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TYPICAL CHAIRS, 1949-1968: AN ANALYSIS OF
STYLE AND EVOLUTION IN DESIGN

By

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PREFACE

This study is concerned with a definition of style in the design of chairs between 1949 and 1968. The primary objective was the development of a notation system for classifying and indexing the traits of chairs. Traits were identified and analyzed to reveal patterns of evolution and styles of the period.

The author wishes to express appreciation to her major adviser, Mrs. Christine Salmon, and research adviser, Dr. Kay Stewart, for their support and guidance throughout the study. Appreciation is also expressed to the other committee members, Dr. Anna Gorman and Dr. Kathryn Greenwood, each contributed to the study in her own unique way.

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CHAPTER I

INTRODUCTION

The culture of a society, whether primitive or highly civilized, is always revealed by the material objects which that society needs and the degree of skill which is displayed in producing or acquiring those objects (Burton, 1970, p. 3). Wallace observed that the most significant contribution to the growth of democracy by 20th century Americans was not in politics and government but in its role in the "widespread distribution of material goods" (Wallace, 1956, p. 2). As such, the objects of the twentieth century material culture are worthy of investigation.

In the past the systematic investigation of the objects of a culture has generally been confined to those of ancient or primitive cultures. However, Fleming (1958) expressed the view that this type of investigation is becoming "increasingly important in the study of recent and contemporary cultures" (p. 277). There is an increasing belief by historians that the "aesthetic expression of a culture" may be more typically found in folk art, carpentry, cabinet-work, metalwork, and craft forms than by the so called major arts (Fleming, 1958, p. 277).

The decorative arts, including furniture, reveal many things about a society through the style which they employ. The study of style helps to define the taste and form preferences of an age. For example,

understanding the difference between a room designed by Samuel McIntire and a John Henry Belter parlor may increase the understanding of the difference between the American culture of 1800 and that of 1850. Style periods are also important to the "subject of historical periodization" (Fleming, 1958), p. 282). The dates of such furniture styles as Chippendale (1750-1785) and Federal (1785-1815) identify aesthetic trends in American society which may be more significant than economic and political trends (Fleming, 1958, p. 282).

Furniture does not necessarily "speak for itself." It must be carefully studied to reveal evidence of its social and cultural influences. This study formulated a method of analysis of modern furniture which would make possible further investigation into the social and cultural influences revealed by modern furniture.

Need and Purpose

There was perhaps no period of greater furniture production in the United States than the years which followed World War II. Furniture was needed to fill thousands of new homes occupied by young families eager for the latest styles. These houses provided a good background for modern home furnishings, and furniture designers created new designs to fill the demand for modern furniture.

Despite the large quantities of furniture produced, Munro (1970) states that furniture design of these years has been only vaguely defined, as to its historical reference and definitive traits. Research was needed to define distinguishing traits, nomenclature, historical setting, and the morphology of furniture. Munro (1970) further states that until the main varieties of form and style are distinguished, it

cannot be determined how these forms arise in the course of history; how they influence other cultural factors and are influenced by these cultural factors. Hennessey (1952, p. 1) also states that a definite need exists for a reference guide where modern furniture design may be "compared and properly evaluated."

Much of the knowledge of the human past is based upon the visual products of man's industry. Things made by man accurately mark the passage of time and characterize the history of an age. Such facts are of consequence in their relation to culture, since every culture is a reflection of its art and products, among other things. Fragments lifted from the life of a period can reveal its nature, a reflection of the social, economic, and emotional changes of its time. To better understand the nature of the life of the 20-year period between 1949 and 1968, there must be greater understanding of the objects which characterize it. This study was an attempt to define the chair style of these years as a basis for further study into the social and cultural aspects of furniture.

All movements that contain something new and important acquire a following of imitators. The imitators of "modern" furniture created fake and faddish "modernistic" furniture. There was a need for a standard whereby modern furniture of these years could be judged.

With advances in new materials and technology there was evidence of a new wave of design in furniture. The new generation of designers were dedicated to producing affordable furniture for mass production. It was necessary to understand furniture forms of the recent past to give direction to new furniture forms for the future.

Certain features came forward in the furniture of the years

between 1949 and 1968 so that it could be analyzed. There was a need to identify characteristic furniture traits within their historical setting.

Much has been written concerning furniture production of recent years from a technological, design, and popular viewpoint. Numerous articles on these subjects can be found in trade publications, art and design journals, and popular magazines. Comparatively few attempts have been made to scientifically document and define the style and traits of furniture of these years. This study formulated a definition of "style" in chair design for the years between 1949 and 1968. A notation system was developed for classifying and indexing those traits which endured to become a style. These traits were then analyzed to reveal developmental changes and trends.

Objectives

This study had four major objectives. They were:

1. To develop a notation system for classifying and indexing traits of chair design.
2. To identify the traits of chairs which occurred year by year, for the years between 1949 and 1968, using this notation system.
3. To determine which traits were characteristic of the period and analyze those traits for patterns of evolution during the period, 1949-1968.
4. To examine the relationship among traits to identify the style or styles which occurred during the period, 1949-1968.

Assumptions

A need for historical research of furniture design of the period between 1949 and 1968 was based on the acceptance of the following assumptions.

1. Furniture is the product of materials and techniques that reflect the socio-economic, technical, and psychological aspects of an age. Chairs exemplify these many facets and have been selected for the study of the period between 1949 and 1968 to determine whether or not elements of a style can be discerned.
2. Certain features have come forward in the furniture produced between 1949 and 1968 and it can now be analyzed.
3. The period between 1949 and 1968 possesses characteristics that mark its boundaries as a period within the modern style.
4. Chairs included in the data sources were an accurate reflection of chairs of this period.

Limitations

The following limitations were acknowledged by the researcher.

1. The study is limited to a scientific analysis of the style of chairs manufactured and/or distributed in the United States between the years of 1949 and 1968. Study of other types, years, and locations, as well as in depth study of cultural, social, and economic implications of furniture design are

outside the scope of this study.

2. Secondary sources were used to obtain the sample for this study. Due to the number of chairs needed for the study and their lack of availability, it was not feasible to use actual chairs for collecting the data.

Definition of Terms

A definition of the following basic terms describe the main types of phenomena in their relationship to furniture.

1. Evolution--One definition of evolution, related to the arts, has achieved wide authoritative usage. It states two general specifications: (1) development, in the sense that implies a series of changes by which objects have acquired the characteristics which distinguishes the object, and (2) "descent with adaptive modification," implying a temporal sequence of change with some causal connection in which the objects become modified by adapting to new and changing environments (Munro, n.d., pp. 220-224). Whiton (1963) defined the concept of evolution as follows:

Each period style has been created by certain external influences, and as these influences have changed, the styles have slowly evolved into new forms (p. 10).

2. Form (Munro, 1970)--

Form includes the physical structure of objects and their outward appearance, as organized or constructed. Form does not consist only in the obvious shell or skeleton of the object where thousands of examples are alike, as in the mere fact of being a chair.

It includes the entire interrelated structure of each example, the materials and shapes selected, and the way in which these are arranged.

Form distinguishes styles, provides a means of analyzing structures of particular works so they may be compared with others, improves techniques for perceiving and understanding the distinct nature of individual objects, and aids in further observation (pp. 5-6).

3. Modern--The word "modern" is a relative term. It is what is typical of its time, and expressive of the life of its time. In this study it is used to mean the kind of design that has evolved within the past 100 years as this country's contribution to furniture design. "It was Mackintosh who probably first used the phrase 'modern movement'." The title 'modern,' however, 'gained its currency from Wagner's book, Modern Architecture, published in 1896" (Benton, 1975, p. xix).
4. Style--Style (Hauser, 1959) may be defined as an
 - . . . interrelated set of traits which is characteristic of the arts produced in a certain place by a certain social group or individuals. The chief historical function of style is to serve as a standard for judging the extent to which a particular work is representative of its time, and its relationship with other works of the same time and general type (p. 213).

The concept of style involves a "complex of interrelated traits" which are necessary to understanding the nature and historical position of the style (Munro, n.d., p. 252).
5. Trait--A trait may be defined as "any observable characteristic" in a feature of an object. Certain traits may be regarded as "more expression of the spirit" of a particular style than others and may be fairly "constant in the

classification of the style" of chairs (Munro, 1970, p. 25).

"Certain traits usually constitute the essence of a style, so that a work that lacks them cannot be classes as an example, or at least typical of that style (Munro, n.d., p. 255). For example, a cabriole leg constitutes the essence of the Queen Anne style, and without it a chair cannot be classed as typical of the Queen Anne style.

(a) Major traits: For this study, major traits refer to those traits which occurred most frequently and which were the most important in distinguishing the style of chairs during this period.

(b) Minor traits: For this study, minor traits refer to those traits which accounted for a small percent of the total traits but which were concentrated within certain few years in such a manner as to make them relevant to the study.

(c) Sub-traits: For this study, sub-traits refer to those traits which were considered to be an extension or variation of a major trait.

6. Type--"A class, group, or kind, distinguished on the ground that its members possess some trait or traits in common." The word type is "roughly equivalent to a 'kind,'" as in saying "a chair of its type." It suggests a category which has been "defined with some precision" (Munro, n.d., p. 228).
7. Typical--For this study typical is used to denote those traits or chairs which are most representative of the traits or chairs of the period.

CHAPTER II

DEVELOPMENT OF THE MODERN MOVEMENT

Introduction

Modern furniture is many things. It is the product of techniques and materials developed over the past century not previously considered appropriate to furniture manufacture. Materials such as laminated wood, metals, glass, rubber, and plastics are used without adornment. It is the furniture of the "machine age, of the chemist and the engineer" (Moody, 1966, p. 6). Modern furniture is utterly different in character and quality from that made in former times.

Furniture designs evolved slowly in response to needs and customs of the times. Prevailing architectural styles set the pattern for the furniture of a period. Joseph Downs (1942, p. xxxii) observed that the characteristic design was "expressed conservatively in the architecture, less conservatively in the furniture." The climate that nourished the growth of Twentieth Century architecture was the same that created the furniture of the period.

Since the Seventeenth Century chairs have been the most prolific furniture form. The parade of successive styles of chairs through the centuries reflects more than the whim of a craftsman who fashioned the furniture. A chair represented the cultural and social tendencies of the period in which it was designed (Bishop, 1972, p. 12).

Chairs have become the subject, not only of focal interest, but of research into problems of a social and cultural nature and of human comfort as well. The idea of western comfort is based on sitting with one's legs hanging down. This concept calls for support outside the body. "The chair, which is the framework for this support, records the notion of comfort as it has changed from period to period" (Giedion, 1948, pp. 260-261).

It was not until the Fifteenth Century that the first step was made in the evolution of comfort when nomadic furniture began to give way to that made for permanence and stability. The early notion of comfort was symbolic of honor and recognized as such in most cultures. It was not until the Eighteenth Century that the second step occurred when the idea of comfortable chairs spread to the general populace. In the last half of the Nineteenth Century the third step in the evolution of comfort came with the introduction of the mechanized mass-produced chair (Giedion, 1948, pp. 260-262).

Nineteenth Century Europe was the foundation on which modern Twentieth Century design rested, but it was in America after World War II that leading modern designers found the fullest scope for their talents. America was not "tradition-bound or rigidly purist," but instead a young and innovative country. It was therefore quick to adopt the new materials, processes, and techniques of this new style (Wilson and Leaman, 1965, p. 66).

Furniture has historically followed the development of architecture and its development within the modern movement was no exception. To understand the development of modern furniture it was important to

trace its beginnings through the history of the modern movement in its parent, architecture.

The Modern Movement

The modern movement had its beginnings in architecture. It did not come into being all at once, but evolved gradually as it became apparent that architecture based on scientific progress would satisfy modern needs in a way that some earlier architecture was not capable of doing.

Throughout history, the style of architecture and ornament has been determined by the knowledge of building techniques, tools, and materials used. These same factors conditioned modern architecture. However, it was not the discoveries of new materials and technology in themselves that produced the revolution in architecture in the Nineteenth Century. The principal reason why modern architecture came into existence was because the needs and values of the age were totally different from previous ages. The principal factor that made modern architecture different from that of the past was the quantitative explosion of invention and production made possible by the factory system (Richards, 1970, pp. 19-22).

By utilizing modern techniques and inventions, it was possible to create structures that were in tune with the times (Richards, 1970, pp. 27-31). By resisting the wrong use of the machine, more human structures could be created. Thus, modern architecture and design consisted in bringing the two elements of imagination and technique to terms with each other (Jordan, 1966, p. 243).

The Industrial Revolution

The break-up of the Eighteenth Century social order which started as an amateur interest in antiques had, in a few years, developed into a general historicism. The skillful application of these styles became the whole of architecture of the Eighteenth and early Nineteenth Centuries. For more than a century, until the mid-Nineteenth Century, architecture was dominated by "revival styles." A break with the authority of historicism was necessary to produce a truly contemporary style.

The Industrial Revolution was the greatest shaper of architecture and art of the Twentieth Century. It was not a purely Victorian phenomenon. Jordan (1966) observed that it was only one chapter of a continuous historical process that began in medieval England and continued to the present day.

When the Industrial Revolution came, it brought changes of incredible magnitude. The invention of the steam engine enabled machines in factories to produce goods in quantities unheard of before. The introduction of machine methods into industry created social and aesthetic problems, such as the housing of industrial masses, that have never been adequately solved. The spread of education among the masses brought about a new social order and formed a powerful new middle class of merchants and industrialists anxious to obtain the trappings that would reflect their newly obtained status.

What the Industrial Revolution meant to architecture was the "end of an era" (Richards, 1970, p. 21). The architect turned his or her back on the realities of industrial structures necessary to the growth

of the new industrial capitalism. In the new age of factories, bridges, and exhibition buildings, the engineer became the dominant force in architecture.

Ferebee (1970) noted that two aspects of the Industrial Revolution affected the appearance of buildings. First, new building techniques were made possible with the production of factory-made materials. Buildings could span greater distances and carry heavier loads. Second, and equally important, was the effect of the specialization of labor. The tradition of craftsmanship in which ornament was created as part of the process of making something and in which the ornament was related to the whole, gave way to machine production. Ornament, divorced from handicraft, no longer served architecture in the traditional way.

The symbol of this industrial era became the Crystal Palace which housed the Great Exhibition of 1851 in England. It was designed by Sir Joseph Paxton (1801-1865), an engineer and builder of greenhouses and indeed the building was a gigantic greenhouse. Jordan (1966) stated that the Crystal Palace was not the first building made of iron. It was, however, the first to attempt the transference of the metallic structural concept from the purely utilitarian field to that of architecture.

One of its functions, to let in light; and its technology, metal and glass bolted together, were both modern. The economy, lightness, and elegance achieved was an architectural revolution (Jordan, 1966, p. 130).

The full pre-fabrication and modular design made it a building without a sequel until the middle Twentieth Century (Jordan, 1966, pp. 130-131).

The bridges, harbors, and railway buildings were the works of great engineers of the period such as Telford (1757-1834), Brunel,

Stephenson, and Paxton. These structures were recognized "as being among the best architecture of the early Nineteenth Century" (Richards, 1970, p. 41).

New social revolutions were concurrent with the Industrial Revolution, and as the new middle class grew in numbers and prosperity, new demands were made for products symbolic of success. Products previously hand-crafted were turned out cheaply and in large quantities by the machine. Machine-made copies of handcrafted products flooded the market. "In the joinery and carving of furniture and cabinetwork the copying was very apparent" (Whiton, 1974, p. 378).

One of the problems to be resolved at the time was whether the machine-made objects could possess the essential qualities of art (Reed, 1954, p. xvi). It was in seeking the answer to this and similar problems that the roots of the modern movement took form. Often, using inferior materials, the machine produced forms and decorations which were imitative. How did the factory system modify design? Ferebee (1970) noted that it "fragmented the work process, displacing hand-craft techniques that had not altered for 1,000 years" (p. 8). Most industrialists did not regard the machine as a tool that could make an aesthetic contribution to design (Evans, 1973, p. 107), and so the design of products was dictated by the efficient use of the new technology. Thus, a new machine inspired style was predicated on the new aesthetic of function.

In the development of furniture during this period, Michael Thonet (1796-1871) turned to a material particularly suited to the use of steam power, beechwood. Steam-bent chairs were designed so that load bearing curves ran along the strong natural grain of wood. This made

possible both simple and fanciful chairs in which the decorative devices "never interfered with the anatomical soundness of the design" (Moody, 1966, p. 45). Thonet's chairs were ideal for mass-production and were sold in undreamt-of-quantities. The Vienna cafe chair, still in production, had sold over 50 million copies by the middle 1960's.

The new technology challenged the imagination of some progressive architects and designers, while at the same time formenting a regression to styles of the past by threatening the established social, ethical, and aesthetic values. These conflicting forces set a pattern which would characterize modern life--"machine and nature, production and reproduction, utility and beauty, past and present" (Ferebee, 1970, pp. 9-10).

After the mid-Nineteenth Century, moral questions arose concerning social issues created by the Industrial Revolution. These included unemployment, child labor, long working hours, and poor living conditions. Moralists argued for the return to handcrafts and suppression of the machine as a means of coping with the evils it produced. In addition, there were objections to the aesthetic quality of the products produced by the machine. These objections proved to be the catalyst in the development of a new design philosophy. Thus, social objections against the effects of the machine and aesthetic objections against the making of designs expressive of the machine brought forth a movement in England about 1860 dedicated to solving this dilemma (Ferebee, 1970, p. 9). It was to become known as the Arts and Crafts Movement and was destined to play a significant role in the shaping of the modern world.

Arts and Crafts Movement

John Ruskin (1819-1900) gave great impetus to the Arts and Crafts Movement in England. Ruskin hated the Crystal Palace and expounded the virtue of returning to the Middle Ages for inspiration, not only in architecture and design but in the social order as well. Ruskin's teachings took root slowly and it was William Morris (1848-1896), his one perfect student, who put these teachings into practice as the leader of the Arts and Crafts Movement which developed in the 1880's and 1890's.

The misuse of the machine led William Morris to attempt a revival of a genuine spirit of craftsmanship, to return validity to everyday design which had been lost when men who designed things were no longer involved with their production. Inspired by examples of medieval craftsmen using traditional methods, Morris conducted a passionate campaign to restore the genuine feeling of creativity to the decorative arts which had been lost with the lowering of standards of cheap mass-produced goods which brought ugliness into everyday life (Pehnt, 1964, p. 37). Morris knew that the re-establishment of values in the design of things for everyday use was essentially a matter of social conscience (Pevsner, 1973, p. 28). His greatest contribution was made in questioning how the machine was used, and by insisting that art and design be part of normal daily life (Whiton, 1974, p. 378). His failure was in trying to abolish the machine, in not admitting the machine was only an instrument, and in not campaigning for a "more intelligent use of it" (Richards, 1970, p. 36).

The success of Morris in spreading his philosophy was due in part to his own expert craftsmanship which was reflected in the simplicity of the furniture made by his firm.

Morris' firm concentrated on designing textiles, wall hangings, carvings, furniture, stained glass, and church decoration. Most of the firm's early furniture reflected the simplicity of the English cottage (Pevsner, 1973, p. 23). This simplicity and directness was reflected in the famous Morris chair. Made of heavy solid wood sections, the honesty of concept and simplicity of construction made this easy chair the symbol of the arts and crafts furniture.

Important names in the movement were those of Morris' friends, Philip Webb (1831-1915), Richard Norman Shaw (1831-1912), and Charles Voysey (1857-1941), all who shared Morris' philosophy of the importance of re-establishing aesthetic everyday surroundings. However, none of them felt the necessity of "establishing an original style of the Nineteenth Century" (Pevsner, 1973, p. 32).

Morris thought that by "pointing to the happiness of the Middle Ages he could persuade Industrialism to abolish itself" (Jordan, 1966, p. 182). In spite of the failure of this philosophy, the Arts and Crafts Movement made a lasting impression. Its curvilinear forms in decoration laid the foundation for the creative efforts of Art Nouveau and for the break with the historicism of the Nineteenth Century (Pehnt, 1964, p. 38).

The engineering triumphs of the early Nineteenth Century and the vernacular domestic architectural contributions of the Arts and Crafts Movement 50 years later were the two English contributions to the development of the modern architectural idea. Neither of these developments had any far-reaching influence in the country of their origin, and the development of modern architecture went no further in England (Richards, 1970, p. 67).

Art Nouveau

On the European continent signs of a coming change in architecture appeared in a different form. There the authority of "revival styles" was being undermined by a movement which became known by its French name, Art Nouveau. The Arts and Crafts Movement had been primarily a moral revolt against the machine; "the causes of Art Nouveau were primarily aesthetic" (Whiton, 1974, p. 379).

All over Europe the arts and crafts rebellion had prepared designers for a radically new decorative style. A few young artists had been experimenting for a number of years with imitations of Morris' work and using forms and ornament honestly expression of contemporary civilization which owed nothing to the past (Rosenthal, 1948, p. 21).

Undoubtedly influenced by the drawings of Arthur Mackmurdo (1851-1942) and Aubrey Beardsley (1872-1898), the movement started in Belgium in the 1880's and was led by Henri Van de Velde (1863-1957). The style consisted of an expressive and forceful use of flowing lines based on botanical forms of flowers and vines and biological forms such as peacocks and butterflies (Evans, 1973, p. 111).

Its influence on the applied arts was seen in furniture, fabrics, wrought iron, and stained glass, which were the great successes of the Paris Exposition of 1900. Its popularity spread throughout Europe and the United States. Most successful as a system of interior architectural ornamentation, "its historic importance was derived from its originality" (Whiton, 1974, p. 379).

Much Art Nouveau furniture suffered from the conflict between the less tactile nature of wood and the demands made upon it by the style.

In France, Emile Galle (1846-1904) and Louis Majorelle (1859-1929) were important furniture designers of the style. Majorelle obtained an unprecedented freedom of form in his furniture by first modeling in clay, thus obtaining ceramic or metallic curves in the wood. Much furniture of the style fashioned in wood would have been more suitable for metal or plastic. Although never stooping to imitation, the furniture revealed a return to the principles and forms of refined Eighteenth Century French styles.

Art Nouveau had a profound influence on public taste, but because it was so much a matter of surface decoration it did not lend itself to large scale architectural design. One of the most outstanding examples in architecture was Antoni Gaudí's (1852-1926) apartment house, Casa Mila, in Barcelona, which reflected the spirit of the style in its avoidance of all flat surfaces, straight lines, and symmetry of any kind. The building appears to have been "molded of a malleable substance" (Janson, 1969, p. 561).

Gaudí represented one extreme in Art Nouveau, Charles Rennie Mackintosh (1868-1928) of Scotland another. Mackintosh's fame rests on his architecture and also on the furniture he designed. He used the chair design to delineate the space within an architectural setting, more symbolic of the structure of its environment than with function. His most famous design, the Glasgow School of Art in 1896, was reflective of later work which displayed a preference for angles rather than curves. The interior featured a minimum of ornament with rectangular posts and lintels (Janson, 1969, p. 561). Rectilinear Art Nouveau was the first significant expression on the part of a growing number of influential designers for the "geometric forms and straight lines which

were to overshadow all of Twentieth Century design" (Ferebee, 1970, p. 56).

Art Nouveau was revolutionary in the sense that it "offered a new vocabulary of form, line, and color, . . . adopting a symbolist aesthetic of form and pattern" which abolished the symbols of historical style" (Ferebee, 1970, p. 56). It bridged the two centuries, historically significant because of its forward looking innovations, its inventiveness, and its refusal to embrace historicism.

The two movements, Arts and Crafts and Art Nouveau, often confused, were in reality diametrically opposed. Voysey, Webb, and Ernest Gimson (1864-1920) were in the Morris tradition of the strict craft approach. Van de Velde and Victor Horta (1861-1947) held the theory of "invented" ornament of languid curves.

The Morris doctrine "could not ultimately exist in an age geared to the machine and metallic architecture. Architectural Art Nouveau could not ultimately exist" because of its ornament had no rational basis in function (Jordan, 1966, p. 199). It was something merely added to the surface. The work of Mackintosh came closest to reconciling the two movements. In the interiors of the houses he built, the non-structural decoration was uninhibited, while the exterior showed "a strict regard for the Arts and Crafts movement" (Jordan, 1966, pp. 199-203).

Art Nouveau had prepared the way for a free outlook. Germany became the next center of new architectural experimentation. In 1907 Henri Van de Velde, who had been profoundly effected by the work of Mackintosh, was appointed director of the German Weimer School of Art. He turned his attention from Art Nouveau furniture and decoration to

the establishment of new values in architecture and the practical arts based on the disciplines imposed by new techniques. The positive building up of a new architectural style, concerned with "breaking down false academic traditions," dates from this time (Richards, 1970, p. 69).

Chicago School

In America, efforts to break with academic traditions, similar to those in Germany were taking place. According to Richards (1970, p. 70), in America the break was confined to "one type of building, the multi-story office" building and to one city, Chicago. It was in this effort that the United States left everyone behind and about 1890 established international leadership (Pevsner, 1973, p. 35). The architect who pioneered this movement was Henry Hobson Richardson (1838-1936). Richardson designed in a style reminiscent of the Romanesque. His use of massive stone walling and semi-circular arcading to produce geometrical compositions did much to free American buildings from antiquarian architecture. This was accomplished by incorporating the continuity, permanence, and security of American Colonial architecture into houses where the spaces inside were visually expanded. "He united continuity and permanent shelter, the union of opposites, into a single theme (Scully, 1965, p. 18). Architecture, turned to the requirements of human habitation, could thereby produce a logical synthesis to design (Benton, 1975, p. xvi).

Richardson established a reputation, not as an architect who imitated past styles, "but as a creative artist inspired by the emotive qualities of the Romanesque" (Whiton, 1974, p. 380). Having little interest in technological advances, Richardson shunned the new

structural systems and new materials. Nevertheless, through the use of simply masonry forms, he was the first American to attempt to find an architecture expression of his time.

Nineteenth Century eclecticism had destroyed the natural rapport between the architect and the cabinetmaker that ensured the unity of building and furnishings in the Eighteenth Century. Builders began to think of furniture as utilitarian and beneath their serious attention. However, from the beginning of his career, Richardson displayed great concern with the interiors of his buildings. No detail was too small for his consideration, since each detail contributed to the new concept of total unity of design.

Richardson restored the unity of architecture and furniture. The architect and furniture designer became one. Structural and ornamental details were an integral part, and inseparable from, the buildings which Richardson designed. Gowans (1964) stated that Richardson's furniture revealed even better than his architecture this new concept of art developing in his work. Its distinction came from the "intrinsic quality of materials and forthright expression of load and support" (p. 359).

The furnishings that came from his drawing board included chairs with turned spindles and bobbins which were related to the Eastlake tradition and often used to contrast with architectural effects (Bishop, 1972, p. 386). It was Richardson's "functional" furniture and "organic" architecture that led directly to the next phase of art in America (Gowans, 1964, p. 359).

Richardson's Marshall Field Store in Chicago, designed in 1885, exemplified the ideal that good architecture springs directly from

honest construction (Richards, 1970, p. 70). It stands midway between the old and the new possessing the logical concepts of massive new-Romanesque style, but with opened-up walls, divided into vertical "bays" which looked "forward to the work of Louis Sullivan (1856-1924), the first undisputedly modern architect" (Janson, 1969, p. 559).

The importance of the Chicago School was in its functionalist approach to commercial architecture and the use of untraditional building techniques. The fact that it was once again the architect who acted to find the solution to these problems, not engineers or other outsiders was also a major contribution to the development of modern architecture (Pevsner, 1973, p. 38). Several events acted to speed the development of the Chicago School of Architecture. These included the invention of the Otis elevator which made modern skyscrapers feasible, the Great Chicago fire, and Louis Sullivan.

Louis Sullivan was unique among the architects of the Chicago School. He used Richardson's Marshall Field Store as the inspiration of his own mature work. His idea of hanging stone on steel was the "breakthrough" that brought into the city a humanist architecture in the form of the skyscraper office building. The concept of horizontal continuity and the "floated" upper stories, achieved through the use of the "Chicago window," was also "characteristic of many American shingle style houses of Eighteen Eighties" (Scully, 1965, p. 20). This "suburban equivalent of Sullivan's urban invention" was derived from the impetus given by Richardson's work (Scully, 1965, p. 11).

Sullivan was a lover of ornament. His work is best characterized by the application of nonperiod naturalistic ornamentation which he used sparingly on his buildings. Although the ornament he used was a

very free interpretation of the Morris style, it was clearly derived from Art Nouveau (Pevsner, 1973, p. 38). Sullivan exhibited a tendency to treat furniture as a minor art, subordinate to the dominant personality of the architecture. Sullivan abandoned the arches typical of Richardson's work and instead consciously stressed the verticality and plastic density which he developed into a free-standing, potentially active building. Sullivan's work was the greatest of any produced by the Chicago school of architects. American architecture might have led the world through Sullivan if his planning of the Chicago Exposition of 1893 had been adopted.

Many American architects of the period were trained at L'Ecole Des Beaux Arts in Paris, and they became masters in the use of period detail for ornamental purposes, which time would reveal, had little to do with architecture (Richards, 1970, pp. 71-72). The influence of these Beaux Arts architects led the Chicago Exposition officials to select a "grandiose Roman Renaissance architectural scheme for the exhibition buildings." As a result, eclecticism became the national style. American architecture relapsed into the Nineteenth Century, and by 1900 Louis Sullivan was a forgotten man (Richards, 1970, pp. 71-72). History, however, was to show that the "modern pioneers" under the leadership of Sullivan were the truly great architects of the period.

One American architect, Frank Lloyd Wright (1869-1959), a pupil of Sullivan, stood out independently against the academicians of the Beaux Arts style, and worked out an architectural philosophy of his own. He was the only American architect to achieve world significance. Wright's main activity during the early years of the Twentieth Century was the designing of his "Prairie House" in the Chicago area. These

early designs paralleled the work of Mackintosh and Van de Velde and exerted an incalculable influence on the formation of the later International style (Jacobus, 1966, p. 135).

Wright realized very early in his career that if the architect was to survive he must "both preserve his imagination and enter into some kind of partnership with the scientist" (Jordan, 1966, p. 257). This is evident in the fluid spatial quality of Wright's architecture by his creation of space-form relationships expressive of modern technology. His insistence on horizontal lines was reflected in the close relationship between building and landscape. Integration was also seen in the interiors of Wright's work with the furniture many times built in, scaled to the house rather than to human use. The design of Wright's houses, including the furniture, was under the control of the architect. Furnishings, such as those in the Robie house in Chicago (1909), were designed as integral and inseparable parts of the house, intended to go with it forever. Wright intended that when an owner sold his house he or she was to sell the furniture, leaving it "exactly as arranged by the architect" (Gowans, 1964, p. 410). Wright's furniture, adapted from the square-framed, angular mission style, represents the beginning of the International style of furniture design (Bishop, 1972, p. 15).

Wright's architecture contained very little ornament. His innovative use of new materials led him to base decorative effects on concrete block and reinforced concrete. The use of natural materials such as wood and stone showed ideas similar to those of the Arts and Crafts Movement, while accepting the presence of the machine.

His domestic architecture, in its handling of space, foreshadowed

the present day "open plan." Although ruggedly domestic, it exploited the inherent possibilities of the cantilever in concrete, big overhangs, and big space beams (Jordan, 1966, p. 260). The methods he used to "explode the box" included

. . . designing interior spaces that flowed from one area to another; . . . allowing light to enter the building where structural planes met rather than through holes cut into the walls; . . . fewer right angles so that space was less defined; . . . and different heights, materials, and unexpected light sources to provide variety and excitement . . . (Alexander, 1976, p. 307).

Wright was able to reconcile the apparent opposites of organic-romantic with the technical architecture. It was in this marriage of the potential of the machine with high romanticism that "Sullivan and Wright gave back to Europe a great theory of architecture" (Jordan, 1966, p. 258). The achievements of these pioneers were not the discovery and use of new materials, but in realizing "more fully the implications of using the new materials for structural and decorative expression," to bring out the "real" character of these materials and to design shapes and planes compatible to them, expressing the nature of the materials (Gowans, 1964, pp. 401-402).

Wright's work was largely ignored in the United States and "the period beginning roughly in 1914" marked a break in the first phase of his career and "in American culture as a whole." The Nineteenth Century in architecture that began with Richardson had played itself out (Scully, 1965, p. 22). Chicago and Wright acted as a catalyst on European architecture. "The historian must turn back to Europe to trace the development of the modern movement further into the Twentieth Century" (Scully, 1965, p. 22).

European Influence

Wright's work became known in Europe as early as 1910 through publications in Germany. His influence on modern architecture was profound. Frank Lloyd Wright and Walter Gropius (b. 1883) are the two figures who mark the transition from the Victorian Age to the present. However, Wright "harnessed the forces of the romantic movement to the new age and struck men's imagination more than did Gropius" (Jordan, 1966, p. 244).

During the first two decades of the Twentieth Century, France made a contribution to architecture in the form of reinforced concrete. Auguste Perret (1874-1954) designed a number of reinforced concrete buildings that gave the architect another new structural material that made new architectural forms possible (Whiton, 1974, p. 385).

DeStijl. In 1917 a group of young artists took part in a movement in Holland which was known as DeStijl. This movement brought the links between art and product design to their closest point. Utter simplicity was its basic creed. It was "primarily concerned with functionalism and the integration of painting and sculpture with architecture" (Moody, 1966, p. 46). Its studies of cubism throughout the nineteen-twenties did much to establish the geometrical refinement of cubism into modern architecture. Here again, the principles of Wright were apparent. His abstract principles of composition and form employing interacting planes and hovering roofs were identical with the basis of the DeStijl movement, which were clarity and order.

It was the transformation of Wright's principles that was the concept behind Gerrit Rietveld's (b. 1888) famous Red-Blue chair of 1917

in which comfort yielded to geometry. A chair completely new in its concept, it functioned as a means of delineating the space of a specific activity, sitting. This academic synthesis of Wright's continuity and spatial movement combined with the geometric abstraction of romantic-classicism into machine terms "formed the International style of the twenties and thirties" (Scully, 1965, p. 27).

Walter Gropius and the Bauhaus

Parallel to the appointment of Henri Van de Velde to head the Weimer School of Art in Germany was the formation of the Deutscher Werkbund in 1907, also in Germany. Peter Behrens (1868-1940), a leader of the association of craftsmen, was concerned with industrial architecture and the expressive forces concealed in new materials. In his studio the greats of modern architecture served as apprentices--Walter Gropius, Le Corbusier (1887-1965), and Ludwig Mies Van der Rohe (b. 1886) (Whiton, 1974, p. 385).

Before Peter Behrens the modern movement had been a series of symptoms and trends. In his work, modern architecture itself came into being. His turbine factory in Berlin, built in 1909, was called the first piece of modern architecture (Richardson, 1970, p. 76).

The last phase of the growth of modern architecture in Europe was the period between the two world wars, a most important formative period, personified by the work of two architects. Walter Gropius and Le Corbusier reflected two distinct tendencies in the movement in the nineteen twenties and early thirties.

In 1919 Walter Gropius reorganized the Weimer Academy with the School of Arts and Crafts and renamed it the Bauhaus. The influence

of Walter Gropius is not so much as an architect but as a teacher. It was this influence that shaped present industrial design and American architectural education. The essence of the Bauhaus was an idea, one that would finally resolve the conflict that began with William Morris. Both the idea and the ideal of the Bauhaus was to bring the craftsman back into the industrialized world. The machine was something to be designed for, not something to be designed against.

The work of Le Corbusier is in striking contrast, yet complementary to the work of Gropius and Wright and might well be classed as a "modernist." In contrast to Wright's organic architecture, Le Corbusier worked in defiance of nature. His buildings often stood on pillars dissociated from the earth. In contrast to the undeviating rationality of Gropius' work, a romantic, poetic quality was found in the work of Le Corbusier (Richards, 1970, pp. 83-84). His phrase, "a house is a machine to be lived in," exemplified much of his work. A striking example of this concept was his design of the Savoy Villa in 1931.

The Bauhaus was the greatest single force in architecture and design between the two world wars. Here and there within the school were found touches of all the movements that preceded it. It was the culmination of these principles which preceded it which made up the Bauhaus philosophy. Workshops of the Bauhaus were laboratories for working out practical new designs for mass-production. They included units for prefabricated building as well as furniture, textiles, product design, pottery, and so on, that would meet the aesthetic, technical, and commercial demands of contemporary conditions (Alexander, 1976, p. 510).

In the years after 1930 politics became an important influence in

the course of architecture. Modern ideas in design and their international scope were identified with progressive ideas politically. It was therefore incompatible with Nazism. In 1933 modern architects were expelled from Germany and eventually from Europe, a significant factor in the spread of modern architectural ideas elsewhere.

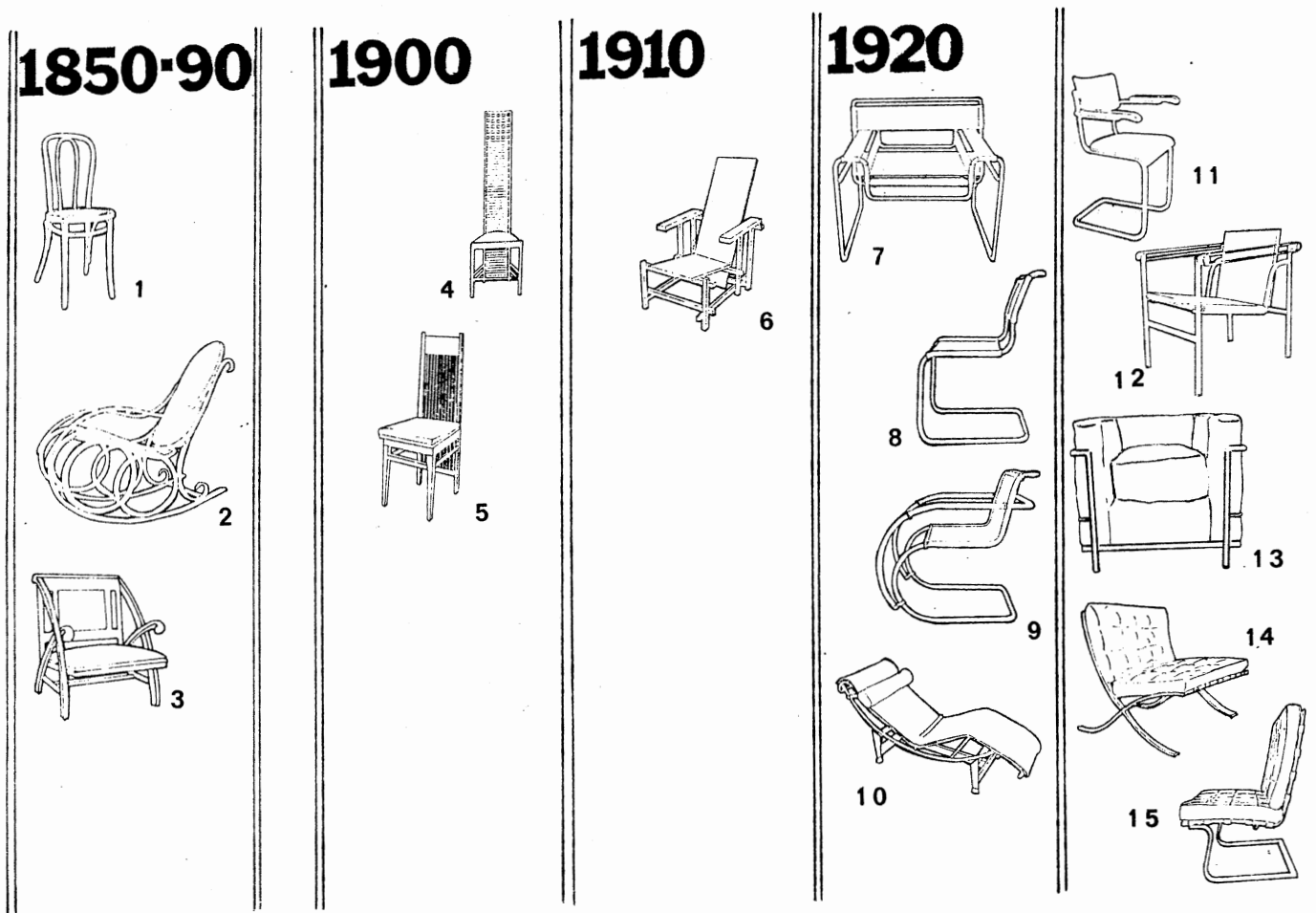
The revolutionary period of the development of technique and design of the modern movement ended with World War II. After 1945 the main center of activity of the style was in the United States (Richards, 1970, p. 108).

After the mid-thirties there was a lull in the invention of new chair types, as the architects whose names were associated with them turned to more urgent tasks. Without question the greatest influence on furniture design of the post-World War II years was the chairs designed at the Bauhaus. The "classic" chairs of the modern movement designed by Breuer, Aalto, Le Corbusier, and Van der Rohe were the first examples of what was to become a "familiar idiom" of modern furniture (Meadmore, 1975, p. 11). The Synopsis of Style tables in Figures 1 and 2 trace the beginning of the modern chair through 1949.

United States Influence--

1933-1949

During the 1920's and 1930's America displayed very little significant architecture and furniture design. In the twenties the Great Depression shook American confidence in the Victorian tradition. However, there were significant contributions in Architecture made by a handful of immigrant architects, exponents of the Bauhaus concepts. These included Richard Neutra (b. 1892) from Austria and Eliel



Source: Richard Armstrong (Ed.), "The Modern Chair: Its Origins and Evolution,"
 Catalogue of an Exhibition by the LaJolla Museum of Contemporary Art (1977).

Figure 1. Synopsis of Style, 1850-1930

1850-90

1. Michael Thonet. Vienna Chair, 1859. Bent Beech.
2. Michael Thonet. Rocker, 1860. Bent Beech with Cane seat and back.
3. H. H. Richardson. Library Chair, 1878.

1900

4. Charles Rennie Mackintosh. Ladderback Chair, 1902. Ebonized wood with upholstered seat.
5. Frank Lloyd Wright. Modern Side Chair, 1904. Oak.

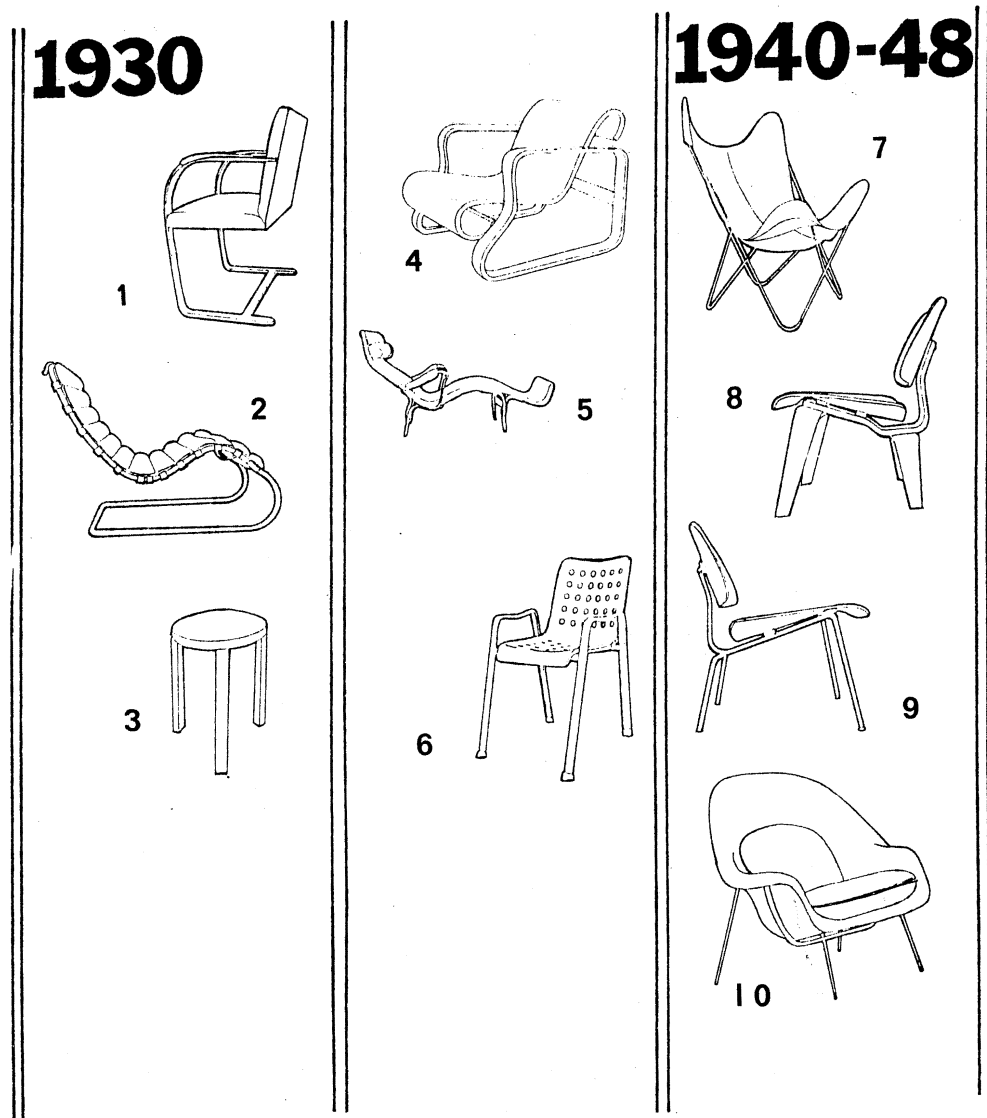
1910

6. Gerritt Rietveld. Red and Blue Chair, 1918. Beech and plywood painted and stained.

1920

7. Marcel Breuer. Wassily Chair, 1924. Tubular steel with canvas strips.
8. Ludwig Mies van der Rohe. Cantilevered chair, 1926. Tubular steel with leather seat and back.
9. Ludwig Mies van der Rohe. Cantilevered chair, 1927. Tubular steel with cane seat and back.
10. Le Corbusier. Chaise-lounge Basculante, 1928. Tubular steel with adjustable pony-skin upholstery.
11. Marcel Breuer. Cesca Chair, 1928. Steel with lacquered wood seat and back.
12. Le Corbusier. Basculant Chair, 1928. Tubular steel with leather.
13. Le Corbusier. Grand Comfort, 1928. Tubular steel with leather upholstered cushion.
14. Ludwig Mies van der Rohe. Barcelona Chair, 1929. Stainless steel with leather upholstery.
15. Ludwig Mies van der Rohe. Tugendhat Chair, 1929. Stainless steel with leather upholstery.

Figure 1 (Continued)



Source: Richard Armstrong (Ed.), "The Modern Chair: Its Origins and Evolution," Catalogue of an Exhibition, "Catalogue of an Exhibition by the LaJolla Museum of Contemporary Art (1977).

Figure 2. Synopsis of Style, 1930-1949

1930

1. Ludwig Mies van der Rohe. Brno Chair, 1930. Stainless steel with leather upholstery.
2. Ludwig Mies van der Rohe. Philip Johnson Chair, 1931. Tubular steel with cloth upholstery.
3. Alvar Aalto. Stool, 1933. Laminated birch.
4. Alvar Aalto. Scroll Chair, 1934. Laminated birch with lacquered birch seat and back.
5. Bruno Mathsson. Chaise, 1934. Laminated beech with jute webbing.
6. Hans Coray. Landi Chair, 1938. Tempered stamped aluminum.

1940-48

7. Hardoy, Bonet and Kurchan. Hardoy Chair, 1938. Steel rod cradle with leather sling.
8. Charles Eames. Petal Chair, 1940. Bent plywood.
9. Charles Eames. Petal Chair, 1946. Bent plywood and tubular steel.
10. Eero Saarinen. Womb Chair, 1948.

Figure 2 (Continued)

Saarinen (1873-1950) from Finland, who prepared the way for the influx of European ideas which were to transform American architecture in the decades to come (Gowans, 1964, pp. 424-425).

In the late 1930's, Gropius, Marcel Breuer (b. 1902), and Van der Rohe came to the United States to teach and to build. Modern architecture in the United States was at first considered just another new style imported from Europe. This new style, however, was to transform the face of American cities.

Until the late thirties furniture design was generally in the hands of company designers in the United States. Many were employed by large industrial designers, and had very little understanding of creative design. They were generally skilled in combining tradition and fashion (Hatje, 1953).

In the period between the mid-thirties and 1949, several influences brought about a new awareness of modern furniture design. These included: an awareness of Scandinavian design; a young generation of American architects, influenced by the International school; social influences such as a demand by a younger generation of Americans demanding forms different from those of their parents; and increased design education.

In the 1940's the influence of young architects on furniture design was substantial. These included designers such as Eero Saarinen and Charles Eames who acknowledged the inspiration of Scandinavian designer Alvar Aalto. Chairs designed and made after the mid-1940's employed significant innovations in material and technology.

The contribution of the United States was a progressive and machine-oriented technology of diverse, innovative, and quantitative

design. Chairs that came before the mid-1940's were the fore-runners of the chairs between 1949 and 1968. Further investigation into the chairs between 1949 and 1968 was needed.

Scandinavian Influence

A burst of admiration for Scandinavian things in 1937-1938 was inevitably followed by items labeled "Danish Modern" and "Swedish Modern." The basic concepts advanced by Bruno Mathesson, an outstanding figure in Swedish furniture design, were closely related to the Swedish crafts tradition. This concept was concerned with the development of furniture made of wood which was practical, relatively inexpensive to manufacture, and aesthetically satisfying (Christiansson, 1966, pp. 11-15).

Early functionalism in Scandinavia was closely allied with the functionalism of the Bauhaus. Scandinavian designs agreed with the premise that new times demanded a new type of furniture. But instead of completely breaking with the past as did the Bauhaus, Scandinavians chose to learn from the past and to build on it whenever possible. Focus was placed on movable furniture, especially chairs, which were designed to look good from all sides (Segerstad, 1963, p. 46).

Materials employed included bent laminated and plywood frames, woven leather, sheepskin, and colored webbing of jute and hemp. Alvar Aalto, Bruno Mathesson (b. 1907), Hans Wegner (b. 1914), Finn Juhl (b. 1912), and Kaar Klint (1888-1954) were the notable Scandinavian designers.

The factors that contributed to Scandinavian design included: a tradition of craftsmanship; mutual respect between designer, producer,

and consumer; an understanding of materials; and a willingness to experiment. Design was based upon research and a "capacity to transform raw materials into products that served both human needs and provided sensuous delight" (Evans, 1973, p. 143).

Modern Furniture

Chair design had changed more in the past 100 years than in the previous five centuries. Furniture had historically followed the development of architecture. By 1920 the two had become so synchronized that they were thoroughly integrated. The architect had replaced the decorative artist as the designer of furniture (Benton, 1975, p. 7).

Experiments at the Bauhaus resulted in a new dimension being projected into furniture. Architects first created the surrounding spaces, and from the same spatial feeling, their furniture. The common factor of all modern furniture was the space surrounding and within the pieces of furniture and the entity with the structure of the building. Only the architect could be expected to understand this concept.

The architect brought about the extinction of furniture design as such . . . seeing no difference in basic principle between a skyscraper and a chair . . . Furniture became only one of the contributing elements to a new kind of total architecture (Gowans, 1964, p. 443).

These new types of furniture were functional, using new materials, or traditional materials in new ways. Their development had been rapid, beginning at the Bauhaus with the appearance of the tubular chair in 1925 and lasting until the mid-thirties. During this period of invention in Europe, English and American enthusiasm for new furniture gave way to a desire for "antiques" (Giedion, 1948, pp. 508-509). It was not until the late thirties that there was a renewed awareness of

modern furniture design in the United States.

The development of modern furniture can be attributed to three main techniques--metallurgy, lamination, and molded plastic. These processes allowed designers to make a complete break with traditional construction techniques. Rubber and latex foam also changed the character of upholstery.

Metallurgy. By the 1920's developments in chromium-plated tubular steel allowed for experiments in tubular steel chairs. At the Bauhaus, Marcel Breuer, inspired by Michael Thonet's bentwood chairs, began working with tubular steel. In 1925 he invented the first chair with continuous tubular frame, the Wassily chair. Reminiscent of Rietveld's Red and Blue chair, this was the first chair truly expressive of the modern movement, a machine expression which could be mass produced. In the climate of the Bauhaus, "it would have been illogical and artistically unthinkable to derive a metal chair from a four-legged wooden chair" (Moody, 1966, p. 61). Breuers' comment on his metal chairs reflected the philosophy of furniture design at the Bauhaus:

We are seeking clear and logical forms, based on rational principles . . . Basically, a well-constructed steel chair will be better able to cope with static loads than an equally well constructed wooden chair, and substantially lighter. A chair made of high-grade steel tubing with tightly stretched fabric in the appropriate places, makes a light, self-sprung seat which is as comfortable, many times lighter, handier, and more hygienic, and therefore more practical in use than an upholstered chair (Benton, pp. 226-227).

In the next few years a succession of metal chairs by Mark Stam, Mies Van der Rohe, Le Corbusier, and Breuer followed. The Barcelona chair, 1929, which Mies Van der Rohe designed for the International Exposition at Barcelona, was the beginning of the chair of the

engineer. The frame and supports were made of solid stainless steel bars. It was more sophisticated than the tubular steel chairs and marked a new tradition of craftsmanship in modern furniture.

Breuer's second tubular chair in 1928 was designed on the cantilever principle. This chair, the Cesca, remains the most perfect solution to the cantilevered process in chairs (Meadmore, 1975, p. 46).

Since the twenties a succession of metal chairs has been produced in all countries. The most significant of modern American chairs was in metal (Moody, 1966, p. 64). Steel furniture designers tended to be persons who worked at metal sculpture or in a metal industry. Metal furniture called for new manufacturing requirements. Success of the product depended on the designer's precision (Moody, 1966, p. 67).

Lamination. The process of veneering and plywood making has been known for centuries, having been used by the ancient Egyptians. At the end of the Eighteenth Century Michael Thonet made a chair from narrow strips of veneer bent and glued together under pressure. In the United States a patent was taken out for plywood in 1865, and it began appearing as a cheap substitute for solid wood. World War I brought immense improvements in plywood, and after 1919 laminated board and blockboard began appearing in products. Laminated board began appearing in furniture with hard geometric lines reflective of the movement of cubism.

Designers continued experimenting with the possibilities of lamination but it was Finnish designer Alvar Aalto (b. 1898) who was first to exploit the natural spring of the material, using laminated birch as "Breuer and Mies Van der Rohe had used the spring in steel." The

springiness was made possible by a new laminating process of forming each layer of wood with the grain each running in the same direction. Strength and spring-like quality was increased because the

. . . imperfections and weaknesses in the grain canceled one another out in successive layers . . . Impregnating the timber with synthetic resins which formed the material and set it into shape further increased its strength (Moody, 1966, p. 74).

Aalto was able to achieve organic forms by developing the possibility of laminated birch. In addition to Aalto, Bruno Mathesson and Kaare Klint also pioneered in the development of moulded wood furniture.

The discovery of new bonding resins during World War II made possible the bending of sheets by electrical methods. This led to the bending of plywood in moulded plywood shapes. The material could be used in a more gentle, undulating manner for chair seats and backs, such as Charles Eames' plywood chairs of 1946. Lightness, economical use of materials, and abstract forms were made possible by the new experiments in lamination (Moody, 1966, p. 78).

Plastics. It is possible theoretically, to produce any shape with a plastic. Several plastics are suitable to the manufacture of chairs: fiberglas, polypropylene, and enrevalglas being the most commonly used.

When plastic was introduced as a material for manufacturing consumer goods after World War II, moulded shell chairs were inevitable. Many considered it a material which could be developed to produce inexpensive, mass-produced furniture. This did not become a reality.

Plastics are particles "which become liquid during the process of being formed into new shapes" (Moody, 1966, p. 114). Making components for the production of reinforced plastic shapes involved complicated processes which explains why custom-made furniture in plastics cannot

be achieved cheaply. Fiberglas required handwork to build up reinforcement which made it impossible to mechanize production sufficiently to appreciably reduce costs (Moody, 1966, p. 117).

With the discovery in 1954 of polypropylene, it was possible to produce chairs without reinforcement costing half as much as glass fiber moulding. It was strong, had aesthetic appeal, and could be mass-produced and is easily maintained. However, the capital outlay of production was sufficiently high to keep it from being distributed as an inexpensive chair (Moody, 1966, pp. 117-121).

The most notable examples of moulded plastic chairs are designs by Charles Eames (b. 1907), Eero Saarinen (b. 1910), Scandinavian designer Arne Jacobsen (b. 1902), and Robin Day (b. 1915) of England. Plastic furniture was a significant contributor to modern design philosophy; "the chair of the designer allied to the chemist" (Moody, 1966, p. 119).

Summary

The culmination of many forces brought the "modern" period into being. Gowans (1964) expressed the view that American architecture best expressed the dreams of the Twentieth Century. Every generation "has propounded its theories" of the existence of an "American" art. Presently architects and furniture designers "all over the world do very much the same things" (Gowans, 1964, p. 472).

Gowans (1964) also suggested that "an 'American Style' must be sought not in the realm of forms but in spirit" (p. 473). Perhaps

this will be the culmination to "modern" furniture style in America, not styles dictated by designers, but determined more and more by forces of change and circumstances.

CHAPTER III

METHODOLOGY

The purpose of this study was to develop a notation system for classifying and indexing chair traits. These traits were then analyzed to reveal developmental changes and trends so that a "style" in furniture design for the years between 1949 and 1968 could be defined.

The first objective of this study was to develop a notation system for identifying and tabulating traits of chairs for each year between 1949 and 1968, so that developmental changes and trends could be analyzed. The analysis was based on a sample of 2,000 chairs which were carefully selected as being representative of chairs from 1949 to 1968.

Chairs, rather than some other pieces of furniture, were chosen for investigation because the chair traditionally possesses those characteristics most typical of any style or period of furniture. Chairs were uniform enough to be compared from one year to another, and they reflected changes in style over time. With reasonable search, adequate information about chair design could be accumulated over periods of time, since chairs were generally shown by the manufacturer to represent a particular style of furniture offered for sale.

Selection of the Years Studied

Jacobus (1966) identified four periods of classification of major

creative activity so far in the Twentieth Century. These periods were distinguished through "outward stylistic features of buildings . . . the first occurred about 1910, the epoch of Frank Lloyd Wright's greatest Prairie Houses and the architecture of Behren's and Loos's in Europe" (Jacobus, 1966, p. 12). A second occurred around the peak years of the International Style, from about 1927 to 1932. The third centered around the post World War II building boom just prior to 1950, and a fourth in the mid-1960's was manifested in the last works of Le Corbusier and of younger architects such as Paul Rudolph (Jacobus, 1966, p. 12). Jens Risom (1970) expressed the view that the middle Twentieth Century years of 1949 to 1969 would become the most important design period since the end of the Eighteenth Century.

The period of investigation for this study, 1949 to 1968, lies within the past two phases identified by Jacobus, and coincides with the years identified by Risom. These years are also generally considered to have been the years of greatest productivity of modern furniture in the United States.

The Sources

Chairs for the study were selected from four periodicals. The main source of the data was the periodical Furniture Forum, published quarterly from 1949 to 1961, and annually from 1962 to 1975. Furniture Forum was selected because of its editorial integrity in achieving the goal of presenting representative examples of modern furniture manufactured and/or distributed in the United States. Noted authorities in the field have commented on the effectiveness of Furniture Forum in maintaining high standards in its editorial and selection policies

(see Appendix E). Information essential or desirable to the analysis of chair design was provided in Furniture Forum: a photograph of the chair, dimensions, name of the designer, date of manufacture, and materials used in construction.

For those years when the number of chairs included in Furniture Forum did not meet the criteria used for selecting the sample or were not sufficient in number to complete the sample of chairs for each year, chairs were chosen from the editorial pages of Interiors Magazine, Everyday Art Quarterly, and Decorative Arts, periodicals also noted for their editorial integrity. The researcher conferred with a panel of experts made up of an architect and two designers regarding the selection of the sources. This panel was also consulted on other decisions made by the researcher in the course of the study.

The Sample

The sample consisted of one hundred chairs for each of the twenty years, 1949 to 1968. The sample was drawn from the population of chairs published in Furniture Forum or one of the other above-mentioned sources. The following information had to be available in order for a chair to qualify for the sample: (1) the year in which the chair was manufactured or distributed in the United States; (2) material(s) of which the chair was constructed; and (3) a photograph which displayed the chair in a manner such that its traits could be easily recognized and identified.

When the issue of Furniture Forum for a given year contained more than one hundred chairs, examples were randomly excluded until the remaining sample equaled one hundred for that year. The randomization

was done by placing photographs of the chairs for the year face down and then randomly drawing out the number of copies needed to make the sample equal one hundred. When issues of Furniture Forum contained fewer than one hundred chairs for a given year, additional chairs were selected from one or more of three other periodicals to make the sample equal one hundred for each year. Beginning with the first issue for a given year, the editorial pages of Decorative Arts were examined first, Everyday Art Quarterly second, and Interiors Magazine third. Chairs for which the necessary information was available were drawn in order of appearance until the sample numbered one hundred for that year.

Development of a Notation System for Traits

The first objective of this study was to develop a notation system for classifying and indexing traits of chair design. The basic features of chairs were divided into eight categories of traits. These categories were:

1. Leg traits
2. Leg shape traits
3. Stretcher traits
4. Back traits
5. Arm traits
6. Material used for seat and back
7. Material used for moulded chairs
8. Material used for exposed legs.

Each category included a number of traits. For example, leg trait could be all straight legs, splayed front legs with straight back legs,

pedestal, etc. Leg shape trait could be round, square, free form, etc.

In order to identify the traits appearing in the chairs, eight tally sheets were prepared, one for each trait category. Each tally sheet contained a row for each of the twenty years of the study, and columns for each trait within each of the eight categories. Small representative drawings or descriptive words for each trait were placed in the heading of each column (see Appendix A, Tables VII-XV).

In the tallying process, eight traits (one from each category) for each chair were tallied in the appropriate square, each square representing a specific year and a specific trait. As each new trait was encountered, its identifying drawing or description was placed in a column heading on the applicable category tally sheet. All traits for the 2,000 chairs were tallied in this manner. When the tallying process was completed, a total of 203 traits had been identified. This tallying process provided an overview of the data as well as an identification of the traits. The tallying process was validated by a second observer repeating the tallying process for the first two years of the study. Results of both tallying processes were compared and found to be comparable.

In order to use the computer for further analysis, a numeric code was assigned to each trait within the eight categories. One computer card was prepared for each chair. The card contained the following information: (1) the year in which the chair was manufactured; (2) eight numeric codes--one for each category of traits; and (3) the source from which the chair was selected.

Data Analysis

Data were processed using the computer system SAS (Statistical Analysis System) 76, an integrated system for data management and statistical analysis. Using this system, it was possible to modify the data and perform procedures necessary to the analysis of the data.

The descriptive analysis was accomplished by frequency counts of the occurrence of specific traits within each year. Percentages of occurrence were plotted on graphs to analyze changes in the appearance of all traits over the twenty year period.

The data revealed patterns which suggested categorizing the data into three year intervals for further analysis of the evolution of the traits within the 20-year period. The analysis of evolution was limited to those categories found to be most important in distinguishing the style of the period. These were leg, back and arm traits. Histograms were plotted which revealed patterns of change over the 20-year period. Chi-Square tests were used to examine differences between the frequency of occurrence of the major traits over the three year time intervals. A significant Chi-Square value indicated that there was a difference in the frequency of occurrence of a particular trait from one time interval to another.

Typical Chair Identification

Analysis of the data revealed specific clustering of traits that could be put together to ascertain a specific chair representative of a certain time period. This clustering of traits enabled the identification of "typical chairs" of the period.

Summary

The sample of this study consisted of one hundred chairs for each year for the 20-year period. These were selected as being representative of chairs between 1949 and 1968.

A flow diagram of the analytical model was shown in Figure 3. The diagram reflected the steps in the analysis of the data. A notation system for classifying and indexing chair traits was developed as shown in Step 1 and Step 2. A total of 203 traits were identified within eight categories. These steps were accomplished simultaneously in the tallying process.

Each trait within each category was coded and punched into computer cards (Step 3) in preparation for computer analysis. Computer programs were written using SAS 76 computer system. Frequency of occurrence of each trait for each category was then tabulated (Step 4).

In Step 5 the ratio of the number of occurrences of one trait to the number of occurrences of all traits was computed. Traits within each category for each year were computed using 100 as the base number of chairs for each year.

The next step (6) divided traits within each of the eight categories into major, minor, and sub-traits. This grouped the traits into more manageable data. The annual change in percentages of occurrence of traits over the period were then plotted into graphs and compared (Step 7). Patterns of change over time were identified and the period was then divided into three year intervals (Step 8).

Major traits were plotted into histograms in three year intervals. Patterns of evolution and most frequently occurring typical traits for

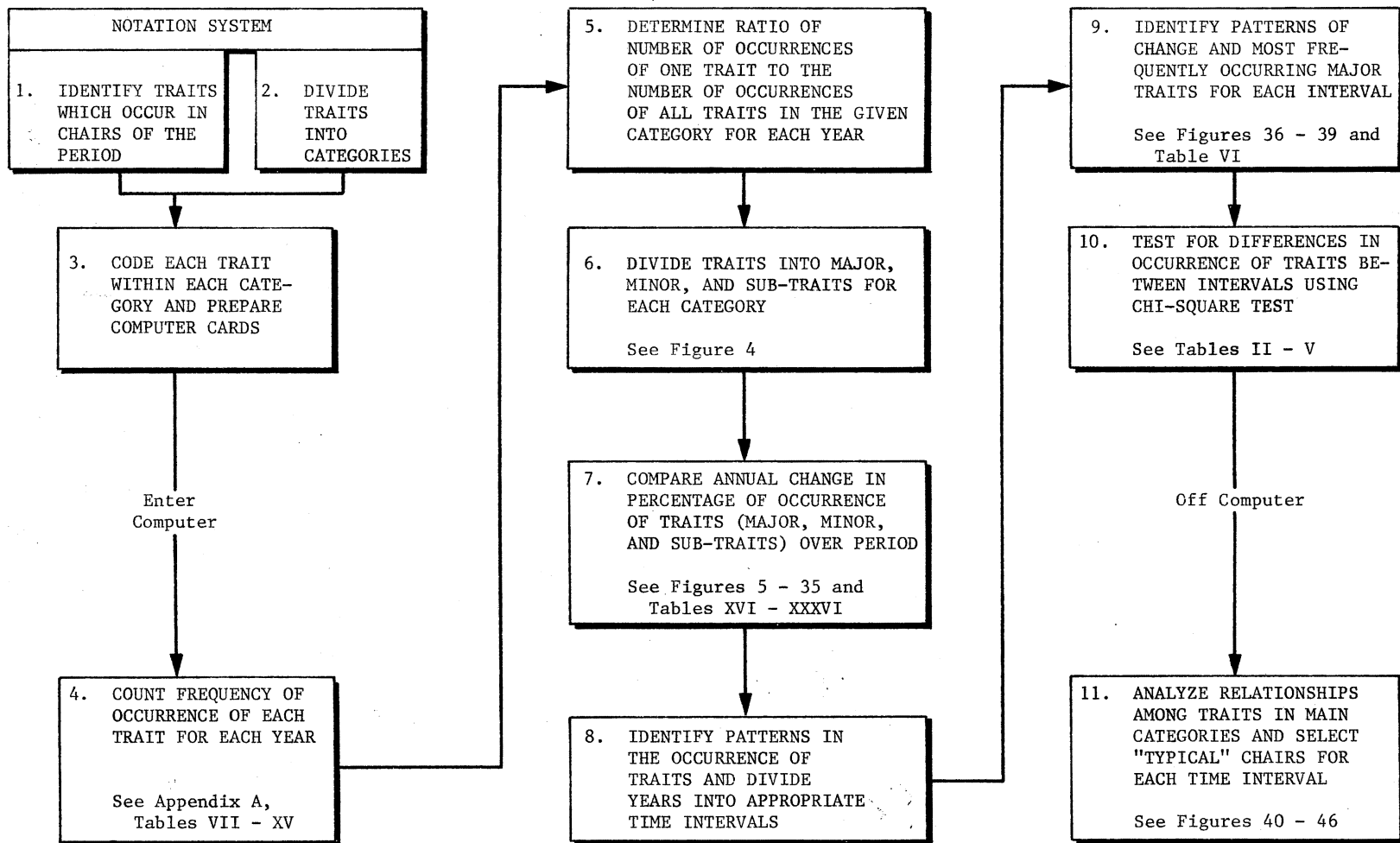


Figure 3. Flow Diagram of the Analytical Model

each interval were identified in Step 9. To test for differences in randomness of occurrence of traits between intervals, Chi-Square tests of significance were computed (Step 10).

The computer analysis was completed. In Step (11) typical chairs for each of the three year intervals of the period were selected by the researcher. This added an important component to the research process, the designers' visual sensitivity to the relationships among the traits.

CHAPTER IV

DISTINGUISHING TRAITS OF MODERN CHAIRS

Introduction

The second objective of this study was to apply the notation system which had been developed to identify the traits which occurred in the sample of 2,000 chairs. This was done year by year for the years between 1949 and 1968.

Each feature of a chair may have a more or less independent history over the period. It seemed advantageous to begin with the descriptive analysis of specific traits within each category of the data. The descriptive analysis of the distinguishing traits of modern chairs is presented in this chapter. The evolution of these traits, within given time intervals, over the 20-year period, is presented in Chapter V.

Descriptive Analysis

In the initial tallying process 203 traits of chairs were identified. Those traits were then classified as major, minor, and sub-traits. The process of dividing the traits into these classifications was accomplished as follows. Some traits were similar enough to be combined and analyzed as one trait. The traits which occurred so infrequently (generally less than 10 percent over the 20-year period)

that they could not be considered relevant to the analysis were deleted. Traits which were considered to be an extension or variation of a more common trait were classes as sub-traits. Traits that accounted for a small percentage of the total traits but which were concentrated within certain few years in such a manner as to make them relevant were analyzed as minor traits. Minor traits were considered exceptional traits in those years in which they occurred rather than typical of the traits for the period. While minor traits occurred less frequently than major traits, they were perhaps no less stylistically and historically significant. They may be predictors of future style. For example, the traits which were combined to make Breuer's metal chair of 1925 could be considered exceptional or minor traits of that period, but were the forerunners of furniture of the modern period. After the classification of sub-traits and minor traits, those traits which remained were analyzed as major traits. A description of the classification is shown in Figure 4.

Frequencies and percentages of all traits were obtained for each of the 20 years (see Appendix B, Table XVI-XXIII). Major, sub-traits, and minor traits were identified within each of the eight categories: (1) leg traits, (2) leg shape traits, (3) stretcher traits, (4) back traits, (5) arm traits, (6) material used for seats and backs, (7) material used for moulded chairs, and (8) material used for exposed legs.

Major, minor, and sub-traits were analyzed separately. In order to examine the relationship among major traits, only those chairs having one of the major traits were included in a particular analysis. For example, Table XVI in Appendix B includes only those chairs which

Category and Code	Classification	Category and Code	Classification
Leg Trait		Stretcher Trait	
01	Major Trait	01	Minor Trait
02	Major Trait	02	Major Trait
03	Major Trait	03	Major Trait
04	Minor Trait	04	Minor Trait
05	Minor Trait	05	Combined with Trait 12
06	Deleted	06	Combined with Trait 12
07	Deleted	07	Deleted
08	Deleted	08	Deleted
09	Combined with Trait 08	09	Major Trait
10	Combined with Trait 08	10	Deleted
11	Major Trait	11	Combined with Trait 12
12	Combined with Trait 11	12	Minor Trait
13	Deleted	13	Major Trait
14	Combined with Trait 15	14 thru	
15	Minor Trait	18	Combined with Trait 13
16	Combined with Trait 20		
17	Major Trait	Back Trait	
18	Combined with Trait 19	01	Major Trait
19	Major Trait	02	Combined with Trait 01
20	Minor Trait	03	Combined with Trait 01
21	Deleted	04	Combined with Trait 01
22	Combined with Trait 17	05	Major Trait
23	Combined with Trait 17	06	Combined with Trait 05
24	Combined with Trait 19	07	Combined with Trait 05
25	Deleted	08	Combined with Trait 05
26	Deleted	09	Major Trait
27	Deleted	10	Combined with Trait 09
28	Sub-Trait	11	Combined with Trait 09
29	Sub-Trait	12	Combined with Trait 09
30	Sub-Trait	13	Major Trait
31	Deleted	14	Combined with Trait 13
32	Deleted	15	Combined with Trait 13
		16	Combined with Trait 13
		17	Minor Trait
		18	Minor Trait
		20	Moulded Shape
		22	Moulded Shape
		23	Combined with Trait 22
		24	Moulded Shape
		25	Moulded Shape
		26	Moulded Shape
		27	Miscellaneous-Deleted
Leg Shape Trait			
01	Major Trait		
02	Major Trait		
03	Major Trait		
04	Sub-Trait		
05	Sub-Trait		
06	Sub-Trait		
10	Deleted		
11	Deleted		

Figure 4. Description of Trait Classification

Arm Traits		Material Used for Exposed Legs	
01	Major Trait	01	Walnut Sub-Trait
02	Sub-Trait	02	Teak Sub-Trait
03	Major Trait	03	Oak Sub-Trait
04	Sub-Trait	04	Beech Sub-Trait
05	Major Trait	05	Birch Sub-Trait
06	Sub-Trait	06	Cherry Sub-Trait
07	Major Trait	07	Ash Sub-Trait
09	Minor Trait	08	Maple Sub-Trait
10	Sub-Trait	09	Mahogany Sub-Trait
11	Major Trait	10	Rosewood Sub-Trait
14	Major Trait	11 thru	
15	Combined with Trait 03	36	Combinations of Trait 01
16	Minor Trait	31	Teak & Oak Sub-Trait
17	Sub-Trait	40	Aluminum Sub-Trait
18	Deleted	41	Chrome Sub-Trait
19	Deleted	42	Wrought Iron Sub-Trait
20	Sub-Trait	43	Brass Deleted
		44	Tubular Steel
			Sub-Trait
Material Used for Seat and Back		45	Metal Major
01	Major Trait	46	Deleted
02	Major Trait	47	Deleted
03	Minor Trait	50 thru	
04	Minor Trait	56	Combined with Trait 58
05	Minor Trait	50	Laminated Birch
06	Minor Trait	51	Laminated Oak
07	Minor Trait	52	Laminated Ash
08	Minor Trait	53	Laminated Beech
09	Minor Trait	54	Laminated Teak and Oak
10	Combined with Trait 08	55	Laminated Oak
11	Combined with Trait 06	56	Laminated Teak
		58	Laminated Wood
			Major Trait
Material for Moulded Chairs		60	Rattan Deleted
01	Major Trait	61	No exposed Material Deleted
02	Major Trait	70	Wood Major Material
03	Major Trait		
04	Combined with Trait 01		
05	Combined with Trait 06		
06	Major Trait		
07	Deleted		
08	Combined with Trait 09		
09	Major Trait		

Figure 4 (Continued)

had one of the major leg traits: 01, 02, 03, 11, 17, or 19. The row percentages in Table XVI should be interpreted as follows: Of the 1949 chairs which had one of the six major leg traits, 57 percent had legs of the trait 01--splayed legs on both front and back. The column percentages should be interpreted as follows: Of all the chairs from 1949 to 1968 which had one of the six major leg traits, 9 percent of the chairs with trait 01 legs appeared in 1949.

Graphs were prepared by plotting the percentages of occurrence of each trait over the 20 years. Major traits were plotted for each year. However, since sub-traits and minor traits were less influential on the development and evolution of the style, they were plotted in five year intervals. Data points for graphs of sub-traits and minor traits were obtained by averaging the percent of occurrences over the five year periods.

Leg Traits

Historically, the leg has been the most distinguishing feature of chair style. For example, the most distinguishing characteristic between Louis XV and Louis XVI furniture was the change from the Louis XV Cabriole leg to the Classical Louis XVI straight, fluted leg. The leg trait, in its relationship with other features, distinguished chairs of the modern period from chairs of other periods and styles.

In the initial tallying process, 32 leg traits were identified (see Appendix A, Table VII). From these, six major traits, four minor traits, and three sub-traits were identified (see Figure 4).

Major Leg Traits. Figure 5 identifies the major leg traits.

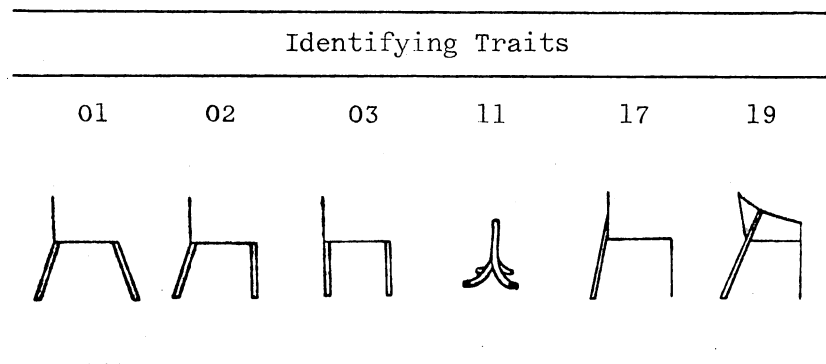


Figure 5. Major Leg Traits Between 1949 and 1968

Major leg traits were described as follows:

- Trait 01 - included legs in which both front and back legs were splayed
- Trait 02 - included legs in which front leg was straight and back leg was splayed
- Trait 03 - included legs in which both front and back legs were straight
- Trait 11 - included single pedestal legs
- Trait 17 - included legs in which the back leg, either straight or splayed, supported the back post of the chair rather than attached to the frame
- Trait 19 - included legs in which the back leg, either straight or splayed, was attached at any point along the arm or top rail of the chair rather than to the frame.

Appendix B, Table XVI, shows frequency distribution of major leg traits for the 20 year period. For this analysis, sub-traits of each major trait were counted as an occurrence of the major trait (see pages 53 and 54 for discussion of sub-traits). The percentages of occurrence of major leg traits, by year, were plotted in Figure 6. The percent was calculated as follows for each leg trait.

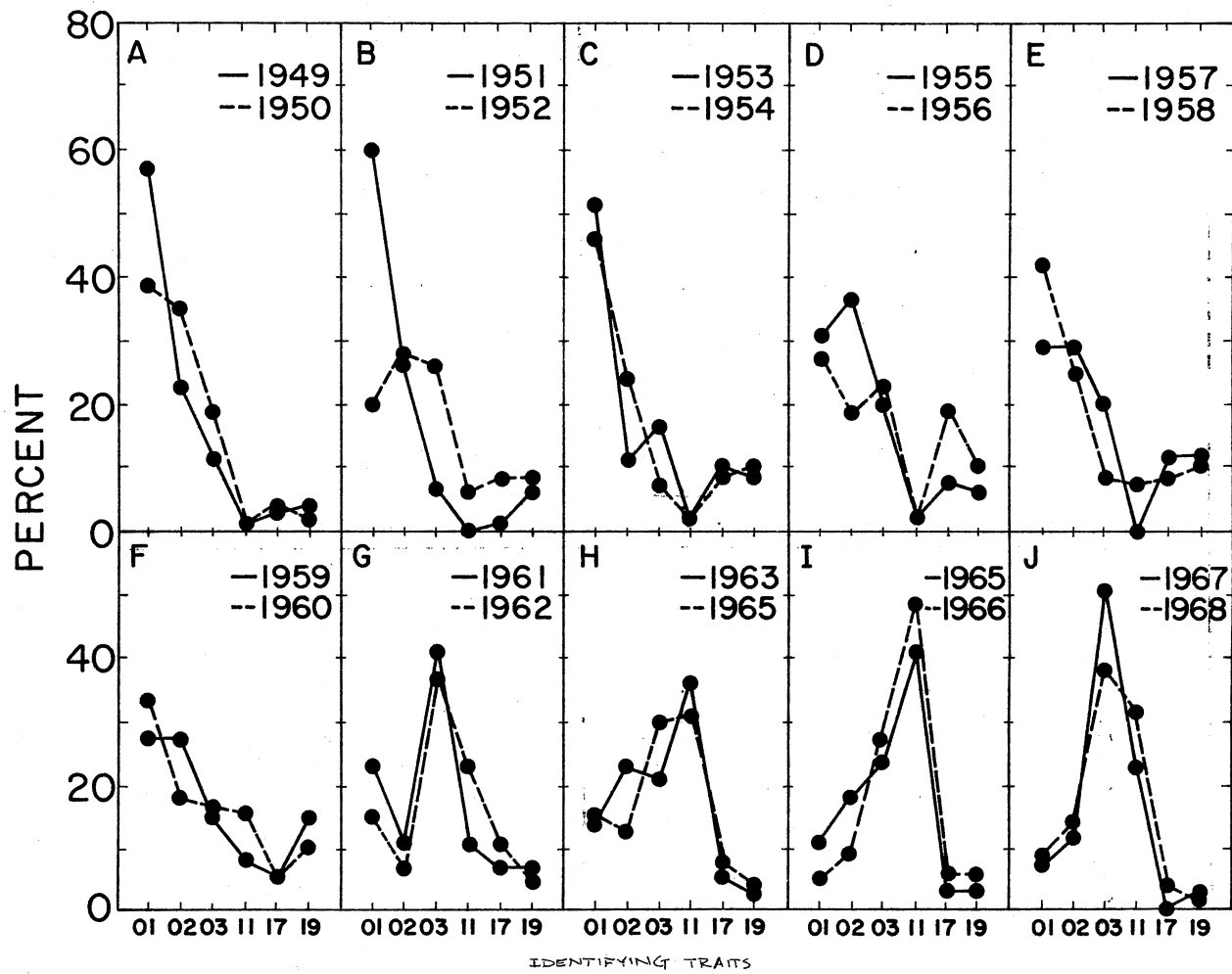


Figure 6. Percentages of Occurrence of Major Leg Traits, 1949-1968 (N = 1579)

$$P = \frac{\text{Number of times that trait 01 occurred in a given year}}{\text{Total Number of times that any of the six major leg traits occurred in a given year.}}$$

The percentages plotted in Figure 6 were obtained from row percentages in Table XVI in Appendix B.

The 20 year period began with a very frequent occurrence of leg trait 01 in 1949 (Figure 6). This remained the dominant trait through 1954. However, during the six year period of 1949 through 1954, an interesting fluctuation occurred biennially. A decline in the percentages of occurrence was noted in every other year, as shown in Figure 6 A, B, and C.

Leg trait 02 and trait 03 remained fairly constant through 1960, with slight fluctuations. A transition period occurred in 1959 and 1960 (Figure 6F). At this point there was less variability in the occurrence of traits. Data points for traits 02 and 03 were confined within a 30 percent range between 5 percent and 35 percent.

In 1956 the famous pedestal lounge chair designed by Charles Eames appeared on the market. Two years later, in 1958, the first pedestal chairs (trait 11) appeared in these data, and from 1959 to 1962 the pedestal leg displayed a small, steady rise. From 1963 to 1966 it peaked dramatically, replacing trait 03 which had peaked two years earlier in 1961, and continued strong in 1962 (Figure 6G). However, trait 03 made a recovery in 1967 when it accounted for over 50 percent of the leg traits that year.

During the entire 20 year period, trait 17 and trait 19 held at a fairly constant 5 to 15 percent each year, before their almost complete demise in 1967 and 1968. While this was a comparatively small

percentage, the stability of these leg traits made them important in the analysis of the style of the period.

When traits decline in occurrence they are replaced by other traits. Leg traits over the 20 year period were characterized by a dominance of trait 01 (although biennial fluctuations occurred) over the first one-third of the period. Trait 01 was replaced by trait 03 and trait 11 during the last one-third of the period. A transitional phase occurred between these two dominant phases. Trait 17 and trait 19 remained fairly constant over the period.

Leg Sub-Traits. Leg sub-trait 28 was similar to leg trait 01 but the back legs continued as one piece with the chair back. This same relationship existed between leg sub-trait 29 and leg trait 03, and between leg sub-trait 30 and leg trait 02. (For identification of leg sub-traits see Appendix D, Table XXX. Leg traits and the applicable leg sub-traits were combined in the analysis discussed above. In order to more clearly analyze the sub-traits, they were separated from other traits and analyzed independently. Appendix D, Table XXX shows frequencies for the three sub-traits. The percentages of occurrence of leg sub-traits were plotted for five year periods in Figure 7. These percentages were based on the 348 chairs which were composed of one of the three sub-traits.

Leg trait 29 changed dramatically over the period, from around 15 percent in the first quarter (1949-1963) to around 60 percent in the last quarter (1964-1968). Leg sub-trait 30 displayed little variability from its lead during the first half, but dropped to second in occurrence the last half of the period. As leg sub-trait 29 advanced

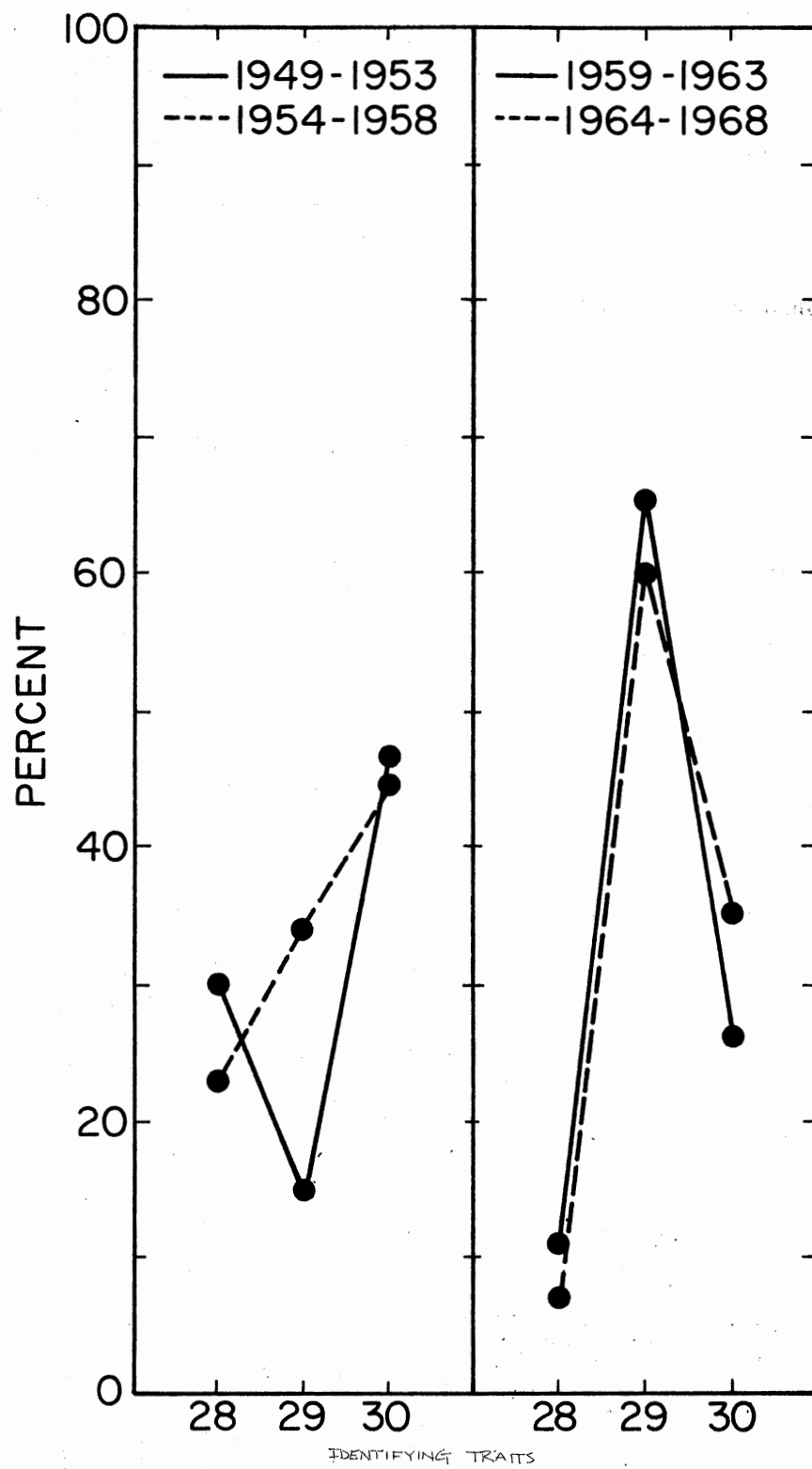


Figure 7. Percentages of Occurrence of Leg Sub-Traits, 1949-1968. (N = 348)

in occurrence during the last half of the period, leg sub-trait 28 declined from its position of around 25 percent during the first half to around 10 percent during the last half.

Minor Leg Traits. Figure 8 identified the minor leg traits and combinations of leg traits. Combinations of leg traits were those which in the classification process, were similar enough to be analyzed as one trait. See Appendix C, Table XXIV for frequency distributions of minor leg traits. Figure 9 showed the percentages of occurrence of minor leg traits. These percentages were based on the 174 chairs which possessed one of the four minor leg traits. These data points were obtained by averaging the percentages for five years.

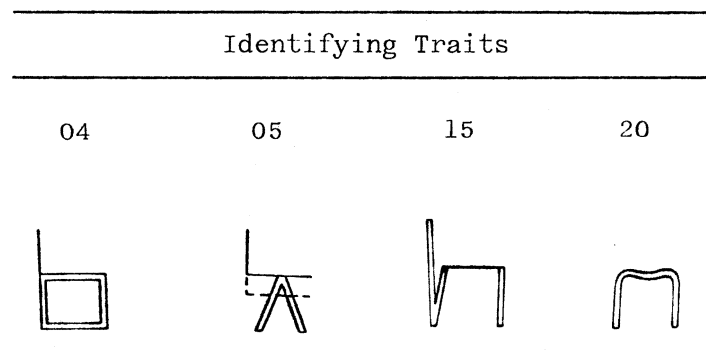


Figure 8. Minor Leg Traits Between 1949 and 1968

In comparing the occurrence of minor leg traits within the period, the first 15 years (1959-1963) showed a dominance of trait 05 which was replaced in the last five years (1964-1968) by trait 04. Leg trait 04

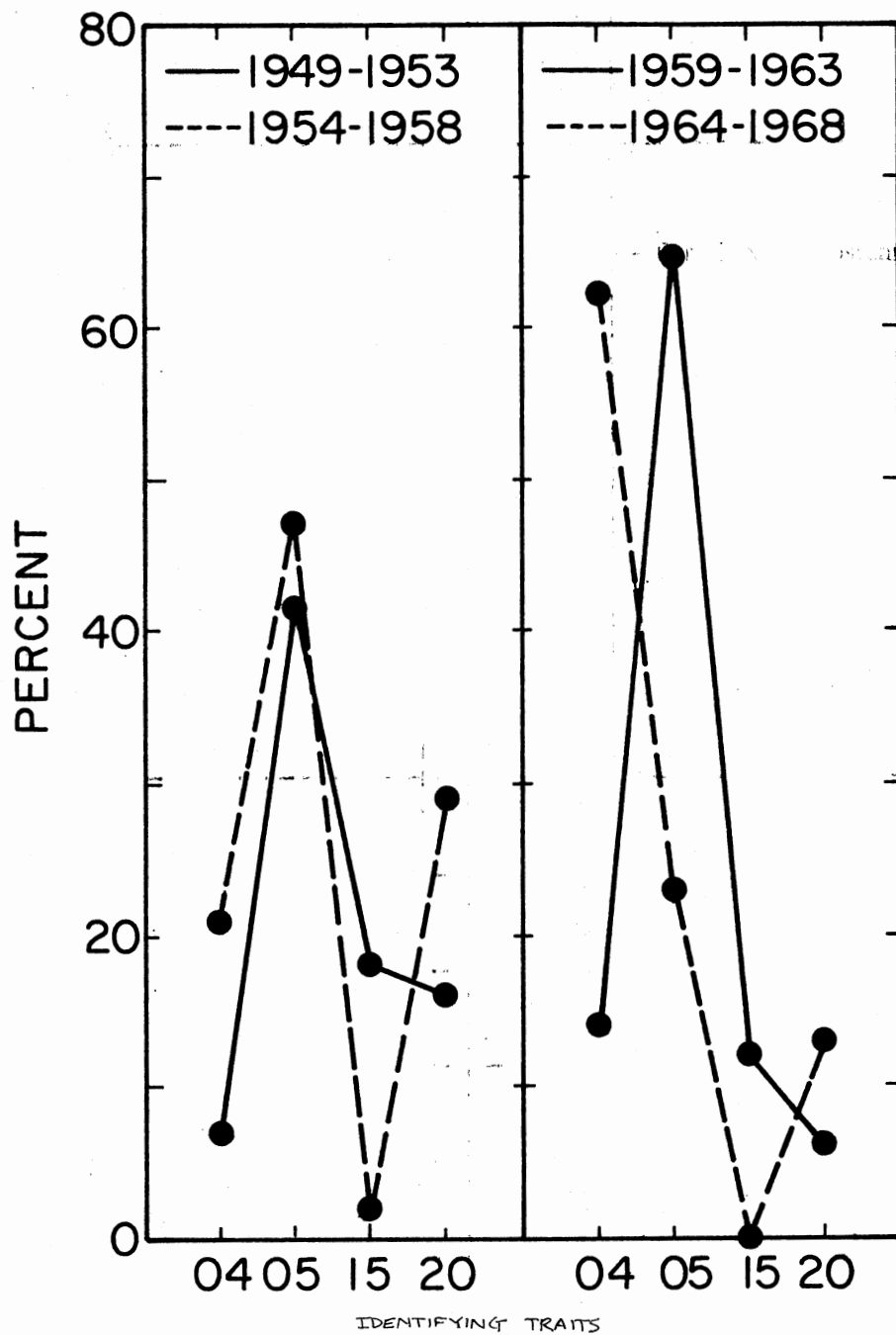


Figure 9. Percentages of Occurrence of Minor Leg Traits, 1949-1968 (N = 174)

gained this dominance by a climb from 21 percent to 63 percent. The plot of trait 05 was the reverse, declining from 65 percent to 23 percent.

Leg trait 15 was a shape designed to be made of wrought iron, a material used frequently in furniture during the years following World War II. This trait showed strength only within the first and third five year periods.

Trait 20 legs were generally associated with laminated legs used on Scandinavian "free-form" chairs (see back trait 26, Appendix A, Table X) of the type designed by Bruno Mathesson. These traits exhibited a relatively stable pattern over the period of this study.

Leg Shape Traits

The shape of a chair leg is a further distinguishing trait of a furniture style. Each leg trait has a leg shape that distinguishes it from other leg traits, in relation to style. For example, the Sheraton style is characterized by a square, tapered leg.

In the initial tallying process, eight leg shape traits were identified (Appendix A, Table VIII). From these eight leg shape traits, three major leg shape traits and three leg shape sub-traits were identified. No minor leg shape traits were identified.

Major Leg Shape Traits. Major leg shape traits were identified and coded as follows:

- 01 - Round Leg
- 02 - Square Leg
- 03 - Rectangular Leg

See Appendix B, Table XVII for frequency distributions of major leg shape traits. The percentages of occurrence of major leg shape traits for each year were plotted in Figure 10.

The years of 1949 and 1950 began the period with all the traits somewhat clustered. After these two years a dramatic separation of the data points occurred, showing a substantial dominance of the round leg (trait 01) from 1951 until 1963. Peak years occurred in 1951 and 1957 when the round leg accounted for about 80 percent of all leg shapes. Very little fluctuation occurred until 1964 when biennial fluctuations of 15 percent to 20 percent occurred through 1968.

The occurrence of square legs (trait 02) increased gradually in percentages before cresting in 1966 at 66 percent. The same type of biennial fluctuations were found for the square leg as were previously reported for the round leg.

The less frequent occurrence of rectangular legs (trait 03) after 1949 and 1950 showed the continuation of the decline of this leg shape which probably began in the years preceding this study. In the 1940s laminated wood had been used extensively in furniture. The rectangular leg is particularly adaptable to laminated wood, and reflects the influence of Scandinavian designer Alvar Aalto. After an attempt at a recovery in 1961, the rectangular leg remained fairly stable at around 5 percent for the remainder of the period.

Round legs appeared most frequently over the first 15 years of the period (1949-1963) being replaced by square legs during the last quarter of the period (1964-1968). Rectangular legs show steady but generally insignificant percentages of occurrence.

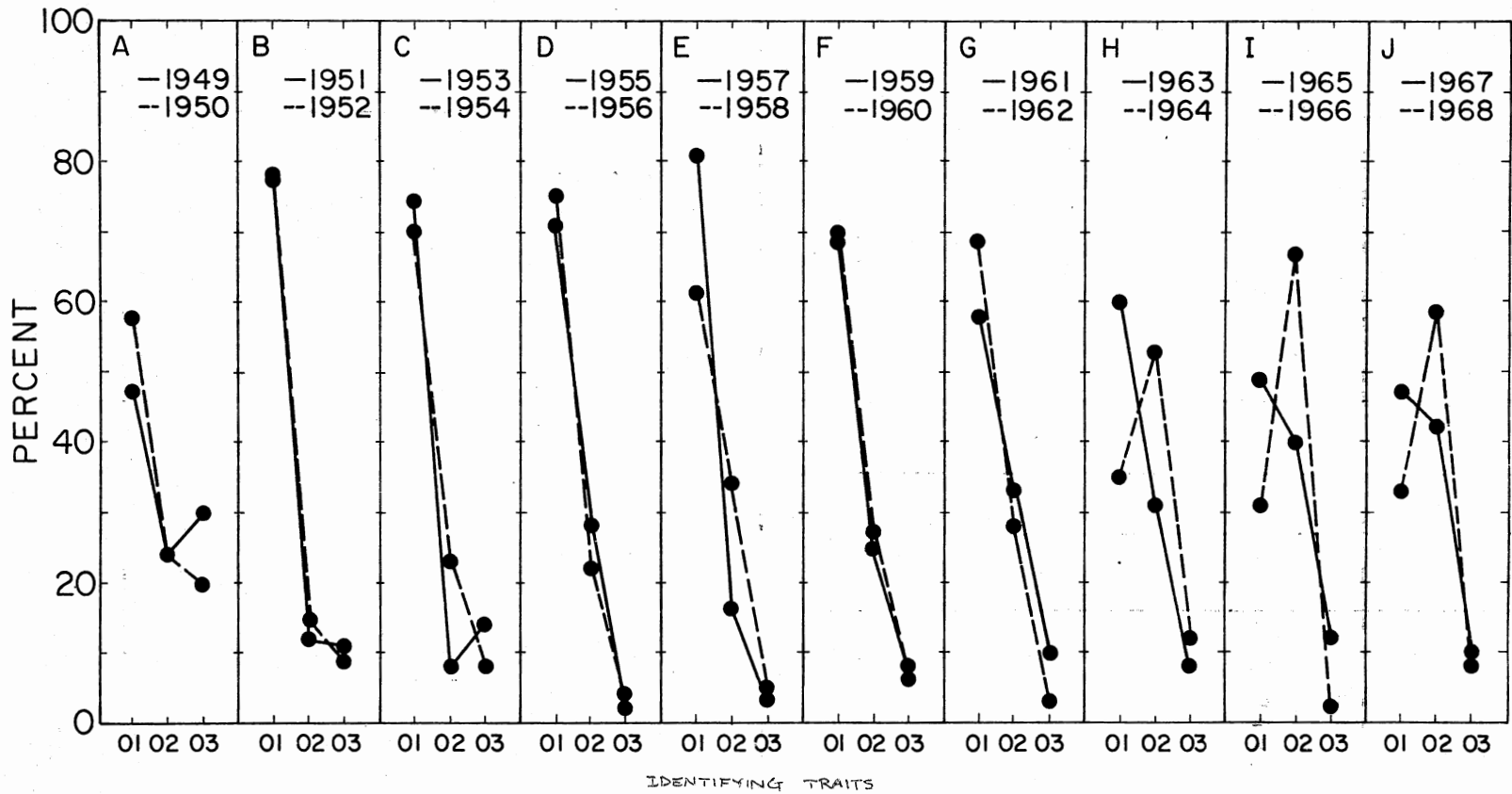


Figure 10. Percentages of Occurrence of Major Leg Shapes, 1949-1968 (N = 1733)

Leg Shape Sub-Traits. Round legs (trait 01) were considered the source traits of round, tapered legs (trait 04). Square legs (trait 02) were considered the source traits of square, tapered legs (trait 05), and rectangular legs (trait 03) were considered the source traits of rectangular, tapered legs (trait 06). Tapered legs were combined with their source trait in the preceding analysis of leg shapes. In this portion of the analysis they were separated out as sub-traits and analyzed independently. See Appendix D, Table XXXI for frequency distributions of leg shape sub-traits. The percentages of occurrence of leg shape sub-traits were plotted in five year periods in Figure 11. These percentages were based on the 722 chairs which possessed one of the sub-traits.

Without question, round, tapered legs (trait 04) appeared most frequently the entire period. Rectangular, tapered legs (trait 06) were the least frequently appearing, with five year averages remaining below 5 percent. Five year averages of square, tapered legs (trait 05) remained around 15 percent for the period.

Stretchers

The functional purpose of a leg stretcher is to give added support and stability to a chair, although it may serve an aesthetic function of contributing balance and proportion. Likewise, the absence of a stretcher, if not needed to serve as a support, may add an aesthetic quality. In some styles, such as Louis XV, the stretcher was almost never seen. Its presence would have detracted from the aesthetic quality of the chair. Therefore, the absence of the stretcher was considered an independent trait in this study.

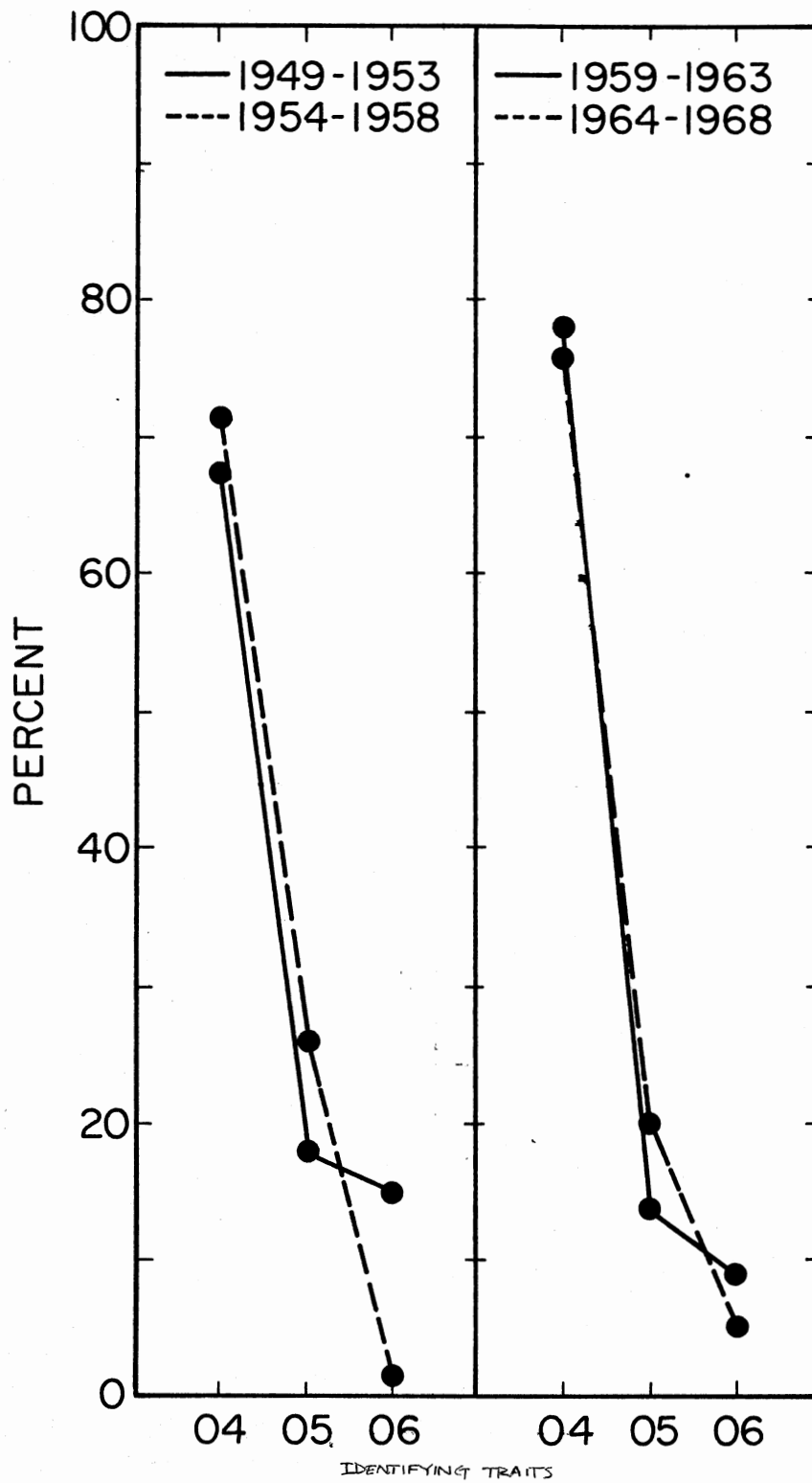


Figure 11. Percentages of Occurrence of Leg Shape Sub-Traits, 1949-1968 (N = 722)

In the initial tallying process, 18 stretcher types were identified (Appendix A, Table IX). From these traits, four major and three minor stretcher traits were identified. No sub-traits were identified.

Major Stretcher Traits. Major stretcher traits are shown in Figure 12. Major stretcher traits were described as follows:

Trait 02 - included front and back stretchers (stretcher attached between the front legs and stretcher attached between the back legs)

Trait 03 - included side stretchers attached between the front and back legs

Trait 09 - no stretcher

Trait 13 - included seat attached to frame in a "floating" manner. Not technically a stretcher.

See Appendix B, Table XVIII for frequency distributions of major stretcher traits. Percentages of occurrence of major stretcher traits were plotted in Figure 13.

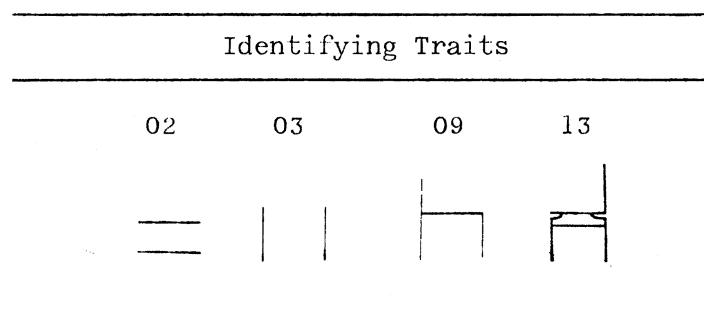


Figure 12. Major Stretcher Traits Between 1949 and 1968

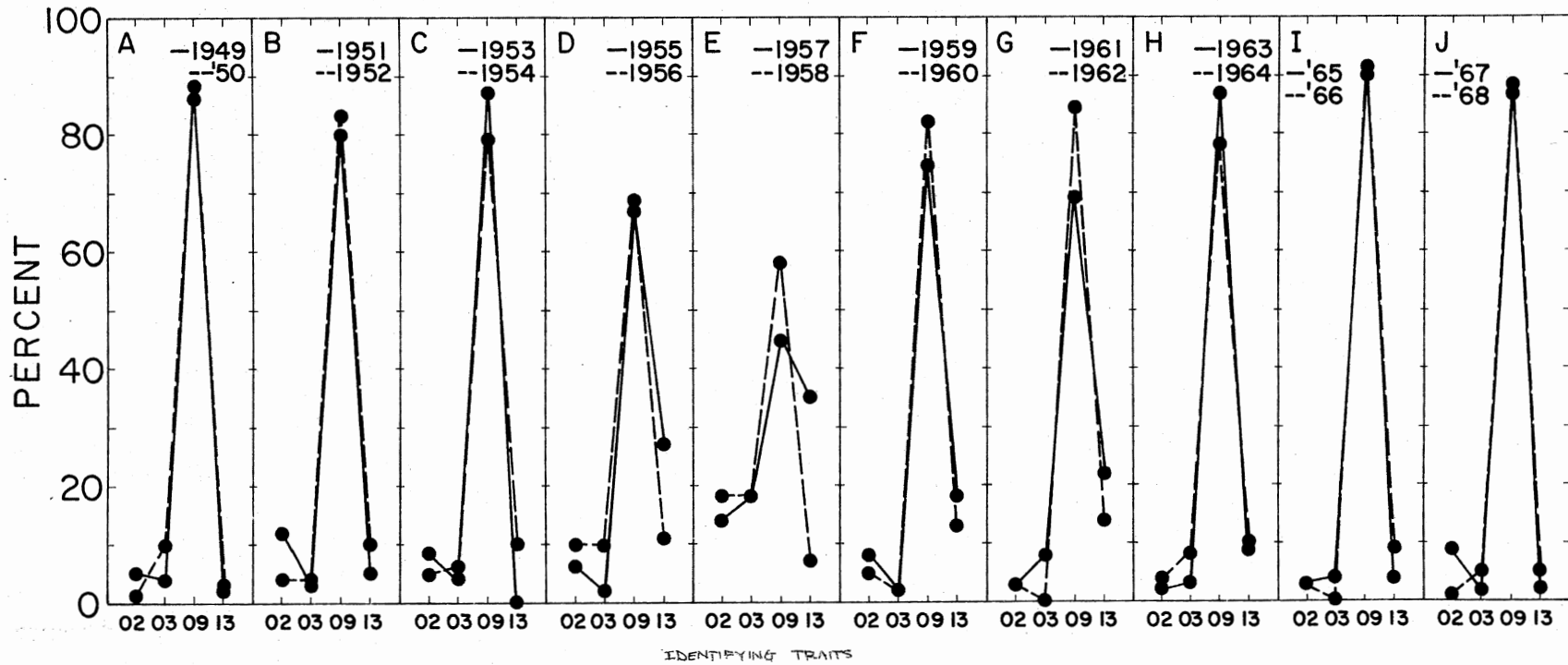


Figure 13. Percentages of Occurrence of Major Stretcher Traits, 1949-1968 (N = 1745)

A look at the plotting in Figure 13 very clearly established the fact that chairs with no stretcher (trait 09) were dominant over the entire period (1949-1968). This percentage of occurrence dropped to below 80 percent only during a period of fluctuation beginning with 1955 at 65 percent to a low of 45 percent in 1957. After a rise to 58 percent in 1958 and 75 percent in 1959, it dropped below 80 percent again only in 1961 and 1964.

One objective of modern design is to achieve a feeling of freedom of the structure in space. An attempt was made to achieve this feeling in chairs of the modern period by attaching seat to frame in a "floating" manner. This concept may be attributed to Danish designer Finn Juhl. While not technically a stretcher, this trait was included in the stretcher category as trait 13 because of its structural relationship to legs.

Stretcher trait 13 showed a slight dominance over front stretchers (trait 02) and side stretchers (trait 03) during the middle decade from 1955 to 1962. Minor fluctuations in trait 02, trait 03, and trait 13 were seen from 1955 to 1962.

Beginning with 1959 there was a resurgence of chairs with no stretcher. At this time front and side stretchers began to decline and there was a reversion to the trend seen before 1955 where less than 10 percent of the stretchers were of these traits.

The 20 year period was dominated by legs with no stretcher. The "floating" seat began at around 2 percent in 1949, gradually rose to a high of 27 percent, then slowly declined until it was barely perceptible by the end of the period. Front stretchers (trait 02) and side stretchers (trait 03) appeared timidly and were closely related over

the entire period, reaching highs of around 7 percent in 1958 and becoming almost extinct by the end of the period.

Minor Stretcher Traits. Figure 14 identifies the minor stretcher traits. See Appendix C, Table XXV for frequency distributions of minor stretcher traits. Percentages of occurrence of minor stretcher traits were plotted in five year periods in Figure 15. Percentages were based on 195 chairs which had one of these three minor traits.




Identifying Traits		
01	04	12
		

Figure 14. Minor Stretcher Traits
Between 1949 and
1968

Stretcher trait 12 was the strongest minor trait in the middle ten years of the period (1954-1963), reaching a high of 62 percent in the third quarter (1959-1963), then dropping during the last quarter (1964-1968) to 27 percent. Trait 04 remained fairly constant over the period. The H-stretcher (trait 01) remained low during the first 15 years but climbed to around 43 percent during the last five years. The H-type stretcher was more likely than other traits to be found on

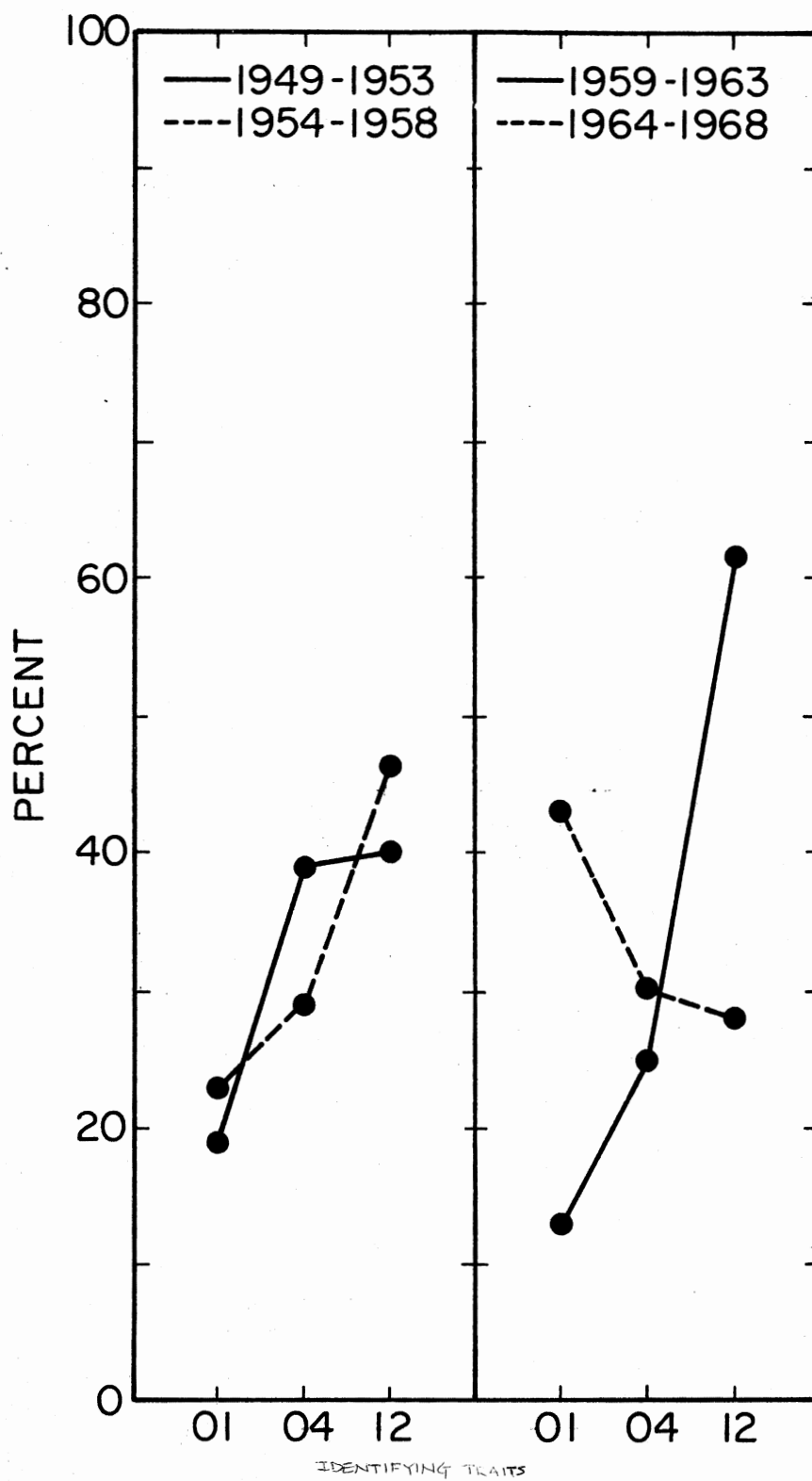


Figure 15. Percentages of Occurrence of Minor Stretcher Traits, 1949-1968
(N = 195)

upholstered chairs. The increase of upholstered chairs during the last quarter could account for the more frequent occurrence of the H-type stretcher.

Back Traits

The back is generally the second most important feature in defining style in chairs. However, in some types, such as Hepplewhite and Sheraton, the back is the dominant feature in identifying the style. This analysis sought to determine the significance of back traits in identifying the modern style.

In the tallying process, 30 back traits were identified (Appendix A, Table X). Four were identified as major back traits and 2 as minor back traits. See Figure 4 for composition of major traits. Of the 30 original traits, seven were identified as moulded or "free form" traits of chairs which were analyzed later in this section of the analysis.

Major Back Traits. Figure 16 identifies the major back traits. See Appendix B, Table XIX for frequency distributions of major back traits. The percentages of occurrence of major back traits were plotted in Figure 17. Back traits were described as follows:

Trait 01 - included all backs with back and seat attached to each other, with no separation between seat and back

Trait 05 - included all backs with separation between back and seat equaling approximately one-fourth of the total height of the back

Trait 09 - included all backs with separation between back and seat equaling approximately one-half of the total height of the back

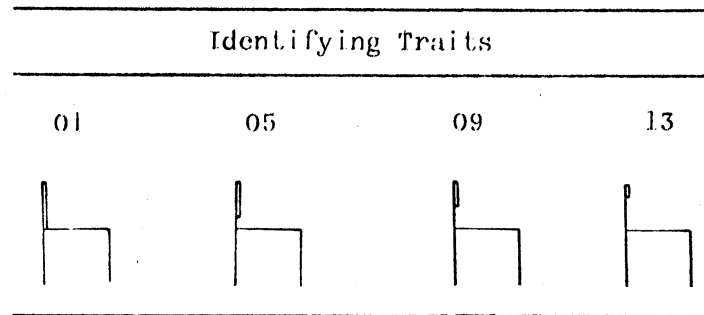


Figure 16. Major Back Traits Between
1949 and 1968

Trait 13 - included all backs with separation between back and seat equaling approximately three-fourths of the total height of the back.

Observation of the plots revealed that the entire period (1949-1968) was dominated by trait 01. There was a slight yearly decline of trait 01 after 1949 until a low point of 38 percent was reached in 1958. After that, a rising trend occurred yearly until the end of the period.

Trait 05 displayed very systematic fluctuations between 10 percent and 30 percent over the entire period. There were exceptions of two low periods of 6 percent and 4 percent in 1959 and 1966, respectively.

Trait 09 also displayed steady fluctuations within a 20 percent range with the exception of an abrupt peak in 1955 of 37 percent. Trait 13 exhibited the same fluctuating trend within a 20 percent range, as was seen in trait 09. The high of 27 percent was reached for 1956. There were no occurrences of trait 13 in the sample for 1949. Trait 13 reached a low of 5 percent in 1955, the year preceding its high of 27 percent in 1956.

The period began with a dominance of back trait 01. As the period progressed the traits began to cluster and percentages of occurrence

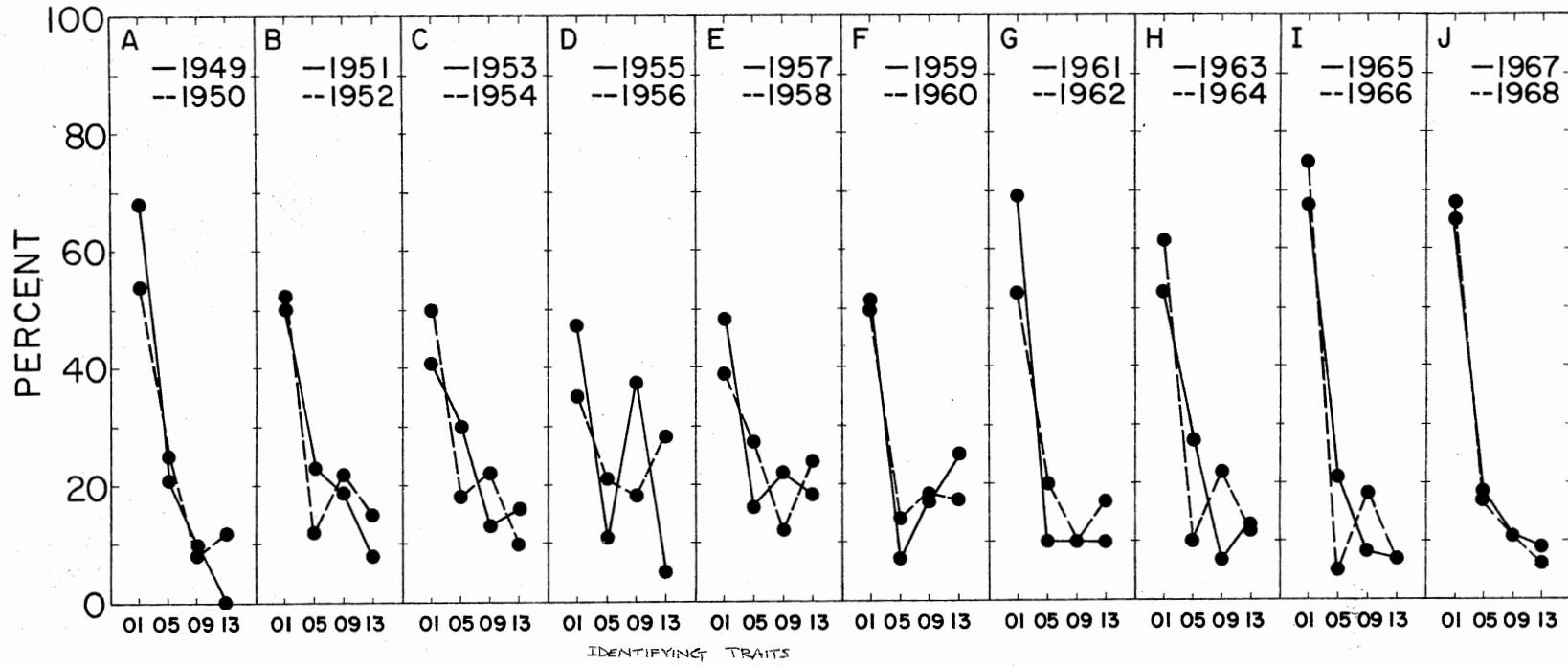


Figure 17. Percentages of Occurrence of Major Back Traits, 1949-1968 (N = 1519)

of back traits were quite similar during the middle years. After these middle transitional years, data points began to separate again until the pattern at the end of the period was almost identical to that at the beginning.

Minor Back Traits. Ladder backs (trait 17) and spindle backs (trait 18) were identified in Figure 18. See Appendix C, Table XXVI for frequency distributions of minor back traits. Percentages of occurrence of minor back traits were plotted in five year periods in Figure 19. These percentages were based on the 99 chairs which had one of the two minor back traits.

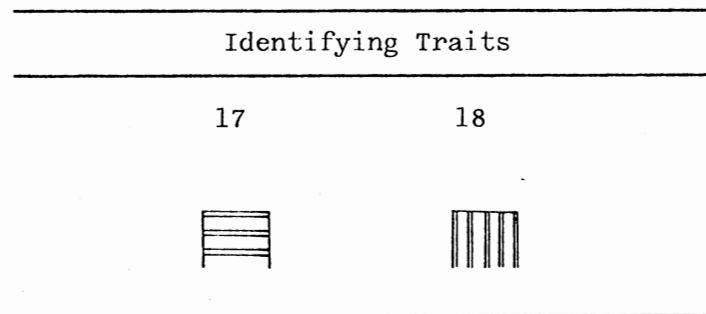


Figure 18. Minor Back Traits Between
1949 and 1968

Ladder back and spindle back chairs are types with a long history, adapting to almost any style. They were also adapted to chairs in the modern period. The spindle back was particularly adaptable to Scandinavian designs of the Windsor type designed by Hans Wegner.

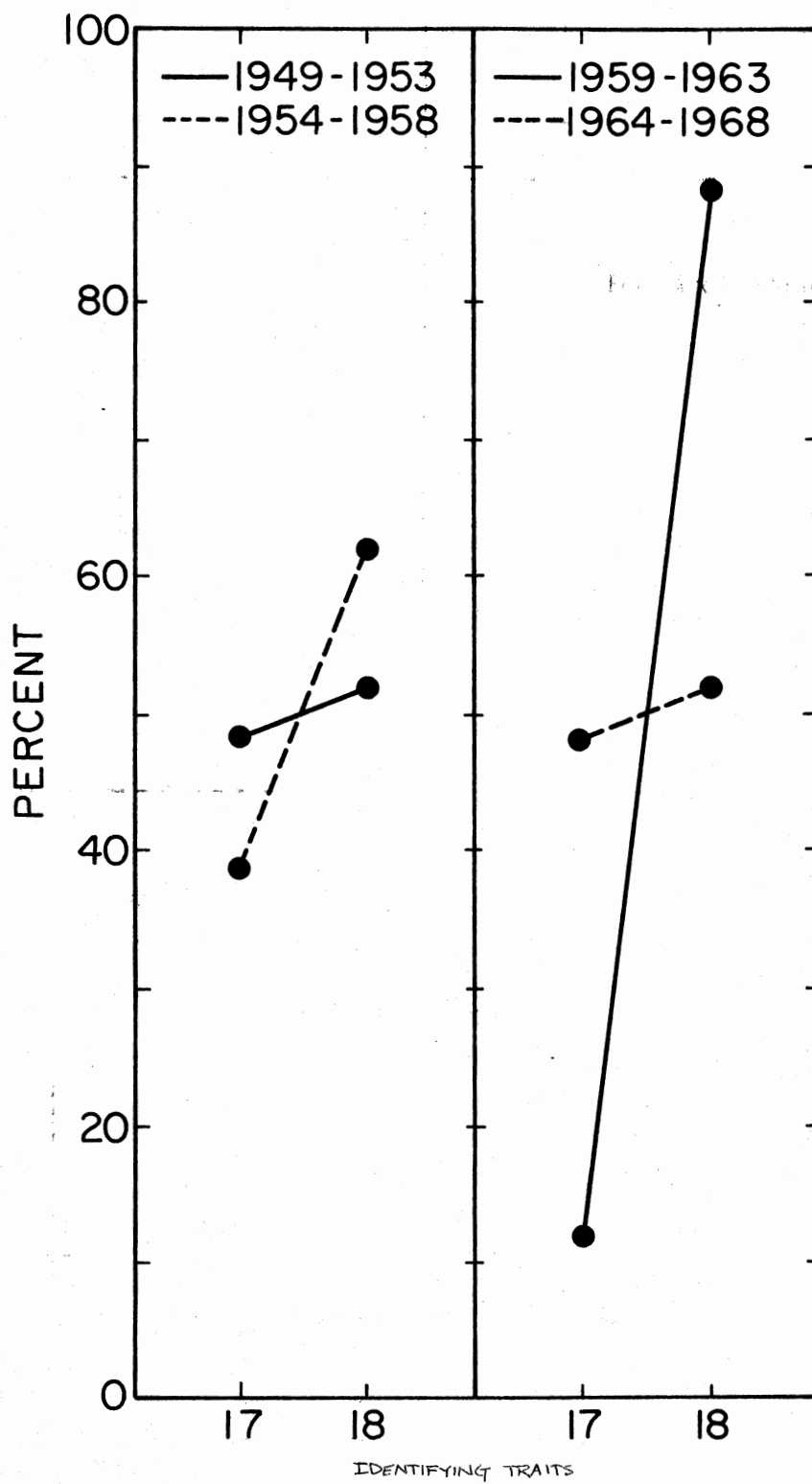


Figure 19. Percentages of Occurrence of Minor Back Traits, 1949-1968 (N = 99)

Spindle backs were the most common minor back trait over the entire period with a high point occurring in the third quarter. Occurrences during other years of the period were stable.

Arm Traits

The functional purpose of arms is to serve as a rest for the elbow. Upholstered chairs are generally designed with arms; however, this is not always the case. Dining chairs or occasional chairs may or may not have arms. The presence or absence of arms, as well as arm traits are important considerations in determining style. Thus, the absence of arms was considered a trait.

In the initial tallying process, 19 arm traits were identified (Appendix A, Table XI). From these, five major traits and three minor traits were identified. Five arm sub-traits which occurred on upholstered chairs were analyzed separately.

Major Arm Traits. Figure 20 identifies the major arm traits. See Appendix B, Table XX for frequency distributions of major arm traits. The percentages of occurrence of major arm traits were plotted in Figure 21. Major arm traits are described as follows:

Trait 01 - included arms which extended downward at the front edge of the seat

Trait 03 - included arms which extended downward at some point between the back post and front edge of seat

Trait 05 - included arms which continued as one piece with the back rail

Trait 07 - included arms where arms and legs continued as one piece to form an inverted U-shape

Trait 11 - no arms.

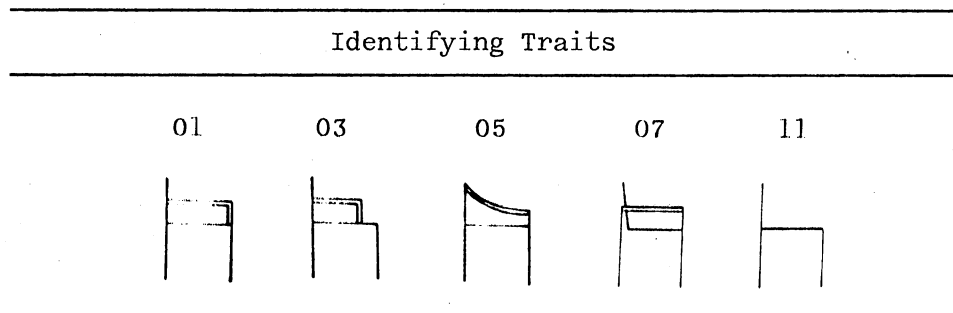


Figure 20. Major Arm Traits Between 1949 and 1968

The 20 year period began with a dominance of chairs with no arms in 1949, dropped to 38 percent the following year, regained its position in 1953, and then steadily declined. After 1958 the percent of chairs with no arms fluctuated at around 20 percent to 35 percent for the remainder of the period. As was shown later in the analysis, upholstered chairs became dominant in the last half of the period. Upholstered chairs generally had arms and would account for the drop in the percentage of armless chairs in the last half of the period.

A somewhat inverse relationship existed between trait 11 and trait 01. As trait 11 declined over the years, trait 01 exhibited a gradual rise from around 20 percent in 1949 to around 35 percent in 1968, with fluctuations of around 5 percent to 10 percent in the intervening years.

Traits 03, 05, and 07 remained fairly steady except in 1961 when trait 07 increased dramatically. This could be explained by the fact that these were generally standard arm traits used on chairs of all periods and common to all styles. As such, they would not be readily influenced by the trends or occurrence of other arm traits, or changes in style.

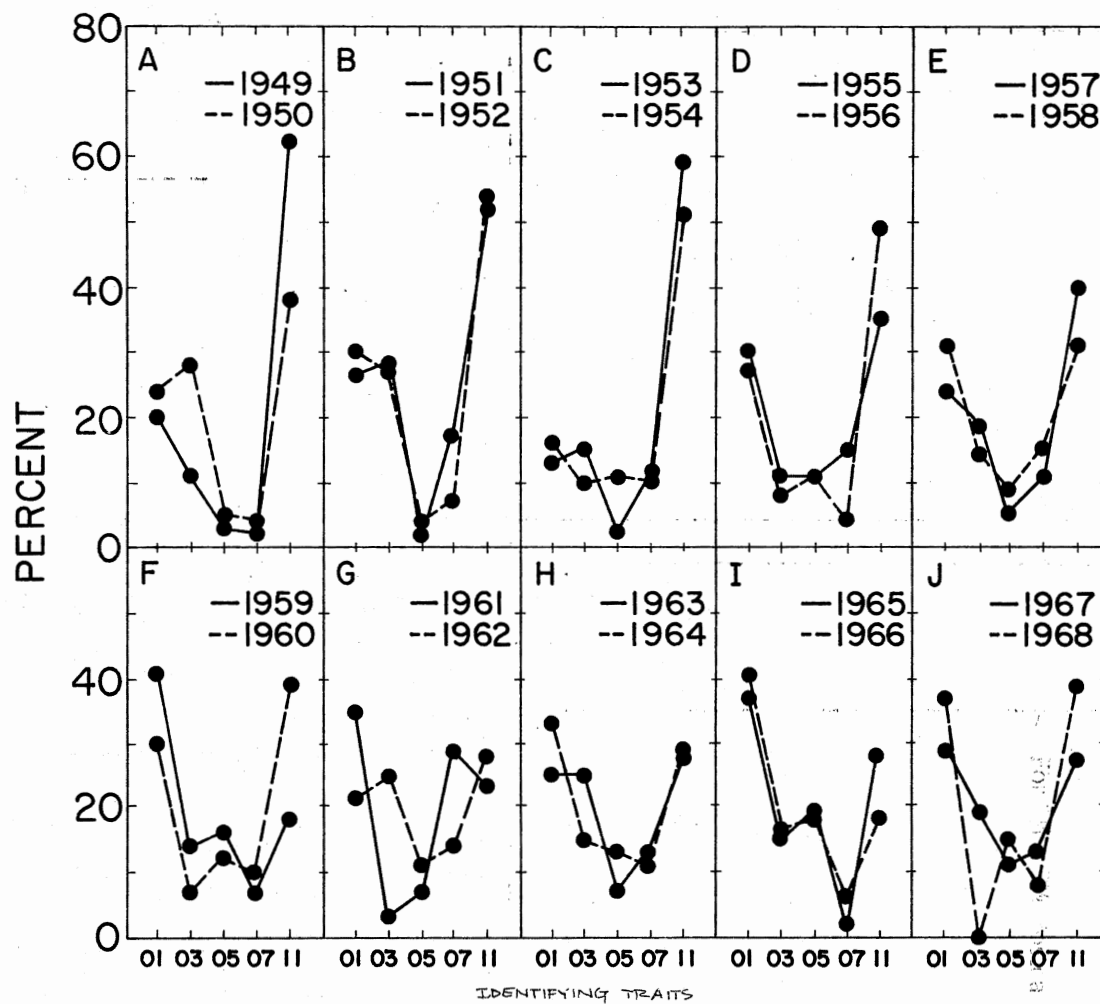


Figure 21. Percentages of Occurrence of Major Arm Traits, 1949-1968 (N = 1822)

The period began with the dominance of armless chairs, which slowly declined over the years. After 1957 armless chairs became fairly stable and comparable with trait 01 in percentages of occurrence. Traits 03, 05, and 07 remained fairly constant over the period, with trait 07 being the most variable of the three traits.

Arm Sub-Traits--Upholstered Chairs. Historically, upholstered chairs have not played as significant a role in the definition of style as has non-upholstered chairs. However, as revealed by the analysis of this study, upholstered chairs were a very significant determinant of style during the last half of the 20 year period. This may have been a consequence of the emphasis placed on contract furniture for offices during these years, and less distinction being made between furniture for home and for office use.

Arm traits were used as the criteria for determining the occurrence of upholstered chairs. If an arm trait was fully upholstered then this was considered to be an occurrence of an upholstered chair. Figure 22 identified the upholstered arm traits. See Appendix D, Table XXXII for frequency distributions of upholstered arm traits. The percentage of occurrence of upholstered arm traits were plotted in Figure 23. These percentages were based on the 468 chairs which possessed one of the upholstered arm traits.

There was no mistaking the evidence of the plots showing that arm trait 02 was dominant throughout the period. The only year it relinquished first place was 1963. The greatest fluctuations appeared in the first 12 years. During the last eight years, trait 02 remained at around 35 to 45 percent.

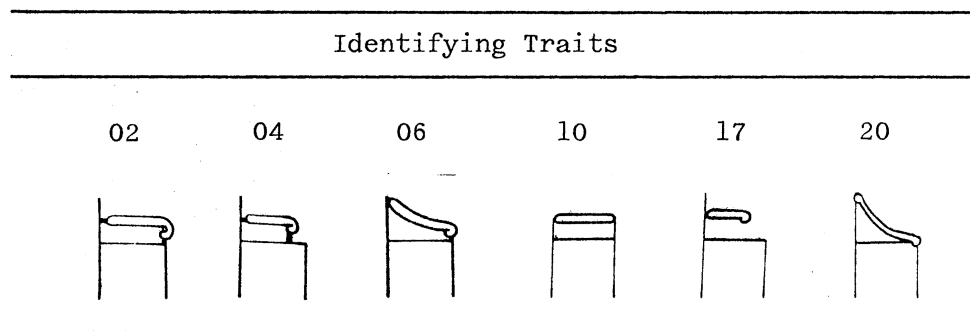


Figure 22. Upholstered Arm Traits Between
1949 and 1968

Trait 04 appeared to be the second most dominant trait. It showed very little variability with the exception of 1953, 1960, and 1968, every seventh year, when the percentage dropped considerably.

Traits 06 and 10 showed very little activity until around 1961 when their percentage of occurrence began to climb. They reached their highest levels during the last five years of the period (1964-1968). Trait 10 reached a high of 35 percent in 1968.

The occurrence of trait 17 was almost non-existent during the entire period. Its high point of percentage was reached in 1965. Trait 20 displayed considerable variation. It reached peaks of 27 percent and 33 percent in 1955 and 1956. It climbed no higher than 11 percent in any other year thereafter.

Minor Arm Traits. Figure 24 identifies the minor arm traits. See Appendix C, Table XXVII for frequency distributions of minor arm traits. Percentages of occurrence of minor arm traits were plotted in five year periods in Figure 25. These percentages were based on 161 chairs which were designed with one of the three minor arm traits.

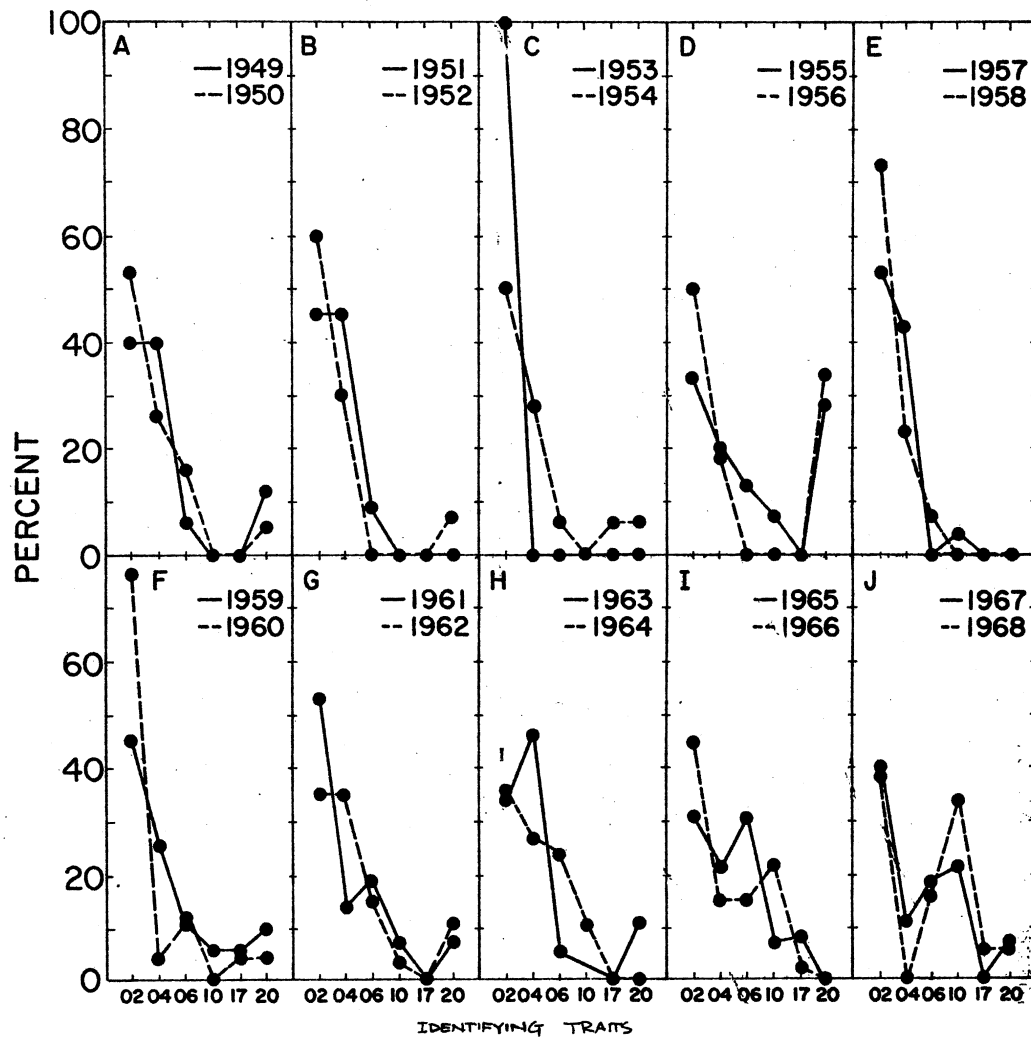


Figure 23. Percentages of Occurrence of Upholstered Arm Traits, 1949-1968 (N = 468)

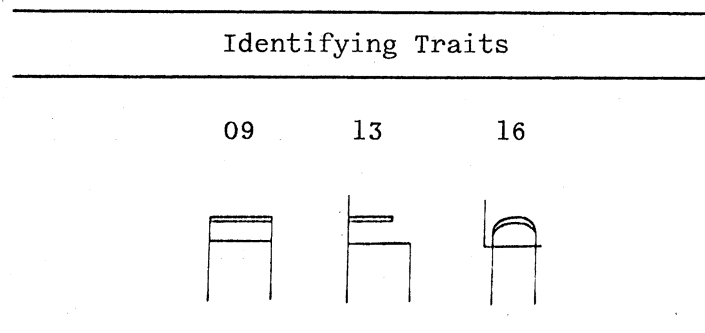


Figure 24. Minor Arm Traits Between
1949 and 1968

The first half of the period showed the highest percentage of occurrence in trait 13, with a high point of 46 percent. Trait 13 fell to a low of 18 percent during the last half of the period. Trait 09 showed steady growth from a low of 24 percent in the first five years to a high of 80 percent during the last five years. Trait 16, which was the most unusual of the three traits in appearance, showed the least activity with its almost complete disappearance during the last five years.

Material Used for Backs
and Seats

Materials used in seats and backs may be an indicator of style or period. For example, the use of webbing is related to Scandinavian design; moulded plastic to "free-form" modern shapes.

Although seat and back material were at first tallied separately, their similarity suggested that they be analyzed together. Eleven materials for seats were identified in the original tallying process

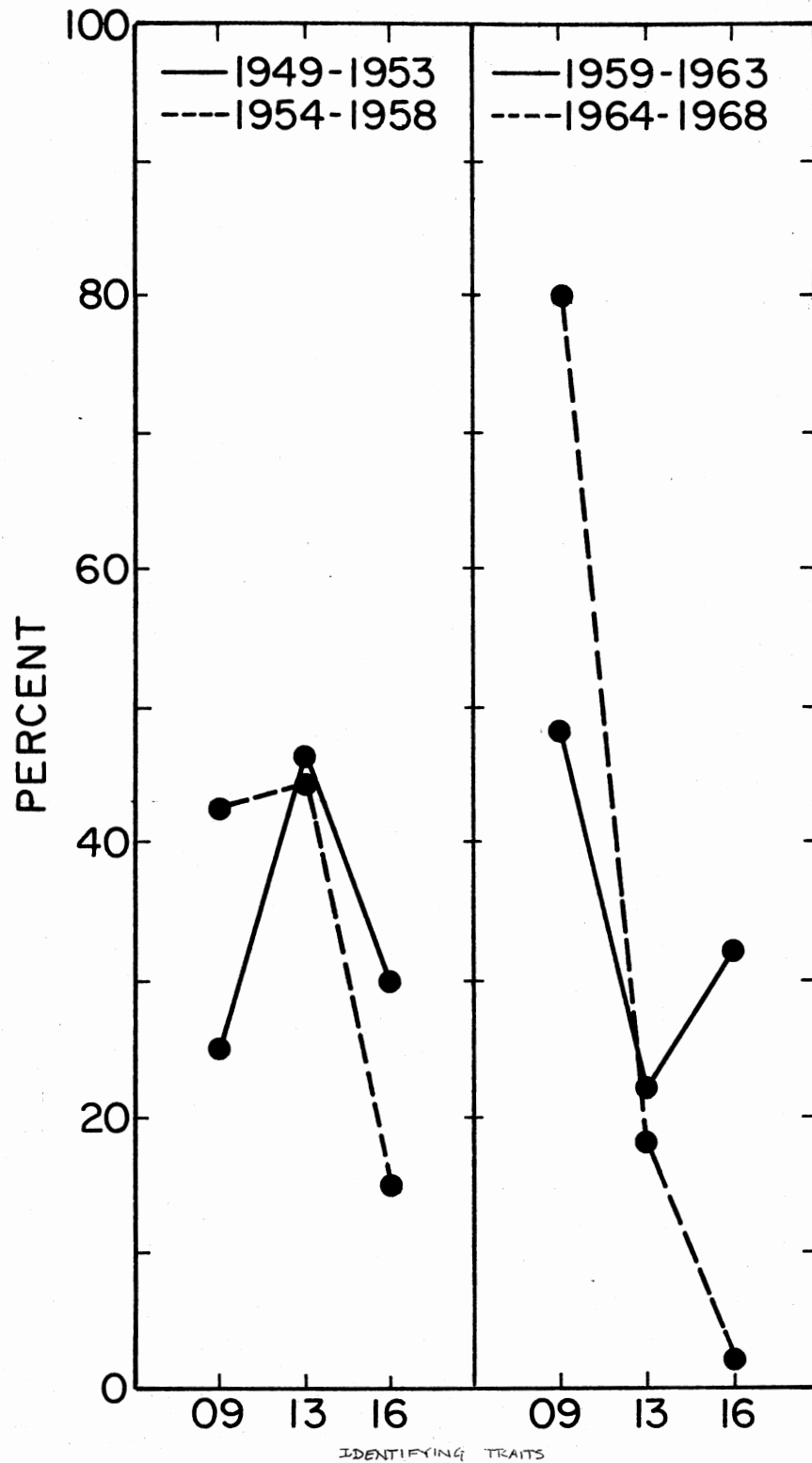


Figure 25. Percentages of Occurrence of Minor Arm Traits, 1949-1968 (N = 161)

(see Appendix A, Table XII). Eleven materials were also identified for backs (Appendix A, Table XIII). Two major materials and seven minor materials were identified. See Appendix B, Table XXI for frequency distributions of major materials used for seats. See Appendix B, Table XXII for frequency distributions for major material used for backs. Percentages of occurrence of seat material were plotted in Figure 26 and of back material in Figure 27. Major materials were identified and coded as follows:

01 - Upholstery

02 - Wood

The evidence displayed in the plotting clearly showed the dominance of upholstered seats and backs. The last half of the period beginning with 1958 was almost entirely dominated by upholstered seats. The highest percentage of wood seats during this period was 5 percent, which recurred in 1960, 1962, and 1968. As expected, wood backs occurred more frequently than wood seats, clustering between 20 percent and 30 percent from 1949 to 1960. Wood backs dropped to 5 percent in 1961, recovered in 1962 to 22 percent, then fluctuated below 10 percent until the end of the period. Lower percentages of occurrence of upholstered backs indicated that combinations of upholstered seats with backs of wood or other materials occurred each year. The most likely combination of materials to occur was upholstered seats and wood backs. The combination of wood seat and upholstered back would probably not occur. Table I shows the percentage of chairs with combination upholstered seats and backs of wood or other material, which occurred during the period.

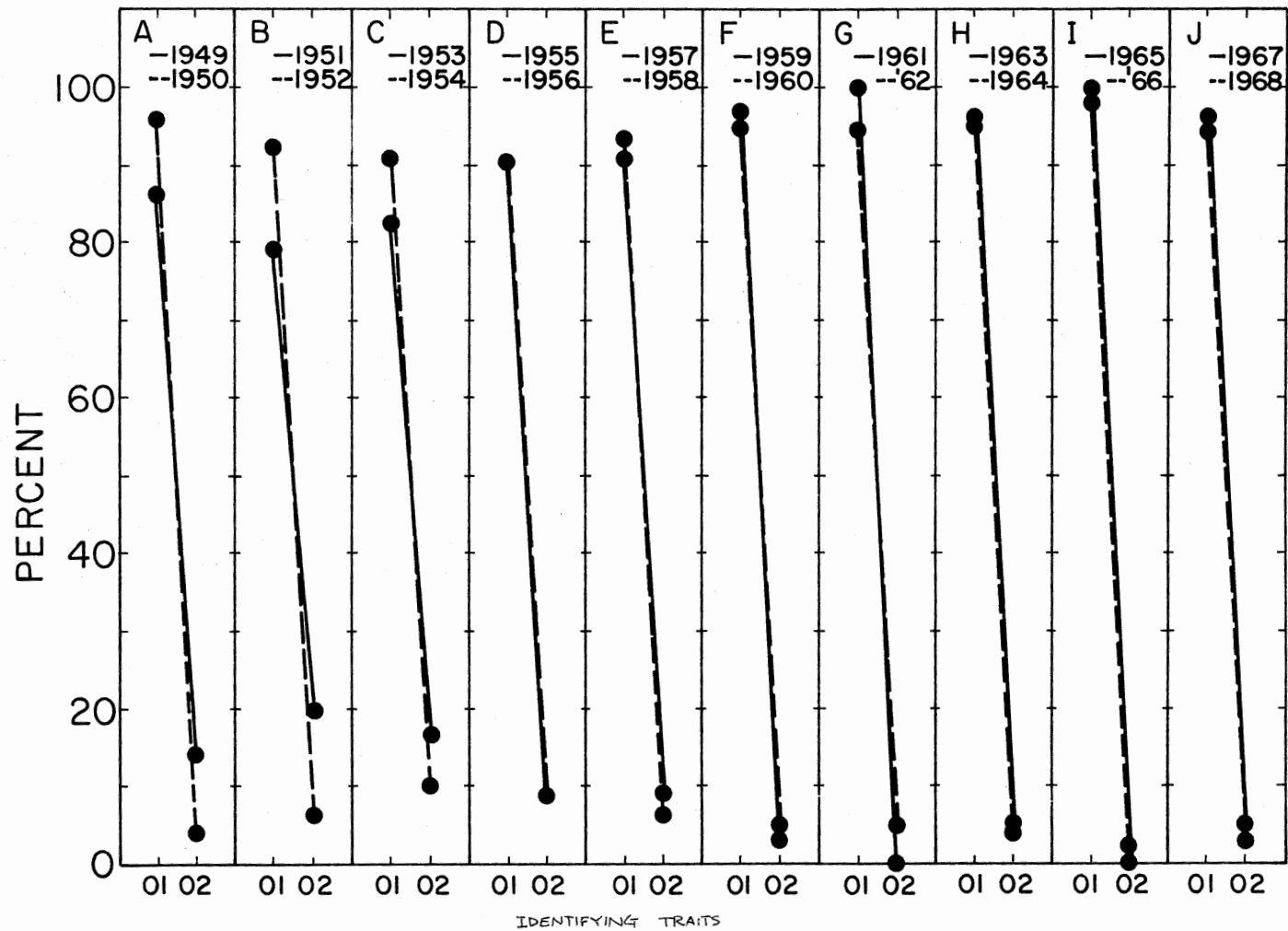


Figure 26. Percentages of Occurrence of Major Material Used for Seats, 1949-1968 (N = 1699)

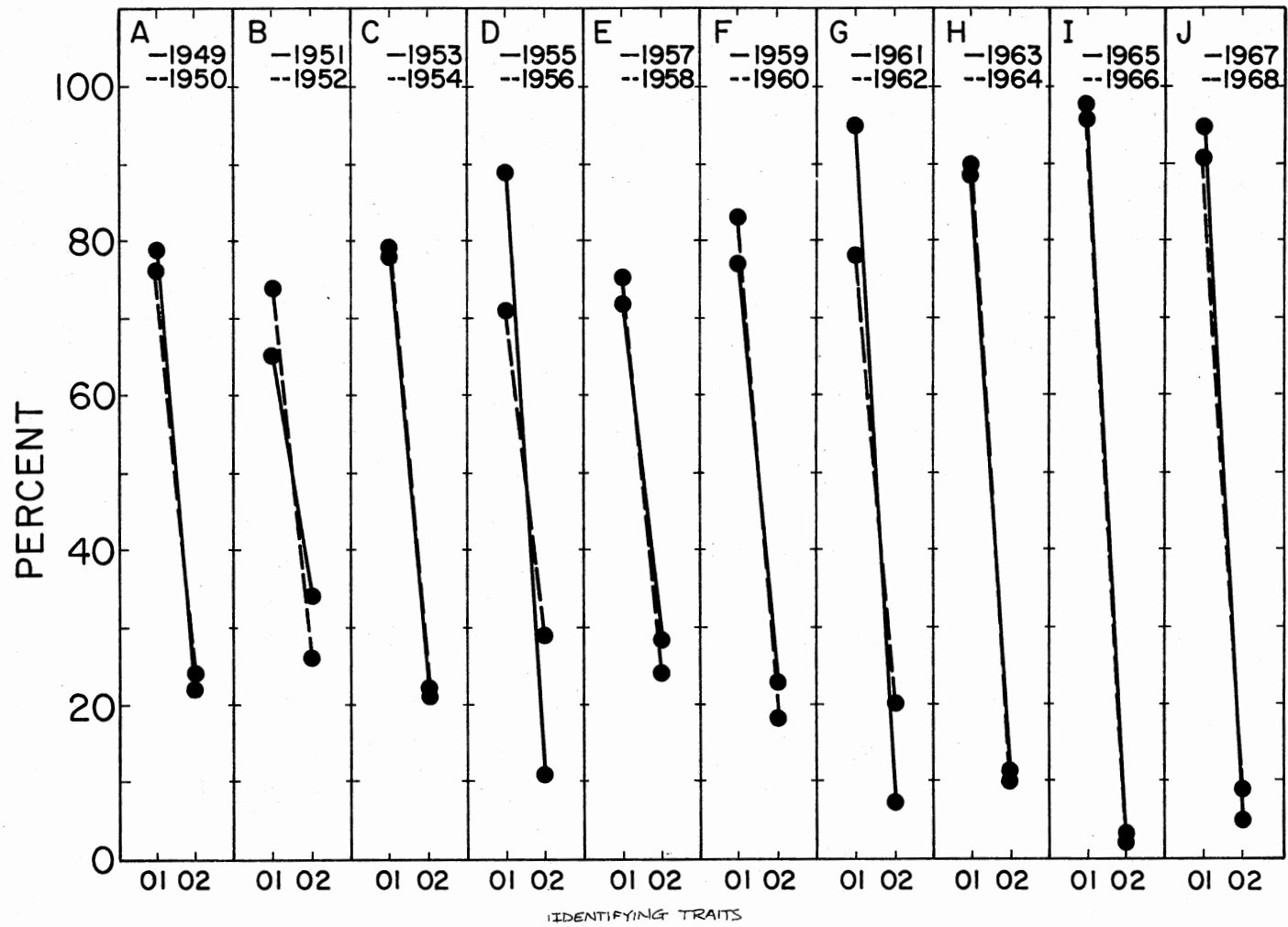


Figure 27. Percentages of Occurrence of Major Material Used for Backs, 1949-1968 (N = 1676)

TABLE I
 PERCENTAGE OF CHAIRS WITH A COMBINATION OF AN
 UPHOLSTERED SEAT WITH BACK OF WOOD OR OTHER
 MATERIAL, 1949-1968

Year	Percent	Year	Percent	Year	Percent	Year	Percent
1949	9	1954	12	1959	21	1964	7
1950	20	1955	3	1960	11	1965	2
1951	14	1956	19	1961	5	1966	4
1952	20	1957	19	1962	17	1967	2
1953	7	1958	19	1963	7	1968	5

Minor Materials Used for Backs and Seats. See Appendix C, Table XXVIII for frequency distributions of minor materials for seats. See Appendix C, Table XXIX for frequency distributions of minor material for backs. Percentages of occurrence of minor seat materials were plotted for five year periods in Figure 28, and of back materials in Figure 29. Minor materials were coded as follows:

- 03 - Cane
- 04 - Rope
- 05 - Webbing
- 06 - Canvas and leather sling type seats
- 07 - Metal or wire
- 08 - Wicker or rattan
- 09 - Plastic

The plotting suggested an opposite situation than existed with major materials. There was no complete dominance of any one material. Cane seats and backs were the most frequently used minor material trait during the second five years with a high at around 35 percent. During the rest of the period, cane remained at around 10 percent for seats.

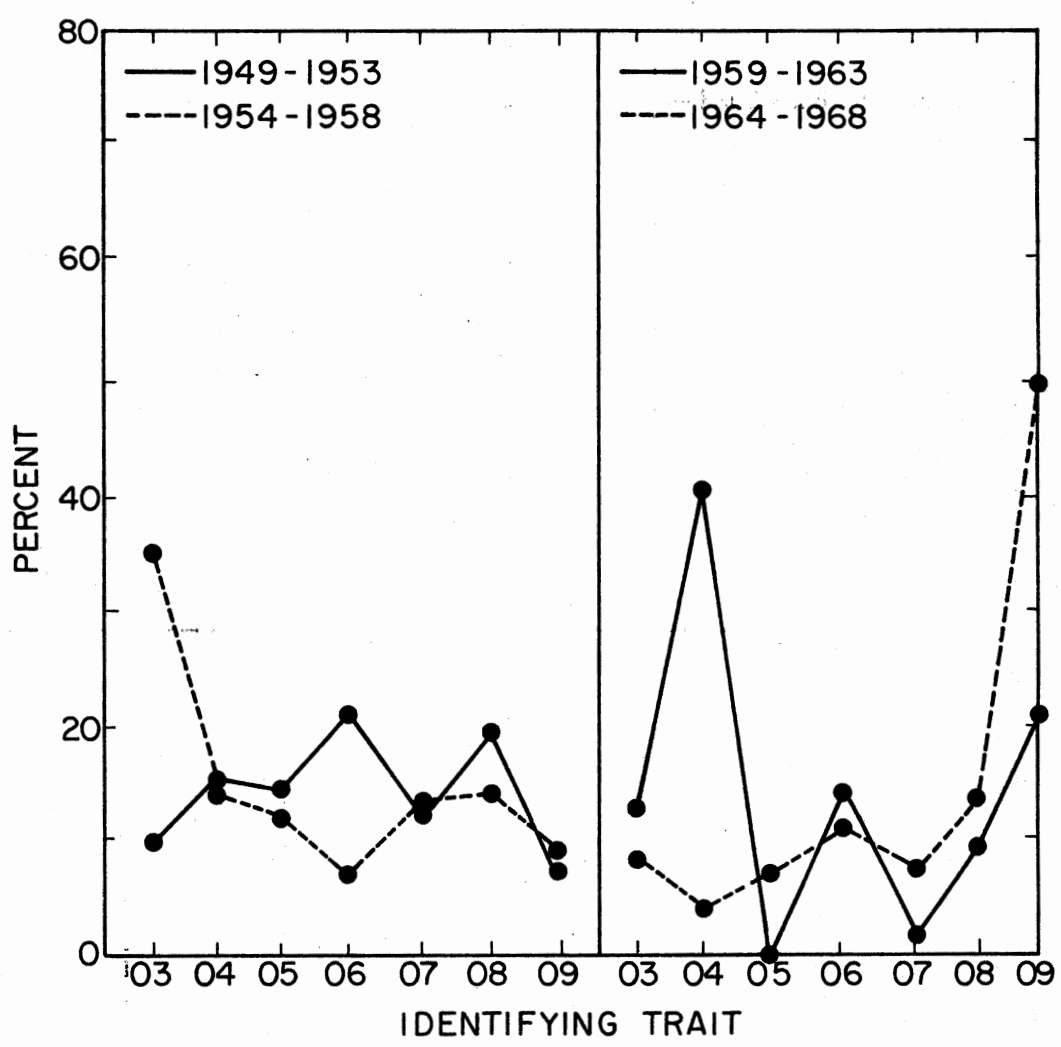


Figure 28. Percentages of Occurrence of Minor Material Used for Seats, 1949-1968 (N = 301)

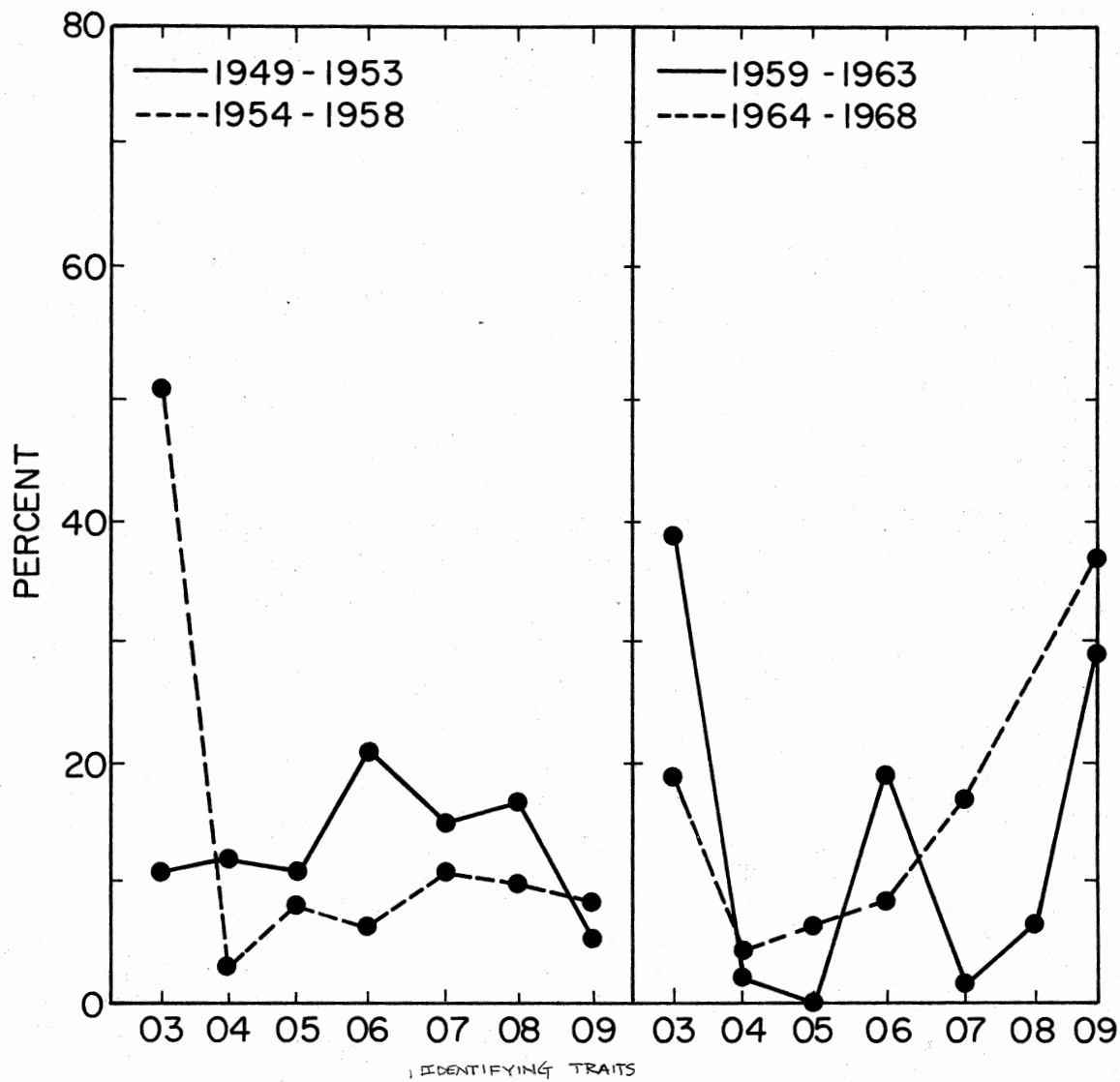


Figure 29. Percentages of Occurrence of Minor Material Used for Backs, 1949-1968 (N = 304)

Greater variability was seen in the last half of the period with rope seats reaching a high in the third quarter. Plastic was a more often used material for both seats and backs in the fourth quarter. The first half of the period displayed less fluctuation than the last half.

Moulded Shapes

Modern furniture is many times associated with eccentric or "free-form" shapes. This may be a result of the fact that the free-form chair is "noteworthy." By virtue of not conforming to the traditional concept of a chair, they have been the topic of discussion in many publications.

In this study, moulded or "free-form" shapes were included in the category of "backs" for tallying. They are identified in Appendix A, Table X. See Appendix D, Table XXXV for frequency distributions for moulded shapes. Figure 30 identifies the shapes. The percentages of occurrence of moulded shapes were plotted in Figure 31.

Only those chairs having moulded or free-form backs were included in this analysis, so the percentages should be interpreted as follows: Of the 1949 chairs which were moulded or free-form, 7 percent were of trait 20, 27 percent were of trait 25, etc.

The entire period was characterized by a great amount of variability and biennial fluctuation. Such fluctuation was expected because these shapes were adaptable to experimentation and used to test public acceptance. Shape 26 appeared to be the dominant moulded shape during the first half of the period with very distinct biennial fluctuations. It began to decline during the last half, but regained the lead again in 1958.

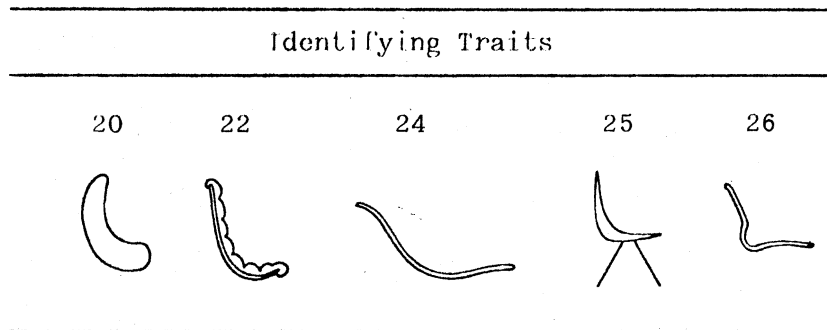


Figure 30. Moulded Shapes Between
1949 and 1968

Shape 22 and shape 25 appeared to be inversely related during the first half of the period. For instance, shape 22 receded in 1955 and 1956, while shape 25 advanced. In 1957 and 1958 shape 22 advanced while shape 25 receded. In the last half, however, they doubled peaked in several years.

Shape 20 and shape 26 were the weakest shapes. Shape 20 gained some strength in 1959 but generally remained weak over the period. Shape 24 displayed a weak but fluctuating trend throughout the period.

Material Used for Moulded Shapes. Moulded and free-form shapes originated as a result of new materials which could be shaped into unconventional forms. What distinguished these materials in the modern period was the fact that they were used according to the nature of the material rather than as an attempt to imitate other materials.

In the initial tallying process, nine materials were identified (Appendix A, Table XIV). These were condensed into five traits and identified as follows:

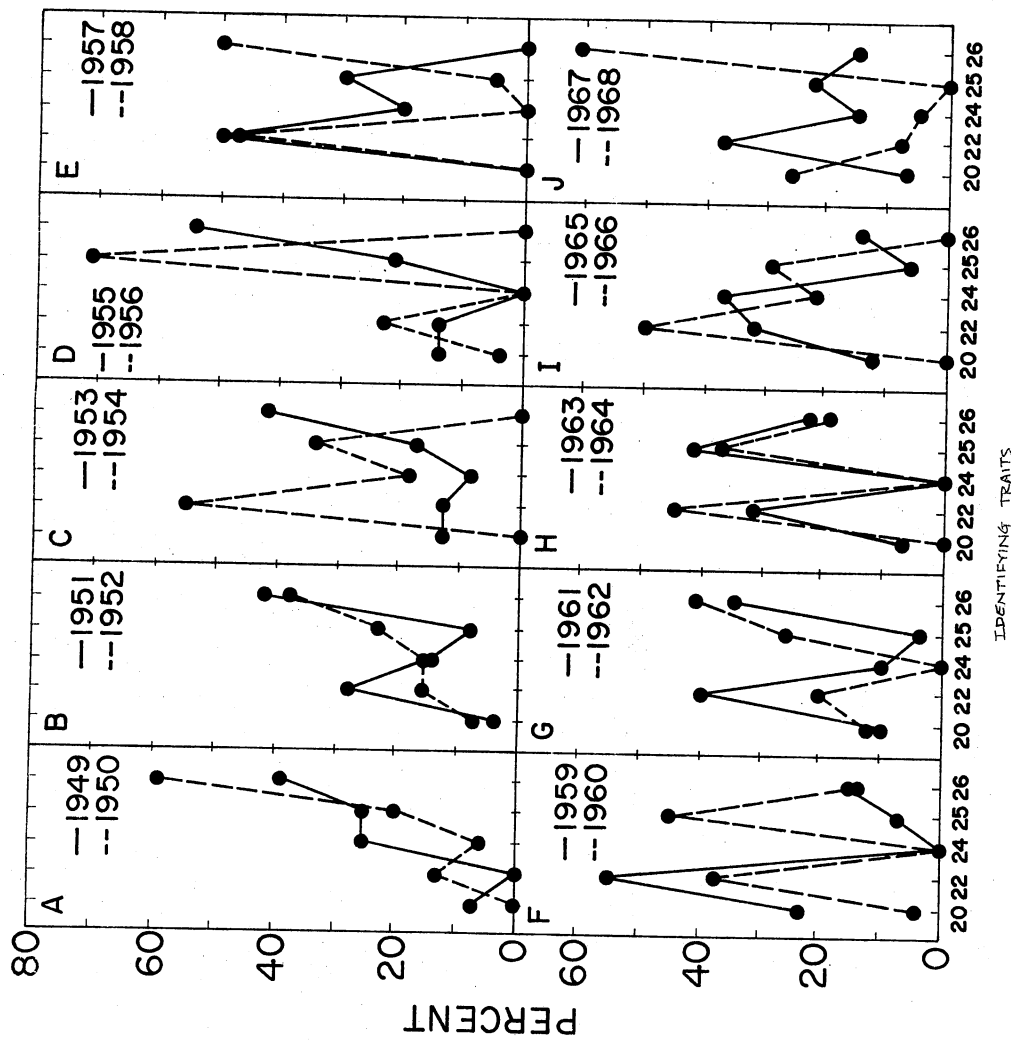


Figure 31. Percentages of Occurrence of Moulded Shapes, 1949-1968 (N = 369)

- 01 - Plywood and laminated wood
- 02 - Plastic
- 03 - Woven wire
- 06 - Leather and canvas sling
- 09 - Wicker and cane

See Appendix D, Table XXXVI for frequency distribution of materials used for moulded chairs. The percentages of occurrence of material used for moulded shapes were plotted in Figure 32.

Plastic (trait 02) was the most frequently used material. During the entire period, however, it showed considerable fluctuation. Every third year during the first half of the period, it dropped to no occurrence at all, but ranged from 8 percent to 60 percent the other two-thirds of these years. It was dominant in the last half, with the exception of 1965 when there were no occurrences in the data.

Plywood and laminated wood (trait 01) were the second most dominant material. They gradually rose to a high of 80 percent in 1957, declined, rose again to a high of 92 percent in 1965, then declined again during the next three years.

Woven wire (trait 03), leather and canvas slings (trait 06), and wicker and cane (trait 09) fluctuated considerably. They were more active during the first half of the period, with very little activity during the last half.

Material Used for Exposed Legs

The material used for the exposed parts of chairs is an important indicator of style. Some furniture style periods are known by the species of wood most often used in the construction of furniture of the period. For example, some authorities refer to the English period between 1680 and 1710 as "The Age of Walnut." Materials changed

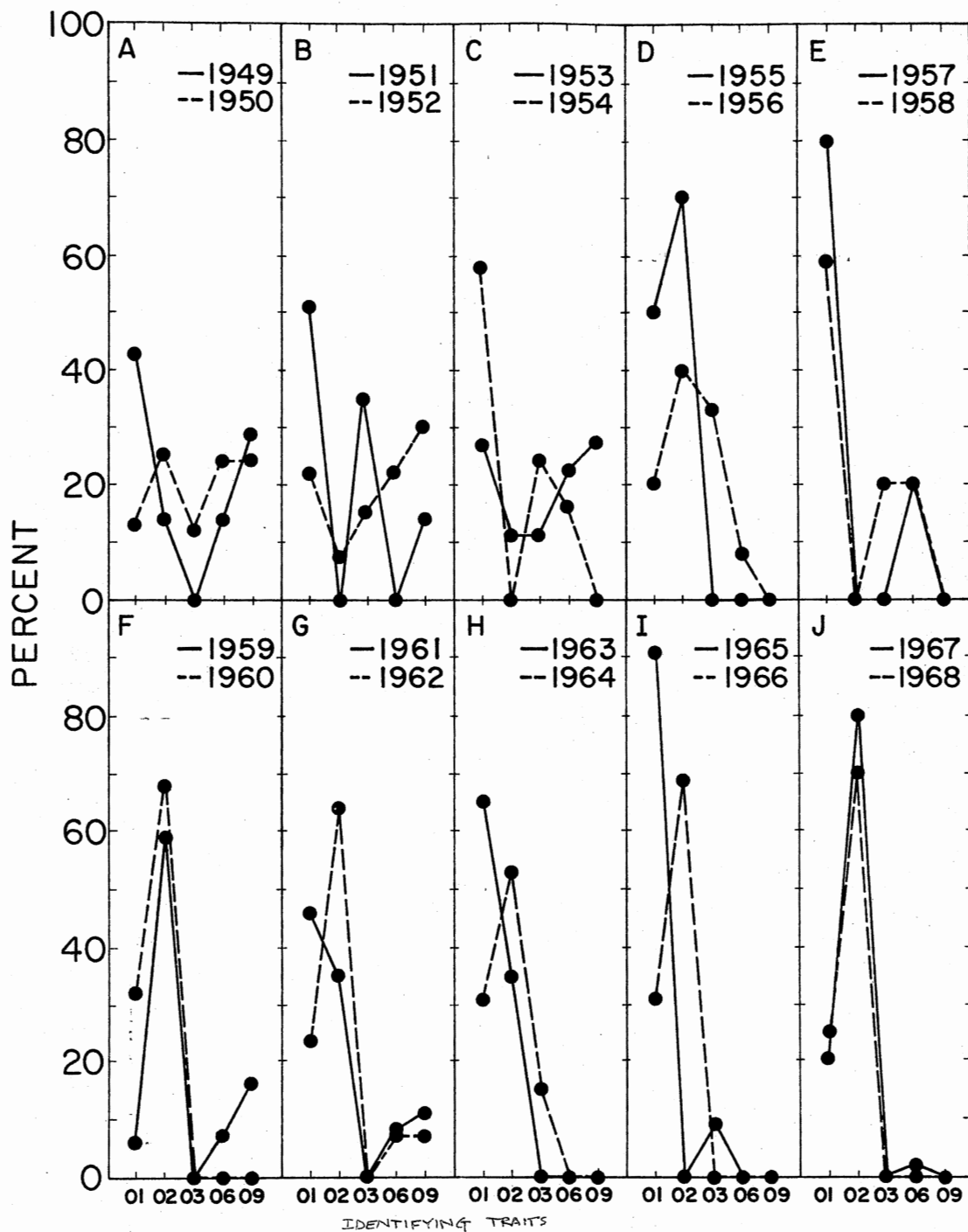


Figure 32. Percentages of Occurrence of Materials Used for Moulded Shapes, 1949-1968 (N = 296)

significantly in the modern period. New materials such as plastic, metals, and laminated wood, were introduced. Compared to the traditional use of wood, these new materials were no less important than wood used in other periods.

In the tallying process, 52 material traits were identified (Appendix A, Table XV). These included three major materials: wood, metal, and laminated wood. As shown in Appendix A, Table XV, there were a total of 29 traits of wood. This large number was due to the variety of woods and combinations of wood in use. Because of the infrequency of occurrence of many of the woods and combinations of woods, six sub-traits of wood were identified. Four sub-traits of metal were identified.

Major Materials. Major materials were coded as follows:

45 - Metal

58 - Laminated wood

70 - Wood

See Appendix B, Table XXIII for frequency distributions of major materials used for exposed legs. The percentage of occurrence of major leg materials were plotted in Figure 33.

The familiar pattern of transition in the middle of the 20 year period also occurred in the distribution of leg materials. The period began with the dominance of wood at 56 percent and reached a high directly after the middle of the period at 84 percent. It began to taper off and by the end of the period had returned to its beginning position of around 50 percent.

Metal showed biennial fluctuations in 1949 and 1950 and also

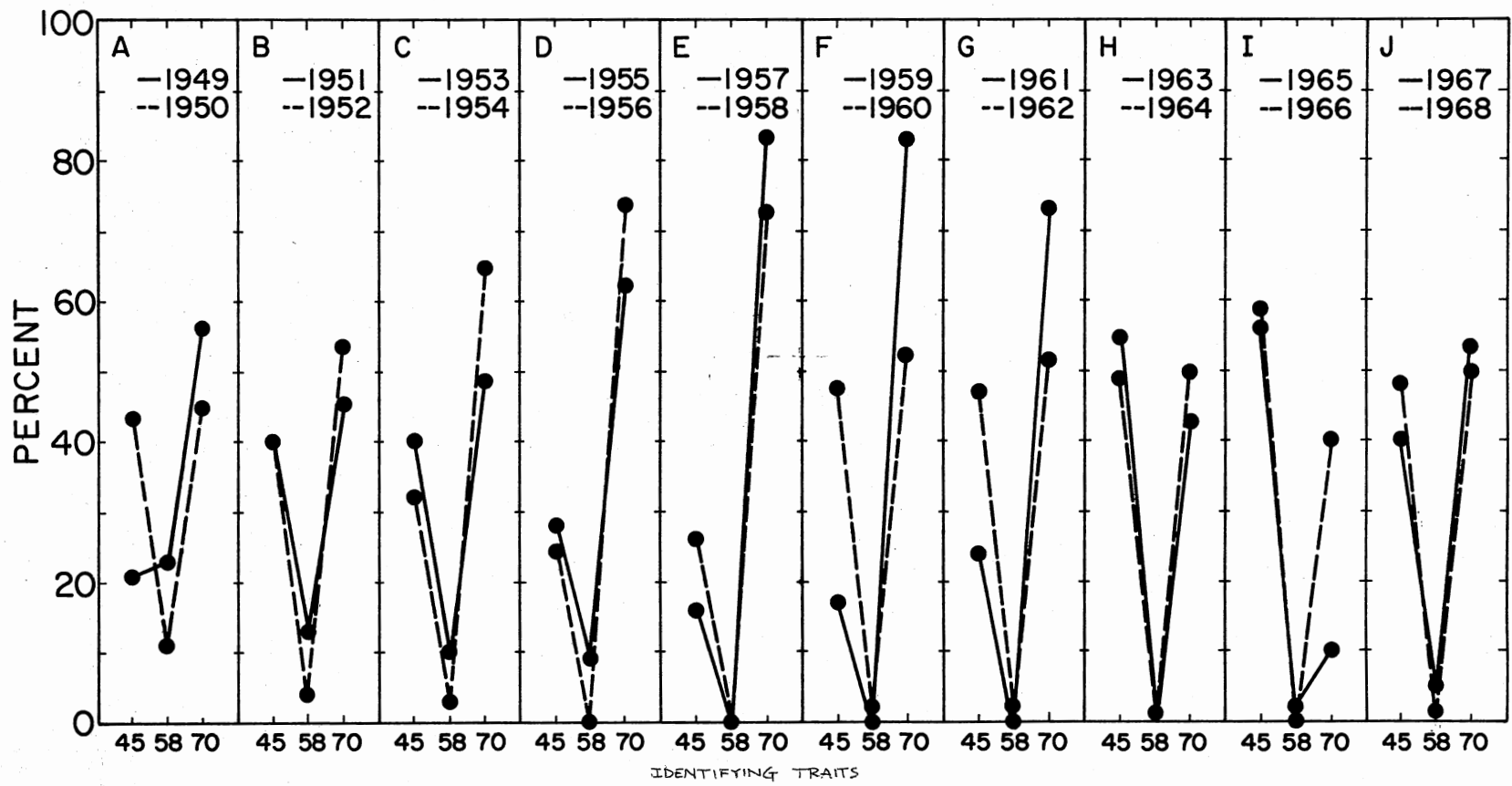


Figure 33. Percentages of Occurrence of Major Materials Used for Exposed Legs, 1949-1968 (N = 1870)

during a six year period beginning in 1957 through 1962. It began to vie for first place with wood beginning in 1960 and replaced or shared first place with wood until the end of the period. The strong position of metal as opposed to wood, the accepted furniture material for thousands of years, emphasized extreme importance of metal in the modern period.

Laminated wood accounted for a small percentage of materials used. It showed slight strength in 1949 and 1950, followed by a decline until its almost complete disappearance by the middle of the period. This would be a manifestation of the ending of the period directly after World War II which had been influenced by the work of Scandinavian designer Alvar Aalto who had used laminated wood extensively in his furniture designs. Also during its descent, a pattern of biennial fluctuations occurred. A slight rejuvenation of laminated wood occurred during the last half of the period.

Material Sub-Traits--Wood. Certain species of wood are generally associated with certain design periods. In Scandinavian furniture teak is a commonly used wood. Also, combinations of wood were used by Scandinavians in the exposed wooden areas of furniture. This portion of the analysis seeks to determine those species of wood most common to the modern period.

See Appendix D, Table XXXIII for frequency distributions for wood species used for exposed legs. The percentage of occurrences of wood species were plotted in Figure 34. The species of wood were identified as follows:

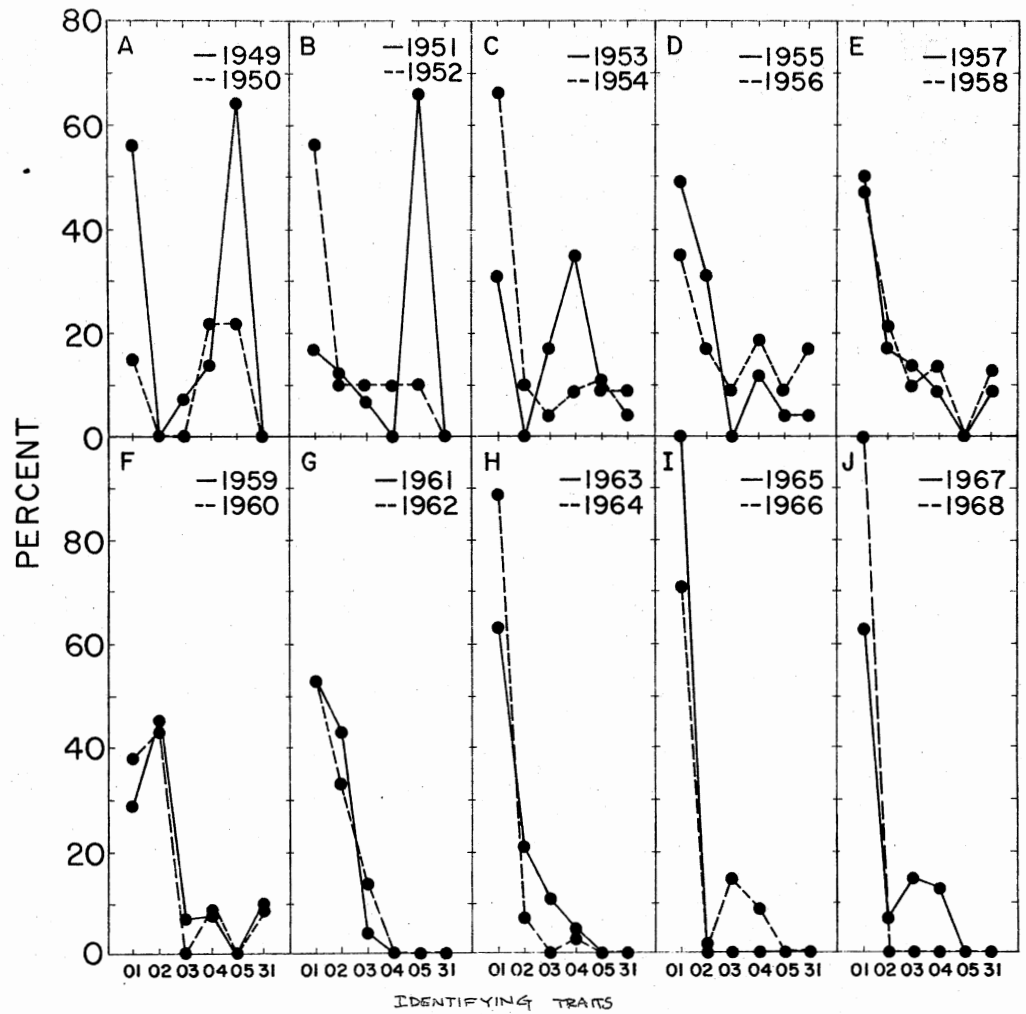


Figure 34. Percentages of Occurrence of Wood Species Used for Exposed Legs, 1949-1968 (N = 651)

- 01 - Walnut
- 02 - Teak
- 03 - Oak
- 04 - Beech
- 05 - Birch
- 31 - Combination of Teak and Oak

The period began in 1949 with birch (trait 05) accounting for 64 percent of the materials used in the chairs having wood legs. This again reflected the influence of Scandinavian design since birch was a frequently used wood in Scandinavian countries and adapted to the lamination process. After a second high of 67 percent in 1951, birch declined until its complete disappearance in 1957.

After 1953 walnut occurred most frequently in all years, with the exception of 1959 and 1960, when teak assumed the dominant position. Teak remained somewhat stable during the middle years of the period. Trait 31 (combination teak and oak) also showed stability at between 5 percent to 15 percent, with no activity during the years before and after 1953 to 1960.

The biennial fluctuations found to occur throughout the analysis were very prominent in these data, particularly with respect to walnut. Walnut was the dominant wood throughout the period. This may be explained by the fact that walnut was readily available in the United States and was a traditional furniture wood.

Material Sub-Traits--Metal. Metal became a popular material for furniture beginning with Marcel Breuer's metal chair of 1925. New techniques of production allowed for different types of metal to be used in furniture design and opened up new design possibilities in furniture.

See Appendix D, Table XXXIV for frequency distribution of metals

used for exposed legs. The percentages of occurrence of metal used for exposed legs were plotted in Figure 35. Metals were identified as follows:

- 40 - Aluminum
- 41 - Chrome
- 42 - Wrought iron
- 44 - Tubular steel

Of chairs with metal legs, wrought iron (trait 42) appeared most frequently the first half of the period, from 1949 to 1953. It reached a peak of 97 percent in 1951, then started to decline. There were no occurrences in 1957. A recovery was attempted in 1958 (33 percent), but its complete demise came the year following, in 1959.

Tubular steel displayed considerable strength during the first nine years until 1957. After this time it began to weaken and remained very weak for the remainder of the period.

Chrome began to fluctuate after 1951 until 1960, after which it remained dominant until the end of the period. It remained above 70 percent between 1961 and 1964.

Aluminum remained relatively stable after its appearance in 1955. It reached a high of 46 percent in 1966.

Biennial fluctuations were again seen in these data. It is most apparent in peak years.

Summary

Over the 20 year period leg traits were characterized by a dominance of splayed legs (trait 01) during the first third of the period. This was followed by a period of little variability and few variations

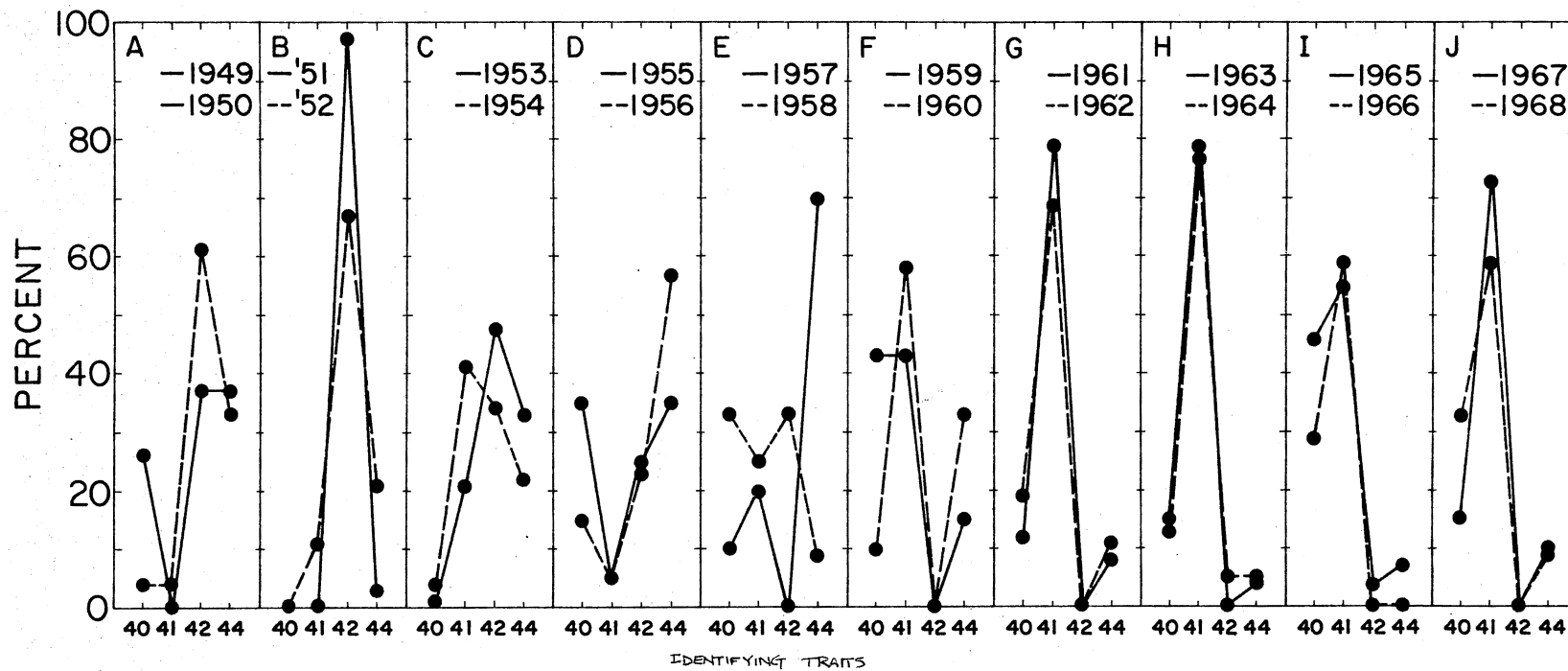


Figure 35. Percentages of Occurrence of Metal Used for Exposed Legs, 1949-1968 (N = 606)

of leg traits during the middle years of the period. A dominance of pedestal chairs was observed during the last third of the period.

Round legs, dominant over the first 15 years, were replaced by square legs during the last five years. Rectangular legs were generally insignificant. Tapered legs occurred throughout but straight legs were dominant. The period was also dominated by chairs with no stretcher.

Chairs with seat and back attached to each other with no separation between seat and back, and with back slightly reclined (trait 04) were characteristic of the 20 year period.

The period began with armless chairs distributed fairly evenly with arms of trait 01 after 1957. Other arm traits displayed little variability. Upholstered arms were very significant during the last third of the period. The 20 year period was a time of upholstered seats and backs with combinations of upholstered seats and wood backs occurring. Wood, walnut in particular, was the most characteristic material used for exposed legs. However, during the last half of the period metal was very significant and equally important with wood.

CHAPTER V

THE EVOLUTION OF TRAITS IN CHAIR DESIGN

The descriptive analysis in the preceding chapter divided each of the eight categories of traits into major traits, minor traits, and sub-traits and analyzed them separately. This chapter carries the analysis one step further by examining patterns of evolution of the traits, from one time interval to another, over the 20 year period. Because no year stands by itself in relation to style, the chairs included in the 20 years of this study reflected certain characteristics of the years which preceded them. Likewise, certain characteristics of these chairs continued into the years following 1968.

Chair styles are subject to change. For this reason, it seemed expedient to consider style as a process of evolution rather than as a series of events. Traits which make up "typical chairs" were considered guidelines which pointed to the direction of change. Thus, by studying these guidelines at regular intervals, it was possible to determine the process of evolution which occurred.

A third objective of this study was to analyze characteristic traits, which had been identified in the descriptive analysis, to reveal patterns of evolution leading to a style or styles for the 20 year period. It was evident that the data needed to be condensed by collapsing the annual frequencies into some other grouping such as 2, 3, 4, or 5 year intervals. This grouping of the data would smooth out

annual fluctuations and isolated occurrences of a trait in one particular year. Data were examined by combining them into various time intervals. It was determined by the researcher and the panel of judges that the three year interval was the best grouping for smoothing out fluctuations in the occurrence of a trait in adjacent years without losing important variations which contributed to an understanding of the evolutionary process. The grouping process resulted in six 3-year periods, beginning with 1949, and one 2-year period at the end, 1967 and 1968.

Some categories of traits have historically been considered the distinguishing features in defining style. These categories are leg traits, back traits, and arm traits. The descriptive analysis revealed that these categories were the most important in distinguishing the style of chairs during the period included in this study. Therefore, the analysis of evolution was limited to these three categories of traits.

For the analysis presented in this chapter, all 100 chairs for each year were included. The percentages shown in the following histograms were to be interpreted as the percent of times in which a given trait occurred in the 300 sample chairs for that three year time period. The final time period shown in Figures 32 through 35 is, of course, based on 200 chairs since it included only two years instead of three. The histograms revealed the pattern of change over the 20 year period but did not test for significant differences in the occurrence of traits from one 3-year interval to the next. In order to test for significant differences, 2-way contingency tables were constructed and Chi-Square tests were performed. The Chi-Square tests measured whether or not the frequencies were distributed over the time period, other than

randomly. A significant Chi-Square value indicated that there was a difference in the frequency of occurrence of a particular trait from one time interval to another.

Leg Traits

For the Chi-Square tests and the histogram, the sub-traits were combined with the major traits as follows:

Sub-trait 28 with leg trait 01

Sub-trait 30 with leg trait 02

Sub-trait 29 with leg trait 03.

Table II shows the Chi-Square values and significance levels for the differences in the frequency of occurrence or non-occurrence of each major leg trait over the seven time intervals. The occurrence of each of the major leg traits was found to differ significantly among the time intervals ($p < .0001$). This finding indicated that the occurrence of a particular trait did vary—other than randomly—over the seven time intervals. The histogram in Figure 36 reveals the patterns of variation which occurred.

The patterns seen in Figure 36 obviously reveal a change over time in the occurrence of leg traits. Chairs with splayed front and back legs (trait 01) led all other traits during the first 12 years. However, they declined gradually, and their occurrence was insignificant in the last two years of the period. In 1961-1963, chairs with splayed front and back legs were replaced by chairs with straight front legs and splayed back legs (trait 02). These fluctuated upward in the first, third and fifth 3-year period, and downward during the intervening three year periods. The trait of straight front and back legs

TABLE II
 CHI-SQUARE VALUES AND SIGNIFICANCE LEVELS FOR THE
 DIFFERENCES IN THE OCCURRENCE OF MAJOR
 LEG TRAITS OVER THE TIME INTERVALS

Trait	χ^2	P
Leg Trait 01	142.9	.0001
Leg Trait 02	40.7	.0001
Leg Trait 03	63.1	.0001
Leg Trait 11	250.5	.0001
Leg Trait 17	32.3	.0001
Leg Trait 19	33.1	.0001

continued as the third most frequent trait until the last two year period when it became dominant. Pedestal chairs were insignificant until the last third of the period when they became dominant in 1964-1966, then declined again during the last two years. While traits 17 and 19 accounted for only a slight percentage of occurrence, they exhibited a significant pattern of change with a gradual increase toward the middle years and a gradual decline thereafter.

Overall, leg traits displayed little variability. Generally their increases and declines were long and gradual, patterns which follow the definition of evolution.

Back Traits

For Chi-Square tests and histograms, the following back traits were combined as follows:

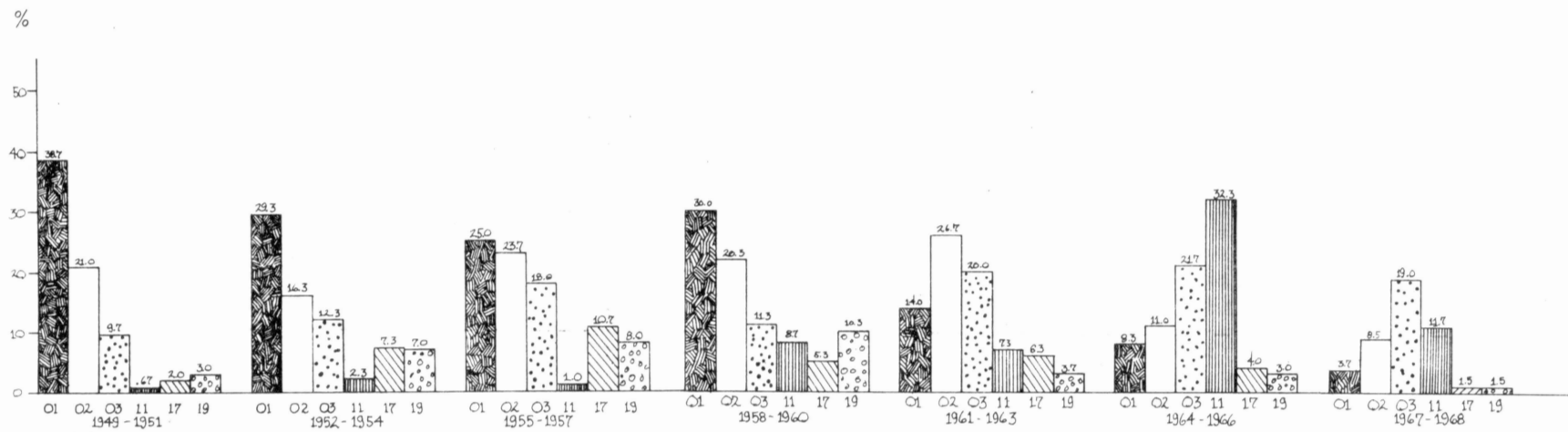


Figure 36. Percentages of Occurrence of Major Leg Traits in Three Year Intervals (N = 300)

Back trait 05 with back traits 02,03,04, and 30

Back trait 05 with back traits 06,07,08, and 31

Back trait 09 with back traits 10,11,12, and 32

Back trait 13 with back traits 14, 15,16, and 33

While these had not been classed as sub-traits, essentially the only difference in these traits was in the tilt of the back and the amount of curve to the back.

Table III shows the Chi-Square values and significance levels for the differences in the frequency of occurrence or non-occurrence of each major back trait over the seven time intervals. The occurrences of three of the major back traits were found to differ significantly among the time intervals ($p < .0001$). This was an indication that the occurrence of these traits did vary, other than randomly, over the seven time intervals.

TABLE III

CHI-SQUARE VALUES AND SIGNIFICANCE LEVELS FOR THE
DIFFERENCES IN THE OCCURRENCE OF MAJOR BACK
TRAITS OVER THE TIME INTERVALS

Trait	χ^2	P
Back Trait 01	27.9	.0001
Back Trait 05	11.1	.084
Back Trait 09	38.6	.0001
Back Trait 13	36.6	.0001

Trait 05, however, was not significantly related to the time intervals ($p < .08$). The histograms, Figure 37, revealed little variability, which indicated a pattern of random distribution.

Chairs with seat and back attached to each other (trait 01) showed a gradual decrease in percentage of occurrence for the first seven to nine years and then an almost identical increase for the next seven to nine years. A continued increase is seen for three more years, followed by a decline the last two years. This slow advancing and receding pattern was seen in the other traits, even though the percentage of occurrences were not as great. Trait 09 showed one peak in 1955-1957, the third period. The lowest period for trait 05 was also seen in this time interval. The high period for trait 13 was in the fourth time interval. The middle time intervals seemed to act as intervening periods for back traits, indicating a tendency for these traits to develop with some commonality.

Arm Traits

Table IV shows the Chi-Square values and significance levels for the differences in the frequency of occurrence or non-occurrence of major arm traits over the seven time intervals. The occurrence of each of the major arm traits was found to differ significantly among the time intervals. Traits 07 and 11 were most highly significantly ($p < .0001$). Although percentages of occurrence of trait 07 were not high, the distribution of these percentages was significant. Traits 01, 02, and 05 were more randomly distributed, although still significantly related to the time intervals. The histograms in Figure 38 revealed the patterns of variation which occurred.

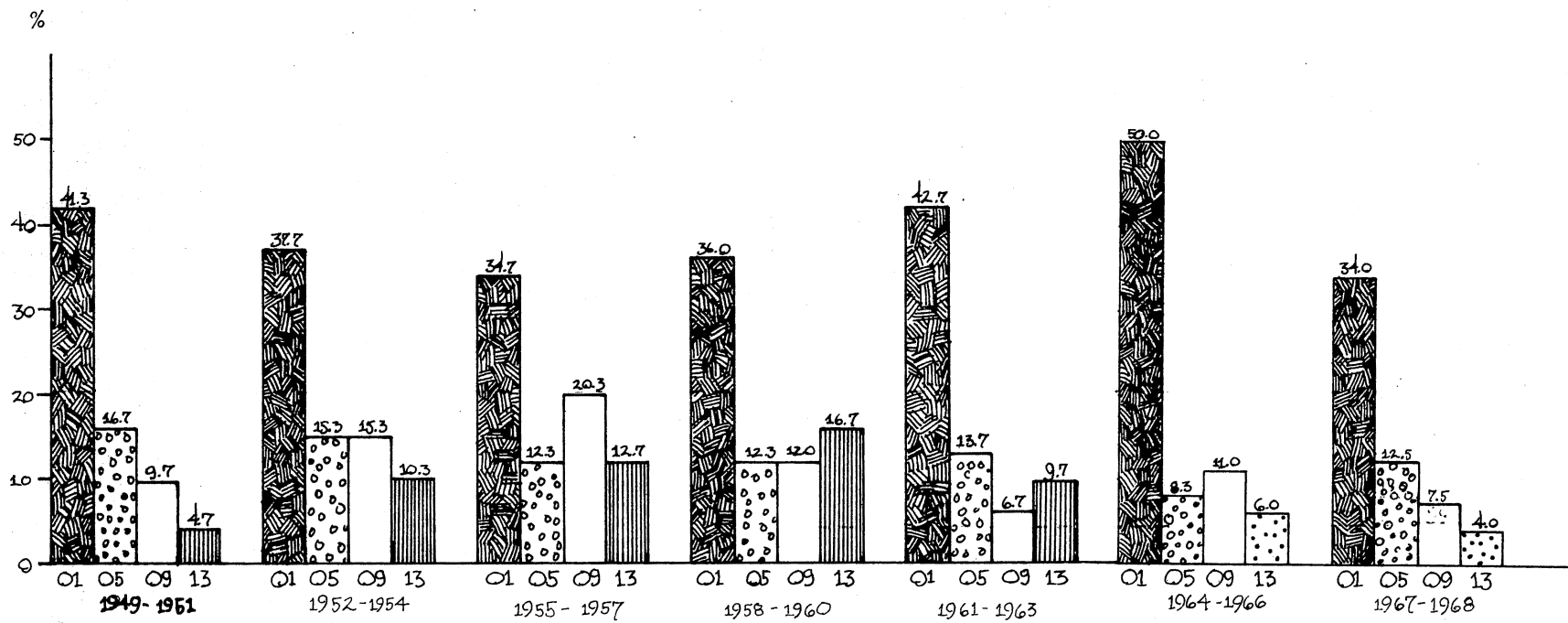


Figure 37. Percentages of Occurrence of Major Back Traits in Three Year Intervals (N = 300)

TABLE IV
 CHI-SQUARE VALUES AND SIGNIFICANCE LEVELS FOR THE
 DIFFERENCES IN THE OCCURRENCE OF MAJOR ARM
 TRAITS OVER THE TIME INTERVALS

Trait	χ^2	P
Arm Trait 01	21.9	.001
Arm Trait 03	15.5	.016
Arm Trait 05	18.3	.006
Arm Trait 07	27.5	.0001
Arm Trait 11	105.2	.0001

Chairs with no arms (trait 11) slowly receded over the period, with only slight fluctuation between the first two time intervals. Trait 01 arms followed an advancing and receding pattern except for a stable interval in 1955-1960. Traits 03 displayed very little fluctuation, receding gradually over the period. Barrell type arms (trait 05) also displayed a slowly rising trend over the first four time intervals, generally receding during the last three intervals. Trait 07 showed two intervals of extreme fluctuation, advancing to its high during the fifth interval, then receding to its low during the sixth interval.

Upholstered Arm Traits

Table V shows the Chi-Square values and significance levels for the differences in the frequency of occurrence or non-occurrence, of each upholstered arm trait over the seven time intervals. The occurrence of each of the upholstered arm traits was found to differ

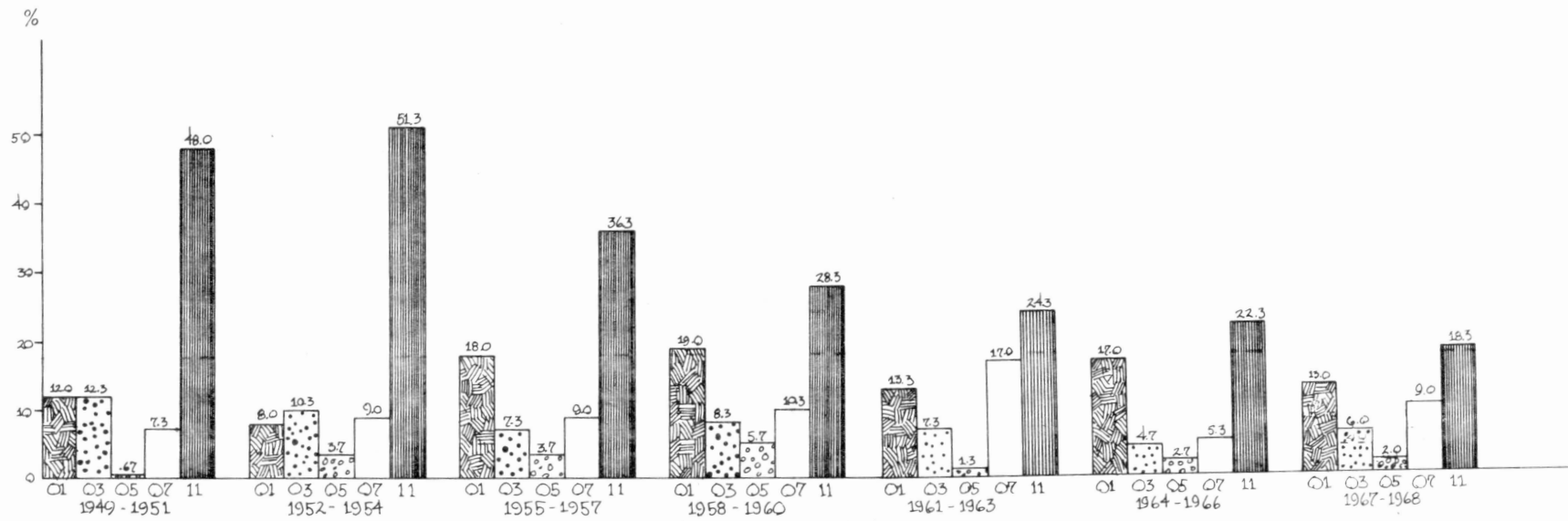


Figure 38. Percentages of Occurrence of Major Arm Traits in Three Year Intervals (N = 300)

significantly among the time intervals ($p < .0001$). This finding indicated that the occurrences of these particular traits did vary, other than randomly, over the seven time intervals. The histogram in Figure 39 revealed the patterns of variation which occurred.

TABLE V
CHI-SQUARE VALUES AND SIGNIFICANCE LEVELS FOR THE
DIFFERENCES IN THE OCCURRENCE OF MAJOR
UPHOLSTERED ARM TRAITS OVER TIME
INTERVALS

Traits	χ^2	P
Arm Trait 02	29.1	.0001
Arm Trait 04	32.5	.0001
Arm Trait 06	66.7	.0001
Arm Trait 10	116.2	.0001

There was an overall increase in the occurrence of upholstered chairs toward the latter part of the period. Lawson type arms (trait 02) increased gradually, but fluctuated slightly in alternating intervals. Tuxedo arms (trait 10) showed only negligible occurrence until the last two time intervals when they advanced significantly.

In the last three time intervals upholstered arms were greater or equal to their non-upholstered counterpart. This showed an evolutionary trend over the period from non-upholstered to upholstered chairs.

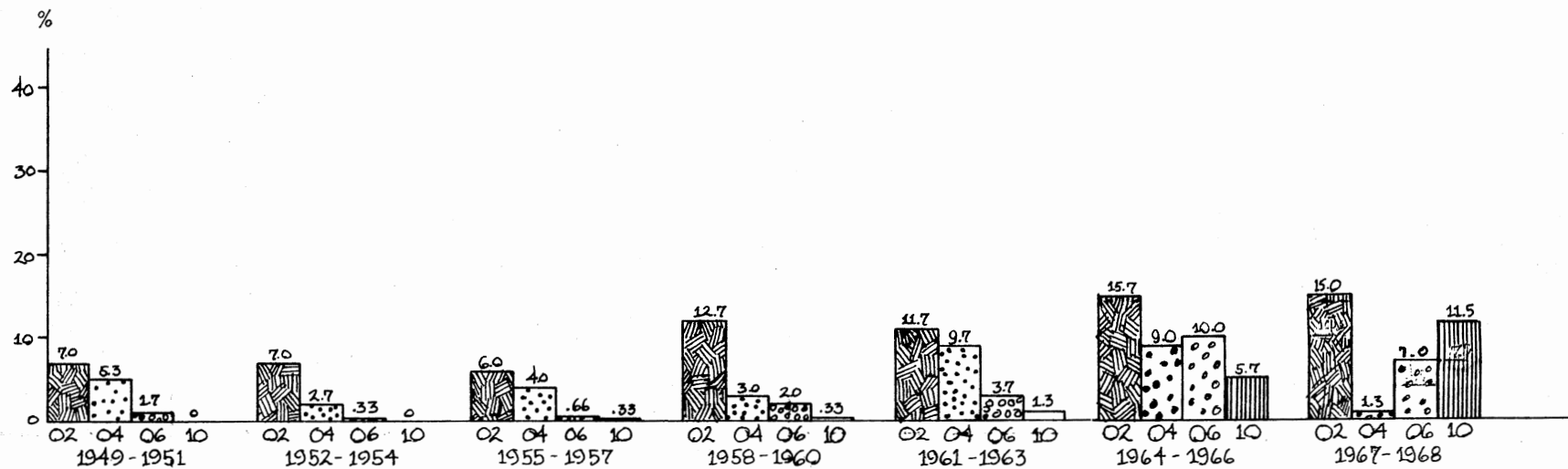


Figure 39. Percentages of Occurrence of Upholstered Traits in Three Year Intervals (N = 300)

Summary

Evolution was present in this period, as illustrated by the changes in the traits. Leg traits began with a dominance of chairs with splayed front and back legs, gradually changed to chairs with straight front legs and splayed back legs. This change continued until both front and back legs were straight. The pedestal leg appeared about mid-way and remained strong throughout the period.

Arm traits of the period began with a dominance of no arms, gradually changed to upholstered Lawson type arms which gradually changed to Tuxedo type arms about three-fourths through the period. Tuxedo type arms gained strength in the last two intervals of the period.

Back traits began with a dominance of chairs with seats and backs attached to each other (trait 01). This trait gradually declined into the middle years when a combination of the other back traits showed strength. Trait 01 then gradually increased again through the last half of the period until a decline was again seen in the last two intervals. The findings in this portion of the analysis indicated patterns of evolution.

CHAPTER VI

THE STYLE OF CHAIRS: 1949-1968

In order to identify styles of chairs for the 20 years from 1949 to 1968, it was necessary to develop a notation system for identifying and quantifying traits of chairs on a year by year basis. The major traits in three categories (leg traits, arm traits, and back traits) were then analyzed for evolutionary patterns over the 20 years.

A fourth objective of this study was to examine the relationships among leg, arm, and back traits in order to identify the style or styles of chairs occurring during the period from 1949 to 1968. Munro (n.d., p. 257) stated, "A style should be objectively defined, after which the critic may evaluate it in any way he sees fit."

To define the style of chairs of this period, the three most frequently occurring traits from each category for each three year intervals were selected. These were shown in Table VI. These traits were used as the basis for choosing a "typical chair" for each three year interval of the study. To choose the typical chair it was necessary to combine traits from each of the three basic categories, leg, arm, and back traits. Traits from the other categories of traits were included to evolve composite chairs.

A computer program could have been used to search the data for possible combinations of the most common traits in each of the three categories--legs, arms, and backs. Such a procedure would have by-

TABLE VI
 MOST FREQUENTLY OCCURRING TRAITS IN THREE
 CATEGORIES FOR EACH TIME INTERVAL,
 1949-1968

Time Interval	Leg Traits	Category Back Traits	Arm Traits
1949-1951	01, 02, 03	01, 05, 09	11, 03, 01
1952-1952	01, 02, 03	01, 05, 09	11, 03, 07
1955-1957	01, 02, 03	01, 09, 13	11, 01, 07
1958-1960	01, 02, 03	01, 13, 05	11, 01, 02
1961-1963	02, 03, 01	01, 05, 13	11, 07, 01
1964-1965	11, 03, 02	01, 09, 05	11, 01, 02
1966-1968	03, 11, 02	01, 05, 09	11, 02, 01

passed an important component of design research--the designers' ap-
 perception. It was the visual sensitivity of the designer of the chair
 that made the chair a delightful object. Thus it was essential that a
 designers' sensitivity to relationships among arm, leg, and back traits
 be applied at this point in the research in order to identify a typical
 composite chair from each time interval. The researcher reviewed all
 the chairs included in the data within each three year interval and
 selected one chair which contained a representative combination of leg,
 back, and arm traits for that time interval. Seven chairs considered
 representative of the style of each time period were chosen. It should
 be emphasized that the chairs selected for each three year time interval
 are considered "typical" chairs of these time intervals, rather than
 "designer" chairs of the period. These chairs are illustrated in
 Figures 40 through 46. As a second check of the researcher's selection,

the chairs chosen as typical were reviewed by the panel of experts.

The results of combining the most frequently occurring traits from each category may not result in a chair which is typical to the same degree as the individual typical traits. In other words, there may not be a large number of chairs exactly like the chair selected as typical. Some chairs would possess several of the typical traits and be quite similar to a typical chair. A number of chairs would possess some of the traits yet be quite dissimilar to a typical chair. The typical chair would act as the central tendency with the similar and dissimilar chairs clustering around the typical. The concept was not very different from that of a "statistical mean." The typical is, nevertheless, the style by which other chairs of the period may be judged to determine how characteristic or representative of the period they are. Young (1966) used this concept in determining typical dress fashions annually from 1760-1937.

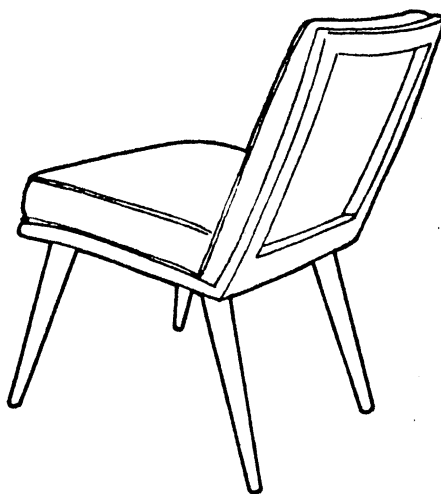
The illustrations in this section portray the combinations of traits which emerged from the data as representing the most typical chairs of the 20 year period. To the knowledge of the researcher this sort of identification had not previously been attempted. Instead, exceptional individual pieces of a style have many times been considered representative of a period. For example, the period between 1643-1700 has become known as the Louis XIV period in French furniture. However, it was the opinion of this researcher that the Louis XIV style actually represented the exceptional examples of the period rather than the typical style. Whiton (1963) stated, "The style (Louis XIV) was imitated very little beyond the royal palaces, due to its costliness and the lack of craftsmen to produce it" (p. 224). In this same context,

the "modern" style was often thought to be those fine designer pieces rather than "typical" pieces that exemplified traits of the period.

Typical Chairs

Typical Chair, 1949-1951

The chair selected as representative of chair styles of 1949-1951 was illustrated in Figure 40. The traits which were combined to make



Description: Manufactured by Lehigh Furniture Corporation
Designer : Harold Bartos
Dimensions : 23"W x 39"D x 33 1/3"H
Material : Bleached Oak, Birch or Walnut.
Foam rubber over coil spring construction

Figure 40. Representative Chair of the Style of Chairs, 1949-1951

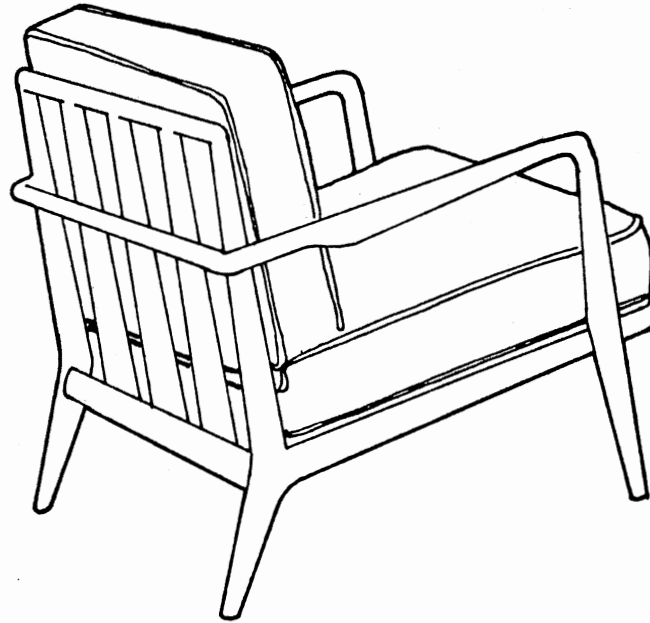
this chair included splayed front and back legs which were round and tapered. The frame and legs were of wood, available in Bleached Oak (popular during the post-war years), Birch or Walnut. The chair had no stretcher and was armless. The upholstered seat and back were attached to each other with no separation between them. The back was slightly curved. A pleasing relationship existed between the splayed tapered leg and the slightly inclined back.

Typical Chair, 1952-1954

Figure 41 illustrates the chair selected as representative of chair styles of 1952-1954.

The legs of this chair were round and tapered, splayed front and back. A change had occurred since the preceding time interval. Observing the chairs in the data the researcher noted that while legs were still splayed and tapered, the taper had become less pronounced and the roundness of the leg had become more oval. This observation made concerning the differences in the appearance of the chairs of the first two periods exemplified the importance of including designers' judgment in design research.

More wood was exposed in the frame, reflective of the Scandinavian influence. Back legs extended into the back frame as one piece. Arm rests reflected the tapering seen in the legs, back spindles and frame. The overall appearance lacked the light feeling observed in the chair designed by Harold Bartos three years earlier. In other words, the spirit of the style was different.

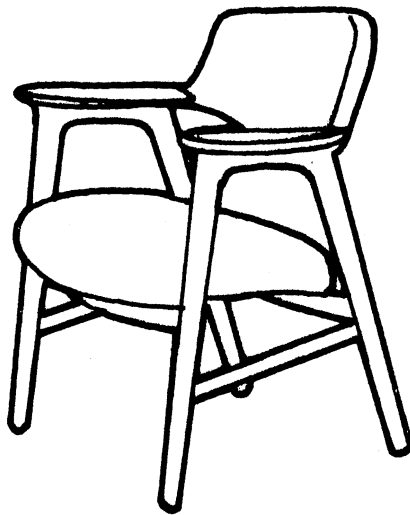


Description: Manufactured by Smilow and Thielle
Designers : Smilow and Thielle
Dimensions : 30"W x 30"D x 27"H
Materials : Solid Walnut or Birch frame. Removable 4½"
foam rubber seat and cushions with con-
cealed zippered covers

Figure 41. Representative Chair of the Style
of Chairs, 1952-1954

Typical Chair, 1955-1957

The chair selected as representative of chair styles of 1955-1957 was illustrated in Figure 42. Legs during this time interval were still



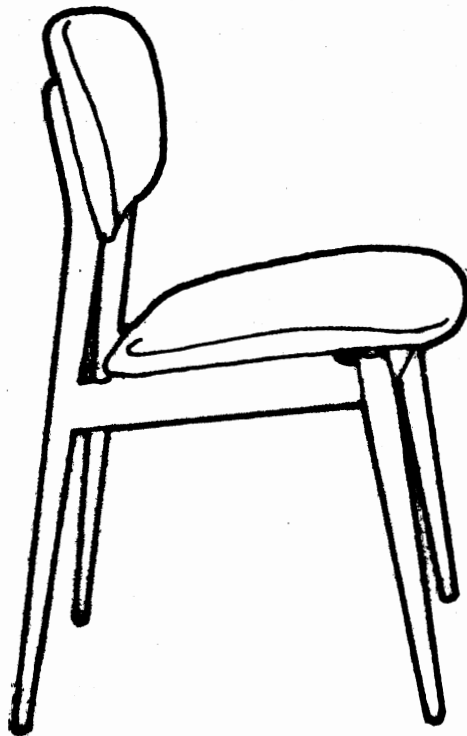
Description: Manufactured by Hagen and Strandgaard, Inc.
Designers : Paul and Ernst Blomhoj
Materials : Solid Oak or solid Teak frame. Form rubber;
leather or fabric upholstery

Figure 42. Representative Chair of the Style
of Chairs, 1955-1957

splayed, front and back. They were also round and tapered, with side stretchers and "floating" seat. Upholstered back was open between back and seat approximately one-half the total height of the back. An inverted U-shape was achieved by the relationship of leg to arm continuing as one piece. A further feeling of lightness was achieved by attaching back to arm rather than legs. The choice of either Teak or Oak wood was characteristic of the Scandinavian style. Teak and oak were favorite woods of the Scandinavian style, often used in combination with each other at this time.

Typical Chair, 1958-1960

The chair selected as representative of chair styles of 1958-1960 was illustrated in Figure 43.



Description: Manufactured by Hanseatic Furniture Co.
Designer : Professor Leowald
Dimensions : 25"W x 30"D x 34"H
Materials : Beech or Teak frame. Seat: upholstered foam or exposed wood.
Back: upholstered foam or exposed wood.

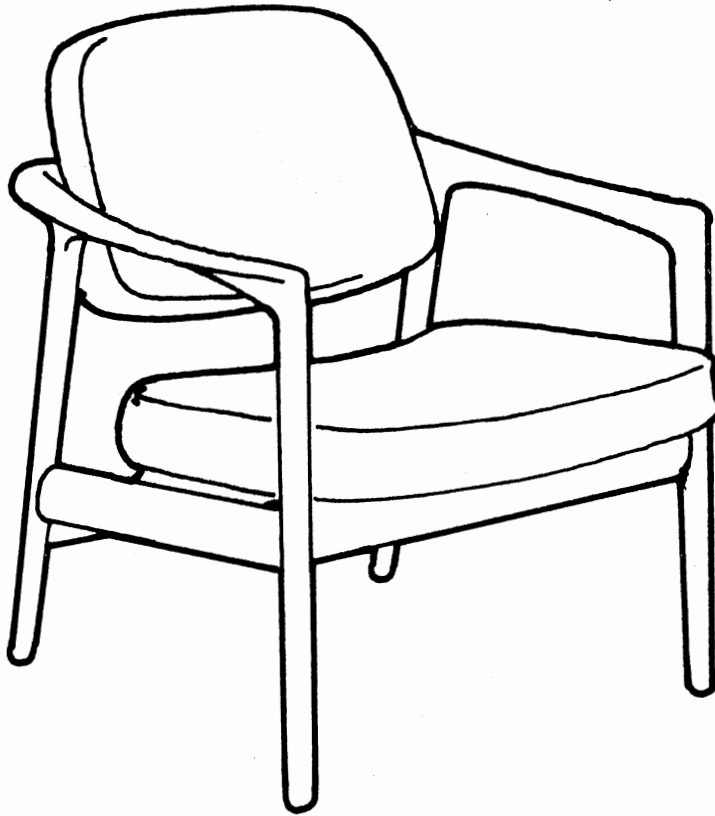
Figure 43. Representative Chair of the Style of Chairs, 1958-1960

Although George Leowald is a German designer, the Scandinavian influence was very apparent in both the form and the materials used. Legs continued round and tapered, splayed front and back. Back legs extended into back frame as one piece. Designed as armless or with arms, the chair with arms was in pleasing relationship with "floating" seat. The slightly curved back was open between seat and back a distance of approximately one-half the total height of the back.

Typical Chair, 1961-1963

Figure 44 illustrated the chair selected as representative of chair styles of 1961-1963.

This chair was characterized by straight front legs and slightly splayed back legs, which were round and not tapered. This reflected the evolutionary process from tapered and splayed front and back legs to straight front and splayed back legs. Arms continued around the back to form a support for the upholstered back which was open between seat and back a distance of approximately one-fourth the total height of the back. Upholstered "floating" seat was attached to a frame which had the appearance of stretchers.



Description: Manufactured by Dux Incorporated
 Designer : Folke Ohlsson
 Dimensions : 26½"W x 29"D x 29"H; seat 15½"
 Materials : Foam rubber seat and back cushions.
 Woods: Solid Walnut or solid Teak

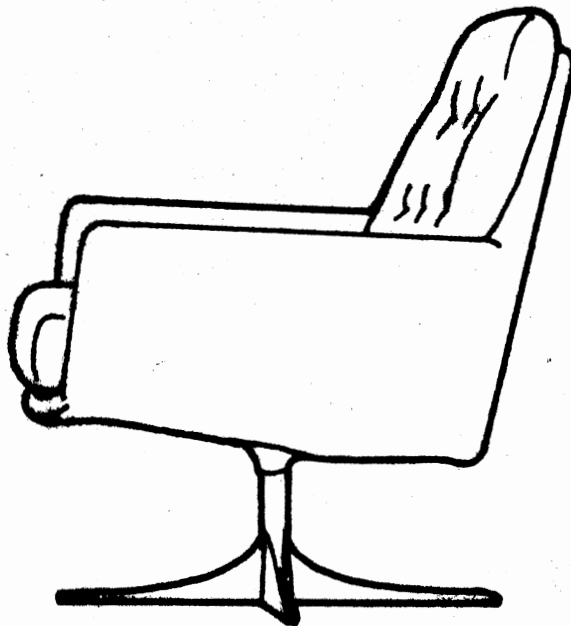
Figure 44. Representative Chair of the Style of Chairs, 1961-1963

Typical Chair, 1964-1966

Figure 45 illustrated the chair selected as representative of chair styles of 1964-1966.

This was the first time a chair with a pedestal base had been determined to be typical of the style of a period. It was fully upholstered, with the exception of the base. The arms were modified Lawson

type. A chair of this type was appropriate for either office or residential use, a feature characteristic of chairs of this period.



Description: Manufactured by Hanseatic Furniture
Co.

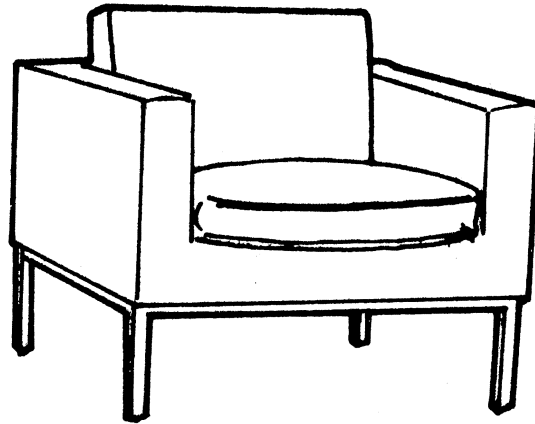
Designer : Name not given

Material : Chrome base, leather upholstery

Figure 45. Representative Chair of the
Style of Chairs, 1964-1966

Typical Chair, 1967-1968

Figure 46 illustrated the chair selected as representative of the style of chairs of 1967-1968.



Description: Manufactured by Jack Cartwright, Inc.
Designer : Jack Cartwright
Dimensions : 32"W x 30"D x 26"H
Materials : Aluminum frame

Figure 46. Representative Chair of the Style
of Chairs, 1967-1968

Both front and back legs of this chair were straight and square. Frame was Aluminum, a material not used in furniture before this period. The chair was fully upholstered except for the legs and frame, with Tuxedo arms, straight enclosed back with loose cushion. This chair would also be at home in either an office or residential setting.

Summary

These illustrations have shown typical chairs of three year intervals over the 20 year period. Examination of these chairs revealed that the same traits differently interpreted over the period, were the basis for the changing styles. For example, the round, tapered leg, splayed

front and back, were traits of the typical chairs for the first 12 years, yet each of the four typical chairs was unique. The interpretation of the traits in their relationship to each other was different in each chair. This resulted in the development of a different style in each chair.

This same concept held true between modern and period chairs. The round, tapered leg was not unique to the modern style. However, in comparison with the round, tapered leg, for example, of the Hepplewhite style, the spirit of the style was entirely different. This was a result of the interpretation of the traits and the relationships to other traits within the style. A look at the chair in Figure 42 showed the relationship of leg and arm continued as one piece to form an inverted U-shape, a characteristic of the styles of these years. Thus, the leg in its relationship to other traits was the main determinant of the styles of the period of this study.

It seemed evident, due to the diversity of designs, designers, and geographical locations of manufacturers for whom the designs were executed, that the styles of these years were influenced, but not dictated by noted furniture designers. No doubt, many designs were influenced by noted designers. For example, Charles Eames and his famous lounge chair. There was also the undisputed influence of the Scandinavian designers. However, influences of this period differed from influences upon the earlier "modern" chairs of the International Style emanating from the Bauhaus. In the Bauhaus setting, designers worked as a group toward a common goal of design. By contrast, styles of the years of this study developed in more independent settings, influenced by considerations regarding manufacturing and marketing

techniques. They were also influenced in part by other factors such as social, economic, or cultural.

Modern furniture has been equated by many with eccentric forms. This research found the opposite to be true. Styles which emerged as representative of years studied revealed them to be conservative, almost classic, in design and appearance.

CHAPTER VII

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study formulated a definition of chair design for the 20 year period between 1949 and 1968. A notation system was developed for classifying and indexing chair traits. For each year of the 20 year period one hundred chairs were chosen as representative of those chairs manufactured and/or distributed in the United States during the time of the study. From those 2,000 chairs, a total of 203 traits were identified within eight categories. Data were coded and punched into computer cards. Data were first analyzed by frequencies, percentages, graphs and histograms. The major traits of legs, arms, and backs were analyzed by Chi-Square tests to determine evolutionary patterns. The relationship between leg, arm, and back traits were examined to identify the typical chairs occurring during the period from 1949 to 1968.

A descriptive analysis of the distinguishing traits within each category of the data was conducted. This analysis revealed that over the 20 year period leg traits were characterized by a dominance of splayed legs during the first one-third of the period. During the middle years a transition period occurred. This was followed by a dominance of pedestal chairs occurring during the last one-third of the period.

Round legs were dominant during the first 15 years of the 20 year period, however square legs became prominent during the remaining five years. Rectangular legs were generally insignificant. A majority of legs were straight during the entire 20 year period. Tapered legs occurring during the period were more frequently round. The period was also dominated by chairs with no stretchers. Chairs with seat and back attached to each other and with back slightly reclined were characteristic of the 20 year period.

At the beginning of the period armless chairs were dominant, however, after 1957 chairs having Lawson type arms appeared in about equal frequency with armless chairs. Upholstered arms were very significant during the last one-third of the period. The 20 year period was a time of upholstered seats and backs. Walnut was the most characteristic wood used for exposed legs. However, during the last one-half of the period metal legs were very prominent.

The quantitative method used in the study of style change in chairs was supplemented by a qualitative evaluation and thus evidenced the steps of scientific research: exact measuring, exact recording, and judgments made on the basis of observed facts. If, through quantitative study, the vagueness which has surrounded style changes in furniture can be clarified, then "why" and "how" these changes occurred may be explained. Richardson and Kroeber (1940) used this concept of quantitative analysis to define stylistic changes in women's dress fashions over three centuries of time.

The purpose of this research was not to make judgments concerning the design merit of chairs, nor attempt a causal analysis related to the findings. The premise of the study was based on the conviction of the

researcher that there was regularity in style change in chairs over time. The research emphasis, therefore, was primarily concerned with patterns of evolution and change, not with prediction or cause.

Conclusions

In the course of this study four general conclusions concerning the change in chairs over the period were noted. The first of these conclusions was that traits did not develop independently, but in relation to other traits similar in appearance. Second, evolution was present, as indicated in patterns of change in the traits. For example, leg traits gradually evolved from a dominance of chairs with splayed front and back legs to straight front and splayed back legs. The change continued until both front and back legs were straight. The pedestal trait appeared after a transition period mid-way through the 20 year period. Another example of this evolutionary pattern was the gradual changing from a dominance of chairs with no arms, to upholstered Lawson and then to Tuxedo type arms. Back traits began with a dominance of chairs with closed seat and back. These traits gradually declined in the middle years, then the trend reversed and there was a gradual increase in the closed seat and back during the last half of the period.

These patterns follow the concept of evolution defined by Whiton (1963) ". . . as influences have changed, the styles have slowly evolved into new forms" (p. 10). In order to test the accuracy of the conclusion regarding evolution, additional research is needed over other time periods to determine the validity and reliability of the instrument used in this study.

The third conclusion was that biennial fluctuations of the traits occurred during the process of change over the 20 year period. The last conclusion made was of the importance of the Scandinavian influence on the design of chairs of this period. This influence became increasingly apparent as the study progressed.

The study identified and recorded chair traits which were typical in each year and showed the evolution of traits over two decades. It also identified typical chairs of the period. The notation system and analytical model developed for this research, could be utilized in similar studies over time periods.

The chief value of this notation system was to furnish a means of studying changes in the occurrence of traits from year to year. This study provided an opportunity to pilot test the notation system developed for this purpose.

The assembling and analysis of data such as these can make a unique contribution to the body of knowledge of the history of furniture. The mere setting apart of periods of time and the counting of phenomena is meaningless unless utilized in making inferences to the past and in studying the interrelations of the phenomena within time periods. This study made possible a method of quantifying phenomena so that these interrelations could be studied.

Recommendations

The development of this model enabled the researcher to determine changes which occurred in chair design over two decades of time. Chair traits of this period have now been singled out, defined, and styles have been identified within the scheme of furniture history. Research

is needed to determine relationships and causes.

The researcher recommends the use of this notation system and analytical model to study present phenomena as well as historical data and other periods. Such present day studies could aid designers and manufacturers in anticipating consumer acceptance of style and in explaining "how" and "why" styles change. Additional research is also needed to examine causes in the patterns of fluctuation found in the analysis of this data.

Observations have led historians to conclude that chair traits introduced by noted designers influence later styles. Designer chairs are many times the result of experimentation. These "exceptional" examples may mean a risk for the designer and the manufacturer. Research is needed to determine the time lag occurring between the design of these chairs and the general acceptance or rejection by the consumer.

Research can continue to explore how furniture operates in human experience under varying conditions by utilizing the notation system developed in this study. Research is needed to describe the cultural, social, and economic conditions paralleling the changes in chair traits over time, and to study relationships between design and its environment.

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APPENDICES

APPENDIX A

TABLES FOR FREQUENCY OF OCCURRENCE
OF ALL CHAIR TRAITS BY YEAR,
1949-1968

TABLE VII
 FREQUENCY OF OCCURRENCE OF ALL LEG TRAITS, 1949-1968

















Year	Identifying Traits															
																
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
1949	33	8	6	1	5	1	3	2	2	3	1	0	2	0	2	1
1950	27	19	16	0	3	1	6	0	2	2	1	0	0	2	0	0
1951	38	11	2	5	5	0	0	3	1	0	0	0	2	3	2	2
1952	15	10	11	0	4	0	1	2	2	0	5	0	0	1	9	0
1953	32	6	7	0	11	0	0	1	0	0	0	1	0	3	4	2
1954	27	15	2	1	10	1	0	2	4	0	1	0	1	0	3	1
1955	25	22	9	0	2	0	0	0	1	0	2	0	1	0	0	0
1956	21	4	9	0	4	2	0	1	1	0	1	0	1	0	0	0
1957	22	8	3	0	6	0	0	4	4	3	0	0	1	0	0	0
1958	29	8	3	1	0	0	0	2	5	1	6	0	4	0	0	0
1959	19	13	8	0	3	0	0	2	2	1	5	2	3	0	0	0
1960	30	16	4	0	5	0	0	6	1	0	11	2	0	0	0	0
1961	15	6	25	4	6	0	1	2	0	0	9	0	1	0	0	0
1962	11	3	15	0	1	0	1	7	0	0	18	1	2	2	0	0
1963	12	17	13	2	3	0	2	2	0	0	32	0	0	0	0	1
1964	10	3	12	0	4	0	1	4	2	0	25	1	0	0	0	1
1965	9	12	16	3	0	1	0	2	1	0	1	3	0	0	0	0
1966	3	1	16	7	1	0	0	8	1	1	37	0	0	0	0	0
1967	5	5	17	8	1	0	4	4	2	0	14	1	0	0	0	1
1968	3	5	10	4	1	0	3	11	0	0	19	1	0	0	0	1
N	386	192	204	36	75	6	22	65	31	11	218	12	18	11	20	10
Percent	19.30	9.60	10.20	1.80	3.75	.30	1.10	3.25	1.55	.55	10.90	.60	.90	.55	1.00	.50

TABLE VII (Continued)














Year	Identifying Traits																
					RECESSED BASE 21				NONE 25						MISC. 31		
1949	2	0	3	5	0	0	0	0	0	0	0	7	2	8	2	1	
1950	3	1	1	0	0	0	0	0	1	0	0	4	0	9	0	2	
1951	1	0	4	1	0	0	0	1	0	1	0	6	3	8	0	1	
1952	5	1	4	2	0	0	2	2	0	0	0	1	9	12	2	0	
1953	8	0	3	0	0	0	0	3	0	4	0	5	5	2	3	0	
1954	3	1	4	2	0	2	2	3	0	0	0	8	3	4	0	0	
1955	3	2	2	4	0	0	4	2	0	0	0	3	8	10	0	0	
1956	11	1	5	3	0	0	5	3	0	1	0	3	12	12	0	0	
1957	5	0	5	1	0	2	2	4	0	0	0	1	13	15	1	0	
1958	6	1	8	0	0	0	0	0	0	0	0	7	4	13	1	1	
1959	4	0	8	0	0	0	1	5	0	1	1	5	5	11	0	1	
1960	5	0	9	1	0	0	0	0	0	0	0	0	10	0	0	0	
1961	1	0	3	0	0	0	4	2	0	0	5	3	7	3	2	1	
1962	3	0	3	0	0	3	3	1	0	1	2	1	15	3	0	4	
1963	5	0	2	0	0	0	0	0	0	1	0	0	5	2	0	1	
1964	2	0	3	0	0	3	1	0	0	3	1	2	13	8	1	0	
1965	2	0	0	0	0	0	0	2	0	4	7	0	4	3	0	0	
1966	2	0	4	0	1	0	2	0	2	0	0	1	4	6	3	0	
1967	0	1	1	3	3	0	1	0	3	3	1	0	16	3	3	0	
1968	1	0	0	0	4	0	1	1	1	1	1	3	14	4	11	0	
N	72	8	72	22	8	10	28	29	7	20	18	60	152	136	29	12	2,000
Percent	3.60	.40	3.60	1.10	.40	.50	1.40	1.40	.35	1.00	.90	3.05	7.60	6.80	1.45	.60	100.00

TABLE VIII
 FREQUENCY OF OCCURRENCE OF ALL LEG SHAPES,
 1949-1968

Year	Identifying Traits						*	MISC. 11	NA*	
	01	02	03	04	05	06				
1949	21	15	19	25	8	11	1	0	0	
1950	39	6	14	17	17	5	1	0	1	
1951	45	9	5	33	4	4	0	0	0	
1952	42	9	6	32	5	1	5	0	0	
1953	41	6	4	33	2	14	0	0	0	
1954	32	11	8	36	12	0	0	0	0	
1955	39	18	2	31	9	0	0	2	0	
1956	35	9	1	40	13	2	0	0	0	
1957	35	5	3	46	11	0	0	0	0	
1958	20	9	1	38	23	3	4	2	0	
1959	19	20	1	44	3	6	7	0	0	
1960	31	17	0	29	5	5	13	0	0	
1961	16	20	5	33	9	3	14	0	0	
1962	32	20	2	25	2	0	19	0	0	
1963	29	17	4	12	5	2	31	0	0	
1964	17	26	3	9	13	6	26	0	0	
1965	18	22	7	12	2	0	33	6	0	
1966	14	37	2	3	0	0	38	3	3	
1967	28	33	9	8	0	0	3	13	6	
1968	14	32	6	7	5	0	20	12	4	
N	568	341	102	512	148	62	215	38	14	2,000
Percent	28.40	17.05	5.10	25.60	7.40	3.10	10.75	1.90	.70	100.00

*Not applicable

TABLE IX

FREQUENCY OF OCCURRENCE OF ALL STRETCHERS, BY YEAR, 1949-1968

Year	Identifying Traits													VARIETY OF FLOATING STRETCHER				NA	
	01	02	03	04	05	06	07	08	NONE 09	10	11	12	13	14	15	16	18		
1949	1	5	4	2	0	0	1	0	81	4	0	0	1	0	0	1	0	0	
1950	1	1	8	6	1	0	1	0	74	4	2	0	1	0	1	0	0	0	
1951	4	10	3	4	3	2	1	0	67	0	2	0	4	0	0	0	0	0	
1952	2	3	3	1	3	0	3	2	69	5	1	0	7	0	1	0	0	0	
1953	0	7	3	3	0	2	9	1	70	0	5	0	0	0	0	0	0	0	
1954	3	4	4	5	6	0	1	1	64	3	1	0	8	0	0	0	0	0	
1955	13	5	2	3	2	0	0	0	51	0	2	2	19	1	0	0	0	0	
1956	2	8	8	3	5	0	0	0	58	0	6	0	10	0	0	0	0	0	
1957	4	10	12	12	6	3	2	0	32	0	2	0	14	0	1	2	0	0	
1958	1	15	14	5	6	0	2	0	49	1	1	0	6	0	0	0	0	0	
1959	0	6	1	7	5	1	3	2	59	1	1	1	8	0	3	2	0	0	
1960	2	3	2	1	2	0	0	1	77	0	0	0	12	0	0	0	0	0	
1961	0	3	8	1	0	1	1	0	64	0	0	1	11	0	1	8	1	0	
1962	1	3	0	1	2	0	3	0	78	0	0	0	8	1	1	1	1	0	
1963	0	2	3	0	0	1	0	0	84	0	0	1	9	0	0	0	0	0	
1964	3	4	8	3	0	0	0	0	73	0	0	0	9	0	0	0	0	0	
1965	3	2	4	3	0	0	2	0	82	1	0	0	3	0	0	0	0	0	
1966	2	2	0	1	1	0	0	0	84	0	0	0	9	0	0	0	0	1	
1967	5	8	2	2	1	0	0	0	77	3	0	0	2	0	0	0	0	0	
1968	0	1	5	0	0	0	0	0	85	1	4	0	3	0	0	0	1	0	
N	47	102	94	63	43	10	29	7	1378	23	27	5	144	2	8	14	3	1	2,000
Percent	2.35	5.10	4.70	3.15	2.15	.50	1.45	.35	68.90	1.15	1.35	.25	7.20	.10	.40	.70	.15	.05	100.00

*Not applicable

TABLE X

FREQUENCY OF OCCURRENCE OF ALL BACK TRAITS, 1949-1968

Year	Identifying Traits															
	01	02 CURVED	03	04	05	06 CURVED	07	08	09	10 CURVED	11	12	13	14	15	16
1949	14	3	3	30	2	3	1	9	0	3	0	4	0	0	0	0
1950	6	0	5	27	7	2	1	5	3	1	0	1	4	0	1	0
1951	15	0	2	15	11	1	0	2	7	1	1	3	0	1	3	1
1952	16	4	4	20	2	2	0	6	5	5	1	7	0	5	4	0
1953	4	1	0	25	3	5	2	11	1	0	0	4	3	1	6	1
1954	9	2	2	23	5	2	2	4	5	3	4	3	0	2	3	1
1955	13	5	2	18	5	2	0	2	17	2	1	9	1	1	1	0
1956	4	2	1	17	5	3	0	6	7	2	0	3	4	7	8	0
1957	10	5	5	21	6	4	0	3	3	7	2	5	3	2	5	3
1958	10	0	1	16	10	2	1	6	3	0	0	6	0	6	3	1
1959	7	4	4	24	0	0	3	0	0	4	1	6	3	5	4	5
1960	3	1	5	22	0	7	1	2	5	1	0	6	0	6	6	0
1961	8	1	5	32	3	1	2	0	1	3	0	3	1	2	2	1
1962	12	1	4	20	5	5	0	1	4	2	0	0	3	3	1	1
1963	5	0	2	28	3	4	1	6	1	0	1	0	1	4	3	0
1964	6	2	5	20	0	0	2	1	9	1	2	2	2	2	1	0
1965	19	3	14	15	2	9	2	3	3	2	1	0	2	0	3	0
1966	26	1	9	13	1	0	1	1	6	1	3	2	3	0	2	0
1967	18	4	9	17	3	4	0	4	0	5	0	3	2	0	3	1
1968	14	1	12	16	7	0	0	4	5	0	0	2	4	0	1	0
N	219	40	94	419	80	56	19	76	85	43	17	60	36	47	60	15
Percent	10.95	2.00	4.70	20.95	4.00	2.80	.95	3.80	4.25	2.15	.85	3.45	1.80	2.35	3.00	.75

TABLE X (Continued)













Year	Identifying Traits													2,000
	 17	 18	 20	 22	 23	 24	 25	 26	MISC. 27	 CURVED 30	 CURVED 31	 CURVED 32	 CURVED 33	
1949	3	4	1	0	0	4	4	6	0	3	2	1	0	
1950	5	8	0	2	0	1	3	9	0	1	3	1	4	
1951	3	10	1	6	0	3	2	9	2	0	1	0	0	
1952	1	2	1	2	0	2	3	5	0	0	0	0	3	
1953	0	0	3	3	0	2	4	9	2	2	2	5	1	
1954	1	8	0	9	0	3	4	0	0	1	0	3	1	
1955	0	4	2	2	0	0	3	8	0	0	0	1	1	
1956	8	2	1	4	0	0	12	0	0	1	1	1	1	
1957	2	2	0	5	0	2	3	0	0	0	0	1	1	
1958	2	2	0	7	0	0	1	7	0	4	3	0	9	
1959	3	4	3	7	0	0	1	2	0	3	2	3	2	
1960	0	3	1	10	0	0	12	4	0	4	0	1	0	
1961	0	1	2	8	0	2	1	7	1	8	2	1	2	
1962	1	5	3	5	0	0	6	10	0	0	3	1	4	
1963	0	1	2	9	0	0	12	6	0	2	5	3	1	
1964	2	3	0	10	0	0	8	4	0	11	3	1	3	
1965	0	2	2	5	3	3	1	2	2	2	0	0	0	
1966	0	2	0	12	5	0	7	0	1	4	0	0	0	
1967	0	0	1	5	1	1	3	2	2	8	3	0	1	
1968	3	0	6	2	1	0	0	14	5	3	0	0	0	
N	34	63	29	113	10	23	90	104	15	57	30	23	34	2,000
Percent	1.70	3.15	1.45	5.65	.50	1.15	4.50	5.20	.75	2.85	1.50	1.15	1.70	100.00

TABLE XI

FREQUENCY OF OCCURRENCE OF ALL ARM TRAITS, 1949-1968

Year	Identifying Traits																		
	01	02	03	04	05	06	07	09	10	11	13	14	15	16	17	18	MISC. 19	20	
1949	14	6	4	6	0	1	2	1	0	60	2	0	1	0	0	0	1	2	
1950	13	10	20	5	1	3	5	0	0	36	1	0	2	2	0	0	1	1	
1951	9	5	8	5	1	1	15	0	0	48	1	0	2	5	0	0	0	0	
1952	10	8	11	4	2	0	6	3	0	50	5	0	0	0	0	0	0	1	
1953	6	6	9	0	2	0	11	2	0	57	2	0	5	0	0	0	0	0	
1954	8	7	5	4	7	1	10	1	0	47	3	2	1	0	1	0	2	1	
1955	21	5	5	3	1	2	13	5	0	30	1	2	1	4	1	1	1	4	
1956	20	3	5	1	7	0	4	6	0	42	7	1	1	1	0	0	0	2	
1957	13	10	7	8	3	0	10	4	1	37	0	2	3	2	0	0	0	0	
1958	19	10	10	3	5	1	14	2	0	29	4	2	1	0	0	0	0	0	
1959	29	9	7	5	8	2	7	3	1	18	2	4	1	1	1	0	0	2	
1960	9	19	3	1	4	3	10	4	0	38	0	4	3	0	1	0	0	1	
1961	17	14	0	4	0	5	25	1	2	21	1	0	0	6	0	1	1	2	
1962	11	9	12	9	3	4	13	1	1	26	1	0	2	2	0	1	2	3	
1963	12	12	6	16	1	2	13	1	1	26	1	0	2	2	0	1	0	4	
1964	16	13	2	10	3	9	10	2	4	26	2	0	2	0	0	0	1	0	
1965	19	14	3	10	1	14	1	2	3	25	1	2	1	1	4	0	0	0	
1966	16	20	6	7	4	7	5	1	10	16	0	5	0	0	1	0	1	0	
1967	12	14	12	4	1	7	11	4	8	24	0	0	0	0	0	0	1	2	
1968	14	16	0	0	3	7	7	1	15	31	0	0	0	0	2	1	2	2	
N	288	210	135	105	57	69	192	44	46	687	34	24	28	26	11	5	13	27	2,000
Percent	14.40	10.15	6.75	5.25	2.85	3.45	9.60	2.15	2.30	34.35	1.70	1.20	1.40	1.30	.55	.25	.65	1.70	100.00

TABLE XII

FREQUENCY OF OCCURRENCE OF MATERIALS USED FOR SEATS, 1949-1968

Year	Identifying Traits											
	UPHOLSTERY 01	WOOD 02	CANE 03	ROPE 04	WEBBING 05	CANVAS 06	METAL OR WIRE 07	RATTAN 08	PLASTIC 09	WICKER 10	LEATHER 11	
1949	67	10	3	11	4	2	0	0	2	1	2	
1950	72	3	1	1	6	3	8	0	3	2	1	
1951	61	15	1	1	3	4	6	0	1	5	3	
1952	76	5	4	1	1	3	0	1	0	7	2	
1953	56	11	2	5	5	3	1	4	3	4	6	
1954	75	7	6	1	1	3	6	0	1	0	0	
1955	80	7	6	1	3	0	0	0	3	0	0	
1956	68	6	4	5	1	0	5	1	4	6	0	
1957	81	8	3	3	0	1	0	3	0	1	0	
1958	83	5	6	1	3	1	1	0	0	0	0	
1959	80	2	2	5	0	0	0	2	1	5	3	
1960	79	4	3	0	0	0	1	0	13	0	0	
1961	93	0	2	3	0	0	0	0	0	0	2	
1962	84	4	1	4	0	1	0	1	3	0	2	
1963	95	4	0	1	0	0	0	0	0	0	0	
1964	88	3	0	0	0	0	3	0	6	0	0	
1965	91	0	0	0	3	1	0	5	0	0	0	
1966	87	1	0	0	0	1	0	0	11	0	0	
1967	92	3	2	1	0	1	0	0	1	0	0	
1968	88	5	0	0	0	0	0	0	5	1	1	
N	1596	103	46	44	30	24	31	17	57	32	20	2,000
Percent	79.80	5.15	2.30	2.20	1.50	1.20	1.55	.85	2.85	1.60	1.00	100.00

TABLE XIII
 FREQUENCY OF OCCURRENCE OF ALL MATERIALS USED FOR
 BACKS, BY YEAR, 1949-1968

Year	Identifying Traits											
	UPHOLSTERY 01	WOOD 02	CANE 03	ROPE 04	WEBBING 05	CANVAS 06	METAL OR WIRE 07	RATTAN 08	PLASTIC 09	WICKER 10	LEATHER 11	
1949	57	16	5	12	4	2	0	0	2	2	0	
1950	49	15	6	1	6	3	15	0	3	2	0	
1951	48	25	1	1	3	4	9	0	1	5	3	
1952	63	22	2	2	1	3	0	1	0	4	2	
1953	54	16	2	3	5	3	1	4	3	3	6	
1954	66	18	9	0	1	3	2	0	1	0	0	
1955	72	9	11	1	3	0	1	0	3	0	0	
1956	55	23	4	2	1	0	7	1	4	3	0	
1957	63	23	5	0	0	1	0	3	0	1	0	
1958	63	21	11	0	3	1	1	0	0	0	0	
1959	64	19	4	3	0	0	0	2	3	1	4	
1960	66	13	1	0	0	0	2	0	18	0	0	
1961	88	5	5	0	0	0	0	0	0	0	2	
1962	73	20	0	0	0	1	0	1	3	0	2	
1963	86	11	3	0	0	0	0	0	0	0	0	
1964	80	9	1	0	0	0	4	0	6	0	0	
1965	89	2	1	0	3	1	0	4	0	0	0	
1966	83	4	0	0	0	1	0	0	12	0	0	
1967	87	5	4	1	0	1	1	0	1	0	0	
1968	83	9	2	0	0	0	3	0	2	0	1	
N	1389	287	79	26	30	24	46	16	62	21	20	2,000
Percent	69.45	14.35	3.95	1.30	1.50	1.20	2.30	.80	3.10	1.05	1.00	100.00

TABLE XIV
 FREQUENCY OF OCCURRENCE OF ALL MATERIALS USED FOR
 MOULDED CHAIRS, BY YEAR, 1949-1968

Year	Identifying Traits										NA*
	PLYWOOD 01	PLASTIC 02	WOVEN WIRE 03	LAMINATED 04	LEATHER SLING 05	CANVAS SLING 06	NYLON MESH 07	RATTAN 08	CANE 09		
1949	5	2	0	1	0	2	0	1	3	86	
1950	2	4	2	0	1	3	0	3	1	84	
1951	5	0	5	2	0	0	0	2	0	86	
1952	3	1	2	0	0	3	0	1	3	87	
1953	7	3	3	0	4	2	0	6	1	74	
1954	6	0	3	1	0	2	0	0	0	88	
1955	1	3	0	1	0	0	0	0	0	95	
1956	3	6	5	0	1	0	0	0	0	85	
1957	4	0	0	0	1	0	0	0	0	95	
1958	3	0	1	0	0	1	0	0	0	95	
1959	1	9	0	0	1	0	0	2	0	87	
1960	11	26	0	1	0	0	0	0	0	62	
1961	12	9	0	0	2	0	0	0	3	74	
1962	2	9	0	1	1	0	0	1	0	86	
1963	11	6	0	0	0	0	0	0	0	83	
1964	0	7	2	4	0	0	0	0	0	87	
1965	11	0	1	0	0	0	0	0	0	88	
1966	4	9	0	0	0	0	0	0	0	87	
1967	1	4	0	0	0	0	1	0	0	94	
1968	5	14	0	0	1	0	0	0	0	80	
N	97	112	24	11	12	13	1	16	11	1703	2,000
Percent	4.85	5.60	1.20	.55	.60	.65	.05	.80	.55	85.15	100.00

*Not Applicable

TABLE XV

FREQUENCY OF OCCURRENCE OF ALL MATERIALS USED FOR EXPOSED LEGS,
1949-1968

Year	Identifying Traits																	
	WALNUT 01	TEAK 02	OAK 03	BEECH 04	BIRCH 05	06 *	07	08	09	10	11	12	13	14	15	16	17	18
1949	2	0	1	2	9	0	2	3	0	0	0	0	1	0	0	0	0	0
1950	5	0	0	2	2	0	1	0	1	0	0	0	0	0	0	0	0	0
1951	3	2	1	0	12	1	1	6	0	0	0	0	0	0	0	0	0	0
1952	11	2	2	2	2	2	0	2	1	0	1	0	1	1	0	0	0	0
1953	7	0	4	8	2	1	0	1	1	0	0	1	6	0	0	0	0	0
1954	23	3	1	3	4	1	3	2	0	0	0	0	2	1	1	2	1	1
1955	16	10	1	4	1	0	0	0	4	0	0	2	14	0	0	0	0	0
1956	19	9	3	10	3	0	0	0	2	0	0	1	1	0	0	0	0	0
1957	28	10	8	5	0	0	2	0	0	0	3	1	0	2	0	0	0	0
1958	20	9	4	6	0	3	1	0	0	0	0	0	2	0	0	0	0	4
1959	17	26	4	5	0	0	1	0	1	0	3	4	0	0	0	0	0	0
1960	12	14	0	3	0	0	2	0	0	0	2	0	0	0	0	0	0	0
1961	27	22	2	0	0	0	2	0	0	1	13	1	2	0	0	0	0	0
1962	18	11	5	0	0	0	1	0	0	1	6	0	0	0	0	0	0	0
1963	12	4	2	1	0	0	0	0	0	2	11	0	0	2	0	0	0	0
1964	25	2	0	1	0	0	0	0	0	3	4	0	0	0	0	0	0	0
1965	27	0	0	0	0	0	0	2	0	1	1	3	0	0	0	0	0	0
1966	23	1	5	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0
1967	24	3	6	5	0	0	3	0	0	0	2	0	0	0	0	0	0	0
1968	29	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0
N	348	128	49	60	35	8	23	16	10	8	47	13	29	6	1	2	1	5
Percent	17.40	6.40	2.45	3.00	1.75	.40	1.15	.80	.50	.40	2.35	.65	1.45	.30	.05	.10	.05	.25

*See Figure 4

TABLE XV (Continued)

Year	Identifying Traits																ALUMINUM 40	
	19	20	21	22	23	24	25	26	27	28	29	31	32	33	34	35		36
1949	0	0	0	0	0	0	0	2	3	1	0	0	0	0	0	0	0	4
1950	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
1951	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1	0
1953	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0
1954	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
1955	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	7
1956	0	3	0	0	0	0	0	0	0	0	0	9	0	0	0	3	0	3
1957	0	1	1	1	0	0	0	0	0	0	0	5	0	0	0	2	0	1
1958	0	1	0	1	0	0	2	0	0	0	0	4	0	2	2	1	0	4
1959	1	0	0	0	0	0	0	0	0	0	0	6	0	0	3	0	0	3
1960	0	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	3
1961	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
1965	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	15
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
1967	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	6
1968	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
N	2	7	1	2	4	2	4	2	3	1	1	31	2	3	9	10	2	107
Percent	.10	.35	.05	.10	.20	.10	.20	.10	.15	.05	.05	1.55	.10	.15	.45	.50	.10	5.35

TABLE XV (Continued)

Year	Identifying Traits																NA*
	CHROME 41	WROUGHT IRON 42	43	TUBULAR STEEL 44	45	46	47	50	52	53	54	55	LAMINATED WOOD 58	60	61	70	
1949	0	6	0	6	5	0	0	7	0	0	0	0	16	0	0	30	0
1950	1	21	0	11	8	0	0	9	0	0	0	0	2	2	0	33	0
1951	0	35	1	1	3	0	0	8	0	5	0	0	0	1	0	20	0
1952	4	22	0	7	7	0	0	3	0	0	0	0	2	0	0	21	0
1953	5	11	5	8	9	1	0	1	0	3	0	0	6	4	0	12	0
1954	11	9	2	6	0	0	0	2	1	0	0	0	0	0	0	7	10
1955	1	5	5	7	0	0	0	0	1	6	1	0	0	1	0	0	10
1956	1	5	0	12	1	0	0	0	0	0	0	0	0	0	0	0	15
1957	2	0	2	7	2	0	0	0	0	0	0	0	0	8	0	0	9
1958	3	4	0	1	9	0	0	0	0	0	0	0	0	2	0	0	19
1959	3	0	0	1	9	2	0	0	0	0	0	0	0	1	0	10	0
1960	18	0	0	10	13	3	0	0	0	0	0	0	1	1	0	14	0
1961	20	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	0
1962	29	0	0	5	3	2	0	0	0	0	0	0	1	2	0	8	0
1963	40	0	0	2	5	0	0	0	0	0	0	0	2	0	0	9	0
1964	35	2	0	2	4	0	0	1	0	0	0	0	0	0	0	15	0
1965	31	2	0	4	2	0	0	0	0	3	0	0	0	2	3	2	0
1966	27	0	0	0	3	6	0	0	0	0	0	0	0	3	0	3	2
1967	27	0	0	4	0	3	1	1	0	1	0	3	0	0	2	3	2
1968	20	0	0	3	8	4	0	0	0	0	0	0	1	0	0	5	9
N	278	122	15	99	91	21	1	32	2	18	1	3	31	27	5	196	76
Percent	13.90	6.10	.75	4.95	4.55	1.05	.05	1.60	.10	.90	.05	.15	1.55	1.35	.25	9.80	3.80

*Not Applicable

APPENDIX B

TABLES FOR FREQUENCY AND PERCENTAGES OF
OCCURRENCE OF MAJOR CHAIR TRAITS,
1949-1968

TABLE XVI
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MAJOR
 LEG TRAITS, 1949-1968







Frequency Row % Column %	Identifying Traits						n
							
Year	01	02	03	11	17	19	
1949	40 57.14 8.97	16 22.86 4.88	8 11.43 2.25	1 1.43 0.43	2 2.86 1.82	3 4.29 2.75	70
1950	31 38.27 6.95	28 34.57 8.54	16 19.75 4.49	1 1.23 0.43	3 3.70 2.73	2 2.47 1.83	81
1951	44 59.46 9.87	19 25.68 5.79	5 6.76 1.40	0 .00 .00	1 1.35 0.91	5 6.76 4.59	74
1952	16 20.78 3.59	22 28.57 6.71	20 25.97 5.62	5 6.49 2.17	7 9.09 6.36	7 9.09 6.42	77
1953	37 51.39 8.30	8 11.11 2.44	12 16.67 3.37	1 1.39 0.43	8 11.11 7.27	6 8.33 5.50	72
1954	35 46.67 7.85	19 25.33 5.79	5 6.67 1.40	1 1.33 0.43	7 9.33 6.36	8 10.67 7.34	75
1955	28 30.43 6.28	32 34.78 9.76	17 18.48 4.78	2 2.17 0.87	7 7.61 6.36	6 6.52 5.50	92
1956	24 27.59 5.38	16 18.39 4.88	21 24.14 5.90	1 1.15 0.43	16 18.39 14.55	9 10.34 8.26	87
1957	23 28.75 5.16	23 28.75 7.01	16 20.00 4.49	0 .00 .00	9 11.25 8.18	9 11.25 8.26	80
1958	36 42.35 8.07	21 24.71 6.40	7 8.24 1.97	6 7.06 2.61	6 7.06 5.45	9 10.59 8.26	85

TABLE XVI (Continued)

Year	Identifying Traits						n
	01	02	03	11	17	19	
1959	24	24	13	7	5	13	86
	27.91	27.91	15.12	8.14	5.81	15.12	
	5.38	7.32	3.65	3.04	4.55	11.93	
1960	30	16	14	13	5	9	87
	34.48	18.39	16.09	14.94	5.75	10.34	
	6.73	4.88	3.93	5.65	4.55	8.26	
1961	18	9	32	9	5	5	78
	23.08	11.54	41.03	11.54	6.41	6.41	
	4.04	2.74	8.99	3.91	4.55	4.59	
1962	12	6	30	19	9	4	80
	15.00	7.50	37.50	23.75	11.25	5.00	
	2.69	1.83	8.43	8.26	8.18	3.67	
1963	12	19	18	32	5	2	88
	13.64	21.59	20.45	36.36	5.68	2.27	
	2.69	5.79	5.06	13.91	4.55	1.83	
1964	12	11	25	26	6	3	83
	14.46	13.25	30.12	31.33	7.23	3.61	
	2.69	3.35	7.02	11.30	5.45	2.75	
1965	9	15	20	34	2	2	82
	10.98	18.29	24.39	41.46	2.44	2.44	
	2.02	4.57	5.62	14.78	1.82	1.83	
1966	4	7	20	37	4	4	76
	5.26	9.21	26.32	48.68	5.26	5.26	
	0.90	2.13	5.62	16.09	3.64	3.67	
1967	5	8	33	15	1	2	64
	7.81	12.50	51.56	23.44	1.56	3.13	
	1.12	2.44	9.27	6.52	0.91	1.83	
1968	6	9	24	20	2	1	62
	9.68	14.52	38.71	32.26	3.23	1.61	
	1.35	2.74	6.74	8.70	1.82	0.92	
N	446	328	356	230	110	109	1579
Percent	28.25	20.77	22.55	14.57	6.97	6.90	100.00

TABLE XVII
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MAJOR LEG
 SHAPE TRAITS, 1949-1968

Frequency Row % Column %	Identifying Traits			n
	01	02	03	
1949	46 46.46 4.26	23 23.23 4.70	30 30.30 18.29	99
1950	56 57.14 5.19	23 23.47 4.70	19 19.39 11.59	98
1951	78 78.00 7.22	13 13.00 2.66	9 9.00 5.49	100
1952	74 77.89 6.85	14 14.74 2.86	7 7.37 4.27	95
1953	74 74.00 6.85	8 8.00 1.64	18 18.00 10.98	100
1954	69 69.00 6.39	23 23.00 4.70	8 8.00 4.88	100
1955	69 70.41 6.39	27 27.55 5.52	2 2.04 1.22	98
1956	75 75.00 6.94	22 22.00 4.50	3 3.00 1.83	100
1957	81 81.00 7.50	16 16.00 3.27	3 3.00 1.83	100
1958	58 61.70 5.37	32 34.04 6.54	4 4.26 2.44	94

TABLE XVII (Continued)

Year	Identifying Traits			n
	01	02	03	
1959	63 67.74 5.83	23 24.73 4.70	7 7.53 4.27	93
1960	60 68.97 5.56	22 25.29 4.50	5 5.75 3.05	87
1961	49 56.98 4.54	29 33.72 5.93	8 9.30 4.88	86
1962	57 70.37 5.28	22 27.16 4.50	2 2.47 1.22	81
1963	41 59.42 3.80	22 31.88 4.50	6 8.70 3.66	69
1964	26 35.14 2.41	39 52.70 7.98	9 12.16 5.49	74
1965	30 49.18 2.78	24 39.34 4.91	7 11.48 4.27	61
1966	17 30.36 1.57	37 66.07 7.57	2 3.57 1.22	56
1967	36 46.15 3.33	33 42.31 6.75	9 11.54 5.49	78
1968	21 32.81 1.94	37 57.81 7.57	6 9.38 3.66	64
N	1080	489	164	1733
Percent	62.32	28.22	9.46	100.00

TABLE XVIII
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF
 MAJOR STRETCHER TRAITS, 1949-1968

Frequency Row % Column %	Identifying Traits				n
	—		NONE	□	
Year	02	03	09	13	
1949	5 5.43 4.90	4 4.35 4.26	81 88.04 5.88	2 2.17 1.17	92
1950	1 1.18 .98	8 9.41 8.51	74 87.06 5.37	2 2.35 1.17	85
1951	10 11.90 9.80	3 3.57 3.19	67 79.76 4.26	4 4.76 2.34	84
1952	3 3.61 2.94	3 3.61 3.19	69 83.13 5.01	8 9.64 4.68	83
1953	7 8.75 6.86	3 3.75 3.19	70 87.50 5.08	0 .00 .00	80
1954	4 5.00 3.92	4 5.00 4.26	64 80.00 4.64	8 10.00 4.68	80
1955	5 6.41 4.90	2 2.56 2.13	51 65.38 3.70	20 25.64 11.70	78
1956	8 9.52 7.84	8 9.52 8.51	58 69.05 4.21	10 11.90 5.85	84
1957	10 14.08 9.80	12 16.90 12.77	32 45.07 2.32	17 23.94 9.94	71
1958	15 17.86 14.71	14 16.67 14.89	49 58.33 3.56	6 7.14 3.51	84

TABLE XVIII (Continued)

Frequency Row % Column %	Identifying Traits				n
	02	03	09	13	
1959	6 7.59 5.88	1 1.27 1.06	59 74.68 4.28	13 16.46 7.60	79
1960	3 3.19 2.94	2 2.13 2.13	77 81.91 5.59	12 12.77 7.02	94
1961	3 3.13 2.94	8 8.33 8.51	64 66.67 4.64	21 21.88 12.28	96
1962	3 3.23 2.94	0 .00 .00	78 83.87 5.66	12 12.90 7.02	93
1963	2 2.04 1.96	3 3.06 3.19	84 85.71 6.10	9 9.18 5.26	98
1964	4 4.26 3.92	8 8.51 8.51	73 77.66 5.30	9 9.57 5.26	94
1965	2 2.20 1.96	4 4.40 4.26	82 90.11 5.95	3 3.30 1.75	91
1966	2 2.11 1.96	0 .00 .00	84 88.42 6.10	9 9.47 5.26	95
1967	8 8.99 7.84	2 2.25 2.13	77 86.52 5.59	2 2.25 1.17	89
1968	1 1.05 .98	5 5.26 5.32	85 89.47 6.17	4 4.21 2.34	95
N	102	94	1378	171	1745
Percent	5.85	5.39	78.97	9.80	100.00

TABLE XIX

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF
MAJOR BACK TRAITS, 1949-1968

Frequency Row % Column %	Identifying Traits				n
	01	05	09	13	
1949	53 67.95 6.39	17 21.79 6.51	8 10.26 3.38	0 .00 .00	78
1950	39 54.17 4.70	18 25.00 6.90	6 8.33 2.53	9 12.50 4.69	72
1951	32 50.00 3.86	15 23.44 5.75	12 18.75 5.06	5 7.81 2.60	64
1952	44 52.38 5.31	10 11.90 3.83	18 21.43 7.59	12 14.29 6.25	84
1953	32 41.56 3.86	23 29.87 8.81	10 12.99 4.22	12 15.58 6.25	77
1954	37 49.33 4.46	13 17.33 4.98	18 24.00 7.59	7 9.33 3.65	75
1955	38 46.91 4.58	9 11.11 3.45	30 37.04 12.66	4 4.94 2.08	81
1956	25 34.25 3.02	15 20.25 5.75	13 17.81 5.49	20 27.40 10.42	73
1957	41 47.67 4.95	13 15.12 4.98	18 20.93 7.59	14 16.28 7.29	86
1958	31 38.27 3.74	22 27.16 8.43	9 11.11 3.80	19 23.46 9.90	81

TABLE XIX (Continued)

Frequency Row % Column %	Identifying Traits				n
	01	05	09	13	
1959	42 52.50 5.07	5 6.25 1.92	14 17.50 5.91	19 23.75 9.90	80
1960	35 50.00 4.22	10 14.29 3.83	13 18.57 5.49	12 17.14 6.25	70
1961	54 69.23 6.51	8 10.26 3.07	8 10.26 3.38	8 10.26 4.17	78
1962	37 52.86 4.46	14 20.00 5.36	7 10.00 2.95	12 17.14 6.25	70
1963	37 52.86 4.46	19 27.14 7.28	5 7.14 2.11	9 12.86 4.69	70
1964	44 60.27 5.31	6 8.22 2.30	15 20.55 6.33	8 10.96 4.17	73
1965	53 66.25 6.39	16 20.00 6.13	6 7.50 2.53	5 6.25 2.60	80
1966	53 72.60 6.39	3 4.11 1.15	12 16.44 5.06	5 6.85 2.60	73
1967	56 65.88 6.76	14 16.47 5.36	8 9.41 3.38	7 8.24 3.65	85
1968	46 66.67 5.55	11 15.94 4.21	7 10.14 2.95	5 7.25 2.60	69
N	829	261	237	192	1519
Percent	54.58	17.18	15.60	12.64	100.00

TABLE XX
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF
 MAJOR ARM TRAITS, 1949-1968

Frequency Row % Column %	Identifying Traits					n
	01	03	05	07	11	
1949	20 20.83 4.02	11 11.46 4.10	3 3.13 1.69	2 2.08 1.04	60 62.50 8.73	96
1950	23 23.96 4.62	27 28.13 10.07	5 5.21 2.82	5 5.21 2.60	36 37.50 5.24	96
1951	14 14.89 2.81	15 15.96 5.60	2 2.13 1.13	15 15.96 7.81	48 51.06 6.99	94
1952	18 19.57 3.61	15 16.30 5.60	3 3.26 1.69	6 6.52 3.13	50 54.35 7.28	92
1953	12 12.50 2.41	14 14.58 5.22	2 2.08 1.13	11 11.46 5.73	57 59.38 8.30	96
1954	15 16.13 3.01	10 10.75 3.73	11 11.83 6.21	10 10.75 5.21	47 50.54 6.84	93
1955	26 29.89 5.22	9 10.34 3.36	9 10.34 5.08	13 14.94 6.77	30 34.48 4.37	87
1956	23 26.74 4.62	7 8.14 2.61	10 11.63 5.65	4 4.65 2.08	42 48.84 6.11	86
1957	23 24.73 4.62	18 19.35 6.72	5 5.38 2.82	10 10.75 5.21	37 39.78 5.39	93
1958	29 30.85 5.82	14 14.87 5.22	8 8.51 4.52	14 14.89 7.29	29 30.85 4.22	94

TABLE XX (Continued)

Year	Identifying Traits					n
	01	03	05	07	11	
1959	38	13	16	7	18	92
	41.30	14.13	17.39	7.61	19.57	
	7.63	4.85	9.04	3.65	2.62	
1960	28	7	12	10	38	95
	29.47	7.37	12.63	10.53	40.00	
	5.62	2.61	6.78	5.21	5.53	
1961	31	4	7	25	21	88
	35.23	4.55	7.95	28.41	23.86	
	6.22	1.49	3.95	13.02	3.06	
1962	20	23	10	13	26	92
	21.74	25.00	10.87	14.13	28.26	
	4.02	8.58	5.65	6.77	3.78	
1963	24	24	7	13	26	94
	25.53	25.53	7.45	13.83	27.66	
	4.82	8.96	3.95	6.77	3.78	
1964	29	14	12	10	26	91
	31.87	15.38	13.19	10.99	28.57	
	5.82	5.22	6.78	5.21	3.78	
1965	33	13	17	1	25	89
	37.08	14.61	19.10	1.12	28.09	
	6.63	4.85	9.60	.52	3.64	
1966	36	14	16	5	16	87
	41.38	16.09	18.39	5.75	18.39	
	7.23	5.22	9.04	2.60	2.33	
1967	26	16	10	11	24	87
	29.89	18.39	11.49	12.64	27.59	
	5.22	5.97	5.65	5.73	3.49	
1968	30	0	12	7	31	80
	37.50	.00	15.00	8.75	38.75	
	6.02	.00	6.78	3.65	4.51	
N	498	268	177	192	687	1822
Percent	27.33	14.71	9.71	10.54	37.71	100.00

TABLE XXI
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MAJOR
 MATERIAL USED FOR SEATS, 1949-1968

Frequency Row % Column %	Identifying Traits		n
	UPHOLSTERY	WOOD	
Year	01	02	
1949	67 87.01 4.20	10 12.99 9.71	77
1950	72 96.00 4.51	3 4.00 2.91	75
1951	61 80.26 3.82	15 19.74 14.56	76
1952	76 93.83 4.76	5 6.17 4.85	81
1953	56 83.58 3.51	11 16.42 10.68	67
1954	75 91.46 4.70	7 8.54 6.80	82
1955	80 91.95 5.01	7 8.05 6.80	87
1956	68 91.89 4.26	6 8.11 5.83	74
1957	81 91.01 5.08	8 8.99 7.77	89
1958	83 94.32 5.20	5 5.68 4.85	88

TABLE XXI (Continued)

Frequency Row % Column %	Identifying Traits		
	Year	01	02
1959	80	2	82
	97.56	2.44	
	5.01	1.94	
1960	79	4	83
	95.18	4.82	
	4.95	3.88	
1961	93	0	93
	100.00	.00	
	5.83	.00	
1962	84	4	88
	95.45	4.55	
	5.26	3.88	
1963	95	4	99
	95.96	4.04	
	5.95	3.88	
1964	88	3	91
	96.70	3.30	
	5.51	2.91	
1965	91	0	91
	100.00	.00	
	5.70	.00	
1966	87	1	88
	98.86	1.14	
	5.45	.97	
1967	92	3	95
	96.84	3.16	
	5.76	2.91	
1968	88	5	93
	94.62	5.38	
	5.51	4.85	
N	1596	103	1699
Percent	93.94	6.06	100.00

TABLE XXII
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MAJOR
 MATERIAL USED FOR BACKS, 1949-1968

Frequency Row % Column %	Identifying Traits		n
	UPHOLSTERY	WOOD	
Year	01	02	
1949	57 78.08 4.10	16 21.92 5.57	73
1950	49 76.56 3.53	15 23.44 5.23	64
1951	48 65.75 3.46	25 34.25 8.71	73
1952	63 74.12 4.54	22 25.88 7.67	85
1953	54 77.14 3.89	16 22.86 5.57	70
1954	66 78.57 4.75	18 21.43 6.27	84
1955	72 88.89 5.18	9 11.11 3.14	81
1956	55 70.51 3.96	23 29.49 8.01	78
1957	63 71.59 4.54	25 28.41 8.71	88
1958	63 75.00 4.54	21 25.00 7.32	84

TABLE XXII (Continued)

Frequency Row % Column %	Identifying Traits		
	Year	01	02
1959	64 77.11 4.61	19 22.89 6.62	83
1960	66 83.54 4.75	13 16.46 4.53	79
1961	88 94.62 6.34	5 5.38 1.74	93
1962	73 78.49 5.26	20 21.51 6.97	93
1963	86 88.66 6.19	11 11.34 3.83	97
1964	80 89.89 5.76	9 10.11 3.14	89
1965	89 97.80 6.41	3 2.20 .70	91
1966	83 95.40 5.98	4 4.60 1.39	87
1967	87 94.57 6.26	5 5.43 1.74	92
1968	83 90.22 5.98	9 9.78 3.14	92
N	1389	287	1676
Percent	82.88	17.12	100.00

TABLE XXIII
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MAJOR
 MATERIAL USED FOR EXPOSED LEGS, 1949-1968

Frequency Row % Column %	Identifying Traits			n
	METAL	LAMINATED	WOOD	
Year	45	58	70	
1949	21 21.00 2.95	23 23.00 26.44	56 56.00 5.23	100
1950	42 42.86 5.90	11 11.22 12.64	45 45.92 4.20	98
1951	40 40.40 5.62	13 13.13 14.94	46 46.46 4.30	99
1952	40 40.00 5.62	5 5.00 5.75	55 55.00 5.14	100
1953	38 40.00 5.34	10 10.53 11.49	47 49.47 4.39	95
1954	29 32.22 4.07	3 3.33 3.45	58 64.44 5.42	90
1955	25 28.09 3.51	8 8.99 9.20	56 62.92 5.23	89
1956	22 25.88 3.09	0 .00 .00	63 74.12 5.88	85
1957	14 16.87 1.97	0 .00 .00	69 83.13 6.44	83
1958	21 26.58 2.95	0 .00 .00	58 73.42 5.42	79

TABLE XXIII (Continued)

Frequency Row % Column %	Identifying Traits			
	Year	45	58	70
1959	16 16.49 2.25	0 .00 .00	81 83.51 7.56	97
1960	44 45.83 6.18	1 1.04 1.15	51 53.13 4.76	96
1961	25 25.00 3.51	0 .00 .00	75 75.00 7.00	100
1962	45 46.88 6.32	1 1.04 1.15	50 52.08 4.67	96
1963	55 55.00 7.72	2 2.00 2.30	43 43.00 4.01	100
1964	49 49.00 6.88	1 1.00 1.15	50 50.00 4.67	100
1965	54 56.84 7.58	3 3.16 3.45	38 40.00 3.55	95
1966	53 59.55 7.44	0 .00 .00	36 40.45 3.36	89
1967	37 40.22 5.20	5 5.43 5.75	50 54.35 4.67	92
1968	42 48.28 5.90	1 1.15 1.15	44 50.57 4.11	87
N	712	87	1071	1870
Percent	38.07	4.65	57.27	100.00

APPENDIX C

TABLES FOR FREQUENCY AND PERCENTAGES OF OCCURRENCE
OF MINOR CHAIR TRAITS, 1949-1968

TABLE XXIV
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MINOR
 LEG TRAITS, 1949-1968





Frequency Row % Column %	Identifying Traits				n
					
Year	04	05	15	20	
1949	1 7.14 2.78	5 35.71 6.67	2 14.29 6.45	6 42.86 18.75	14
1950	0 .00 .00	3 60.00 4.00	2 40.00 6.45	0 .00 .00	15
1951	5 27.78 13.89	5 27.78 6.67	5 27.78 16.13	3 16.67 9.38	18
1952	0 .00 .00	4 25.00 5.33	10 62.50 32.26	2 12.50 6.25	16
1953	0 .00 .00	11 55.00 14.67	7 35.00 22.58	2 10.00 6.25	20
1954	1 5.88 2.78	10 58.82 13.33	3 9.68 9.68	3 17.65 9.38	17
1955	0 .00 .00	2 33.33 2.67	0 .00 .00	4 66.67 12.50	6
1956	0 .00 .00	4 57.14 5.33	0 .00 .00	3 42.86 9.38	7
1957	0 .00 .00	6 85.71 8.00	0 .00 .00	1 14.29 3.13	7
1958	1 100.00 2.78	0 .00 .00	0 .00 .00	0 .00 .00	1

TABLE XXIV (Continued)

Frequency Row % Column %	Identifying Traits				n
	04	05	15	20	
1959	0 .00 .00	3 100.00 4.00	0 .00 .00	0 .00 .00	3
1960	0 .00 .00	5 83.33 6.67	0 .00 .00	1 16.67 3.13	6
1961	4 40.00 11.11	6 60.00 8.00	0 .00 .00	0 .00 .00	10
1962	0 .00 .00	1 33.33 1.33	2 66.67 6.45	0 .00 .00	3
1963	2 33.33 5.56	3 50.00 4.00	0 .00 .00	1 16.67 3.13	6
1964	0 .00 .00	4 80.00 5.33	0 .00 .00	1 20.00 3.13	5
1965	3 100.00 8.33	0 .00 .00	0 .00 .00	0 .00 .00	3
1966	7 87.50 19.44	1 12.50 1.33	0 .00 .00	0 .00 .00	8
1967	8 61.54 22.22	1 12.50 1.33	0 .00 .00	4 30.77 12.50	13
1968	4 66.67 11.11	1 12.50 1.33	0 .00 .00	1 16.67 3.13	6
N	36	75	31	32	174
Percent	20.69	43.10	17.82	18.39	100.00

TABLE XXV

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MINOR
STRETCHER TRAITS, 1949-1968

Frequency Row % Column %	Identifying Traits			n
	H	□	II	
Year	01	04	12	
1949	1 33.33 2.13	2 66.67 3.17	0 .00 .00	3
1950	1 10.00 2.13	6 60.00 9.52	3 30.00 3.53	10
1951	4 26.67 8.51	4 26.67 6.35	7 46.67 8.24	15
1952	2 28.57 4.26	1 14.29 1.59	4 57.14 4.71	7
1953	0 .00 .00	3 30.00 4.76	7 70.00 8.24	10
1954	3 20.00 6.38	5 33.33 7.94	7 46.67 8.24	15
1955	13 59.09 27.66	3 13.64 4.76	6 27.27 7.06	22
1956	2 12.50 4.26	3 18.75 4.76	11 68.75 12.94	16
1957	4 14.81 8.51	12 44.44 19.05	11 40.74 12.94	27
1958	1 7.69 2.13	7 38.46 7.94	8 53.85 8.24	13

TABLE XXV (Continued)

Frequency Row % Column %	Identifying Traits				
	Year	01	04	12	n
1959	0	7	8	15	
	.00	46.67	53.33		
	.00	11.11	9.41		
1960	2	1	2	5	
	40.00	20.00	40.00		
	4.26	1.59	2.35		
1961	0	1	2	3	
	.00	33.33	66.67		
	.00	1.59	2.35		
1962	1	1	2	4	
	25.00	25.00	50.00		
	2.13	1.59	2.35		
1963	0	0	2	2	
	.00	.00	100.00		
	.00	.00	2.35		
1964	3	3	0	6	
	50.00	50.00	.00		
	6.38	4.76	.00		
1965	3	3	0	6	
	50.00	50.00	.00		
	6.38	4.76	.00		
1966	2	1	1	4	
	50.00	25.00	25.00		
	4.26	1.59	1.18		
1967	5	2	1	8	
	62.50	25.00	12.50		
	10.64	3.17	1.18		
1968	0	0	4	4	
	.00	.00	100.00		
	.00	.00	4.71		
N	47	63	85	195	
Percent	24.10	32.31	43.59	100.00	

TABLE XXVI
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MINOR
 BACK TRAITS, 1949-1968



Frequency Row % Column %	Identifying Traits		n
			
Year	17	18	
1949	3 42.86 8.33	4 57.14 6.35	7
1950	5 38.46 13.89	8 61.54 12.70	13
1951	3 23.08 8.33	10 76.92 15.87	13
1952	1 33.33 2.78	2 66.57 3.17	3
1953	1 100.00 2.78	0 .00 .00	1
1954	1 11.11 2.78	8 88.89 12.70	9
1955	0 .00 .00	4 100.00 6.35	4
1956	8 80.00 22.22	2 20.00 3.17	10
1957	2 50.00 5.56	2 50.00 3.17	4
1958	2 50.00 5.56	2 50.00 3.17	4

TABLE XXVI (Continued)

Year	Identifying Traits		n
	17	18	
1959	3 42.86 8.33	4 57.14 6.35	7
1960	0 .00 .00	3 100.00 4.76	3
1961	0 .00 .00	1 100.00 1.59	1
1962	1 16.67 2.78	5 83.33 7.94	6
1963	0 .00 .00	1 100.00 1.59	1
1964	2 40.00 5.56	3 60.00 4.76	5
1965	0 .00 .00	2 100.00 3.17	2
1966	0 .00 .00	2 100.00 3.17	2
1967	1 100.00 2.78	0 .00 .00	1
1968	3 100.00 8.33	0 .00 .00	3
N	36	63	99
Percent	36.36	63.64	100.00

TABLE XXVII
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MINOR
 ARM TRAITS, 1949-1968

Frequency Row % Column %	Identifying Traits			n
	09	13	16	
1949	1 33.33 1.11	2 66.67 4.44	0 .00 .00	3
1950	0 .00 .00	1 33.33 2.22	2 66.67 7.69	3
1951	0 .00 .00	1 16.67 2.22	5 83.33 19.23	6
1952	3 37.50 3.33	5 62.50 11.11	0 .00 .00	8
1953	2 50.00 2.22	2 50.00 4.44	0 .00 .00	4
1954	1 20.00 1.11	4 80.00 8.89	0 .00 .00	5
1955	5 45.45 5.56	2 18.18 4.44	4 36.36 15.38	11
1956	6 42.86 6.67	7 50.00 15.56	1 7.14 3.85	14
1957	5 71.43 5.56	0 .00 .00	2 28.57 7.69	7
1958	2 33.33 2.22	4 66.67 8.89	0 .00 .00	6

TABLE XXVII (Continued)

Frequency Row % Column %	Identifying Traits			n
	09	13	16	
Year				
1959	4 50.00 4.44	3 37.50 6.67	1 12.50 3.85	8
1960	4 80.00 4.44	1 20.00 2.22	0 .00 .00	5
1961	3 30.00 3.33	1 10.00 2.22	6 60.00 23.08	10
1962	2 40.00 2.22	1 20.00 2.22	2 40.00 7.69	5
1963	2 40.00 2.22	1 20.00 2.22	2 40.00 7.69	5
1964	6 75.00 6.67	2 25.00 4.44	0 .00 .00	8
1965	5 45.45 5.56	5 45.45 11.11	1 9.09 3.85	11
1966	11 91.67 12.22	1 8.33 2.22	0 .00 .00	12
1967	12 100.00 13.33	0 .00 .00	0 .00 .00	12
1968	16 88.89 17.78	2 11.11 4.44	0 .00 .00	18
N	90	45	26	161
Percent	55.90	27.95	16.15	100.00

TABLE XXVIII
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MINOR
 MATERIAL USED FOR SEATS, 1949-1968

Frequency Row % Column %	Identifying Traits							n
	CANE	ROPE	WEBBING	CANVAS	METAL OR WIRE	RATTAN	PLASTIC	
Year	03	04	05	06	07	08	09	
1949	3	11	4	2	0	1	2	23
	13.04	47.83	17.39	8.70	.00	4.35	8.70	
	6.52	25.00	13.33	4.55	.00	2.04	3.51	
1950	1	1	6	4	8	2	3	25
	4.00	4.00	24.00	16.00	32.00	8.00	12.00	
	2.17	2.27	20.00	9.09	25.81	4.08	5.26	
1951	1	1	3	7	6	5	1	24
	4.17	4.17	12.50	29.17	25.00	20.84	4.17	
	2.17	2.27	10.00	15.91	19.35	10.00	1.75	
1952	4	1	1	5	0	8	0	19
	21.05	5.26	5.26	26.32	.00	42.11	.00	
	8.70	2.27	3.33	11.36	.00	16.33	.00	
1953	2	5	5	9	1	8	3	33
	6.06	15.15	15.16	27.27	3.03	24.24	9.09	
	4.35	11.36	16.67	20.45	3.23	16.33	5.26	
1954	6	1	1	3	6	0	1	18
	33.33	5.56	5.56	16.67	33.33	.00	5.56	
	13.04	2.27	3.33	6.82	19.35	.00	1.75	
1955	6	1	3	0	0	0	3	13
	46.15	7.69	23.00	.00	.00	.00	23.08	
	13.04	2.27	10.00	.00	.00	.00	5.26	
1956	4	5	1	0	5	7	4	26
	15.30	19.23	3.85	.00	19.23	26.92	15.38	
	8.70	11.36	3.33	.00	16.13	14.29	7.02	
1957	3	3	0	1	0	4	0	11
	27.27	27.27	.00	9.09	.00	36.36	.00	
	6.52	6.82	.00	2.27	.00	8.16	.00	
1958	6	1	3	1	1	0	0	12
	50.00	8.33	25.00	8.33	8.33	.00	.00	
	13.04	2.27	10.00	2.27	3.23	.00	.00	

TABLE XXVIII (Continued)

Year	Identifying Traits							n
	03	04	05	06	07	08	09	
1959	2	5	0	3	0	7	1	18
	11.11	27.78	.00	16.67	.00	38.89	5.56	
	4.35	11.36	.00	6.82	.00	14.29	1.75	
1960	3	0	0	0	1	0	13	17
	17.65	.00	.00	.00	5.88	.00	76.07	
	6.52	.00	.00	.00	3.23	.00	22.81	
1961	2	3	0	2	0	0	0	7
	28.57	42.86	.00	28.57	.00	.00	.00	
	4.35	6.82	.00	4.55	.00	.00	.00	
1962	1	4	0	3	0	1	3	12
	8.33	33.33	.00	25.00	.00	8.33	25.00	
	2.17	9.09	.00	6.82	.00	2.04	5.26	
1963	0	1	0	0	0	0	0	1
	.00	100.00	.00	.00	.00	.00	.00	
	.00	2.27	.00	.00	.00	.00	.00	
1964	0	0	0	0	3	0	6	9
	.00	.00	.00	.00	33.33	.00	66.67	
	.00	.00	.00	.00	9.68	.00	10.53	
1965	0	0	3	1	0	5	0	9
	.00	.00	33.33	11.11	.00	55.56	.00	
	.00	.00	10.00	2.27	.00	10.20	.00	
1966	0	0	0	1	0	0	11	12
	.00	.00	.00	8.33	.00	.00	91.67	
	.00	.00	.00	2.27	.00	.00	19.30	
1967	2	1	0	1	0	0	1	5
	40.00	20.00	.00	20.00	.00	.00	20.00	
	4.35	2.27	.00	2.27	.00	.00	1.75	
1968	0	0	0	1	0	1	5	7
	.00	.00	.00	14.29	.00	14.29	71.43	
	4.35	2.27	.00	2.27	.00	2.04	8.77	
N	46	44	30	44	31	49	57	301
Percent	15.28	14.62	9.97	14.62	10.30	16.28	18.94	100.00

TABLE XXIX

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MINOR
MATERIAL USED FOR BACKS, 1949-1968

Frequency Row % Column %	Identifying Traits							n
	CANE	ROPE	WEBBING	CANVAS	METAL OR WIRE	RATTAN	PLASTIC	
	03	04	05	06	07	08	09	
1949	5	12	4	2	0	2	2	27
	18.52	44.44	14.81	7.41	.00	7.41	7.41	
	6.33	46.15	13.33	4.55	.00	5.41	3.23	
1950	6	1	6	3	15	2	3	36
	16.67	2.78	16.67	8.33	41.67	5.56	8.33	
	7.56	3.85	20.00	6.42	32.61	5.41	4.84	
1951	1	1	3	7	9	5	1	27
	3.70	3.70	11.11	25.93	33.33	18.52	3.70	
	1.27	3.85	10.00	15.91	19.57	13.51	1.61	
1952	2	2	1	5	0	5	0	15
	13.33	13.33	6.67	33.33	.00	33.33	.00	
	2.53	7.65	3.33	11.36	.00	13.51	.00	
1953	2	3	5	9	1	7	3	30
	6.67	10.00	16.67	30.00	2.17	23.33	10.00	
	2.53	11.54	16.67	20.45	2.17	18.92	4.84	
1954	9	0	1	3	2	0	1	16
	56.25	.00	6.25	18.75	12.50	.00	6.25	
	11.39	.00	3.33	6.82	4.35	.00	1.61	
1955	11	1	3	0	1	0	3	19
	57.89	5.26	15.79	.00	5.26	.00	15.79	
	13.92	3.85	10.00	.00	2.17	.00	4.84	
1956	4	2	1	0	7	4	4	22
	18.18	9.09	4.55	.00	31.82	18.18	18.18	
	5.06	7.69	3.33	.00	15.22	10.81	6.45	
1957	7	0	0	1	0	4	0	12
	58.33	.00	.00	8.33	.00	33.33	.00	
	8.86	.00	.00	2.27	.00	10.81	.00	
1958	11	0	3	1	1	0	0	16
	68.75	.00	18.75	6.25	6.25	.00	.00	
	13.92	.00	10.00	2.27	2.17	.00	.00	

TABLE XXIX (Continued)

Year	Identifying Traits							n
	03	04	05	06	07	08	09	
1959	4	3	0	4	0	3	3	17
	23.53	17.65	.00	25.53	.00	17.65	17.65	
	5.00	11.54	.00	9.09	.00	8.11	4.84	
1960	1	0	0	0	2	0	18	21
	4.76	.00	.00	.00	9.52	.00	85.71	
	1.27	.00	.00	.00	4.35	.00	29.03	
1961	5	0	0	2	0	0	0	7
	71.43	.00	.00	28.57	.00	.00	.00	
	6.33	.00	.00	4.55	.00	.00	.00	
1962	0	0	0	3	0	1	3	7
	.00	.00	.00	42.86	.00	14.29	42.86	
	.00	.00	.00	6.82	.00	2.70	4.84	
1963	3	0	0	0	0	0	0	3
	100.00	.00	.00	.00	.00	.00	.00	
	3,80	.00	.00	.00	.00	.00	.00	
1964	1	0	0	0	4	0	6	11
	9.09	.00	.00	.00	36.36	.00	54.55	
	1.27	.00	.00	.00	8.70	.00	9.68	
1965	1	0	3	1	0	4	0	9
	11.11	.00	33.33	11.11	.00	44.44	.00	
	1.27	.00	10.00	2.27	.00	10.81	.00	
1966	0	0	0	1	0	0	12	13
	.00	.00	.00	7.69	.00	.00	92.31	
	.00	.00	.00	2.27	.00	.00	19.35	
1967	4	1	0	1	1	0	1	8
	50.00	12.50	.00	12.50	12.50	.00	12.50	
	5.06	3.85	.00	2.27	2.17	.00	1.61	
1968	2	0	0	1	3	0	2	8
	25.00	.00	.00	12.50	37.50	.00	25.00	
	2.53	.00	.00	2.27	6.52	.00	3.23	
N	79	26	30	44	46	37	62	304
Percent	24.38	8.02	9.26	13.58	14.20	11.42	19.14	100.00

APPENDIX D

TABLES FOR FREQUENCY AND PERCENTAGES OF
OCCURRENCE OF CHAIR SUB-TRAITS,
1949-1968

TABLE XXX
 FREQUENCY AND PERCENTAGES OF OCCURRENCE OF LEG
 SUB-TRAITS, 1949-1968

Frequency Row % Column %	Identifying Traits			n
	28	29	30	
1949	7 41.18 11.67	2 11.76 1.32	8 47.06 5.88	17
1950	4 30.77 6.67	0 .00 .00	9 69.23 6.62	13
1951	6 35.29 10.00	8 17.65 1.97	8 47.06 5.88	17
1952	1 4.55 1.67	9 40.91 5.92	12 54.55 8.82	22
1953	5 41.67 8.33	5 5.92 3.29	2 16.67 1.47	12
1954	8 53.33 13.33	3 20.00 1.97	4 26.67 2.94	15
1955	3 14.29 5.00	8 38.10 5.26	10 47.62 7.35	21
1956	3 11.11 5.00	12 44.44 7.89	12 44.44 8.82	27
1957	1 3.45 1.67	13 44.83 8.55	15 51.72 11.03	29
1958	7 29.17 11.67	4 16.67 2.63	13 54.17 9.56	24

TABLE XXX (Continued)

Year	Identifying Traits			n
	28	29	30	
1959	5 23.81 8.33	5 23.81 3.29	11 52.38 8.09	21
1960	0 .00 .00	10 100.00 6.58	0 .00 .00	10
1961	3 23.08 5.00	7 53.85 4.61	3 23.08 2.21	13
1962	1 5.26 1.67	15 78.95 9.87	3 15.79 2.21	19
1963	0 .00 .00	5 71.43 3.29	2 28.57 1.47	7
1964	2 8.70 3.33	13 56.52 8.55	8 34.78 5.88	23
1965	0 .00 .00	4 57.14 2.63	3 42.86 2.21	7
1966	1 9.09 1.67	4 36.36 2.63	6 54.55 4.41	11
1967	0 .00 .00	16 84.21 10.53	3 15.79 2.21	19
1968	3 14.29 5.00	14 66.67 9.21	4 19.05 2.94	21
N	60	152	136	348
Percent	17.24	43.68	39.08	100.00

TABLE XXXI

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF LEG
SHAPE SUB-TRAITS, 1949-1968




Frequency Row % Column %	Identifying Traits			n
				
Year	04	05	06	
1949	25 56.82 4.88	8 18.18 5.41	11 25.00 17.74	44
1950	17 43.59 3.32	17 43.59 11.49	5 12.82 8.06	39
1951	33 80.49 6.45	4 9.76 2.70	4 9.76 6.45	41
1952	32 84.21 6.25	5 13.16 3.38	1 2.63 1.61	38
1953	33 67.35 6.45	2 4.08 1.35	14 28.57 22.58	49
1954	36 75.00 7.03	12 25.00 8.11	0 .00 .00	48
1955	30 76.92 5.86	9 23.08 6.08	0 .00 .00	39
1956	40 72.73 7.81	13 23.64 8.78	2 3.64 3.23	55
1957	46 80.70 8.98	11 19.30 7.43	0 .00 .00	57
1958	38 59.38 7.42	23 35.94 15.54	3 4.69 4.84	64

TABLE XXXI (Continued)

Frequency Row % Column %	Identifying Traits			n
	04	05	06	
1959	44 83.02 8.59	3 5.66 2.03	6 11.32 9.68	53
1960	29 74.36 5.66	5 12.82 3.38	5 12.82 8.06	39
1961	33 73.33 6.45	9 20.00 6.08	3 6.67 4.84	45
1962	25 92.59 4.88	2 7.41 1.35	0 .00 .00	27
1963	12 63.16 2.34	5 26.32 3.38	2 10.53 3.23	19
1964	9 32.14 1.76	13 46.43 8.78	6 21.43 9.68	28
1965	12 85.71 2.34	2 14.29 1.35	0 .00 .00	14
1966	3 100.00 .59	0 .00 .00	0 .00 .00	3
1967	8 100.00 1.56	0 .00 .00	0 .00 .00	8
1968	7 58.33 1.37	5 41.67 3.38	0 .00 .00	12
N	512	148	62	722
Percent	70.91	20.50	8.59	100.00

TABLE XXXII

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF ARM
SUB-TRAITS, 1949-1968







Frequency Row % Column %	Identifying Traits						n
							
Year	02	04	06	10	17	20	
1949	6 40.00 2.86	6 40.00 5.71	1 6.67 1.45	0 .00 .00	0 .00 .00	2 13.33 7.41	15
1950	10 52.63 4.76	5 26.32 4.76	3 15.79 4.35	0 .00 .00	0 .00 .00	1 5.26 3.70	19
1951	5 45.45 2.38	5 45.45 4.76	1 9.09 1.45	0 .00 .00	0 .00 .00	0 .00 .00	11
1952	8 61.54 3.81	4 30.77 3.81	0 .00 .00	0 .00 .00	0 .00 .00	1 7.69 3.70	13
1953	6 100.00 2.86	0 .00 .00	0 .00 .00	0 .00 .00	0 .00 .00	0 .00 .00	6
1954	7 50.00 3.33	4 28.57 3.81	1 7.14 1.45	0 .00 .00	1 7.14 9.09	1 7.14 3.70	14
1955	5 33.33 2.38	3 20.00 2.86	2 13.33 2.90	0 .00 .00	1 6.69 9.09	4 26.67 14.81	15
1956	3 50.00 1.43	1 16.67 .95	0 .00 .00	0 .00 .00	0 .00 .00	2 33.33 7.41	6
1957	10 52.63 4.76	8 42.11 7.62	0 .00 .00	1 5.26 2.17	0 .00 .00	0 .00 .00	19
1958	10 71.43 4.76	3 21.43 2.86	1 7.14 1.45	0 .00 .00	0 .00 .00	0 .00 .00	14

TABLE XXXII (Continued)

Year	Identifying Traits						n
	02	04	06	10	17	20	
1959	9 45.00 4.29	5 25.00 4.76	2 10.00 2.90	1 5.00 2.17	1 5.00 9.09	2 10.00 7.41	20
1960	19 76.00 9.05	1 4.00 .95	3 12.00 4.35	0 .00 .00	1 4.00 9.09	1 4.00 3.70	25
1961	14 51.85 6.67	4 14.81 3.81	5 18.52 7.25	2 7.41 4.35	0 .00 .00	2 7.41 7.41	27
1962	9 34.62 4.29	9 34.62 8.57	4 15.38 5.80	1 3.85 2.17	0 .00 .00	3 11.54 11.11	26
1963	12 34.29 5.71	16 45.71 15.24	2 5.71 2.90	1 2.86 2.17	0 .00 .00	4 11.43 14.81	35
1964	13 36.11 6.19	10 27.78 9.52	9 25.00 13.04	4 11.11 8.70	0 .00 .00	0 .00 .00	36
1965	14 31.11 6.67	10 22.22 9.52	14 31.11 20.29	3 6.67 6.52	4 8.89 36.36	0 .00 .00	45
1966	20 44.44 9.52	7 15.56 6.67	7 15.56 10.14	10 22.22 21.74	1 2.22 9.09	0 .00 .00	45
1967	14 40.00 6.67	4 11.43 3.81	7 20.00 10.14	8 22.86 17.39	0 .00 .00	2 5.71 7.41	35
1968	16 38.10 7.62	0 .00 .00	7 16.67 10.14	15 35.71 32.61	2 4.76 18.18	2 4.76 7.41	42
N	210	105	69	46	11	27	468
Percent	44.87	22.44	14.74	9.83	2.35	5.57	100.00

TABLE XXXIII

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF WOOD
SUB-TRAITS USED FOR EXPOSED LEGS, 1949-1969

Frequency Row % Column %	Identifying Traits						n
	WALNUT	TEAK	OAK	BEECH	BIRCH	TEAK AND OAK	
	01	02	03	04	05	31	
1949	2	0	1	2	9	0	14
	14.29	.00	7.14	14.29	64.29	.00	
	.57	.00	2.04	3.33	25.71	.00	
1950	5	0	0	2	2	0	9
	55.56	.00	.00	22.22	22.22	.00	
	1.44	.00	.00	3.33	5.71	.00	
1951	3	2	1	0	12	0	18
	16.67	11.11	5.56	.00	66.67	.00	
	.86	1.56	2.04	.00	34.29	.00	
1952	11	2	2	2	2	0	19
	57.89	10.53	10.53	10.53	10.53	.00	
	3.16	1.56	4.08	3.33	5.71	.00	
1953	7	0	4	8	2	2	23
	30.43	.00	17.39	34.78	8.70	8.70	
	2.01	.00	8.16	13.33	5.71	6.45	
1954	23	3	1	3	4	1	35
	65.71	8.57	2.86	8.57	11.43	2.86	
	6.61	2.34	2.04	5.00	11.43	3.23	
1955	16	10	1	4	1	1	33
	48.48	30.30	3.03	12.12	3.03	3.03	
	4.60	7.81	2.04	6.67	2.86	3.23	
1956	19	9	3	10	3	9	53
	35.85	16.98	5.66	18.87	5.66	16.98	
	5.46	7.03	6.12	16.67	8.57	29.03	
1957	28	10	8	5	0	5	56
	50.00	17.86	14.29	8.93	.00	8.93	
	8.05	7.81	16.33	8.33	.00	16.13	
1958	20	9	4	6	0	4	43
	46.51	20.93	9.30	13.95	.00	9.30	
	5.75	7.03	8.16	10.00	.00	12.90	

TABLE XXXIII (Continued)

Year	Identifying Traits						n
	01	02	03	04	05	31	
1959	17	26	4	5	0	6	58
	29.31	44.83	6.90	8.62	.00	10.34	
	4.89	20.31	8.16	8.33	.00	19.35	
1960	12	14	0	3	0	3	32
	37.50	43.75	.00	9.38	.00	9.38	
	3.45	10.94	.00	5.00	.00	9.68	
1961	27	22	2	0	0	0	51
	52.94	43.14	3.92	.00	.00	.00	
	7.76	17.19	4.08	.00	.00	.00	
1962	18	11	5	0	0	0	34
	52.94	32.35	14.71	.00	.00	.00	
	5.17	8.59	10.20	.00	.00	.00	
1963	12	4	2	1	0	0	19
	63.16	21.05	10.53	5.26	.00	.00	
	3.45	3.13	4.08	1.67	.00	.00	
1964	25	2	0	1	0	0	28
	89.28	7.14	.00	3.57	.00	.00	
	7.18	1.56	.00	1.67	.00	.00	
1965	27	0	0	0	0	0	27
	100.00	.00	.00	.00	.00	.00	
	7.76	.00	.00	.00	.00	.00	
1966	23	1	5	3	0	0	32
	71.88	3.13	15.63	9.38	.00	.00	
	6.61	.78	10.20	5.00	.00	.00	
1967	24	3	6	5	0	0	38
	63.16	7.89	15.79	13.16	.00	.00	
	6.90	2.34	12.24	8.33	.00	.00	
1968	29	0	0	0	0	0	29
	100.00	.00	.00	.00	.00	.00	
	8.33	.00	.00	.00	.00	.00	
N	348	128	49	60	35	31	651
Percent	53.46	19.66	7.53	9.22	5.38	4.76	100.00

TABLE XXXIV

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF METAL
SUB-TRAITS USED FOR EXPOSED LEGS, 1949-1968

Frequency Row % Column %	Identifying Traits				n
	ALUMINUM	CHROME	WROUGHT IRON	TUBULAR STEEL	
Year	40	41	42	44	
1949	4 25.00 3.74	0 .00 .00	6 37.50 4.92	6 37.50 6.06	16
1950	1 2.94 .93	1 2.94 .36	21 61.76 17.21	11 32.35 11.11	34
1951	0 .00 .00	0 .00 .00	35 97.22 28.69	1 2.78 1.01	36
1952	0 .00 .00	4 12.12 1.44	22 66.67 18.03	7 21.21 7.07	33
1953	0 .00 .00	5 20.83 1.80	11 45.83 9.02	8 33.33 8.08	24
1954	1 3.70 .93	11 40.74 3.96	9 33.33 7.38	6 22.22 6.06	27
1955	7 35.00 6.54	1 5.00 .36	5 25.00 4.10	7 35.00 7.07	20
1956	3 14.29 2.80	1 4.76 .36	5 23.81 4.10	12 57.14 12.12	21
1957	1 10.00 .93	2 20.00 .72	0 .00 .00	7 70.00 7.07	10
1958	4 33.33 3.74	3 25.00 1.08	4 33.33 3.28	1 8.33 1.01	12

TABLE XXXIV (Continued)

Year	Identifying Traits				n
	40	41	42	44	
1959	3 42.86 2.80	3 42.86 1.08	0 .00 .00	1 14.29 1.01	7
1960	3 9.68 2.80	18 58.06 6.47	0 .00 .00	10 32.26 10.10	31
1961	3 12.00 2.80	20 80.00 7.19	0 .00 .00	2 8.00 2.02	25
1962	8 19.05 7.48	29 69.05 10.43	0 .00 .00	5 11.90 5.05	42
1963	8 16.00 7.48	40 80.00 14.39	0 .00 .00	2 4.00 2.02	50
1964	6 13.33 5.61	35 77.78 12.59	2 4.44 1.64	2 4.44 2.02	45
1965	15 28.85 14.02	31 59.62 11.15	2 3.85 1.64	4 7.69 4.04	52
1966	23 46.00 21.50	27 54.00 9.71	0 .00 .00	0 .00 .00	50
1967	6 16.22 5.61	27 72.97 9.71	0 .00 .00	4 10.81 4.04	37
1968	11 32.35 10.28	20 58.82 7.19	0 .00 .00	3 8.82 3.03	34
N	107	278	122	99	606
Percent	17.66	45.87	20.13	16.34	100.00

TABLE XXXV

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MOULDED
TRAITS, 1949-1968






Frequency Row % Column %	Identifying Traits					n
						
Year	20	22	24	25	26	
1949	1 6.67 3.45	0 .00 .00	4 26.67 17.39	4 26.67 4.44	6 40.00 5.77	15
1950	0 .00 .00	2 13.33 1.77	1 6.67 4.35	3 20.00 3.33	9 60.00 8.65	15
1951	1 4.76 3.45	6 28.57 5.31	3 14.29 13.04	2 9.52 2.22	9 42.86 8.65	21
1952	1 7.69 3.45	2 15.38 1.77	2 15.38 8.70	3 23.08 3.33	5 38.46 4.81	13
1953	3 14.29 10.34	3 14.29 2.65	2 9.52 8.70	4 19.05 4.44	9 42.86 8.65	21
1954	0 .00 .00	9 56.25 7.96	3 18.75 13.04	4 25.00 4.44	0 .00 .00	16
1955	2 13.33 6.90	2 13.33 1.77	0 .00 .00	3 20.00 3.33	8 53.33 7.69	15
1956	1 5.88 3.45	4 23.53 3.54	0 .00 .00	12 70.59 13.33	0 .00 .00	17
1957	0 .00 .00	5 50.00 4.42	2 20.00 8.70	3 30.00 3.33	0 .00 .00	10
1958	0 .00 .00	7 46.67 6.19	0 .00 .00	1 6.67 1.11	7 46.67 6.73	15

TABLE XXXV (Continued)

Frequency Row % Column %	Identifying Traits					n
	20	22	24	25	26	
Year	20	22	24	25	26	n
1959	3 23.08 10.34	7 53.85 6.19	0 .00 .00	1 7.69 1.11	2 15.38 1.92	13
1960	1 3.70 3.45	10 37.04 8.85	0 .00 .00	12 44.44 13.33	4 14.81 3.85	27
1961	2 10.00 6.90	8 40.00 7.08	2 10.00 8.70	1 5.00 1.11	7 35.00 6.73	20
1962	3 12.50 10.34	5 20.83 4.42	0 .00 .00	6 25.00 6.67	10 41.67 9.62	24
1963	2 6.90 6.90	9 31.03 7.96	0 .00 .00	12 41.38 13.33	6 20.69 5.77	29
1964	0 .00 .00	10 45.45 8.85	0 .00 .00	8 36.36 8.89	4 18.18 3.85	22
1965	2 12.50 6.90	5 31.25 4.42	6 37.50 13.04	1 6.25 1.11	2 12.50 1.92	16
1966	0 .00 .00	12 50.00 10.62	5 20.83 50.00	7 29.17 7.78	0 .00 .00	24
1967	1 7.69 3.45	5 38.46 4.42	2 15.38 4.35	3 23.08 3.33	2 15.38 1.92	13
1968	6 26.09 20.69	2 8.70 1.77	1 4.35 10.00	0 .00 .00	14 60.87 13.46	23
N	29	113	33	90	104	369
Percent	7.86	30.62	8.94	24.39	28.18	100.00

TABLE XXXVI

FREQUENCY AND PERCENTAGES OF OCCURRENCE OF MATERIAL
USED FOR MOULDED CHAIRS, 1949-1968

Frequency Row % Column %	Identifying Traits					n
	PLYWOOD OR LAMINATED	PLASTIC	WOVEN WIRE	CANVAS OR		
				LEATHER SLING	CANE	
Year	01	02	03	06	09	
1949	6 42.86 5.56	2 14.29 1.79	0 .00 .00	2 14.29 8.00	4 28.57 14.81	14
1950	2 12.50 1.85	4 25.00 3.57	2 12.50 8.33	4 25.00 16.00	4 25.00 14.81	16
1951	7 50.00 6.48	0 .00 .00	5 35.71 20.83	0 .00 .00	2 14.29 7.41	14
1952	3 23.08 2.78	1 7.69 .89	2 15.38 8.33	3 23.08 12.00	4 30.77 14.81	13
1953	7 26.92 6.48	3 11.54 2.68	3 11.54 12.50	6 23.08 24.00	7 26.92 25.93	26
1954	7 58.33 6.48	0 .00 .00	3 25.00 12.50	2 16.67 8.00	0 .00 .00	12
1955	2 40.00 1.85	3 60.00 2.68	0 .00 .00	0 .00 .00	0 .00 .00	5
1956	3 20.00 2.78	6 40.00 5.36	5 33.33 20.83	1 6.67 4.00	0 .00 .00	15
1957	4 80.00 3.70	0 .00 .00	0 .00 .00	1 20.00 4.00	0 .00 .00	5
1958	3 60.00 2.78	0 .00 .00	1 20.00 4.17	1 20.00 4.00	0 .00 .00	5

TABLE XXXVI (Continued)

Frequency Row % Column %	Identifying Traits					n
	01	02	03	06	09	
Year	01	02	03	06	09	n
1959	1 7.69 .93	9 69.23 8.04	0 .00 .00	1 7.69 4.00	2 15.38 7.41	13
1960	12 31.58 11.11	26 68.42 23.21	0 .00 .00	0 .00 .00	0 .00 .00	38
1961	12 46.15 11.11	9 34.62 8.04	0 .00 .00	2 7.69 8.00	3 11.54 11.11	26
1962	3 21.43 2.78	9 64.29 8.04	0 .00 .00	1 7.14 4.00	1 7.14 3.70	14
1963	11 64.71 10.19	6 35.29 5.36	0 .00 .00	0 .00 .00	0 .00 .00	17
1964	4 30.77 3.70	7 53.85 6.25	2 15.38 8.33	0 .00 .00	0 .00 .00	13
1965	11 91.67 10.19	0 .00 .00	1 8.33 4.17	0 .00 .00	0 .00 .00	12
1966	4 30.77 3.70	9 69.23 8.04	0 .00 .00	0 .00 .00	0 .00 .00	13
1967	1 20.00 .93	4 80.00 3.57	0 .00 .00	0 .00 .00	0 .00 .00	5
1968	5 25.00 4.63	14 70.00 12.50	0 .00 .00	1 5.00 4.00	0 .00 .00	20
N	108	112	24	25	27	296
Percent	36.49	37.84	8.11	8.45	9.12	100.00

APPENDIX E

COMMENTS ON EDITORIAL POLICIES OF

FURNITURE FORUM

EDGAR KAUFMANN, Jr. needs no introduction to our readers.

As former Director of The GOOD DESIGN Exhibitions he did more to foster and encourage contemporary design and designers than any one other person. He was definitely the motivating spirit of the Museum of Modern Art Interior Furnishings Exhibitions, and in many ways responsible for moulding and developing wide consumer acceptance of contemporary design. Fortunately, he has continued writing and lecturing and is still very actively engaged in the movement. Currently he is editing a festive book for Frank Lloyd Wright's 90th birthday (June 8), richly illustrating the color and texture of Wright's original drawings. He is also editing a New Talent issue of Art in America. In addition he is lecturing at the Graduate School of Retailing at the University of Pittsburgh and preparing some future enterprises.



The Furniture Forum and its staff are to be congratulated on the good sense of their readers and contributors, who increasingly over the last nine years have supported the publication. A business venture, Furniture Forum has generally done a job of encouraging cultural progress that might be emulated by larger or more 'educational' enterprises.

Guided by the common-sense requirements of its business obligations Furniture Forum has been able to avoid ad hoc theorizing, a priori standard-setting and "impartiality" — the Three Fates of any public review, in print or in exhibition, and the triple frustration of those who are eager to see modern design continue its vigorous contribution to the enjoyments of life.

Furniture Forum has taken its chosen title seriously; it has in fact provided a public meeting place for open discussion. We are lucky that this discussion has not been presented in floods of words, unsuited to visual phenomena, but in picture pages, adequately documented and doubly authenticated because of their further utility to contributing firms as mailing pieces and catalog sheets.

continued

Were Furniture Forum no more than a compilation of diversified catalog sheets, uniform and brightly covered for distribution, no doubt it could not have survived; but Furniture Forum has tended to present the decent and progressive side of its industries. For this reason it has a position, a value and a future. The business man today (and the surveyor of civilizations tomorrow) will find in it no dead average, no fear of the less than ideally perfect, but a picture of development in a useful and significant field.

It would be a mistake to ignore the profiles that open each issue of Furniture Forum. Once again current curiosity is satisfied, and the future may turn to these faces and paragraphs for a more direct acquaintance with certain personalities of our times.

A mysterious multiplicity hides behind names like Belter, Chippendale or Sheraton. While Furniture Forum has not, to my knowledge, attempted to record the fascinating secret of modern design, yet thanks to it many present day designers need not be as unknown as those of only a few generations ago.

What might be an appropriate wish to round out Furniture Forum's first decade, beyond a healthy continuation of its progress? Two rather tentative suggestions occur. One concerns the eye catching covers. They need not be more elaborate, nor need they lose their 'family' look, but they could easily range further afield into visual adventure. It might be good too, if in each issue more than the Publisher's Notes voiced ideas, perhaps letters from users, reactions from the Design Selection Board, or word from designers — at least four designers in the course of a year may want urgently to say something well worth listening to. Without falling into the pre-cut habits of other publications, Furniture Forum, I submit, could add this careful modicum of words to its ample illustrations. But I'd be content to peruse another ten years' issues without any charges.

EDGAR KAUFMANN, JR.

VITA

Alta N. Lane

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