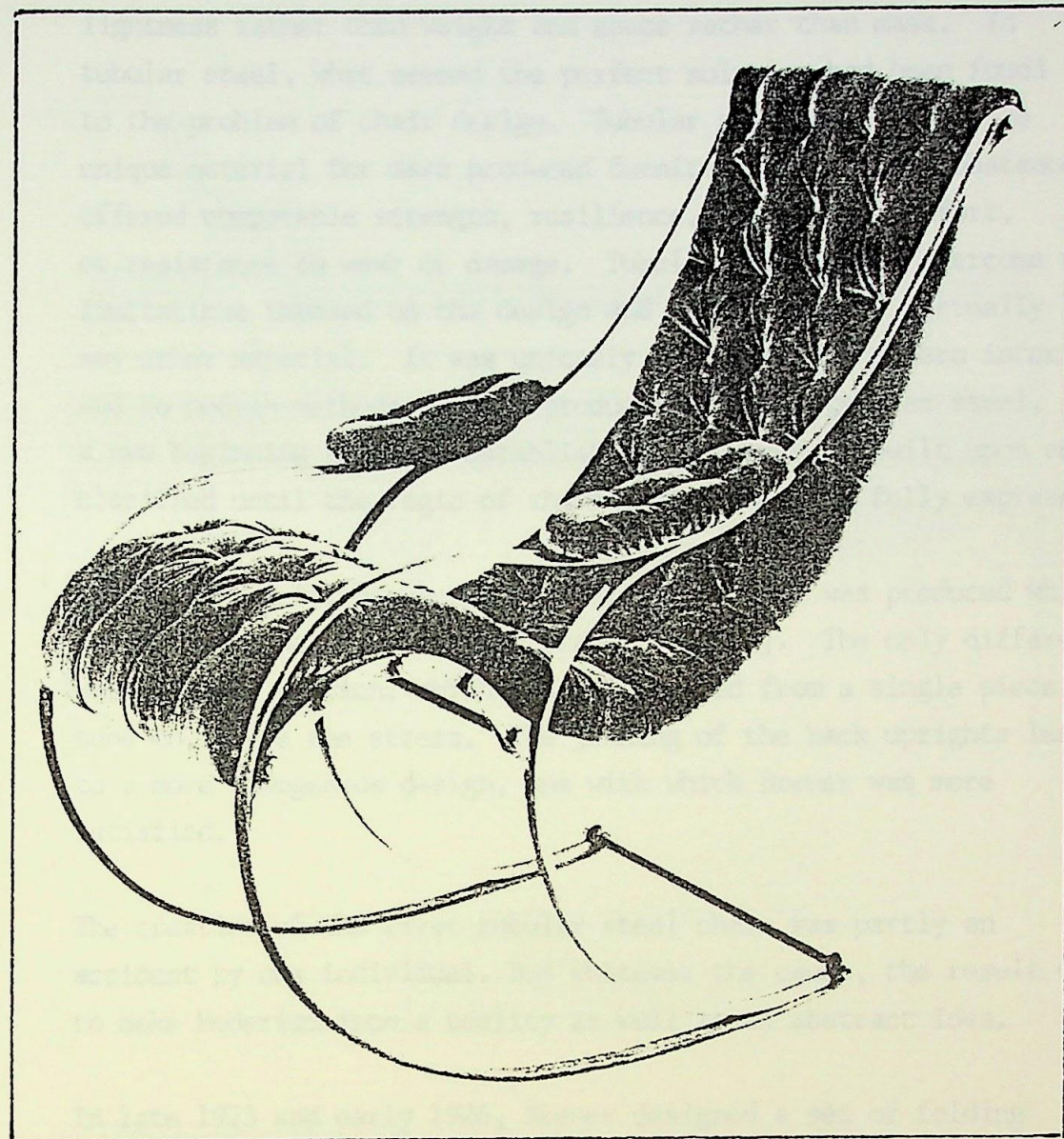


FIG. 6

Tubular steel was to become one of the emblems of the Modern Movement. It signified everything the movement stood for - lightness rather than weight and space rather than mass. In tubular steel, what seemed the perfect solution had been found to the problem of chair design. Tubular steel was, and is, a unique material for mass produced furniture. No other substance offered comparable strength, resilience, lightness, comfort, or resistance to wear or damage. Tubular steel could overcome the limitations imposed on the design and manufacture of virtually any other material. It was uniquely suited to the modern interior and to modern methods of mass production. With tubular steel, a new beginning had been established, and would be built upon and clarified until the logic of the material could be fully expressed.

In 1927-28, a further version of Breuer's chair was produced which became known as the 'Wassily' chair, [Fig. 7]. The only difference was the back section, which was constructed from a single piece of tube to reduce the stress. The joining of the back uprights led to a more homogenous design, one with which Breuer was more satisfied.

The creation of the first tubular steel chair was partly an accident by one individual. But whatever the cause, the result was to make Modernism into a reality as well as an abstract idea.

In late 1925 and early 1926, Breuer designed a set of folding theatre chairs, [Fig. 8], a side chair [Fig. 9] and a small stool, [Fig. 10]. Although he maintained that these designs were developed independently of the new Bauhaus building, he could not have been unaware that the radically new building called for new and appropriate furniture.

The theatre chairs were bolted to the floor and through the use of the cantilevered seat, exploited the structural possibilities of tubular steel far more effectively than had the club armchair. The armrests, which were also cantilevered showed Breuer's

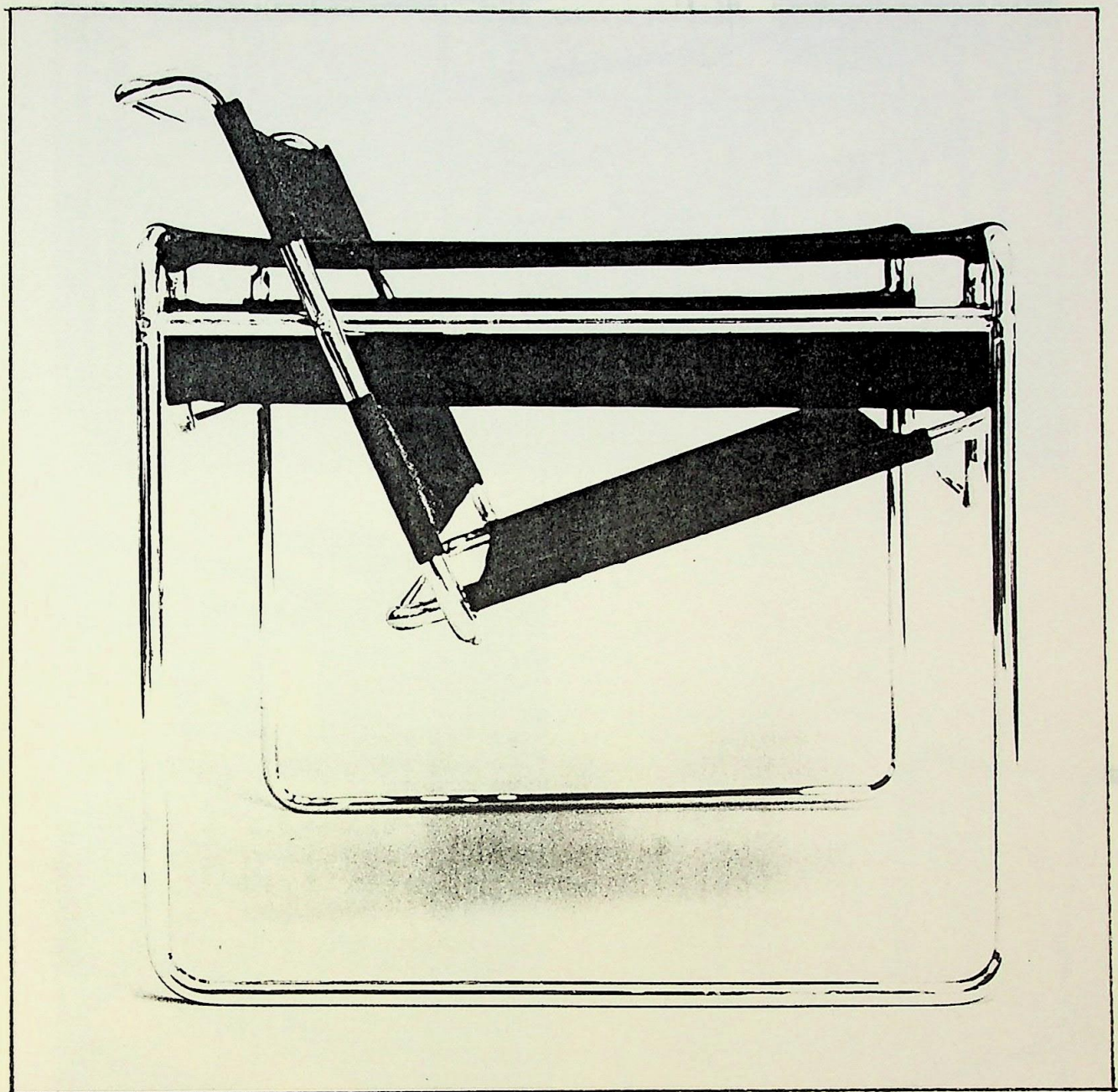


FIG. 7

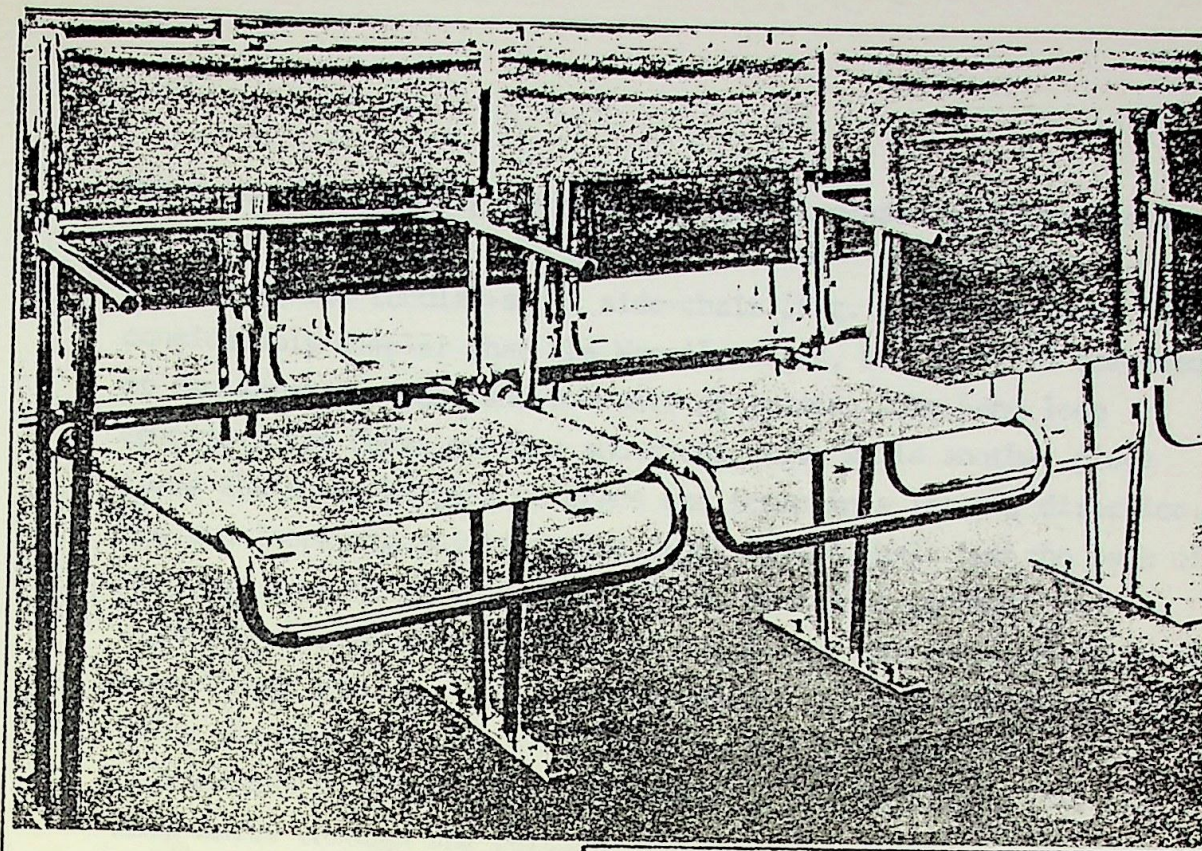


FIG. 8

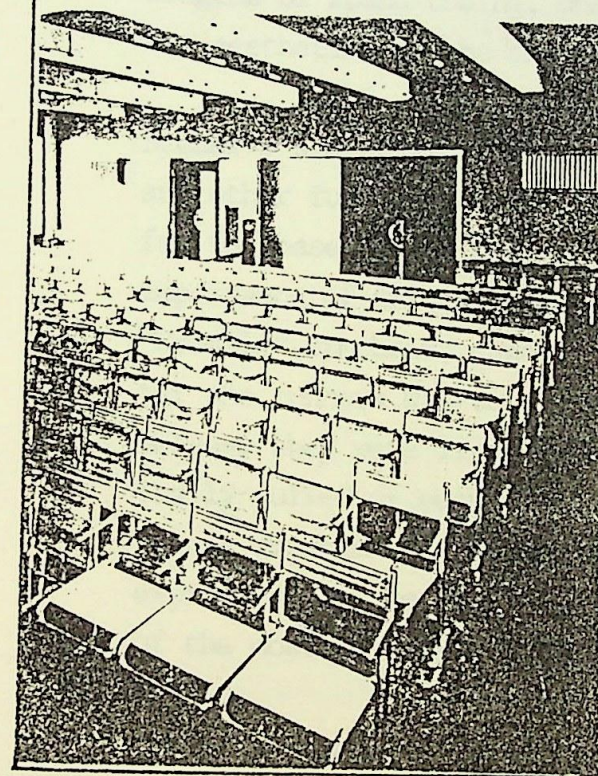
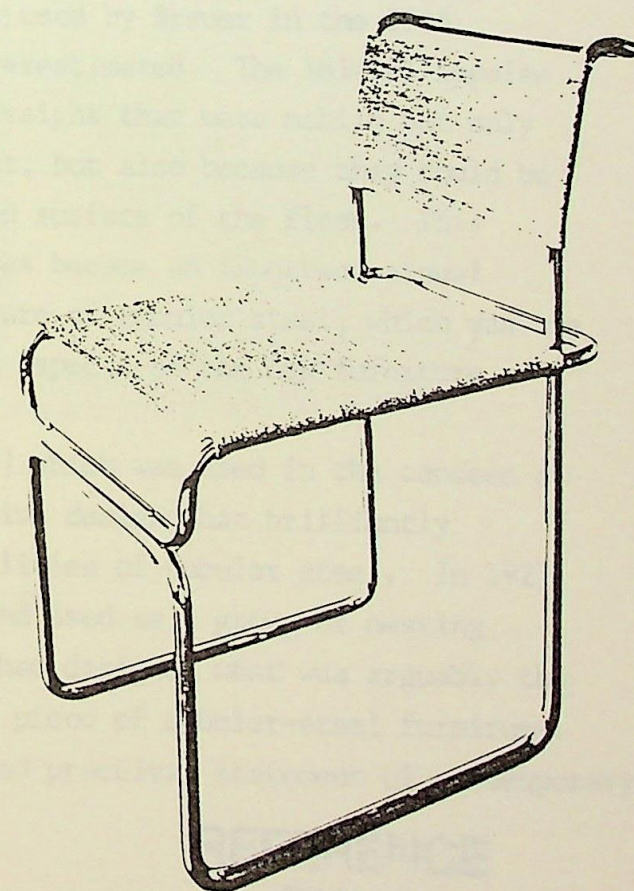


FIG. 9



obsession for creating structures which dispensed with visible supports.

Breuer's first tubular-steel side-chair [Fig. 9] design looks considerably simpler than the Wassily chair, but is still composed of two separate loops and two sets of joints. One bent loop comprises the back, runners and front legs, while another piece forms the seat, helping to brace the frame in a lateral direction. The two loops are joined at the front of the chair but the back of the seat loop is carried clear of the back legs to show its separateness. In most versions of the chair, the sections of steel that formed the back and rear legs flared outward both above and below the bottom of the back upholstery. This lent a certain awkwardness to the design. In addition, the joining of the two main units through the bolting together of two parallel horizontal lengths of round tubing, one resting on the other, also took from the aesthetics of the chair.

Breuer's side-chair confirmed his interest in working on chairs, and other furniture, that utilized a runner or sled arrangement for the base of the chair, rather than four separate legs. The importance of this element first used by Breuer in the 1925 "Wassily" armchair, cannot be overestimated. The initial impulse for the runners was to provide designs that were mobile not only because they were light in weight, but also because they could be easily pulled or pushed along the surface of the floor. This runner arrangement for chair bases became an important visual expression of the continuous nature of tubular steel, which was one of the most important structural aspects of the new furniture.

Breuer's 'Laccio' stool [Fig. 10] which was used in the canteen at the Bauhaus, was another innovative design that brilliantly exploited the structural possibilities of tubular steel. In 1927, the stool was modified in size and used as a group of nesting tables. With the stool, Breuer had designed what was arguably the simplest possible solution for a piece of tubular-steel furniture. The stool was a clear, honest, and practical statement of contemporary

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design. It proved Breuer's belief that only through simplicity can furniture be versatile enough to adapt to the multifaceted activities of modern living.

In this design, for the first time, the inherent rigidity of tubular steel is used in a way which would be impossible in wood. Other designs in metal all use sufficient bracing and joining for a less resilient and far cheaper material than steel to be quite practicable.

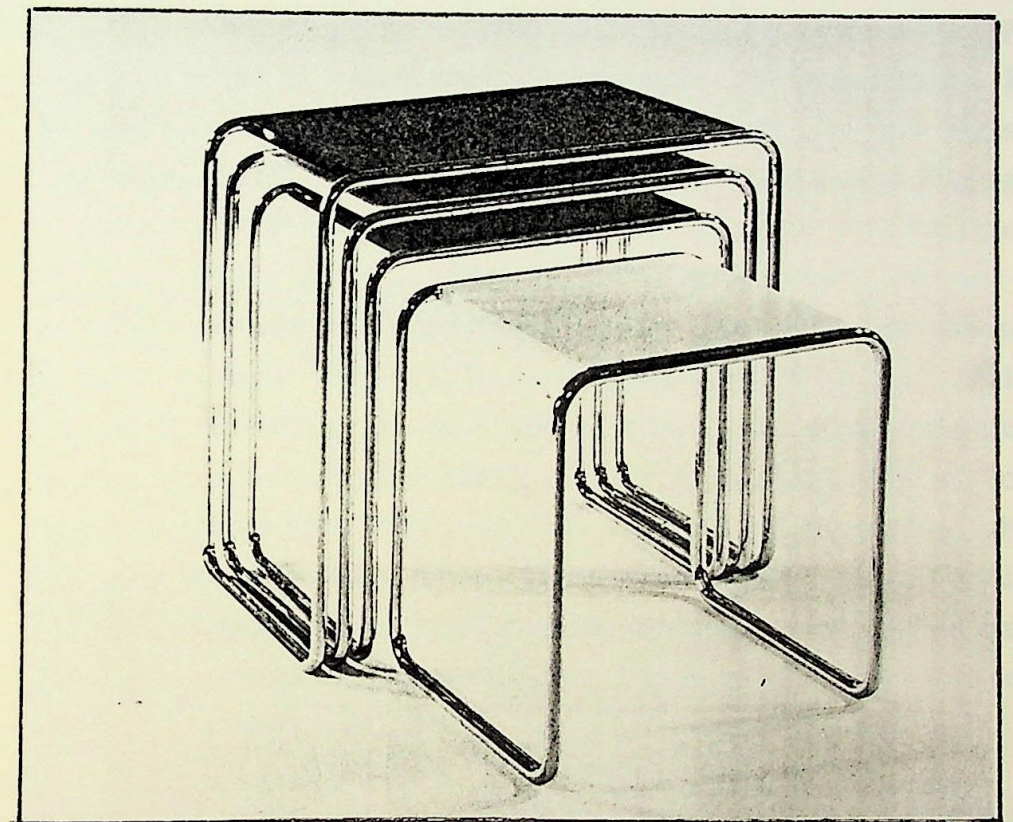


FIG. 10

In an advertisement for Standard Mobel, Breuer tries to justify his designs in tubular steel. He states:-

"Tubular steel furniture with a fabric seat, back and armrests is as comfortable as well upholstered furniture, without having its weight, price, unwieldiness and insanitary quality. One type has been worked out for each of the required kinds of uses and improved to the point where no other variation is possible..... Steel tubing of small cross-section is stronger than any other material used so far in the production of chairs. The result is a particular lightness and a particularly light appearance. All types can be taken apart. The parts are interchangeable. The light weight plays an important part in transportation. For instance, an easy chair of tubular steel weighs about 13.25 lbs (one fourth to one sixth of an upholstered easy chair). Taken apart, approximately 54 easy chairs or about 100 chairs with back rests can be packed into a space of 30 cubic feet. The cost of an easy chair, for example, is about 30% of that of an upholstered chair. The cost of a theatre chair or a chair with a back rest, both fabric covered, is roughly 75% of similar thinly upholstered wooden furniture. Due to its durability and sanitary quality, Breuer's metal furniture is approximately 200% more economical in use than ordinary chairs".²

In this advertisement, Breuer has picked on the very qualities which had made Thonet's bentwood furniture so successful: standardization of parts, ease of transportation, lightness, cost. In many respects he was wrong, particularly about 'no other variation being possible' - tubular steel furniture is still being designed today. It is difficult to check the accuracy of his claims about cost. Upholstered furniture was, in comparison to tubular steel, extremely expensive, but cheap bentwood furniture was generally

cheaper and as strong, if perhaps heavier than cheap tubular-steel. For example, one of the cheapest of Breuer's designs for Standard Mobil, a light folding chair, with a seat and backrest of wood, [Fig. 11], cost RM21.20, while the popular bentwood design by Ferdinand Kramer [Fig. 2] manufactured by Thonet cost RM12. Breuer's 'Laccio' stools cost between RM16 and RM22, according to size. So, comparing wood and steel frames with comparable sitting surfaces ends up distinctly to the former's advantage.

The answer to bringing down the cost with an expensive industrial material is, first, to reduce the amount of material used, and, secondly, to make the processes of manufacture as simple as possible. The ideal solution lay in the potential investigation in Breuer's stool. Looking at the stool, it must have seemed possible, at least on theoretical level, for a chair to be made from a single continuous, bent length of tube. The impulse towards designing chairs from a single piece of material has been a strong and persistent one in modern times. As technology improved and new materials and processes were invented, designers moved closer and closer to that goal. Tubular steel was the first material since the development of bentwood in the 1840's to offer the opportunity for such furniture, even if it was necessary to add fabric, leather or caning for the seats and backs. It was with the development of the cantilevered chair in 1926-27 that this idea of a chair, constructed from a continuous loop became, at least in principle, fulfilled.

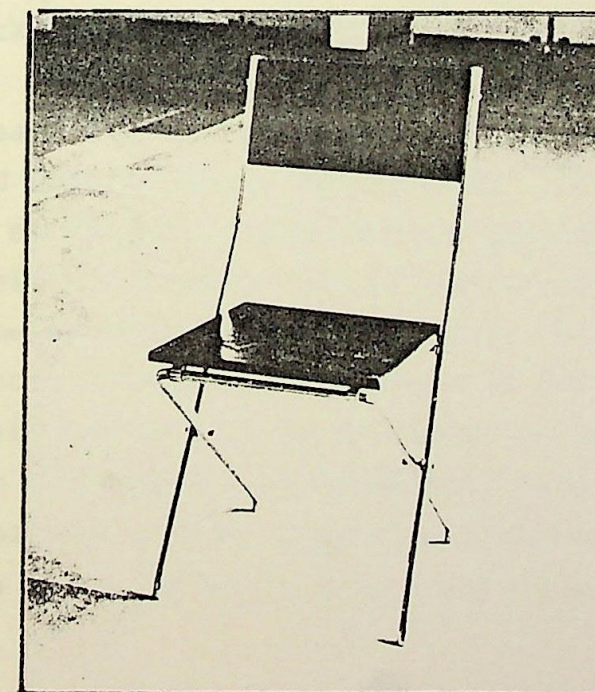


FIG. 11

FIRST CANTILEVERED CHAIRS

The Dutch architect, Mart Stam was the first to design and make a tubular steel chair of cantilevered construction. At a meeting on 22nd November 1926, held in preparation for the Weissenhof exhibition, Stam sketched the new chair he was working on, which was constructed from pipes and somewhat clumsy standard pipe fittings, [Fig. 12]. Mies der Rohe, inspired by the drawing, also began working on a cantilevered chair. The Stam cantilevered chair, exhibited at the Weissenhof exhibition was manufactured by L & C Arnold from 1928. The bent steel tubing was painted black, with a seat made from canvas stripes, and small round pieces of rubber attached to the base. Stam also designed a cantilevered lounge chair with arms of similar construction, but with a leather seat and back [Fig. 13].

That same year, Mies van der Rohe altered the basic shape of Stam's cantilevered chair producing the 'MR Chair', [Fig. 14]. Aside from their great elegance and sophistication, Mies chairs surpassed Stam's in being far more springy and resilient. Mies was the first to patent the principle of the cantilever. The frame of the side chair consisted of three separate pieces of $\phi 24$ m.m. nickel-plated tubular steel, bent to form the frame for the back, seat, and semicircular sled base and joined by dowels and screws or welding. Two additional curved rods, which wrapped around the back, screwed to the sides of the top of the frame, and clipped to the lower

legs with metal bands, formed the arms of the arm chair, [Fig. 15]. His chairs which originally were covered in black or natural cane work, were manufactured by Berliner Metallgewerbe (Jos. Muller) of Berlin. The income from these patents for Mies appears to have been quite substantial, and the 'MR' Chairs can be seen in most of the luxury modern interiors designed in this period.

In 1928, Marcel Breuer followed suit and produced his own set of cantilevered chairs. The sled base and support for the seat, back and armrests of the 'Cesca Chair' [Fig. 16] were bent from a single length of steel tubing. The seat and back consisted of bent wooden frames, filled with natural caning and attached to the metal support with screws. Breuer's chair was made of steel tubing by Standard-Mobel, but appears to have been marketed by Thonet. In Breuer's cantilevered design a new dimension was added through the textural and coloristic contrast of the highly polished steel tubing with the wooden frames and caning. The caning makes the seat and back almost transparent and was also an unmistakable reference to the bentwood and cane chairs of Thonet, which had enjoyed a tremendous revival of popularity during the mid 1920's. A version without arms was also produced [Fig. 17].

Each of the cantilevered chairs can be taken as an architectural and design manifesto. Some of these statements are quite out of proportion with the intended nature and function of the object. Stam's chairs, for instance, make a virtue out of their starkness, while Mies aimed for the most pleasing curve as well as the most elastic one. Whenever the 'MR' chairs appear in photographs of interiors they make an impressive contribution to the formal arrangement of the room. The sweeping curve contrasts sharply with the rectilinear interiors of the Modern Movement. For Breuer, however, the contrasts of texture, and the increased comfort of the bentwood and cane fittings, added to the advantage of using the wooden frames for rigidity. Both Stam's and Mies's chairs had hidden curving braces of steel under the seat to maintain lateral rigidity.

The 'Cesca' chair was the nearest any designer had come in producing a chair fabricated out of a single piece of material, although it was still necessary to use canned back and seat rests. The cantilevered chair was also one step closer to Breuer's preoccupation with trying to suspend the sitter in space on resilient air columns. This hovering effect was to become an important aspect of furniture design in the Modern Movement.

After the Weissenhof exhibition, in June 1927, the idea of using tubular steel for furniture spread throughout Europe. Until that point, most metal furniture was made by the architects themselves, or by manufacturers producing in very limited quantities. The Weissenhof exhibition evoked wide discussion of tubular steel and sparked the interest of larger companies in its manufacture.

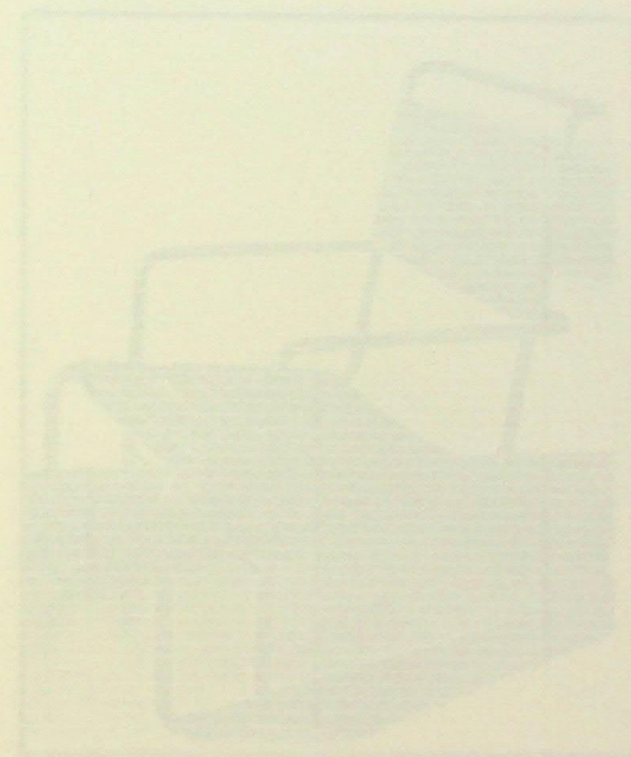


FIG. 13

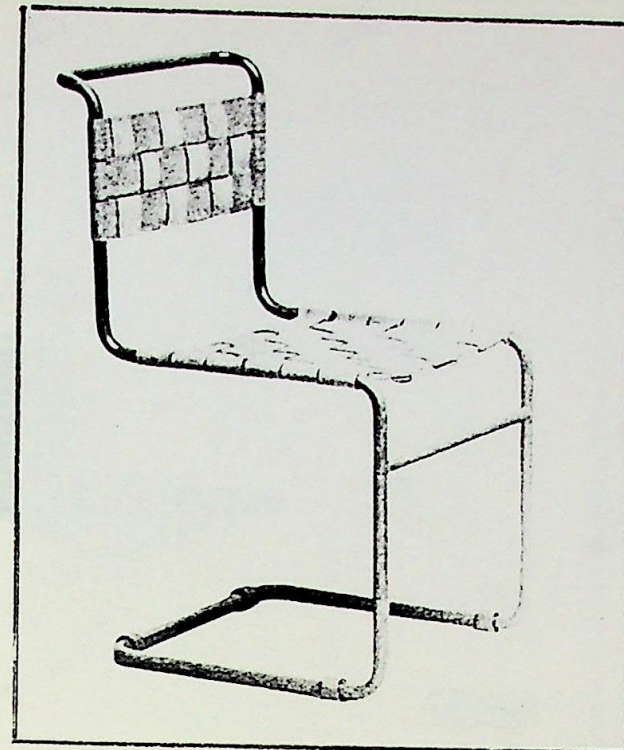


FIG. 12

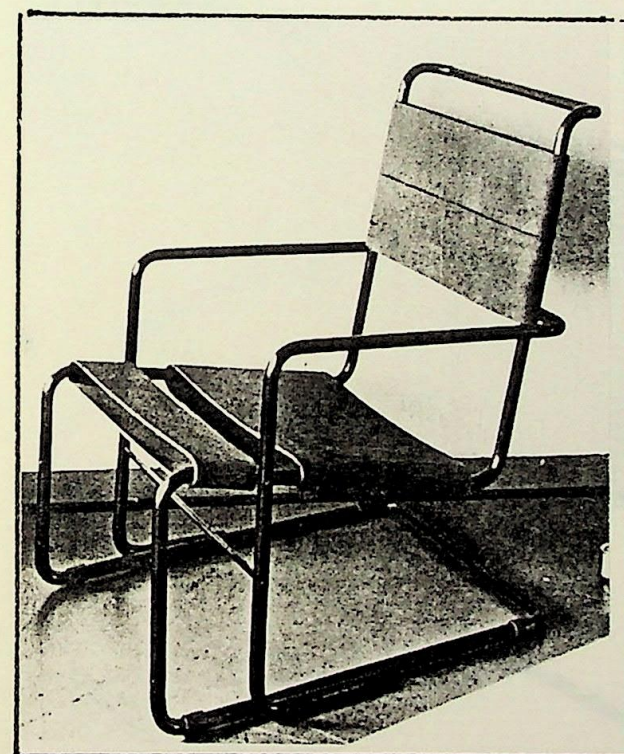


FIG. 13

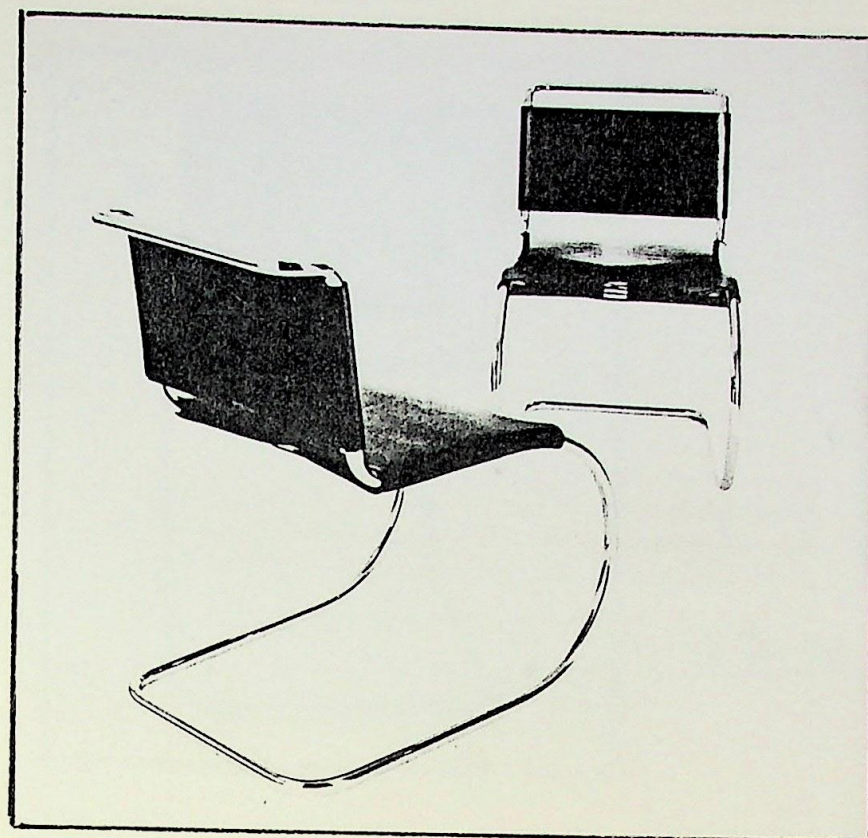


FIG. 14

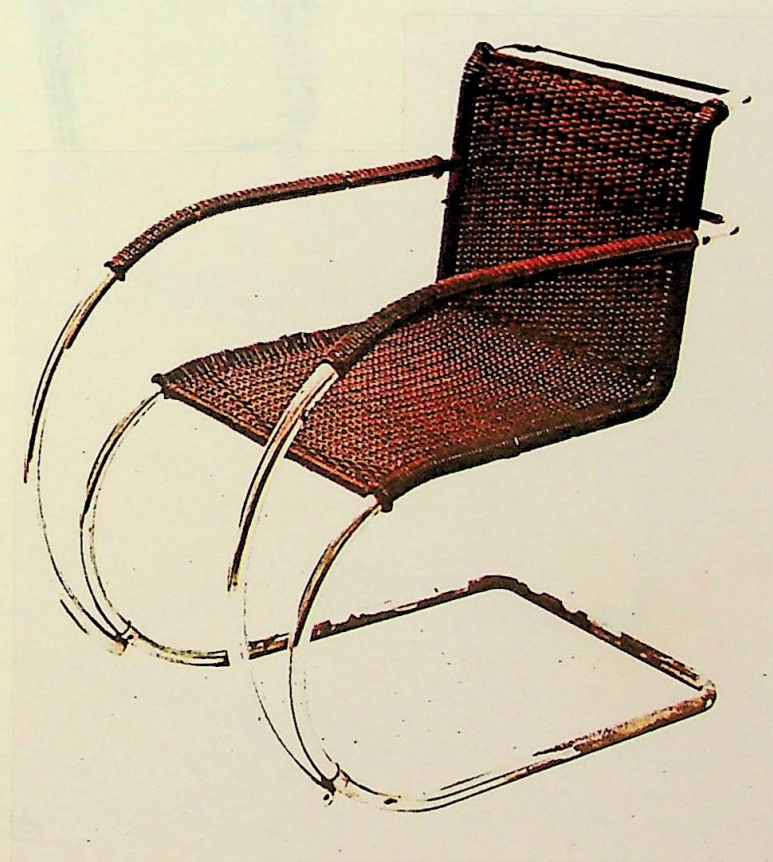


FIG. 15

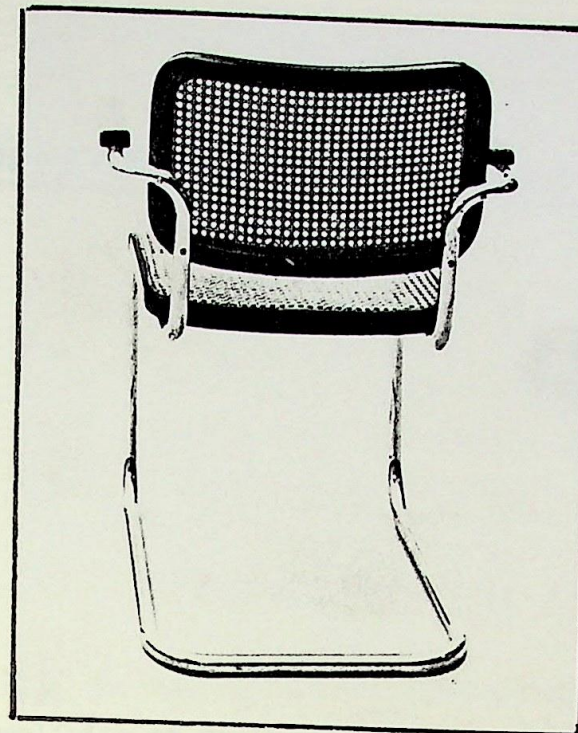


FIG. 16

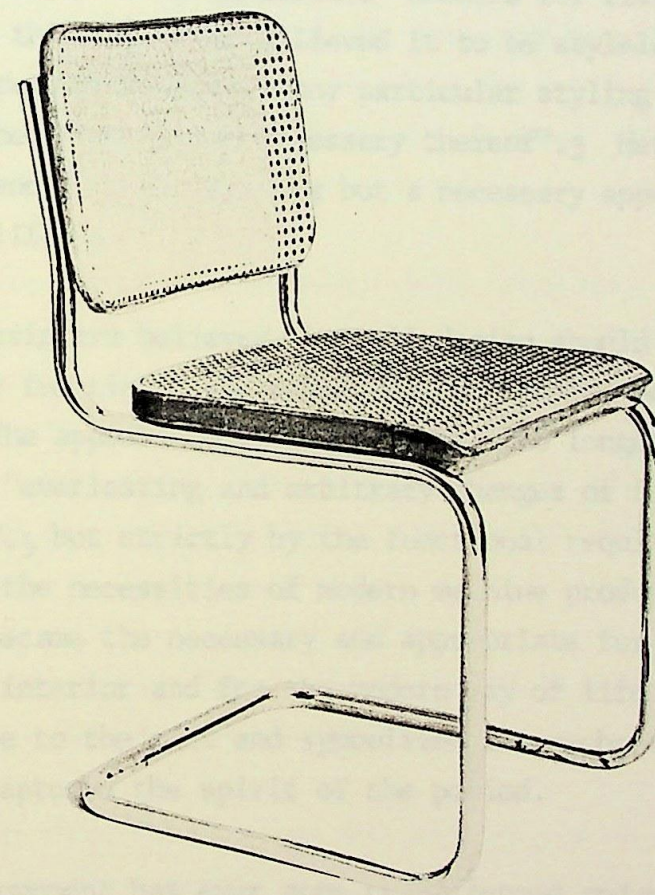


FIG. 17

OPPONENTS OF TUBULAR STEEL

All of the new tubular steel furniture was characterised by simplicity of design and construction, physical and visual lightness and transparency. It was regarded simply as a machine for sitting in, similar to Le Corbusiers 'machine for living in'. The proponents of this furniture believed it to be styleless "for it is not expected to express any particular styling beyond its purpose and the construction necessary thereof".³ Metal furniture was intended to be "nothing but a necessary apparatus for contemporary life".⁴

Early modernist designers believed that all design should be impersonal, purely functional and made up almost exclusively of straight lines. The appearance of objects would no longer be influenced by the "everlasting and arbitrary changes of form, colour and styles",⁵ but strictly by the functional requirements of the object and the necessities of modern machine production. So tubular steel became the necessary and appropriate furniture for the new modernist interior and for the modern way of life. It was devoid of reference to the past and symbolized the mechanised environment that captured the spirit of the period.

But no great art movement has ever gone unchallenged and the modern movement certainly had its fair share of criticism. Many designers, critics and consumers were horrified by the widespread

use of tubular-steel furniture. They believed it to be cold, sterile and inhumane, unfit for use in domestic interiors. John Gloag, the English writer commented on the new furniture:-

"Although metal equipment may be satisfying to the standards of commercial life, and may adequately resist the wear and tear of an office, there does not appear to be any case for substituting metal for wood in furniture that is designed to give convenience and harmony to the home

The designer may devise an interior in which chairs of shining aluminium are an essential part of the composition. But in such schemes, human beings appear intrusive; there is no sympathy between them and the setting. Metal is cold and brutally hard and .. gives no comfort to the eye".⁶

The critics did however, believe that the furniture was well suited to the movement it belonged to. It reflected the harsh limitations of the modern movement. Believing that tubular steel was only fit for hospitals equipment Aldous Huxley wrote:-

"Metal furniture will be modern with vengeance. Personally I very much dislike the aseptic, hospital style of furnishing. To dine off an operating table, to loll in a dentist's chair - this is not my idea of domestic bliss ... the time, I am sure, is not far off when we shall go for our furniture to the nearest Ford or Morris agent".⁷

Many found the uniformity of the new furniture to be its most depressing quality. Maurice Dufrene writes:-

"The same chair, mechanical and tubular, is to be found in almost every country ... it is the anonymous, neutral, universal chair, ... and this is the root of Dullness".⁸

In W. Heath-Robinson's and K.R.G. Browne's 1936 satire, 'How to live in a flat', tubular-steel furniture was ridiculed saying that if conversation at dinner lapses an interesting diversion can be trying to find the joins in the metalwork [Fig. 18].

The proponents of tubular steel, of course, were not swayed from their beliefs in the material. As early as 1927, Breuer had addressed these attitudes when he wrote:-

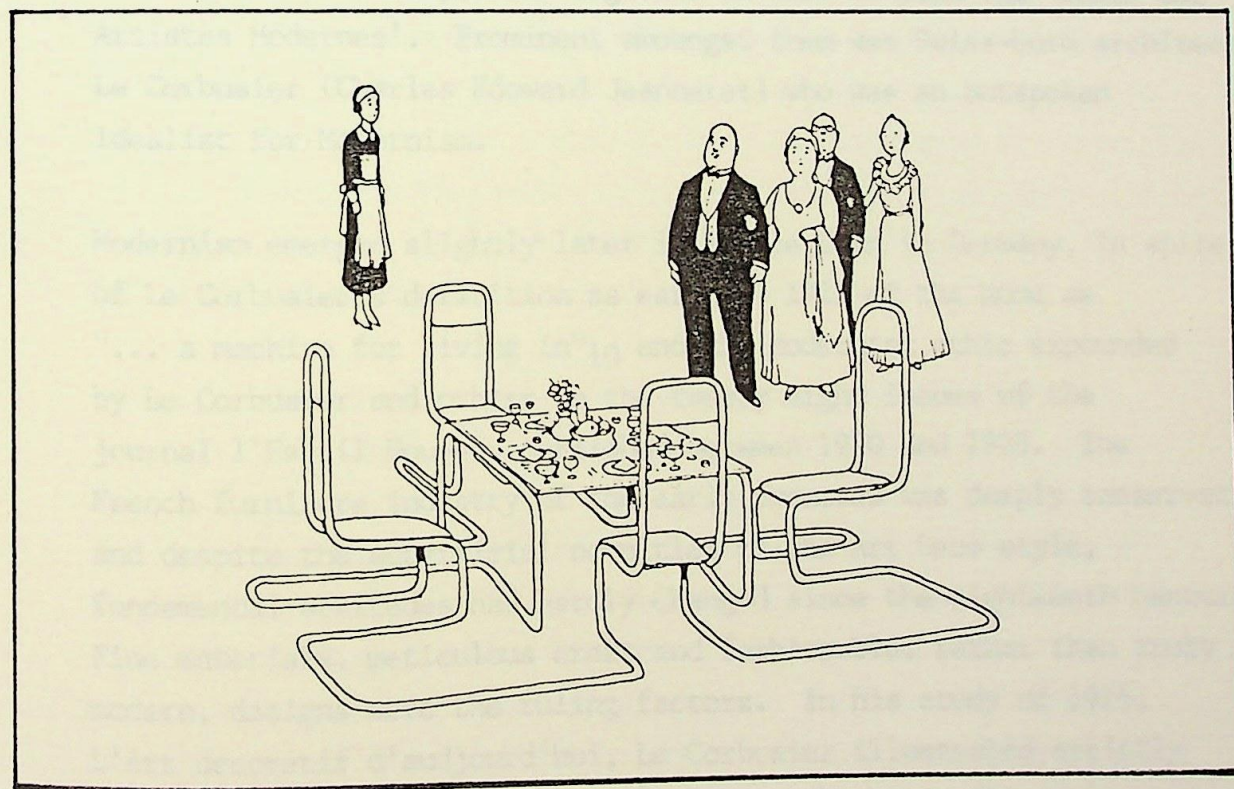
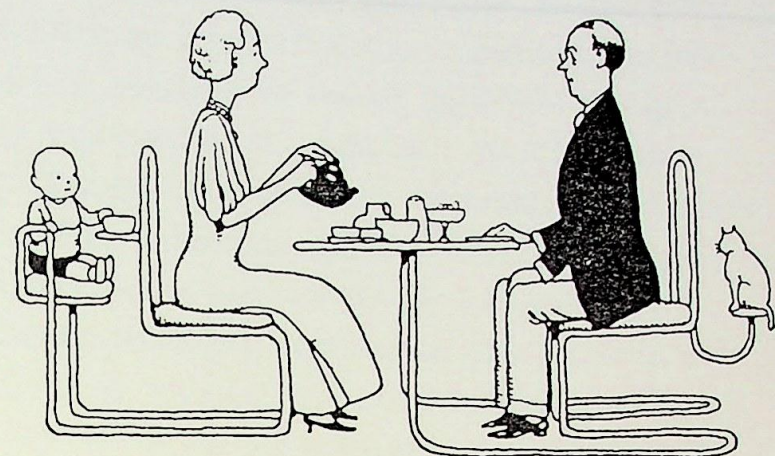
"Our work is unrelenting and unretrospective; it despises tradition and established custom. A frequent criticism of steel furniture is that it is cold, clinical and reminiscent of an operating theatre. But these are concepts which flourish from one day to the next. They are the product of habit, soon destroyed by another habit".⁹

Although the proponents of this machine style believed they represented the unalterably correct expression of the modern world, the style was itself no more than an expression of a particular taste. There are many standards of taste. Artistic and philosophic attempts to rationalize these different standards form a fundamental part of design. The market dominates taste. Therefore it is not possible for a small elite, no matter how well-intentioned to set universal standards.



FIG. 18

FRANCE AND MODERNISM



FRANCE AND MODERNISM

If modernism and tubular steel furniture found its most forceful expression in Germany, and in particular, within the Bauhaus, it was by no means without its advocates in other countries. The major contribution outside Germany came from a group of architects and designers in Paris, many of whom, after first working independently, came together in 1930 to form the 'Union des Artistes Modernes'. Prominent amongst them was Swiss-born architect, Le Corbusier (Charles Edouard Jeanneret) who was an outspoken idealist for Modernism.

Modernism emerged slightly later in France than in Germany, in spite of Le Corbusier's definition as early as 1921 of the home as "... a machine for living in"¹⁰ and the Modernist ethic expounded by Le Corbusier and others in the twenty eight issues of the journal *l'Esprit Nouveau* published between 1920 and 1925. The French furniture industry of the early twenties was deeply conservative and despite the superficial novelties of the Art Deco style, fundamental attitudes had hardly changed since the eighteenth century. Fine materials, meticulous craft and fashionable, rather than truly modern, designs were the ruling factors. In his study of 1925, *L'Art decoratif d'aujourd'hui*, Le Corbusier illustrated strictly functional metal office furniture as a worthy basis for a new furniture aesthetic. "These designs are cold and brutal, but they

are appropriate and honest - these are the right criteria".¹¹

Amidst the luxury and decorative refinements of the 1925 Paris International Exhibition, Le Corbusier's simple and modernistic contribution, the Pavillon de l'Esprit Nouveau, pointed the way to the future development of progressive French furniture design. The pavilion was more interesting as a spatial, architectural exercise than for its furnishings, however. Although Le Corbusier devised plain metal cabinet furniture for the interior, he used standard Thonet bentwood chairs and was not to design his own classic Modernist seating furniture until three years later, he undertook the furnishing of a villa in Ville d'Avray. For this project, working in collaboration with Charlotte Perrinand, and his cousin Pierre Jeaneret, he conceived three furniture designs which are considered masterpieces of the Modern Movement.

The most remarkable of these was the "Chaise Longue" [Fig. 19], the concepts and construction of which were entirely without precedent. The seat frame contoured to the lines of the body and raised on two arcs, was in tubular steel with steel webbing and a loose seat cover upholstered in fabric or hide to support the sitter. This upper unit rested on the rubber-covered stretchers of the steel base and was adjustable in position from a reclining to an almost sitting posture. In an article published in 'The Studio' in 1929, Charlotte Perriand wrote about the 'Chaise Longue' saying:-

"Metal plays the same part in furniture as cement has done in architecture. It is a revolution".¹²

The two other chairs which the three designed for Ville d'Avray, were the 'Basculant' [Fig. 20] and the 'Grand Confort' [Fig. 21]. The former taking its name from the pivoting back rest, which allowed the back to conform to the users posture, show the influence of Marcel Breuer's 'Wassily' chair and its Cubist form, [Fig. 7]. Though a close relationship exists, the 'Wassily' chair seems complicated and excessive in its size and use of materials when

compared to the percision of the 'Basculant' chair.

The concept of the 'Grand Confort' was more remarkable, for this chair turned the traditional design of deep upholstered chairs inside out. The cushions were contained within the cradle framework instead of serving to conceal it.

The group also designed a revolving chair [Fig. 22] manufactured with a tubular steel frame. The back and seat were padded with polyurethane with a fabric, or leather upholstery. This piece of furniture along with the other three designs were more luxurious than their German counterparts.

This grandeur was part of the heritage of French Furniture design, and had the designs been any more harsh, they would have run the risk of being rejected outright by the fickle public.

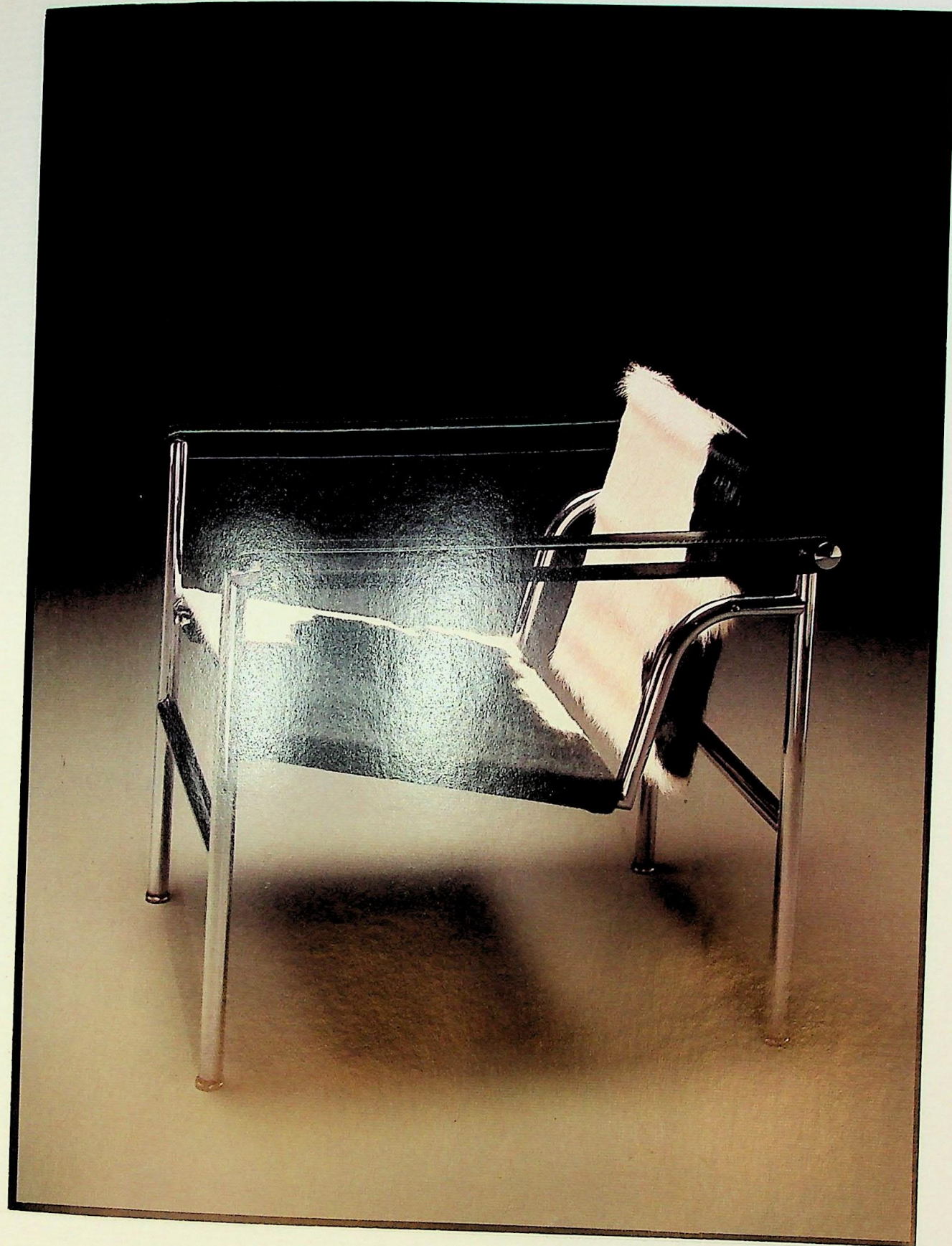


FIG. 20

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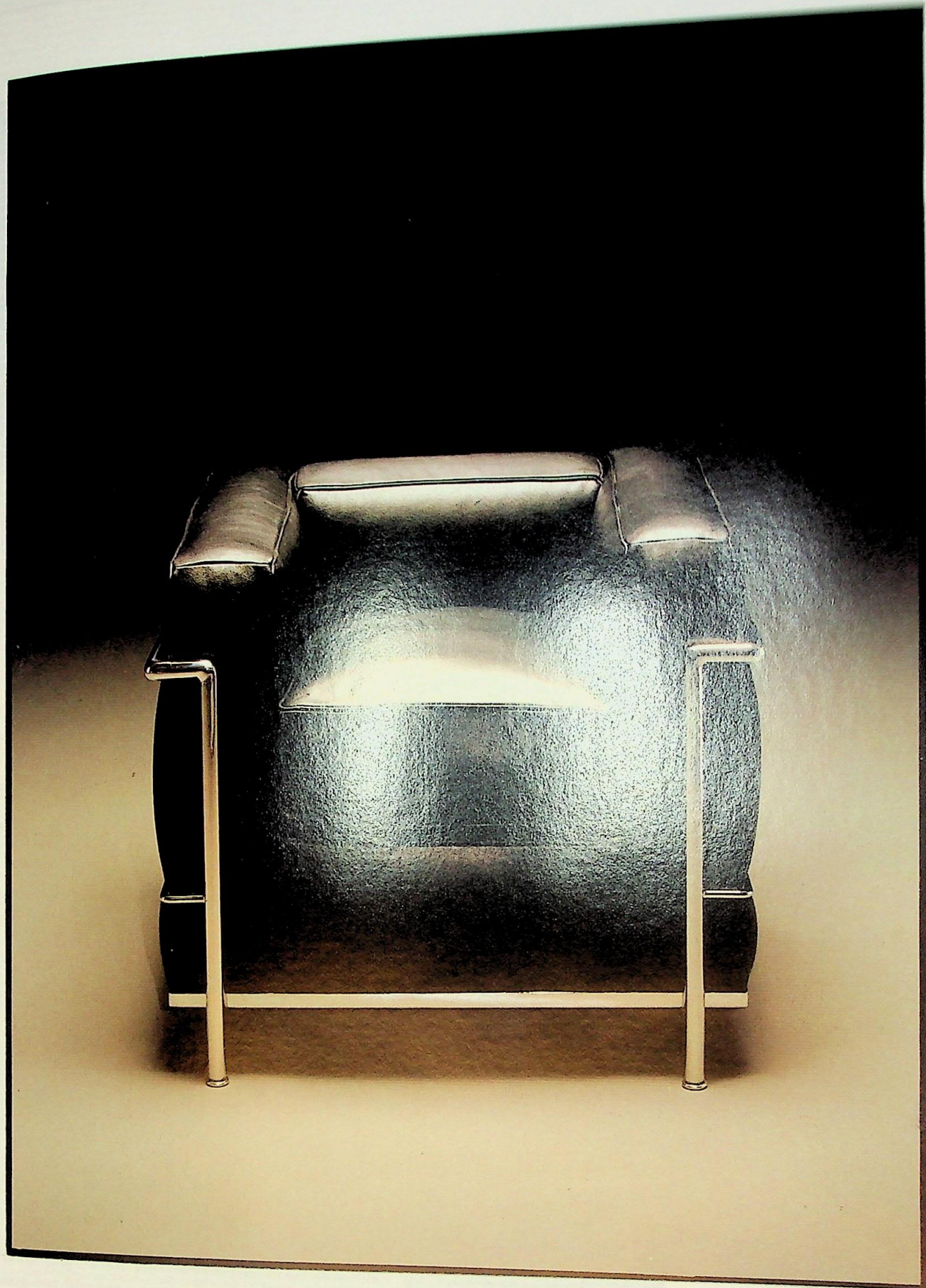


FIG. 21



FIG. 19

THE THIRTIES

There was a great deal of diversity in furniture design in the thirties. It was a decade of eclecticism. It explored many styles and ideas and witnessed the creation of furniture which ranged from the uncompromising functional to the indulgently romantic or the Surrealist.

At the beginning of the decade the demand for Modernist furniture was at its peak. Simple designs in steel and glass were very popular. By the close of the decade, however, tastes had again changed and the bare look of tubular-steel furniture was rejected in favour of the purely decorative.

Modernism did not die, by any means, but it certainly evolved from the idealism which had characterised its beginnings. It became as much a decorator's style as a theorist's. The tubular-steel furniture of the 1920's began to be incorporated into a luxurious and stylish mode of decoration. The founders of the Modernist Movement, however, still believed in the idealism of tubular steel and continued to add to the collection of sophisticated designs. In the United States, on the other hand, Modernism was taken as a basis for a new approach to furniture design with style as the goal. This new approach to design in America during the thirties became known as streamlined design.

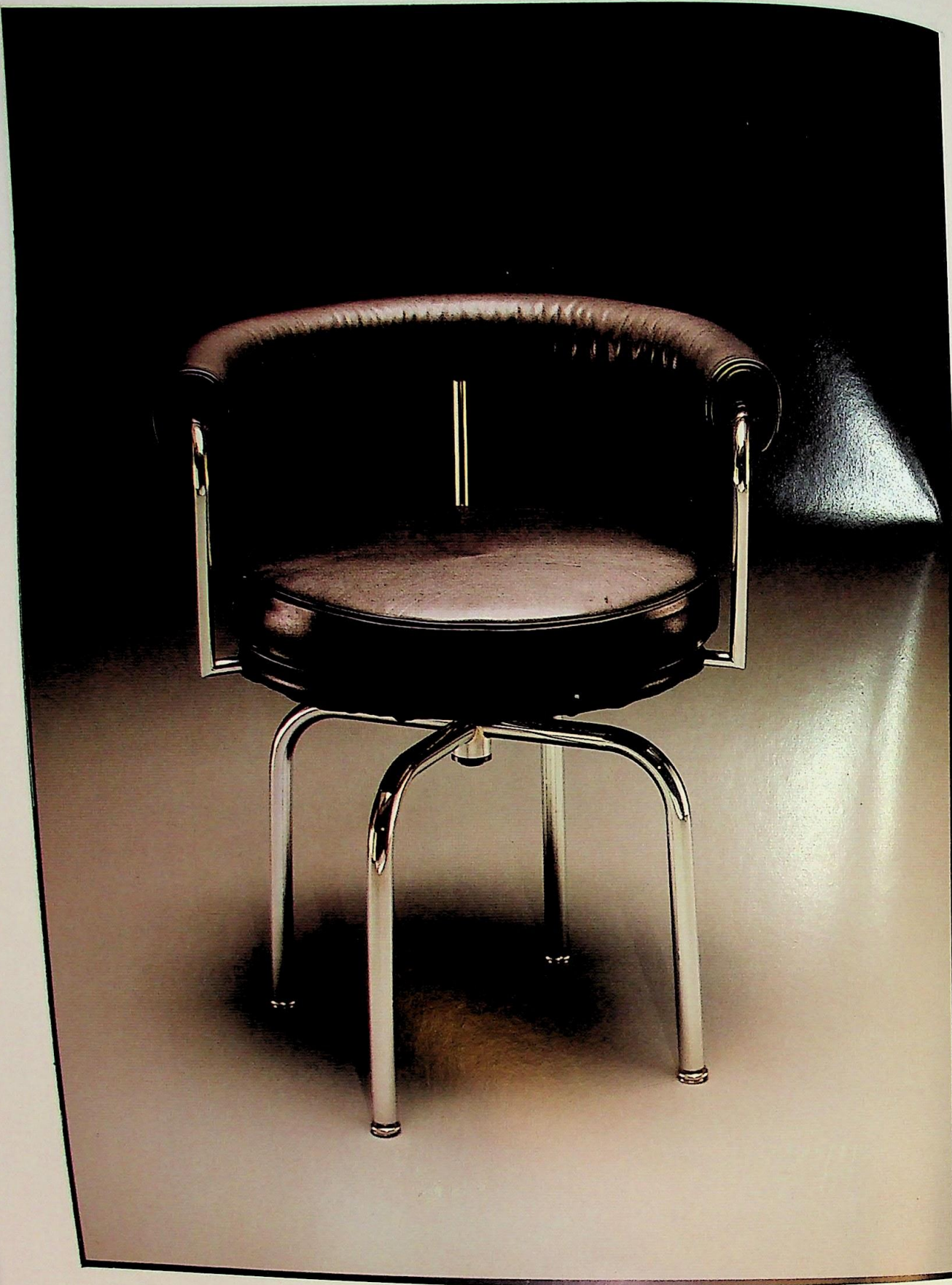


FIG. 22

For many designers, and certainly a large proportion of the public, Modernism as a fashion had soon had its day and was replaced by essentially romantic styles and a renewed interest in past styles. The neo-baroque, or neo classical styles which found increasing popularity from the early thirties gave the impression of comfort and opulence.

In France the early thirties saw the development of International Modernism as a decorator's style. The ideological background was lost in an attempt to portray status. The resulting interiors were often of considerable elegance and sophistication, if at times somewhat inhumane and theatrical. An example of this can be seen in the furniture designed by the artists of the 'Union des Artistes Modernes' between 1931 and 1933 for the palace of the Maharja of Indore. These pieces of furniture, such as the games table and four armchairs, [Fig. 23] designed by Louis Sognot and Charlotte Alix, were extremely stylish in a hard and uncompromising, though luxurious vein. The frames are in chromed metal, while the arm, backs and seats of the chair are in synthetic material.

The modernist style and tubular steel furniture did not find real acceptance in the United Kingdom until the beginning of the thirties. Marcel Breuer and Walter Gropius of the Bauhaus both moved from the increasingly restrictive climate of Germany to participate for a few years in the promotion of Modernism in Britain. Gropius arrived in 1934 and Breuer followed in 1935. Although Breuer was the pioneer of tubular steel furniture, his best work in England was in laminated wood and plywood such as the Isokon Long and Short Chairs [Fig. 24 and Fig. 25].

Bauhaus styles of tubular steel furniture were copied and developed into a quite extensive range by the firm of Pel. The initials stood for Practival Equipment Limited, a company registered in 1931 as a subsidiary of the Birmingham based firm of Accles and Pollock. A London showroom was opened in December 1931 and very soon Pel furniture was in strong demand. The 1932 catalogue maintained that

'Steel furniture is not a novelty but an inspiration of efficiency which originated about thirty years ago, through its hygienic and structural satisfaction of medical requirements'.¹³

By 1937, however, in which year both Walter Gropius and Marcel Breuer left to assume teaching posts in the United States, the British public had tasted and for the most part rejected the uncompromising character of Modernist furniture and design.

The Second World War was soon to follow and the shortage of materials proved crippling to the furniture industries of Europe. Because of the drastic cutbacks imposed on the European furniture industry, it was left to a new generation of American designers, such as Eames, Bertolia and Saarinen, to struggle through the war years developing a new, softened, more compromising version of functionalism, taking away from the austerity of the Bauhaus look and paving the way for post-war design.

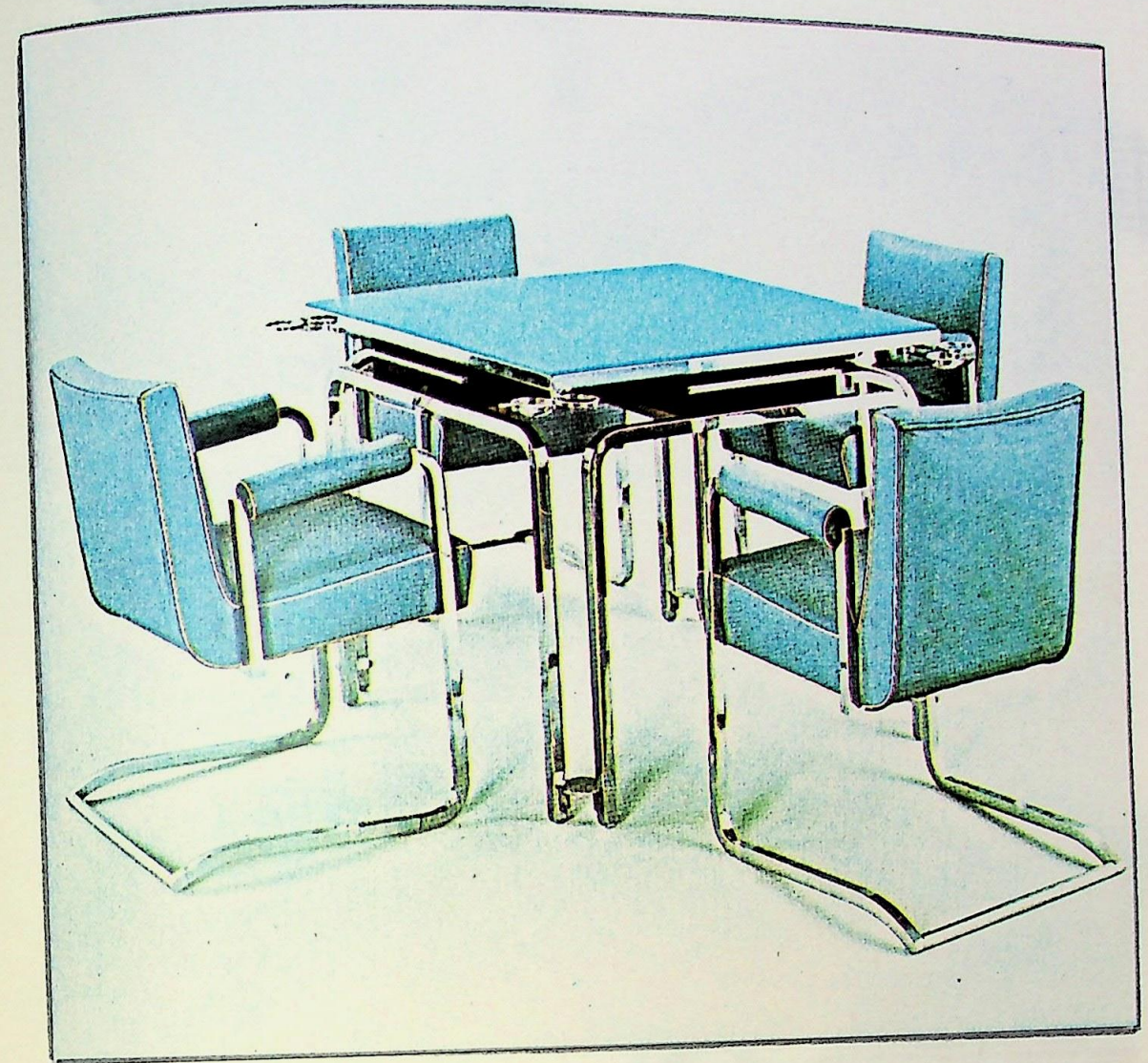


FIG. 23

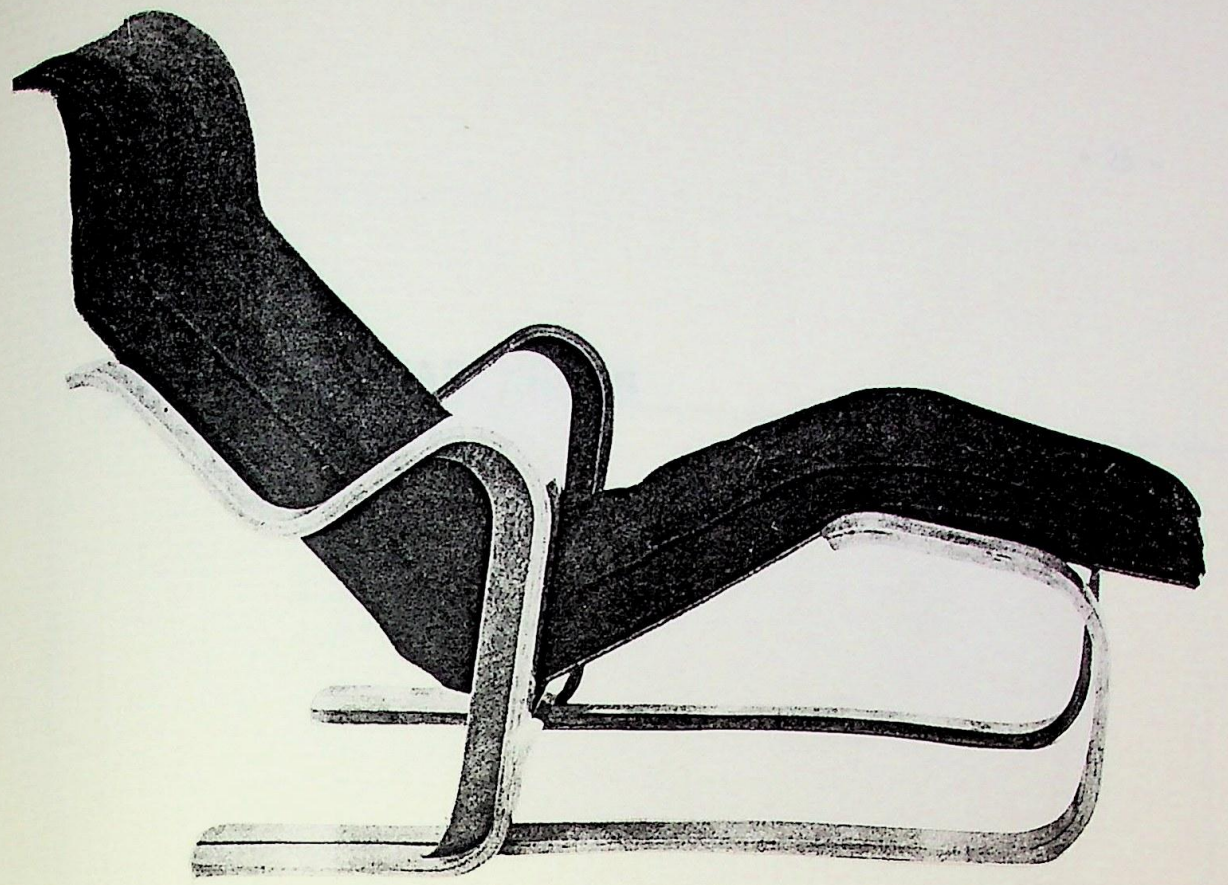


FIG. 24

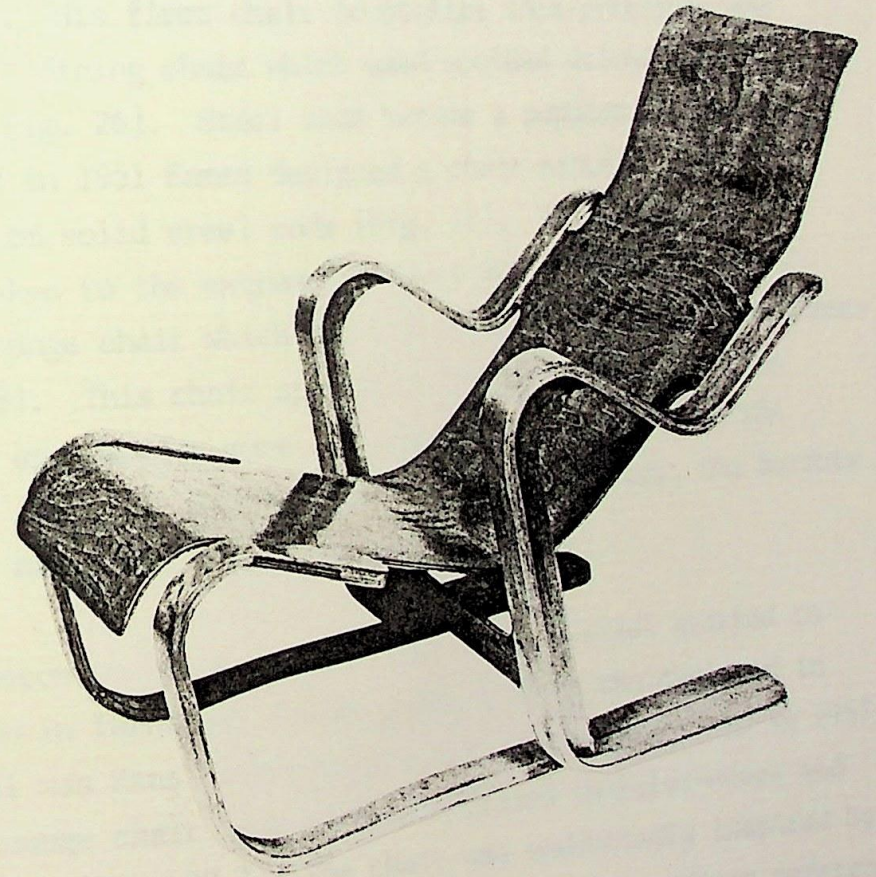


FIG. 25

THE POST WAR YEARS

Because of the shortage in materials imposed by the war, tubular-steel rarely appeared in the manufacture of furniture during the forties and early fifties. New techniques were developed, the most notable being the three dimensional moulding of plywood by Charles Eames. His first chair to utilize this principle was his 1946 dining chair which used moulded walnut ply and steel rods, [Fig. 26]. Steel rods became a popular material to work with and in 1951 Eames designed a chair manufactured completely from solid steel rods [Fig. 27]. This idea of wire chairs was taken to the extreme by Harry Bertolia who in 1952 designed a lounge chair which had the appearance of shaped chicken-wire [Fig. 28]. This chair specified for interior as well as exterior use appears far more suitable for the patio than the living room. Yet, despite this make-shift appearance, the Bertolia steel chairs have been widely successful.

During the second half of the fifties, tubular-steel started to be used again in furniture design. Among those who designed in tubular steel was Hans Eichenberger, a swiss designer, who in 1957 designed a lounge chair made of chrome-plated tubular-steel and rubber webbing, [Fig. 29.]. The chair was undoubtedly inspired by the classics of the 1920's. The seat and back make direct reference to Le Corbusier's 'Chaise Longue' [Fig. 19] while the sled type legs may be compared with Marcel Breuer's 'Wassily' chair [Fig. 7],

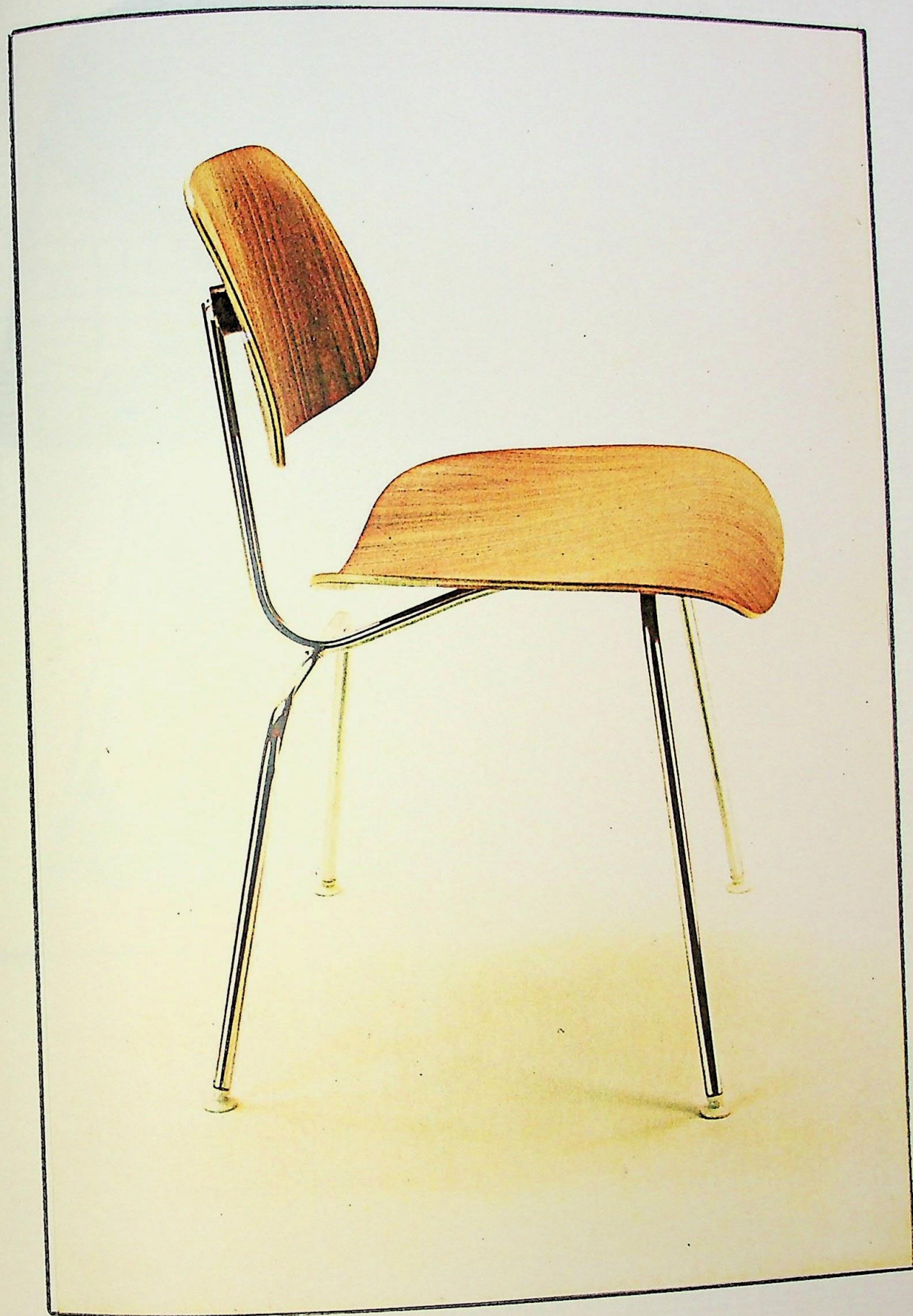


FIG. 26

FIG. 27

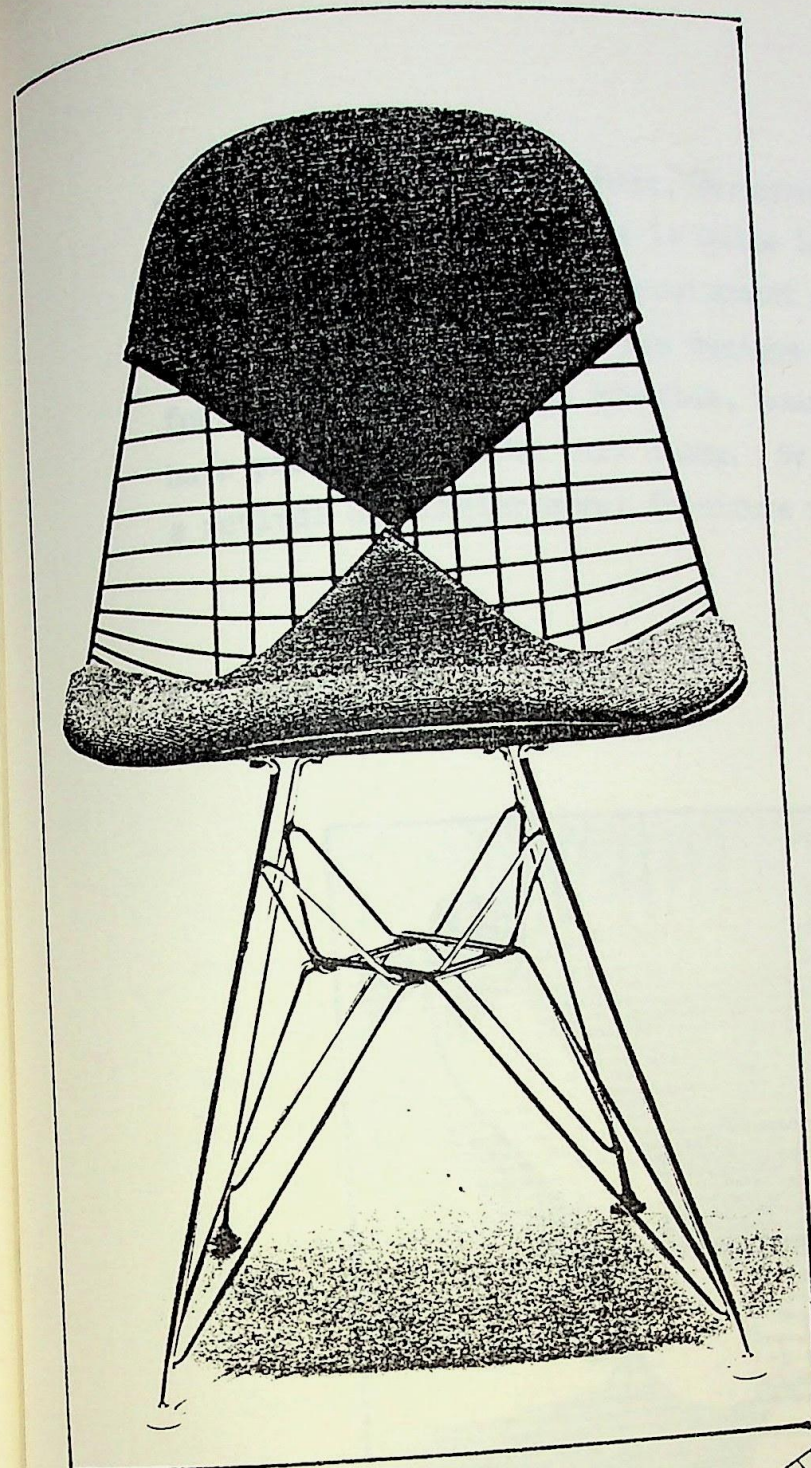
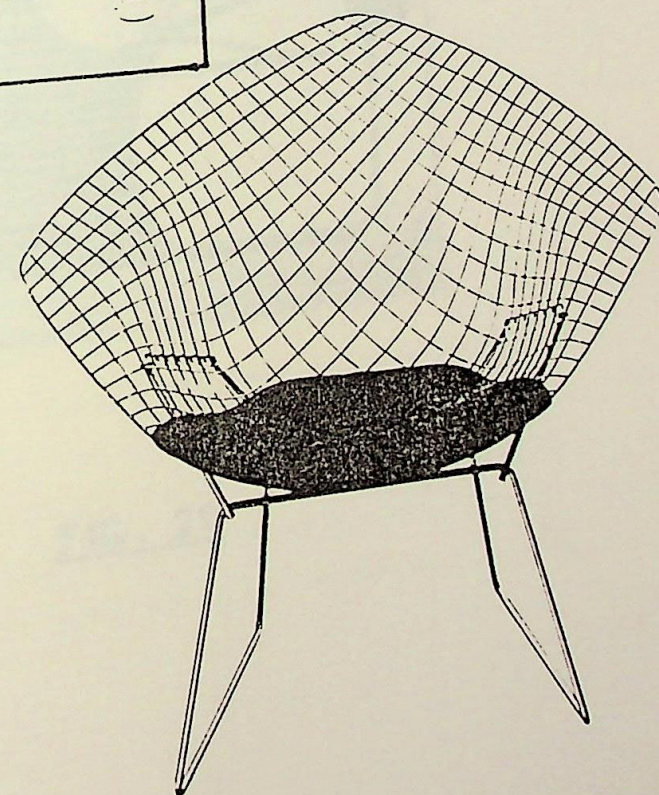


FIG. 28



the first tubular-steel chair, designed in the Bauhaus. The borrowing of old principles is quite legitimate for it is only then that improvement and development can take place. In 1927, Marcel Breuer stated that his designs were developed until no further improvement was possible, however, the past few decades have proved him to be very wrong. By the end of the fifties, a revival of tubular-steel furniture was again underway.

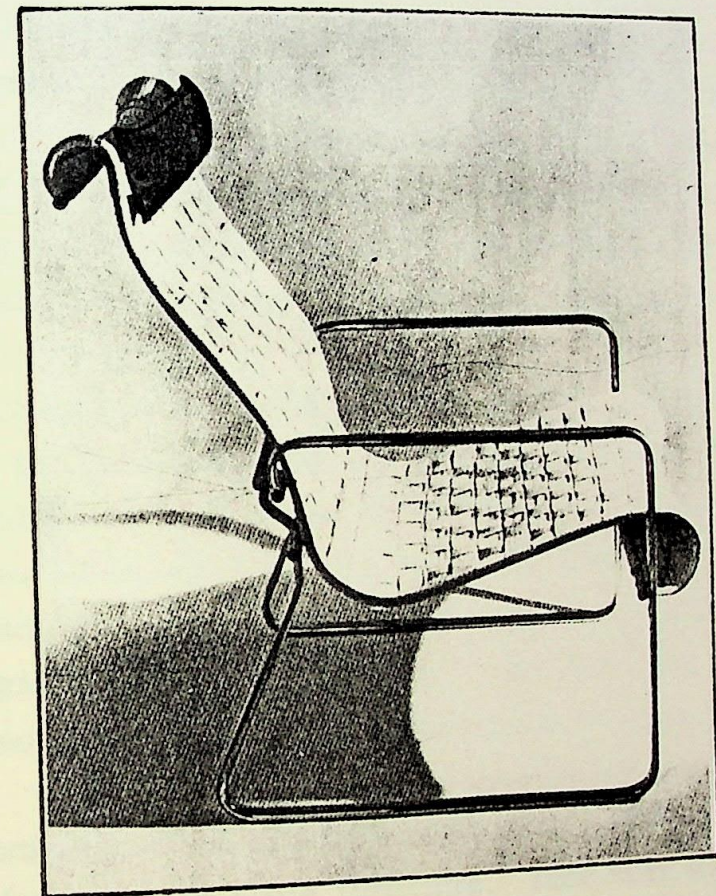


FIG. 29

THE SIXTIES ONWARD

Many forces combined to make the sixties a lively and facinating decade in the arts, in technology and above all socially. Youth emerged as a strong market force. The 'Swinging Sixties' was an iconoclastic decade and inevitably produced fashions and designs, for furniture and domestic objects to match the mood of the period.

The strongest link of the sixties furniture with the previous decade was in the persistence of the International Modernist revival. The decline of organic modernism, which was evident during the fifties, (Charles Eames work) saw the return of International Modernism which had taken on a chic new image. International Modernism became a very prestigious style of furniture. It dominated the contract market but was also widely apparent in domestic decoration.

The sixties saw the extensive revival of chromium-plated tubular metal for seat and table furniture. Zeev Aram and Associates of London began to manufacture, under licence, the Bauhaus and Le Corbusier Classics. In the late 1970's a number of designs were added to this range from another pioneer of modernism, Eileen Gray. The revival of a new modernism, along with tubular-steel furniture, in the sixties, was an international phenomenon.

Among its exponents was Achille Castiglioni from Italy. Castiglioni is best known for his kneeling stool for Zanotta and his 'Arco' Light for Flos. In 1969, he designed an armchair [Fig. 30] called 'Castiglia' which is also manufactured by Zanotta. The chair can be bought with either a chrome plated or white laquered steel tube frame with leather or canvas slings. The frame is made up of two pieces of tubing, the same piece serving as back legs and armrests. The armrests are not upholstered which was going against Breuer's idea that the sitter should never be allowed to touch the framework of the chair. This is an example of the inevitable slacking of the stringent Bauhaus ideas over the years. The very same year (1969) Marcellor Minale, and Brian Tattersfield of Great Britain designed a stacking chair 'MTPI' which is manufactured by their own company [Fig. 31]. A striking resemblance exists between this chair and the 'Castiglia' chair. The only differences are the alternative coverings and the fact that the two sections are welded together in the Italian design and screwed together in the English version. The similarity of these two designs in the treatment of the different angles cast some doubts as to whether they are both original designs.

Another designer who worked in tubular steel was Sigurd Persson from Sweden. His rocking chair [Fig. 32] with a tubular steel frame and rattan seat is a direct development of the 1851 cantilevered rocker, carried out in a functionalist style. The rocker which was produced in 1967 also bears testimony to the ingenuity of Thonet rockers [Fig. 33] which were designed 107 years previously.

This link with the past is very beneficial in the design world but it is important that past designs are developed upon with improvement in mind and not pirated for commercial gain. In a 1986 medical supply catalogue it becomes apparent how classic designs of past years have been changed to suit other purposes other than their original applications resulting in a disastrous piece of commercial kitsch. [Fig. 34] shows a beautitians couch which is almost an exact replica of Le Corbusier 'Chaise Longue' but by the repalcement of the leg section has lost all of its masterly qualities.

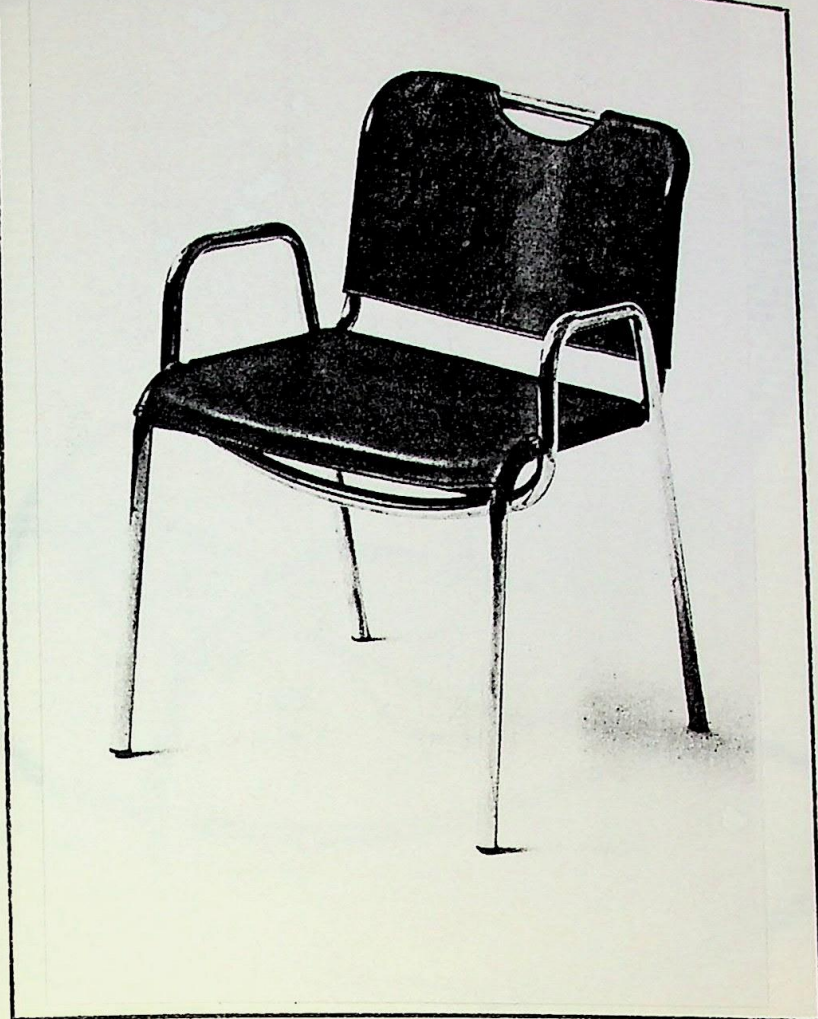


FIG. 30

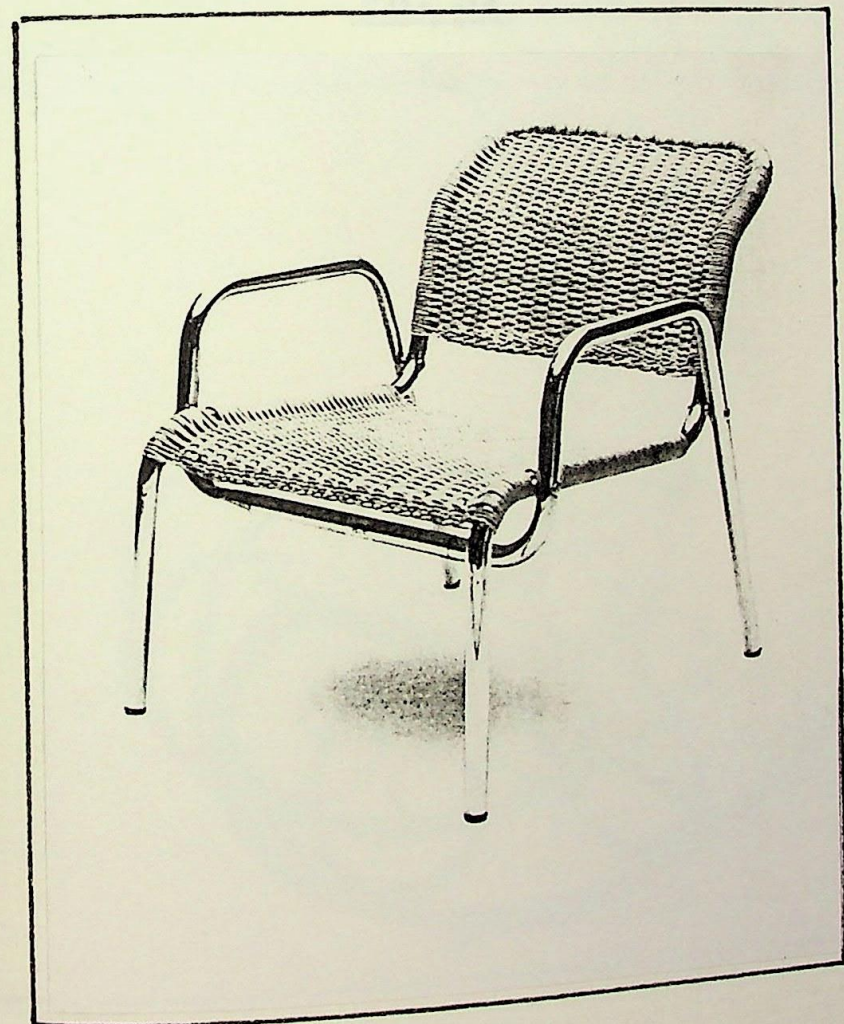


FIG. 31

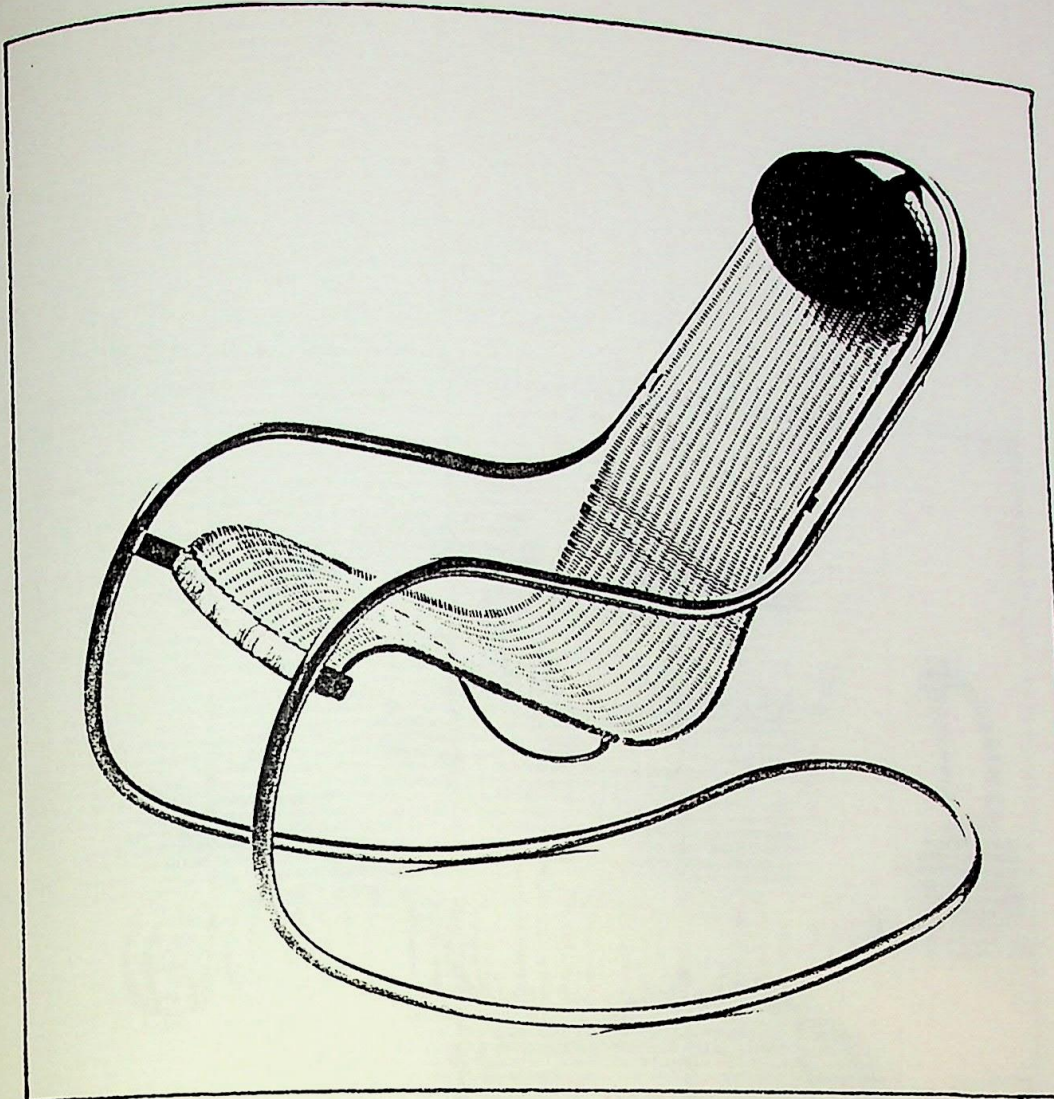


FIG. 32

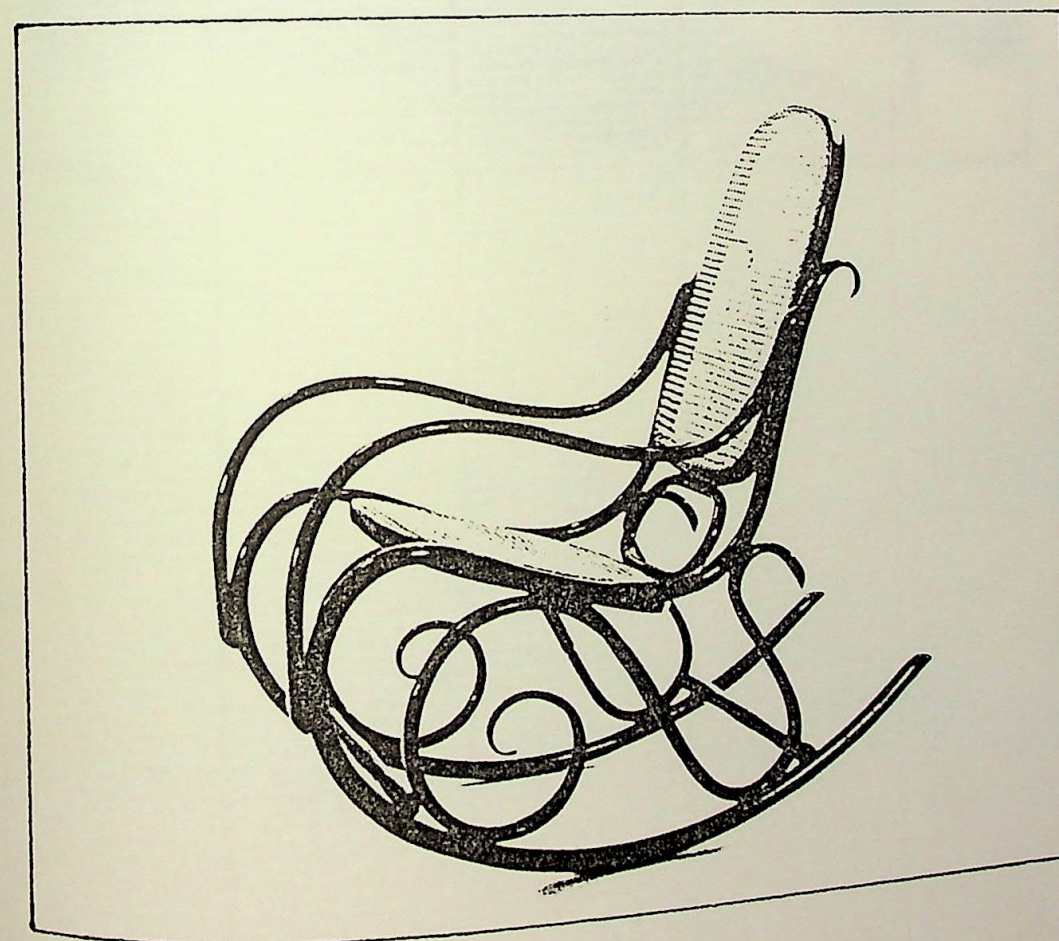


FIG. 33

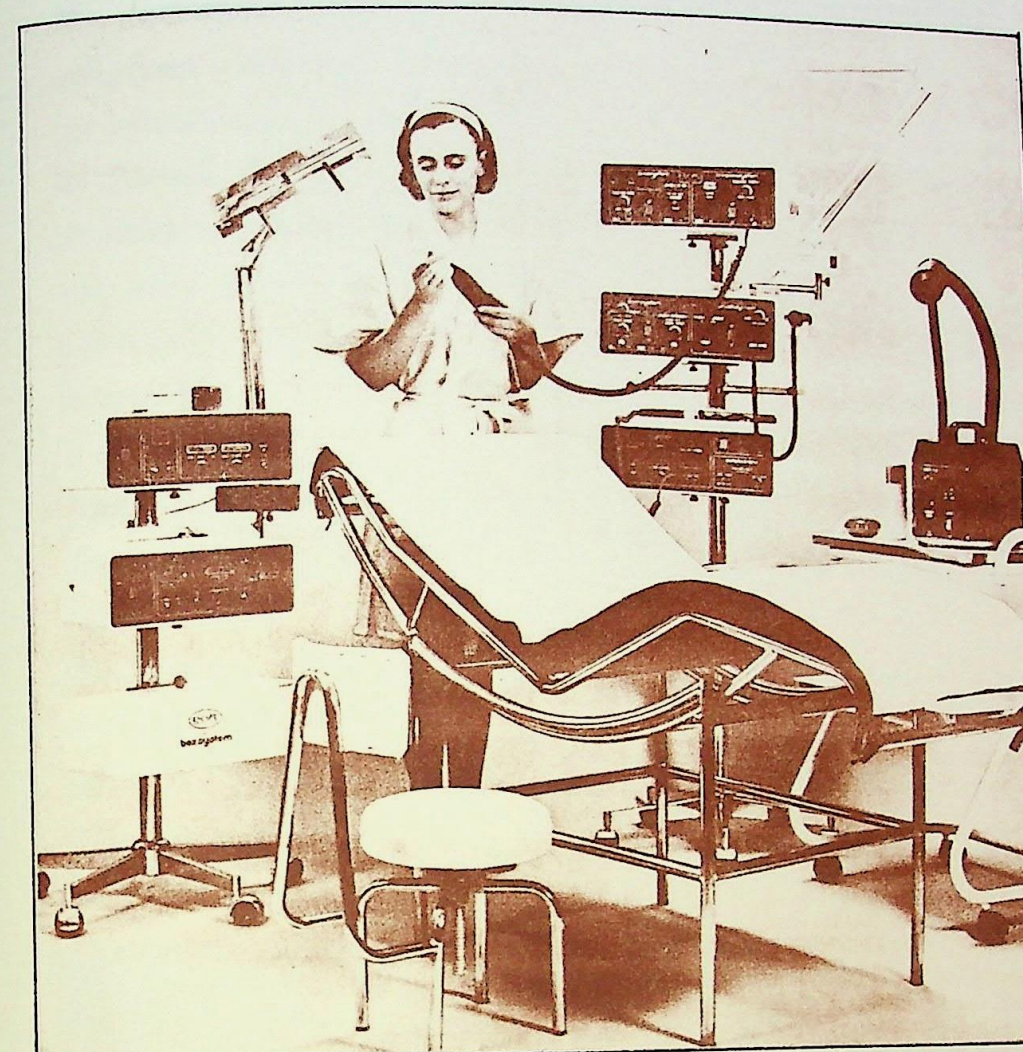


FIG. 34

During the seventies, the popularity of tubular steel furniture began to decline although there were still new designs being produced. Frank Mingis' 1972 Easy Chair is a good example of this [Fig. 35]. The 'premier' chair with a frame of chrome plated tubular-steel, has polyfoam cushions and slings of canvas or suede. This modern design is remarkable in that it has basically the same structural framework as Marcel Breuer's 1926 'Laccio' stool, [Fig. 10] but is used as an armchair. Breuer had realised the potential of turning his stool on its side in the development of the cantilevered chair but he obviously overlooked this unique and innovative use of the structural framework.

Today in the eighties, the old classics of the twenties are being produced by Cassina and Knoll and tubular steel furniture has firmly rooted itself as a status object. This would probably disappoint the pioneers of this furniture for it is contrary to everything their furniture stood for. Nevertheless, the 1920's and the following decades produced some classic tubular-steel furniture which can still be appreciated today despite the loss of its idealistic origins.

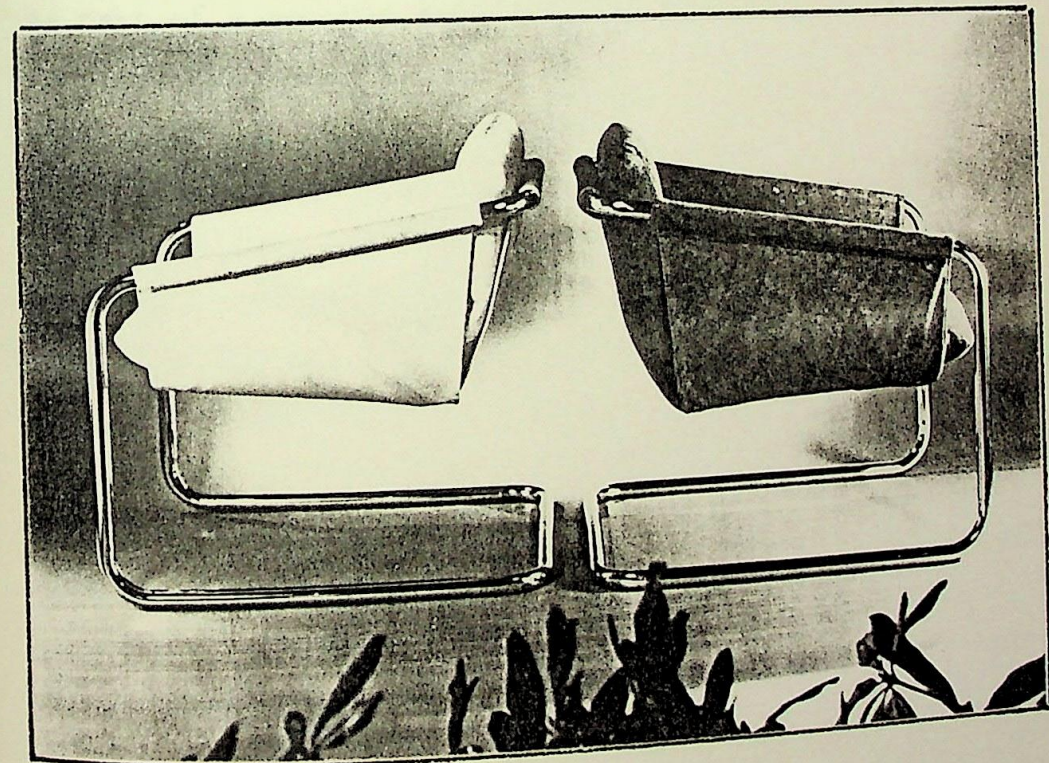


FIG. 35

CONCLUSION

The 1920's in Europe, witnessed dramatic changes in designers' attitudes to materials, and their applications. But if the idea of turning to the methods and materials of industrial production haunted the 1920's we must be careful to distinguish carefully between those real attempts to bring down the cost of everyday furniture for the working class or middle class market, and the artistic (and elitist) use of the idea of industrial production as part of a machine aesthetic. The story of the modern chair shows how a purely artistic set of ideas, born out of the mixture of Constructivist and De Stijl concepts could spread, once they were given the impetus in Germany around 1925. And yet the rage for metal furniture was short lived compared to the continuing process of improvement and rationalization evident in the history of a firm like Thonet. Cheap furniture continued to be mostly made of wood, except for certain functions where durability was of prime importance, such as Breuer's auditorium seats [Fig. 8]. Only when new developments in plastics made it possible to reduce the number of components to a minimum (while still employing an intrinsically cheap material) was a significant change to occur in the manufacture of cheap mass-produced furniture.

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