The Influence of the Bauhaus on Contemporary Office Furniture.

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Fourth Year Industrial Design.

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1.Introduction.

Many historians believe that one cannot comment on the present without having a knowledge of the past. This is due to the fact that what exists in the present reflects in many ways what has come before. In relation to design it can be argued that every product is derived from or has been influenced by designs that have gone before. For example, whether a modern chair is completely different aesthetically and technically from previous chairs, the alterations that took place, took place in relation to the previous designs. This is true for most industrially designed products because it is from previous designs that we learn what features should be maintained and enhanced and what details do not work well and should be altered. In this way the world of industrial design is a world of constant re-invention. The work of an industrial designer involves continually up-dating and improving existing products in what may be described as a form of evolution. Therefore, the design of furniture is an ever changing and ever progressing field. Many of the factors that influence the changes in furniture design include the introduction of new materials, technological advancements and changes in society.

Designers often design with regard to the future. They attempt to predict how society will develop so that they can have all the relevant amenities ready for the future world. This is necessary in design because, as society is constantly changing, by the time one's design has come in to production, society may possibly have moved ahead and the design may already be dated. Therefore, designers try to design with regard to the future, not only in relation to the possible needs of society but also in relation to new and developing materials and technologies. It is often interesting to look at and examine the works of designers and to see how accurate their predictions were. Their success can be rated in many ways including, possibly, some of the following points :

- how the particular designs and the designer have been remembered and acknowledged throughout time,
- how the product is still in use today, or, at least was in use for many years after its manufacture,
- how the designs and the ideas of the designer have influenced many of the designs that have followed, for example, features or a style that has been maintained.

One of the best examples of a group of designers who designed with regard to the future are those of the Bauhaus. It is the intention of this thesis to examine the theories and ideas behind the Bauhaus. Some of the prominent designers, such as Breuer, Gropius and van der Rohe, shall also be examined in relation to the work that they produced in furniture design. As it was the intention of many of these designers to design with regard to the future, this research will allow us to examine how accurate their predictions were. Any influences that the Bauhaus and its designers

have had on contemporary furniture can then be highlighted. Any differences that may exist between the furniture then and now can also be explored so as to reveal the possible reasons as to why they differ.

The area of contemporary furniture design that has been chosen in order to examine the influence of the Bauhaus, is that of office furniture. It is an area that is constantly changing and progressing so as to stay up-to-date with advances in technology. Therefore, the designs in this field are always extremely modern and even futuristic. One of the reasons why it was decided to analyse the Bauhaus in relation to office furniture include the fact that the designers of the Bauhaus were modernists and, therefore, they firmly believed in the notion that 'form follows function'. Contemporary office furniture is a prime example of functional design. There is little or no room in the modern office for ornament or decoration. A sense of efficiency and of clarity are what are conveyed via the interior design and the furniture of an office. "The office has stuck rigidly to a functionalist approach" (Williams,1993, p.30). This idea is similar to that embodied by the designers of the Bauhaus.

2.Aims and Objectives.

While researching this topic, many books and writings were found relating to the history of the Bauhaus, its teachings and its designers. But few were found that explored the influence that the whole Bauhaus era has had on contemporary furniture design. Hopefully, we shall be able to examine the extent to which the Bauhaus has influenced contemporary office furniture design. The main objectives of this thesis are:

- To briefly examine the history of the Bauhaus, including the ideas of the school,
- To focus on the prominent designers of the Bauhaus, and the work that they produced,
- To look at contemporary office furniture and to focus on several particular designs,
- To explore how the Bauhaus may have influenced the design of office furniture and to highlight specific examples of how this is so.

3.The History of the Bauhaus.

"Even in its brief lifetime the Bauhaus had become a legend .....For

the school set out, in a resurgence of optimism and idealism after the First World War, to train a generation of architects and designers to accept and anticipate the demands of the twentieth century" (Naylor, 1969,p.7).

Over half a century has gone by since the Bauhaus started its activities in Weimar in Germany. But it has since gained the reputation of being the most influential and significant centre of design in the 20th century. It was founded in April 1919 by Walter Gropius. Gropius had been appointed the director of the Weimar Art Academy and of the Arts and Crafts School. It was he who changed the name of this newly combined school to Staatliches Bauhaus Weimar and its teachings were primarily based on his own conception of art and design education. As early as 1913 Gropius had written, in the 'Werkbund Yearbook', about the important relationship that he felt should exist between the artist and industry: "The artist has the power to give the life-less machine-made product a soul. His collaboration is ... an indispensable part of the industrial process and must be regarded as such"(Wilk, 1981, p.17).It was with this idea in mind that Gropius went about setting up the Bauhaus. The program in the school began with a six month introductory course which would allow the student to become familiar with the basic principles of materials, colours and images. This time was also used to encourage the student to think for themselves, to be creative and to develop their own natural talents. The student would then be able to choose one of several courses to undertake. Each workshop involved studying with a different material. These materials included stone, wood, glass, metal, clay and textiles. In these workshops the students would work under the guidance of a Master of Craft and a Master of Form; from these they would learn the basic techniques of the craft and how to deal with form and content. The intention of this was to provide the student with a whole and rounded knowledge of the field so that they could feel free to apply this knowledge as they saw fit.

The first exhibition of the Bauhaus was held in 1923 and it marked a turning point in relation to the policy of the school. Until now students had been taught various skills and encouraged to develop their talents, but it was at this stage that Gropius emphasised the importance of the Bauhaus involving itself with industry. During the week of activities, which was part of the exhibition, Gropius gave a speech entitled "Art and Technology : The New Unity". In this speech and also in the book published by Gropius around the same time, entitled 'The Theory and Organisation of the Weimar Bauhaus', he emphasised this idea stating that "the Bauhaus believes the machine to be our modern medium of design and seeks to come to terms with it" (Wilk,1981, p.29).Some of those attending the school, and even some of its masters, did not approve of this union with industry. But it was not only from them that Gropius received objections. The Thuringian government, under whose jurisdiction the Bauhaus was at that time, was constantly putting pressure on the school. One of the only reasons that the school held its exhibition in 1923 and not at a later date was because of pressure from the Thuringian government.

Since it opened, the school suffered severe economic problems, as did all of Germany at the time. It was not until 1920, after the school actually opened,

that all the workshops were fully operational, and even then some were only run on a limited basis due to lack of equipment. But it was finally due to the Thuringian government that the Bauhaus in Weimer was forced to close. It was in April 1925 that the Weimer school was shut down and this was also partially due to the people outside of the school who did not approve of the unusual social, political and even artistic activities. But the school reopened within the same year in the town of Dessau. At this stage Gropius decided to enforce his new Bauhaus philosophy even further. The ceramics workshop was shut down and replaced by a graphic design course. The workshops themselves were no longer run by Masters of Form and Masters of Craft, but were now being run by a 'Professor'. Here the school existed under improved conditions as it now had better funding and was a flourishing institute for approximately a further three years.

What finally brought the Bauhaus to an end was internal feuding amongst the faculty members, along with continued criticism from those outside of the school. Eventually Gropius resigned as director of the school in 1928. Reasons for his resignation included, firstly, that he felt responsible for a lot of the criticism that the school received and, secondly, that he wished to work independently on his architectural projects. His resignation occurred around the same time as those of other professors, such as Breuer and Bayer, who also wished to begin working independently of the school. Yet it can still be said of the Bauhaus that while ".. its existence was threatened by shortage of funds, hostile officials and internal feuds....in its brief lifetime the Bauhaus had become a legend"(Naylor,1969, p.7).

A lot of controversy exists, even today, as regards the true originality of the ideas of the Bauhaus. The de Stijl movement had occurred just previous to the beginning of the school and its focus was on constructivism. While this theme was also prominent in the Bauhaus, many students denied the possibility that the school had been influenced by de Stijl. These students believed that "tendencies 'parallel' to de Stijl and other constructivist groups had developed independently at the Bauhaus"(Wilk, 1981, p.25). While this may be true for some designers at the time, many of the pieces of furniture produced in the Bauhaus displayed an obvious influence of de Stijl, particularly the works produced by Marcel Breuer during this period. Yet, whether influenced by de Stijl or not, the achievements of the Bauhaus meant that it did more than any other organisation in the twentieth century, or in the nineteenth for that matter, to unite man and his man-made environment: "..indeed the whole de Stijl effort was to be greatly overshadowed, however, by the exceptional expressions of Modernism nurtured in the progressive atmosphere of the Bauhaus" (Garner,1980, p.96).

The main foundation of the idea for the school was based on the combination of design and technology and, whatever its influences were, the ideas of the Bauhaus were extremely progressive for that time. It realised the significance of the machine and wished to come to terms with it and to use it to the advantage of mankind. It used all possible resources, technical, artistic, scientific and intellectual, in

a significant attempt to create the perfect environment in which to live, both functionally and spiritually. "It is this essential humanism, based on an attempt to understand man's psychological as well as his physical needs, that has been the Bauhaus's most important contribution to twentieth-century architecture and design"(Naylor,1969, p.7).

4.The Teachings of the Bauhaus.

"While Arts and Crafts designers believed that good design should be available to all classes, ...their work, in practice, was available only to the wealthy. Designers of the Bauhaus saw the remedy in high-quality machine production; they sought to bring industry together with art in order to create prototypes for mass production, and they saw the need to develop new techniques and materials to make this possible" (Stimpson, 1987, p.60).

As stated earlier, the Bauhaus was set up so as to train designers and architects to design for the twentieth century. Gropius wished to create among the students an understanding of the design of a product so that they, in turn, could be able to apply the product with ease to mass-production methods. He wished to combine the artist with the craftsman with the intention that the work produced would not only be of excellent quality, but would also be affordable by the mass-market.

Thus, the basic aim of the school was to train designers so as to enable them to produce high-quality, functional designs for mass-production. It was the designers of the Bauhaus who realised that the only way that it was possible to provide well-designed products for people of all classes was to design products for the purpose of high-quality production. Therefore, it was necessary to develop new materials and new techniques of manufacturing: "It was an idea which combined the objective values of standardisation and technology with the humanism of craft production and thereby confronted, even if it did not resolve, the major issues in the education of the designer in this century"(Sparke,1986, p.161).The 'education of the designer in this century' consisted of training them to apply artistic as well as practical and technological methods in the designing of products. This evolution was sparked off by the ideas of Gropius in the Bauhaus. He firmly believed that, by providing functional, well-crafted products for the mass-market, it would create a harmonious environment for mankind in which to live which would in turn improve society on a whole. Although few products were actually mass-produced that had been designed by designers of the Bauhaus, the idea was there and it was from there that this idea expanded and resulted in a revolution in the design of furniture and furnishings. It is beyond doubt that "the teachings at the Bauhaus sowed the seeds none the less for modern industrial design education. It eagerly embraced mass-production and attempted to instil into students a vision of the new technological society and its constraints"(Sparke,1986, p.161).

And so, how did these ideas affect the style of the products ? Designers of the school often argued that their designs were styleless. This was due to that fact that their intention was to design products for purely functional reasons. They believed that in a modern functional product that there was no room for style. But, in actual fact, by designing for the future and in relation to machinery, the forms that were created embodied a style all onto themselves that represented this idea. Their lack of decoration and functional qualities *was* their style. "The point that emerges is, of course, that despite all protestations of stylelessness, the foremost designers at the Bauhaus were in fact masterful stylists who embraced a functionalist, machine aesthetic, but appreciated nonetheless the profoundly cerebral stylistic potential of the strict disciplines which they willingly imposed upon themselves"(Garner,1980).With changes in materials and methods of production, it was inevitable that the style of the products would develop also.

There was certainly no room in these designs for excessive ornament. Their aesthetic qualities developed along with the changes that were taking place with regard to technological advancements. The clean style that did develop was due to the merger of art and technology. This new and more functional style symbolised the progressive attitude that was present at the time, and this was not only portrayed through the aesthetics of the end product but also by the means of reaching it : production, packaging, marketing and use. The 'beauty' of the products was partly derived from the fact that they were well designed and that they clearly displayed and fulfilled their function. As Gropius himself said ,"An object is defined by its nature. In order, then, to design it to function correctly – a container, a chair, or a house – one must first of all study its nature; for it must serve its purpose perfectly, that is, it must fulfil its function usefully, be durable, economical, and 'beautiful'"(Marcus, 1995, p.14). In this way the 'beauty' of the designs was partly derived from the fact that they clearly displayed and fulfilled their function.

Another factor that determined the 'beauty' of the products was the particular stylistic characteristics of the individual designer. Every designer has their own particular style, even if it is influenced by the designs of others. For example, while the work of Marcel Breuer was said to have been influenced by the de Stijl movement, as mentioned earlier, there was also a distinct and unique style to his designs. The tubular steel furniture of Breuer, created during his stay at the Bauhaus, generally displayed a sense of lightness and mobility. The simple framework and neatness of his designs portrayed an image of airiness. In examining the Club Armchair, (fig. 1), it is observed that, as with other chairs designed by Breuer, the person seated seems to be almost hanging in air. This image is created by the light fabric seat material that is suspended across bars, and so, like the seating, the person is also suspended in the chair. While this image of lightness is part of the individual style of Marcel Breuer, this style has inspired and can be seen to be reflected in many examples of contemporary furniture.

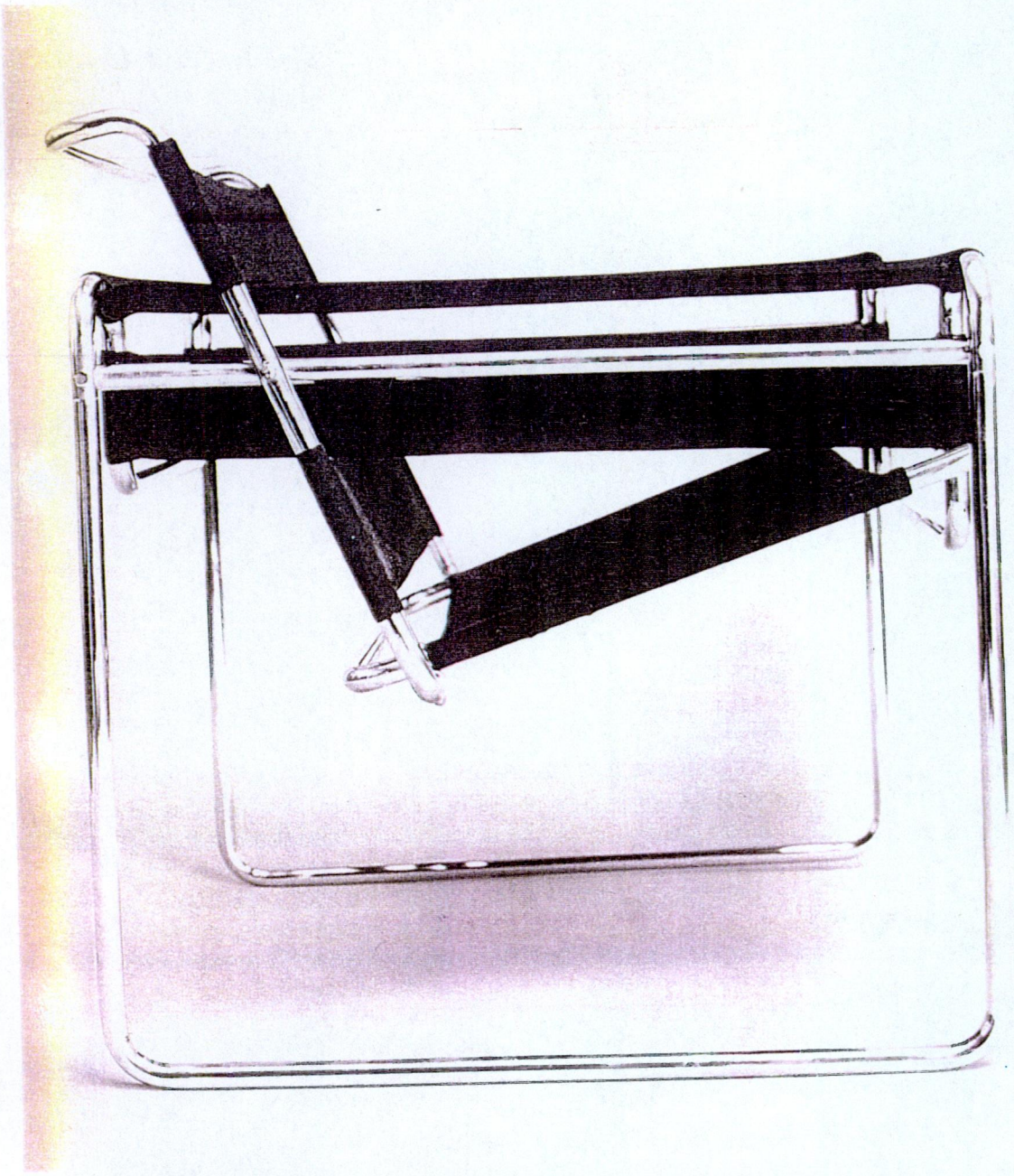


Figure 1. The Club Armchair designed by Marcel Breuer in 1925

5.Marcel Breuer and the Introduction of Tubular Steel into Furniture Design.

Out of the Bauhaus came some of the greatest and most influential designers of this century, including Breuer, van der Rohe, and Gropius himself. But the designer that possibly achieved the most during this time is Marcel Breuer, as he was the one who introduced the use of new materials into furniture design and has, therefore, become a pioneer of industrial design. Having joined the Bauhaus as a student in 1920 Breuer entered the wood-working workshop. It was at this stage that he began to develop his own knowledge of materials and his own sense of what design was about. Breuer eventually left the school as a professor in 1928. During his time there he brought about great changes in the field of furniture design. He spent much of his time exploring the relationship between form and space. Breuer believed that a piece of furniture should be light, mobile and adaptable to different environments. While, at the time, furniture was usually made from wood and was often quite large, heavy and adorned with decoration, Breuer succeeded in creating visually light and spacious furniture, producing a wide range of designs. Breuer also designed in relation to standardisation, this was due to his interest in the possibility of mass-production. But Breuer realised that one of the main problems in attempting to mass-produce products at that time arose because the majority of designs were made from wood, which tended to cause problems. This is mainly because, at that time, machinery for producing furniture did not exist and, therefore, furniture made from wood was hand-crafted and this was a particularly time-consuming process. And so he set about exploring the possibility of using different materials.

Inspired by his bicycle and the way in which the arms curved, Breuer decided to apply the use of tubular steel to furniture design. Originally Breuer went to seek the help of the Adler company, which was a plumbing company based in Dessau, but they refused to help him. And so, in1925 Breuer eventually bought his own steel tubing and, with the help of a plumber, began designing furniture that was to result in a turning point in world of furniture design. "The tubular steel furniture of Marcel Breuer.... was a totally independent and deliberate approach to the problems of rationalisation, industrial production, and distribution, cast in a medium that had a new and distinctly modern presence"(Marcus,1995, p.89). He accepted the idea expressed by Gropius that furniture of the twentieth century required a combination of art and technology that would result in creation of quality, efficient products by mass-production. And so it was Breuer who took the first brave step in reaching this goal by introducing into the world of furniture design a material that had never before been applied to this purpose. Along with many other designers, he then went on to explore all the possibilities of designing with this new material.

6.The Office Environment.

Since the closure of the Bauhaus in 1928 there have been many changes and developments in relation to the world of furniture design. Some of these changes include:

- The constant introduction to design of new materials, from different plastics to man-made fibres,

- The introduction of new materials which often requires or inspires new methods of production. These methods usually tended to be faster and less expensive than the ones that had gone before,

- Rapid advancements that have been taking place in the field of computer technology, especially over the last thirty years or so.

As was stated at the beginning of this thesis, the world of design is constantly progressing as man strives to improve and modernise his environment. But, however the methods of improving man's environment might change, the objectives are generally the same all the time. These objectives include the designing of products that are functional, efficient and stylish. These requirements are particularly true for furniture for the office environment, as there is certainly no room in a modern office for inefficiency or unnecessarily decorative designs. The office is a modern and efficient environment and this is portrayed through the furniture and the interior design which should, therefore, also be modern and efficient.

One of the greatest changes that has occurred in the office environment in recent years is the introduction of computer technology. Since its introduction into this environment in the 1960s, computer technology has resulted in many changes in relation to the work being done in the office. Many different areas of work can now be dealt with via one computer. This means that office workers now find themselves sitting in their seats for a much longer time than they would have previous to this. Initially this resulted in many problems for the worker, problems mainly as a result of the computer itself and its incompatibility with the office furniture. These problems included sore eyes and headaches that were due to the computer screen, and pains in the back, neck and arms, all experienced by the worker. The pains experienced were a condition known as Repetitive Strain Injury (RSI). This occurs when a person is sitting or situated in a poor position or is straining a muscle for a long period of time and can often result in permanent damage. Hence, office furniture had to be redesigned to account for the introduction of technology to the workplace. "No matter how rapidly man adjusts to technological change, he cannot keep pace with all the social, economic, psychological and political implications of technology"(Naylor, 1969, p.156).Designers today are still designing office furniture with the intention of improving the life of the worker, who still experiences problems.

7.Contemporary Office Furniture.

What are the basic requirements of contemporary office furniture ?

- The modern office is an extremely competitive and fast-paced environment. Companies are constantly changing as they grow, develop and branch out and so it is often required that the interior of the office also be changed, for example, to allow for new staff or new technology. Therefore, one of the most important requirements for contemporary office furniture is that it is relatively mobile and flexible. It should be easy to move it around the office and to be able to change the office layout without much difficulty. The height of the chair, and possibly the desk, should be adjustable for different people and for different functions. It is often an advantage to have accessories that can be added on to the desking unit, such as shelves or drawers. This option gives the user more control over their office furniture and its uses.

- The actual office desk should not be so large as to take up too much space in the office. But, in relation to the tasks being performed, it should provide enough room for all necessary appliances, for example, the computer, telephone, fax machine. These products should also be within easy reach of the user, particularly those that are used most regularly. The work that is being carried out at the desk should determine its size and shape .... form follows function.

- Stylish and aesthetically pleasing furniture are required so as to make the office environment a pleasant place in which to work. Any unnecessary decoration or ornament makes the environment appear cluttered. In office layout and planning it is always important to utilise the space provided in the best possible way, getting as many people working in the area provided as possible, without having them cluttered. Therefore, while the furniture should be appealing to the user, any unnecessary ornament only functions in taking up valuable space. What makes a piece of furniture stylish is its simplicity and efficiency in fulfilling its function. If a product is streamlined, simple and clearly displays its function, it is then, in turn, aesthetically pleasing to its user. "Systems have developed, responding to both technological and human needs with more sophisticated details, added functions, and smarter styling"(Williams, 1993, p.34).

8.The Influence of the Bauhaus on Contemporary Office Furniture.

When examining the Bauhaus in relation to the field of contemporary office furniture it can be found that many of the objectives laid out by the designers of office furniture reflect those of the Bauhaus. One of the main objectives of the Bauhaus, as stated earlier, was to 'unite man and his man-made environment'. Man's environment is continuously changing due to changes in society and technological developments, hence the process of uniting man with his surroundings is an ongoing one. It can be found that, today, in the design of office work furniture, the focus of the designer is on producing user-sensitive products that will function in uniting the user with their environment. This whole idea was initiated by the designers of the Bauhaus and will continue to be an important factor well on into the future. To create user-

sensitive designs it is necessary to understand man's physical and psychological needs so as to design in a way that provides for all his possible requirements. It has been stated earlier that the Bauhaus attempted to explore the combination of technology with the humanism aspect of design. This was one of the most important contributions of the school towards design in this century. The designers of the Bauhaus were the first to look at design at such detailed levels and yet this idea is still in existence today and can be seen in the design of office furniture.

Gropius truly believed in providing functional designs that were well-crafted and, that, while this would eventually unite man and his environment, it would, in turn, improve society as a whole. A similar idea is conveyed by the designers of office furniture. They are of the opinion that if an office worker is provided with efficient, user-friendly furniture that this will, in turn, increase their productivity. The health of the worker is improved as there is less chance of them experiencing R.S.I.. And on a large scale the companies annual yield should increase with the increase in productivity of their workers,"studies by the Norwegian State Institute of Working Physiology ... found that when seating and workstation changes were made to improve back problems alone, absenteeism dropped by 50 percent and turnover declined from 40 percent to 5 percent over a four year period"(Zelinsky, 1991, p.118).

It was the intention of the designers of the Bauhaus to design products for 'purely functional reasons'. Unlike the designers before them who focused on craft and ornamental design, in the Bauhaus they believed that there was no room for unnecessary ornamental details. They believed that what made a 'good design' was when it fulfilled its function efficiently and when it could be clearly seen, simply by looking at the product exactly how it fulfilled this function. Breuer himself stated that "elements should receive different forms as a natural consequence of their different structural purpose",(Amery,1991). Similarly the importance of contemporary office furniture is primarily placed on the function of the design. What with the need for efficiency in the office, there is no room in the office environment for unnecessary decoration or ornamental features on the furniture. As work in the office must be done without interruption or interference, furniture that clearly displays its function and fulfils this function accurately is what is required. As regards furniture design of both eras, the foundation behind them was based on the idea that 'form follows function'.

The basic aim of Gropius in starting up the Bauhaus was to unite the world of craft with that of industry with the intention that high-quality, well-crafted designs could be mass-produced and in that way made available to the mass-market. It was this idea that inspired him to be the director of the Bauhaus and he spent his time there transforming this idea into a reality. It was his opinion that the machine was "the enemy neither of beauty nor of style. On the contrary it is the potential means of bringing both beauty and sound design to a vast public"(Garner, 1980). While this idea of combining craft and industry for mass-production is in use today, a similar problem faces contemporary designers, it is the union of design and technology. The world of technology develops so rapidly that design can often be left behind. It is therefore the

aim of the contemporary office furniture designers to combine technology with design so as to continue providing high-quality products for the mass-market. The problem lies in the fact that "furniture manufacturers continue to do their part, and computer companies do their part ... but the opportunities lie in the coming together of both factors to determine the real needs of the worker"(Interiors, 1991).

Gropius was planning for the new technological society and its constraints, now that that new society is here it is necessary for its designers to plan for its future. It was the designers of the Bauhaus that decided what the requirements of modern furniture were to be, in Breuer's opinion it involved: "good, well-formed, independent models, whose main characteristics are mobility, lightness, and where possible, transparency" (Naylor, 1985, p.152). A prime example of a range of products that are available on today's market that are mobile, functional and devoid of ornament are in the field of contemporary office furniture.

9. Chair Design - the Appearance and Use of Air.

One of the first ideas that has been chosen so as to show how the Bauhaus has influenced contemporary office furniture is this idea, by Breuer, of people sitting on air. A strong theme that seems to run through his designs in tubular steel is this sense that the seat is "suspended above the ground - or, more correctly, floating within a network of lines and planes(Wilk,1981,p.40). So as to show how he felt the future of seating design would, or should, develop Breuer created a photomontage in 1926, as shown in fig. 2. From this it can be seen how Breuer believed that the 'perfect' seat would eventually consist of "resilient air columns"(Wilk,1981,p.41). It was Breuer's belief that air would be the ideal 'seating' material providing comfort and flexibility for the user and that this form of seating would possibly exist in the future. His designs in tubular steel, in which the seat is suspended in the chair, show how Breuer was striving towards this idea of 'sitting on air'.

Designers today, who create furniture for the office environment, are also still seeking the ideal chair. As the understanding of the public towards design increases so too do the demands made on the designer. What with the office environment being a place of advancement and precision, the demands upon the designer working in this field are particularly high. Breuer designed furniture that reflected the idea of 'sitting on air', as do many contemporary designers. But designers of contemporary furniture not only design chairs which reflect this image, they have, in some ways, turned this idea into a reality.

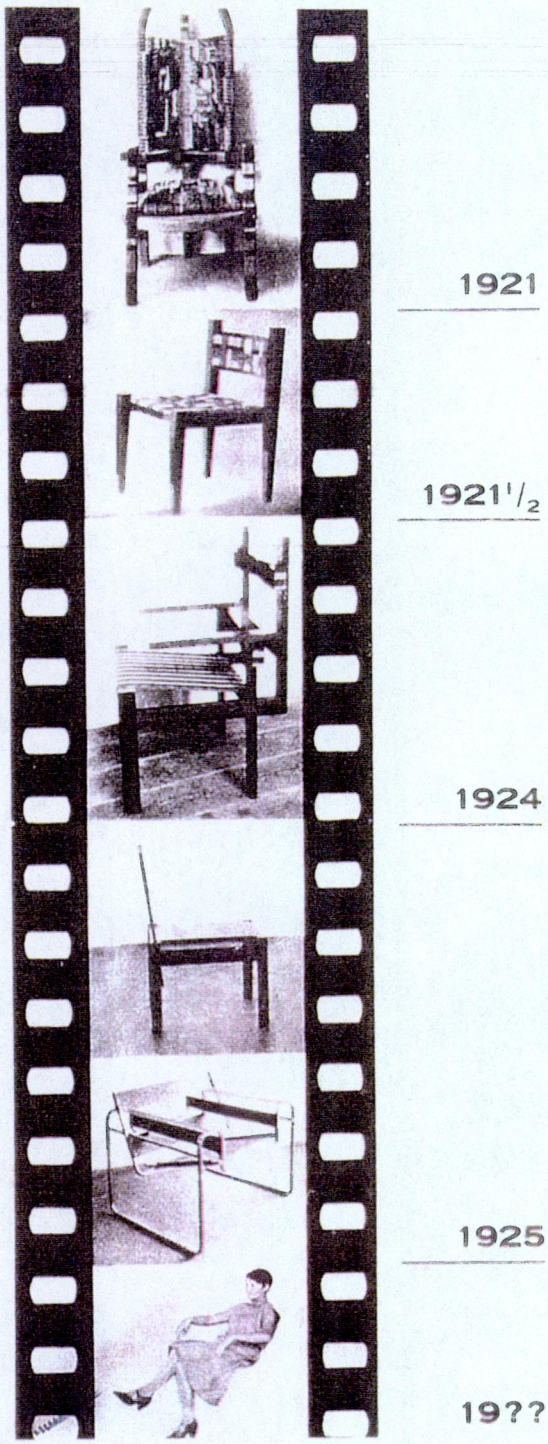
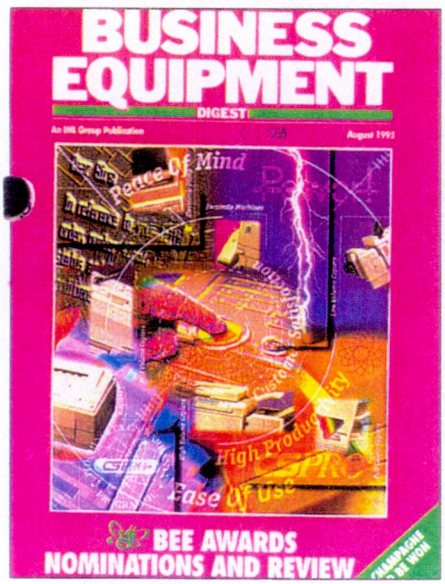


Figure 2. The photomontage created by Breuer in 1926.

An extremely literal example of a piece of contemporary office seating that utilises air as a 'material' in its design is the 'Lisboa' chair from the Carleton Seating Company. The title for the advertisement for this chair, shown in figure 3, reads 'Floating on Air'. While this advertisement literally resembles the idea first introduced by Marcel Breuer, the actual chair displays this idea in the workings of the design. The chair works in such a way that the seat height can be adjusted by an air lift mechanism, hence the seat is actually resting on pressurised air and, in this way, the user is 'floating on air'. The adjustability of the seat height, to suit people of different sizes, adds to the 'perfection' of the chair.

FLOATING ON AIR



The innovative Lisboa chair from Carleton Seating is one of only five chairs nominated in the prestigious Business Equipment Excellence Awards. The award scheme is run by the leading magazine 'Business Equipment Digest', whose readers cast postal votes.

Lisboa is a multi task chair whose air lift mechanism is simpler and more robust than gas, the conventional lift system. If the pressure is lost, it can be restored by use of a foot pump, whereas a gas lift has to be replaced. Pressure in the system can be adjusted to suit the weight of the user. Lisboa features contoured foam cushioning with a choice of medium or high backs. There are also cantilever and low legged versions for visitors.

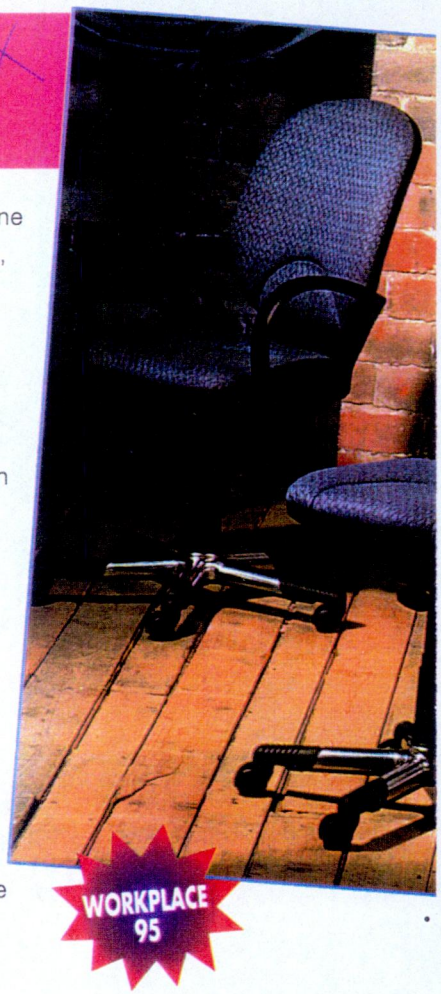


Figure 3. The Lisboa office chair produced by the Carleton Seating company.

The notion of 'air' in this chair is also achieved in the appearance of the Lisboa chair. Instead of having four legs leading from the seat to the floor, it has one main 'stem' which leads down to five small castors. This not only gives the chair a sense of lightness but also conveys the mobility of the chair. The wheels allow for the chair to be easily moved around by the user, even when they are seated.

10.The Comfort of the Chair.

While one of the main aims, with regard to the design of furniture at the Bauhaus, was to design products for mass-production, another feature which was also taken into consideration and examined was that of the comfort of the user. This can be seen in the way that Breuer explored the idea of sitting on air. A lot of the furniture produced by the designers of the Bauhaus was as a result of functional analysis. Tests were carried out and any decisions that were made were as a result of these. As stated by Breuer in 1925: "The starting point for the chair was the problem of creating a comfortable seat and combining it with simple design. This led to the formulation of the following requirements:

a) Elastic seat and back rest, but no heavy, expensive or dust-collecting cushioning.
b) Angling of the seat so that the full length of the upper leg is supported without the pressure arising from a horizontal seat.
c) Angled position of the upper half of the body.
d) Spine left free, since any pressure on the spine is both uncomfortable and unhealthy." (Droste, 1990, p.82).

All items of furniture produced by Breuer, and other Bauhaus designers at this time, could be justified by this form of functional analysis. The comfort of the user had never before been studied in such a detailed and anatomical way - once again, the Bauhaus was a pioneer in this field.

The requirements listed by Breuer may differ slightly from those of a contemporary designer, due to more detailed tests taking place and the constant introduction of new materials. In modern society, what with greater expectations of the public, the awareness of RSI and other factors, industrial designers are now required to examine the ergonomic and anthropologic aspects of a design in greater detail. No decision can be made with regard to the design of a product without justification. This functional analysis of products has reached advanced levels with the introduction of computer technology into the world of industrial design. In figure 4 we are shown the structural analysis of a seat designed by the Lamm furniture company, Italy. The company claim that this particular seat, the A1000: "adapts to any position, uniformly distributing the weight and offering correct support" (Lamm, p.3). Figure 5 is from the Klober Cresta catalogue and it displays: "the synchronised movement mechanism" (Klober Cresta, p.11),which enables the user to adjust the seat to suit their personal body weight. The detailed analysis of the product, its functions and its relationship with the user, displayed by these seats, show the extent to which technology has allowed

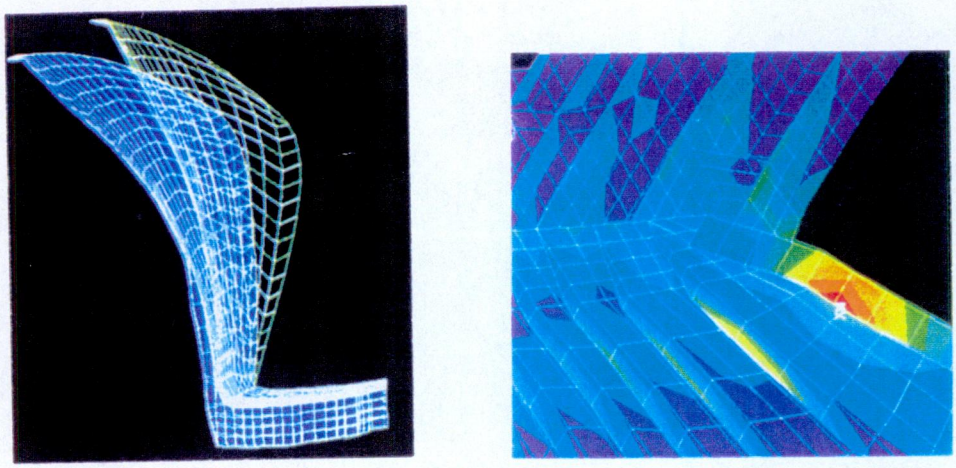


Figure 4. The structural analysis of a seat designed by the Lamm furniture company, Italy.

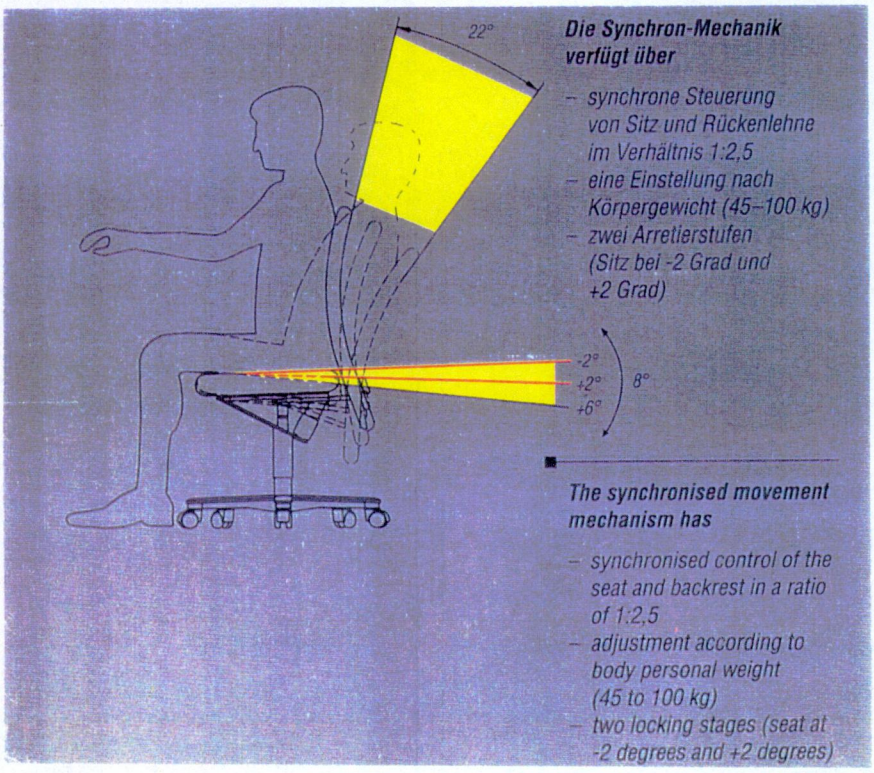


Figure 5. The 'synchronised movement mechanism' of the Klober Cresta office chair.

man to improve his environment to extents that have never before been achieved. Yet, while the research performed by Breuer may seem somewhat primitive in comparison to this, it was he who first began to look at furniture in such an analytical light. It was he who initiated the idea of designing furniture to suit the user and their requirements. It was he, whose designs: "half a century later, remained as modern and contemporary, as vital and relevant, as anything designed in our own time" (Dormer, 1987, p.182).

11.The Cantilever Chair - Mobility and Materials.

Ludwig Mies van der Rohe was the final director of the Bauhaus from August 1930 until its closure in July 1933. Before this he had been a student in the school. As director van der Rohe also taught architecture to senior students. While his main profession was that of an architect, van der Rohe produced a small amount of furniture during his period at the Bauhaus. This furniture, and in particular his cantilever chair, have become some of the greatest pieces of work produced by the Bauhaus. This cantilever chair, produced in 1927, was marketed by the Thonet furniture company in 1932 and was eventually reproduced by the Knoll International furniture company. This chair has been described as : "the most visually exciting of the cantilever chairs of the 1920s" (Sparke, 1986, p.48). What the chair consists of is a seat and back which are suspended from two semicircles of tubing which form the only supports. The seat and back were available in either leather or cane. In observing the chair, in figure 6, it can be seen that due to the materials used and the simplistic form of the chair, it has the light and airy appearance first introduced into furniture design by Breuer. But while Breuer created and developed the tubular steel chair, he never actually succeeded in designing a truly 'good-looking' piece or one that was commercially successful. It therefore remained for van der Rohe to create a successful and aesthetically pleasing steel chair. Tubular steel is a strong and yet flexible material and it was van der Rohe who, through the design of his cantilever chair, really utilised the tensile capacity of this material. His chairs have been described as being : "more comfortable because the resilience of the suspended tubing gives them a kind of springlike action resembling, in some sense, the back-and-forth motion of a rocking chair" (Dearstyne, 1986, p.99).

Figure 6. The cantilever chair designed by Mies van der Rohe in 1927.

The natural flexibility of the tubular steel allowed for the user to experience a kind of 'bounce' when sitting on the chair. This cantilever chair, from the Bauhaus, was one of the first to introduce the idea of movement into the frame of the chair. This idea of a moveable frame was successful in providing greater comfort for the user.

The style of the cantilever chair has not altered greatly over the years. Contemporary cantilever chairs still retain the simplistic form based on those first introduced by the Bauhaus. Remarkably, despite advances in science and technology over the last fifty years, the chair shown in figure 7, which comes from the Klober Caddy range of office furniture, is made from tubular steel. The fact that this chair is made from the same basic material that was first introduced into furniture design by Marcel Breuer in 1925, certainly highlights the overwhelming influence that the work done by the designers of the Bauhaus has had on contemporary office furniture. The Klober cantilever chair also portrays an image of lightness and mobility due to the simplistic style of the chair and the way in which the seat seems to be hanging in air. This image of lightness, as well as the actual physical lightness of the chair, which is achieved by the materials and how they are used, results in a chair which is ideal for the office environment. Due to the constant changes and developments that take place within this environment, the mobility and flexibility of the furniture is an essential requirement. Because of its use of tubular steel the Klober chair also has the natural 'springlike action' provided by the flexibility of the material. This, along with the upholstered seat and back, provides the user with an extremely comfortable, and yet simple, chair.

One of the differences between the cantilever chair by Klober and that by van der Rohe is that the seating area of the contemporary chair is made from a single plastic shell. The cantilever chair designed by van der Rohe consisted of a section for the seat and a separate one for the back, of either leather or cane. But for the Klober chair the seat and back are combined into one plastic unit that is covered in foam and fabric upholstery. Designers did not begin exploring the possibilities of introducing plastic into furniture design until after the Bauhaus had closed, "It was not until after the Bauhaus period that Mies and Walter Peterhans considered stamping chairs and other furniture out of plastic, a pioneering idea at the time" (Dearstyne, 1986, p.103). In the design of the Caddy range of office furniture, plastic is being used in conjunction with tubular steel and other materials. As with the tubular steel, the properties of this material are being utilised in the design of the chair. The plastic shell allows for a certain amount of elasticity. Therefore, when the user leans back in the chair, it moves slightly so as to support them: "Allows flexible leaning movements above the lumbar area" (Klober Caddy).

Figure 7. The cantilever chair from the Klober Caddy range of office furniture.

12.The Design of Free-Standing Furniture.

One of the major contributions of the Bauhaus to the world of the contemporary office environment is the idea of free-standing furniture. While this idea may have firstly been developed in the domestic environment, for example, by Breuer in the homes of his tutors, they, none-the-less, went on to be incorporated into and become a vital part of the modern office. While attending the Bauhaus, Breuer designed furniture for the homes of many of his tutors, including Gropius, Kandinsky and Muche. In the Muche living room Breuer placed a simple and neat desk in the middle of the room, as shown in figure 8. The desk was a simple box-like construction and, as seen in the picture below, was extremely light in appearance and, therefore, did not intrude in on the spaciousness of the room.

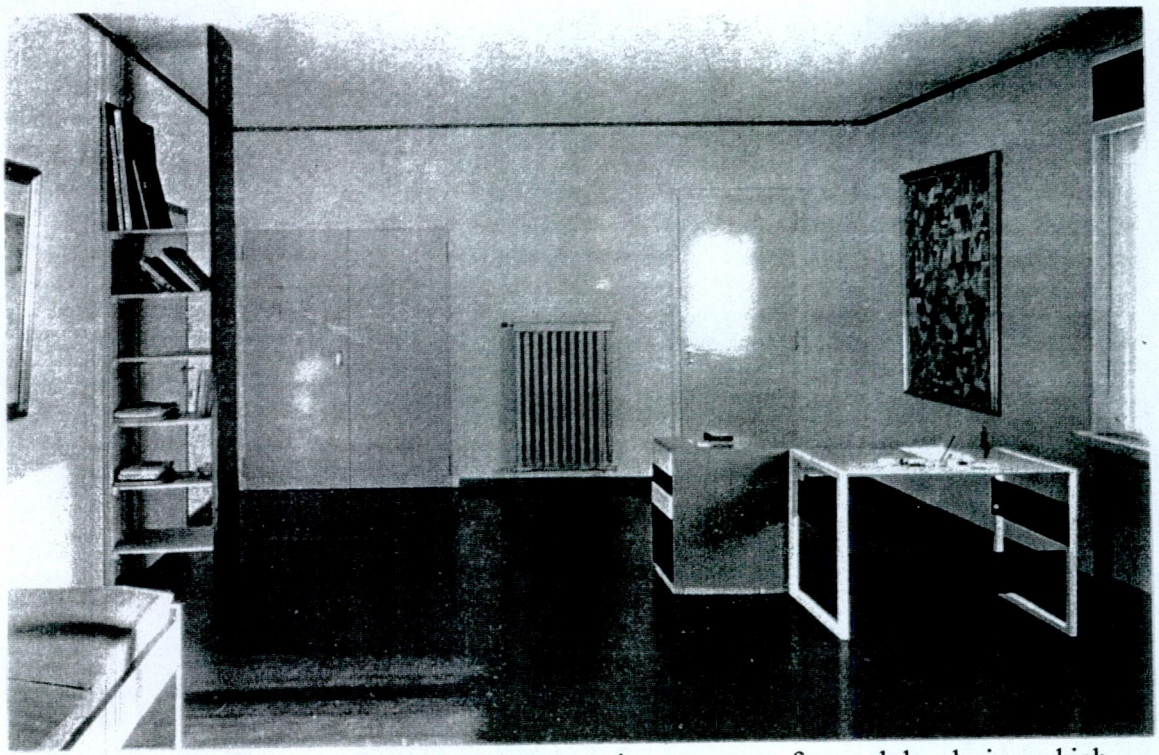


Figure 8. The desk and drawer unit were part of a modular design which Breuer worked on in 1926.

While advances in technology have resulted in some changes in the functions and requirements of office desks, the basic requirements of these pieces of furniture has remained the same over the years. Marcel Breuer believed that furniture should be designed in relation to the space that it occupies: "The pieces of furniture and even the very walls of a room have ceased to be massive and monumental, apparently immovable and built for eternity. Instead they are more opened out, or, so to speak, drawn in space. They hinder neither the movement of the body nor of the eye. The room is no longer a self-bounded composition, a closed box, for its dimensions and different elements can be varied in many ways" (Naylor, 1985, p.148). This statement by Breuer is almost like a prediction if we look at it in relation to today's world. It actually describes the modern office environment - open-plan layout, mobile, variable furniture.

In the office in figure 9, which displays the Sonata range of furniture designed by the Carleton Furniture Group, it can be seen how none of the desks are facing the walls and few are even in contact with it. This is a result of the fact that a lot of contemporary office workstations are designed to suit open-plan offices.

Figure 9. The Sonata range of office furniture from the Carleton Furniture Group.

The furniture is, therefore, designed in relation to the space that it occupies, or, as Breuer stated, it is 'drawn in space'. The partitions on some of the workstations shows one way in which the desks have been designed in relation to open-plan offices. These partitions provide a certain amount of privacy for the worker, while not restricting their view or isolating them. These partitions, along with drawer units, desk extensions and other features can be attached to, or removed from, the basic desk unit as required. This is one of the most important features of contemporary office furniture - the variety and interchangeability of components.

13.Furniture Range, Materials and Machining.

After he had left the Bauhaus, Gropius received a contract from the Feder Stores furniture company in Berlin between 1929 and 1930, to design a range of office furniture. The specifications for the design included that it was : "...simplified and standardised as much as possible; some parts had to be interchangeable ... Manufacturing processes were to be those of industry and not of the crafts; handwork was to be reduced. Furniture finishes were to be applied by mechanical means, rapidly cured, and resistant to wear. Variations were to be achieved by combinations of colours and grain. Packaging was to be improved to reduce damaging in shipping. (Isaacs, 1991, p.155). Remarkably, Breuer succeeded in meeting all of the requirements. The furniture consisted of a range of thirty three individual pieces that could be matched together in different ways. Therefore many office layouts were possible due to the wide range of pieces available. This is one of the first known ranges of office furniture that is interchangeable.

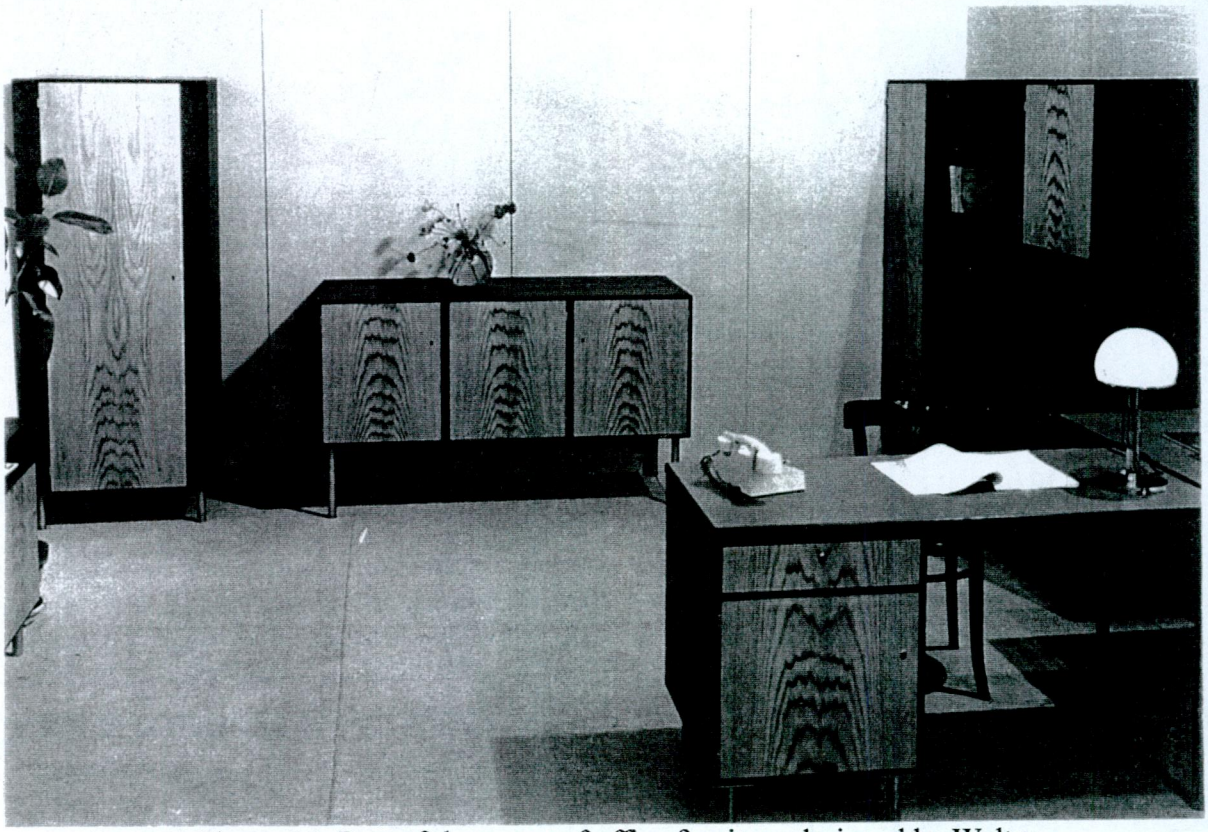


Figure 10. Part of the range of office furniture designed by Walter Gropius for the Feder Stores furniture group, 1929 - 1930.

Aesthetically, the furniture consists of clean lines and simple functional shapes, (fig. 10). The materials used by Gropius in the furniture range included wood, linoleum and metal. This is certainly a development from only five years previous to this, when Breuer had first introduced tubular steel into furniture design. The combination of the materials chosen resulted in strong furniture that was relatively light weight. The materials were also chosen because they were easy to machine and, therefore, the basic unit could easily be used with interchangeable parts.

Figure 11. Part of the '9-27' range of office furniture by Archiutti, Italy.

The requirements laid down by the Feder Store for Gropius could easily be used as requirements for contemporary office furniture. If we examine the '9-27' range of office furniture by Archiutti, an Italian furniture company,(fig.11), we see that there are many parts available and that this results in the availability of many layout variations. Some of the parts available in the range include: "desks, return desks,... modesty panels, pedestals, sideboards, bookcases" (9-27 office furniture, Archiutti). From the two pictures shown, it can be seen how the desks can be adjusted to suit the needs of the user. As those requirements change, so too can the workstation. Once again, this idea brings us back to Breuer. While attending the Bauhaus he once wrote that : "A piece of furniture ... is not an arbitrary composition. In itself impersonal, it takes on meaning only from the way it is used or as part of a complete scheme" (Naylor, 1969, p.119). In observing the 9-27 range of office furniture, one may feel that the Archiutti company actually based their furniture on this idea by Breuer.

Similar to the furniture designed by Gropius in 1929, this range is extremely functional in both its use and appearance. The clean, simple lines gives the furniture a light and yet practical appearance. As Gropius incorporated some of the latest materials of the time into the design of his furniture range, so too have the designers of the 9-27 range. The legs and under-frame are made from Epoxy-coated steel. The tops are available in Beech veneer and either laminate or melamine. Yet these materials were chosen and used for the same reasons that Gropius chose the materials that he did - durability, light weight, easy to machine and therefore relatively cheap to produce with interchangeable parts.

But one of the main differences between the furniture of then and now is that, in relation to the requirements list set out for Gropius, for contemporary workstations, the extra requirement that must be included is that they are designed to allow for the use of electronic equipment on their surfaces, including computers and telephones. Therefore, a feature that is included in many new office workstations is the room allowed for cabling to run along the desk without being obtrusive. In the 9-27 range of desks they have provided, running under the surface, a specially shaped cross-member to accommodate cables. It has retaining clips to keep the cables in place and outlet holes which allow for them to run onto the desk surface, (fig. 12).

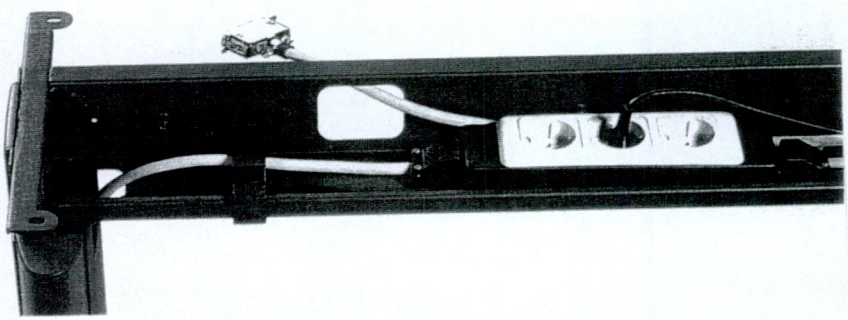


Figure 12. A specially shaped cross-member to accommodate cables in the '9-27' workstation by Archiutti.

The Sonata range, featured earlier, also allows for cables to run through the workstation. It's features include a sliding desk top for easy access to cables and, as seen in figure 13, the cables discretely run up onto the work surface, they are, therefore, non-obtrusive but yet easily accessible when required. In these two examples of contemporary office furniture the products have been designed purely around their functional requirements, this echoes the intentions and ideas of the Bauhaus: "to the Bauhaus the combination of the advantages of mass-production and the virtual abolition of ornament provided designers with a chance to make things that rejoiced in their function" (Amery, 1991, p.5).

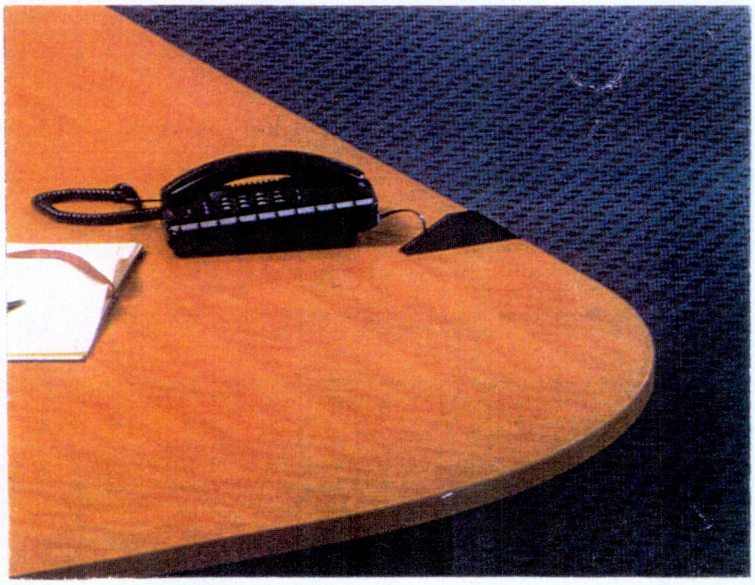


Figure 13. The Sonata workstation, by the Carleton Furniture Group, allows cables to discretely run up onto the worksurface.

14.Conclusion.

This thesis has found that the Bauhaus, from the ideas of Walter Gropius to the designs of Marcel Breuer, certainly had a profound effect on contemporary office furniture design. In the introduction were listed some of the ways in which the success of a designer could be rated. If we now look at the work of the Bauhaus and its designers in relation to this list, we find that, without any doubt, it fulfils all the requirements needed to make it a successful school.

- Designers, such as Breuer and Gropius, have not only been remembered for their work as industrial designers, but are considered to be the pioneers of modern furniture. It is the dedication and innovation of these designers that has resulted in the school being considered the most influential institute in the history of design. It was, for the time in which it existed, brave in its ambitions and bold in its methods of fulfilling these ambitions. "A few gifted men had recognised the potentialities of industrially-produced materials and mechanical methods ; and these pioneer industrial designers ultimately changed the whole characteristic of furniture and furnishings" (Gloag, 1960, p.186).

- Several of the pieces of furniture made by the designers of the Bauhaus were in use for many years after their production. While none of the designs from the Bauhaus were actually produced on a large scale, it was from the school that the whole idea of designing high-quality furniture for mass-production was instigated. One of the reasons that it was not accomplished at that time was because of the fact that the designers of the Bauhaus had only just begun to experiment with new materials that would have been suited to large-scale production. It remained for the designers that followed to turn this idea into a reality.

- The most significant method of rating the 'success' of the Bauhaus is to examine how the ideas of the school have had an influence on the world of furniture design. The areas which have been covered in this thesis, which highlight the influence that the Bauhaus has had on contemporary office furniture, include:

    - The idea of using air in seating for ultimate comfort and flexibility,

    - The design of furniture that is light and mobile in appearance and that is also, due to the materials used, light in weight,

    - The study of the man/product relationship so as to design the most comfortable chair as is possible with the available materials,

    - The use of materials that allow for machining and the interchangeability of parts,

    - The properties of the materials being incorporated into the function of the product, to increase comfort,

    - The style of the cantilever chair which has changed very little and some of which is still being produced from tubular steel,

    - The simple, clean style of the furniture, which clearly displays its function.

    - Allowing the design of the product to be influenced mainly by its function and therefore discarding any ornamental details or unnecessary features,

    - Designing products that are adaptable to different environments and different functions and that are therefore mobile and flexible.

All the aforementioned factors in design were initiated by the designers of the Bauhaus and are still relevant in the design of contemporary products. The modern office environment has been influenced by the Bauhaus and has adapted the ideas of the school to suit the changing needs of the day. While many of the products designed by the Bauhaus have influenced the design of contemporary office furniture, the strongest

influence contributed by the Bauhaus to the world of design is the *ideas* that it presented. The Bauhaus made a brave and practical attempt at achieving its goals, "it was the aim of the school ... to undertake systematic research in order to establish the appropriate formal, technical and economic requirements for design" (Naylor, 1985, p.125). While many of the ambitions of the school were not fulfilled, the ideas themselves were none-the-less revolutionary. It was the strength of these ideas alone that has resulted in the Bauhaus being the pioneer of design in the twentieth century. After all, as stated by Mies van der Rohe in 1954: " 'The Bauhaus was not an institution with a clear programme - it was an idea.' It was an idea which combined the objective values of standardisation and technology with the humanism of craft production and thereby confronted, even if it did not resolve, the major issue in the education of the designer in this century" (Sparke, 1986, p.163).

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