

THE DESIGN AND FUNCTION OF LIVING ROOM TABLE LAMPS
IN SELECTED RESIDENTIAL AREAS OF MANHATTAN, KANSAS

by

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B. S., University of Nebraska, 1955

A THESIS

submitted in partial fulfillment of the

requirements for the degree of

MASTER OF SCIENCE

Department of Art

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

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INTRODUCTION

Although most of the homes of today have kept pace with new and beneficial improvements, modern lighting has lagged far behind. This is evident in both lighting fixtures and portable lamps. The problem of selecting well-designed, functional table lamps is apparent both in the home and on the market. The article, "Residence Lighting during the Last Fifty Years," in Illuminating Engineering (19) states,

"There is probably no branch of applied art in which the scope for pleasing design is so noticeably neglected. The true purpose of lighting fixtures--to give light--seems to have been forgotten in a frantic effort to make fixtures decorative."

Since nearly one-half of the total light in the living room comes from portable lamps, it is essential to investigate the adequacy of living room table lamps in function as well as design.

In the Manhattan area little research has been done concerning the design and function of table lamps. This study is not only an attempt to determine the adequacy of table lamps in various activity areas but also to discover some of the factors that influence the selection of table lamps. Table lamps are essential in fulfilling both the decorating plan and the basic lighting needs. Therefore, it is important to deter-

mine the extent to which living room table lamps meet the established principles of design as well the functional requirements.

REVIEW OF LITERATURE

The mood or expression of an interior as well as its utility depends upon the quantity of light falling upon the various surfaces. The average individual gives little thought to either art or comfort, but accepts that which is supplied and seeks no further (Kraehenbuehl, 9). Lighting in many homes has become an afterthought rather than an integral part of planning in the blueprint stage. Methods of illumination which are harmful to the eye are employed each year resulting in millions of misspent dollars (Godinez, 7). The fact that improper lighting exists in nearly 80 per cent of the homes in this country may have resulted from the ability of the eye to adjust itself to a wide range of illumination. This particular ability is the worst enemy of those wishing to correct faulty illumination because it is commonly believed that illumination is satisfactory if it is possible to see with any degree of comfort. However, visibility does not always mean comfortable seeing. The extent of eye defects caused by improper lighting can be seen in the following table:

Table 1. Eye defects (Kraehenbuehl, 9).

Age under	: Per cent of defective eyes
20	23
30	39
40	48
50	71
60	82
over 60	95

Since nearly one-third of the time is spent at home after dark, good lighting must be an important part of home planning. It is estimated that 60 per cent of this lighting is provided by portable lamps, consequently playing a vital part in the eye comfort of the family (Fahsbender, 16). Even though the portable lamp has become important in home lighting today, it has not received technical attention to adequately fit its role. In the design of portable lamps people seek something different or exotic, and design is unhampered. With these considerations it seems worthwhile to investigate both the design and functional requirements of home lighting.

Dramatically and psychologically light and color are the two greatest influences in home decoration. Light conditioning opens up space and creates a distinctive atmosphere, enhances the appearance of objects, gives freedom of movement for work and play, and is flexible (Commerly and Stephenson, 3). Perhaps the most important characteristic of light is its mobility resulting in a variety of light and shade altered to suit a

function or mood. This may be expressed as "painting with light." Actually, "light conditioning" consists of the fundamentals of good lighting practice applied to activities in the home to assure light that fits the needs of every member of the family in every room (Comnery, 21). This is accomplished by both general and local lighting. Portable lamps not only provide local lighting for activities but heighten dignity, make a room gloomy or cheerful, and create atmosphere. Bright light gives a stimulating effect while low light is quieting. Strong contrasts of light and dark are dramatic but fatiguing to the eyes. All home lighting, then, must be designed for both beauty and duty.

The living room must have a pleasing composite of general, local and decorative background lighting. To be good, lighting must be adequate, absent of glare, properly diffused and directed, steady, and suitable in color (Caldwell, 2).

General lighting "ambient luminescence" lights the room in a soft, reassuring way and increases the feeling of spaciousness by minimizing heavy shadows (Faulkner, 6). This lighting is often provided by a central fixture which may be of several types: direct-sending light downward; semi direct-sending a greater percentage of light downward than upward; general diffuse-giving an equal amount in all directions; semi indirect-directing a greater percentage of light upward than downward; indirect-directing all or nearly all of the light to the ceiling.

Design factors of the fixture such as proportion to the room, harmony in color and finish, appropriate decorative style, and electrical and mechanical maintenance must be considered.

Decorative lighting which also provides general illumination in the living room may be achieved by several means:

1. Cove lighting having a wall molding which conceals the light source and producing a moderate level of over-all lighting.
2. Recessed lighting including built in panels of relatively large area for diffuse illumination and also the more concentrating types of downlighting unit.
3. Window lighting--lighted valances which provide both indirect lighting on the ceiling as well as dramatic down lighting; lighted cornices which are mounted at the ceiling and direct all the light downward.
4. Wall lighting which may be recessed in the ceiling, from a cornice, or valance.
5. Lighted wall brackets which are similar in design as valances but are used on unbroken wall spaces and may be mounted somewhat lower than valances (23).

Paintings, floral decorations, and other art objects or room accessories may be accented with spot lighting.

Local lighting is provided by table, floor, and wall lamps. Most living rooms need at least five lamps not only to create focal points of interest but to give rhythm to the entire scene. They should be ensembled so that the shades match or the lamps match, so they have a relationship to one another and to the period of the room (26). One portable lamp can properly light only one small area--40 to 50 square feet and include only one serious activity. If a living room is lighted entirely by

portable lamps at least two of them should be of the semi-indirect type (Fahsbender, 4). Portable lamps provide high lighting levels for reading, studying, and sewing as well as lower lighting levels for conversation and television.

The living room as well as other rooms require plenty of light and a workable control of light. Light may be controlled by a dimmer--a rheostat which makes higher or lower levels of illumination possible by turning a knob or handle. This is only one of the many devices developed throughout the centuries for improvement of artificial lighting.

History of Lamps

Man's first portable light was the torch. The oil lamp in many forms was the succeeding development in open-flame light sources. Egyptians made oil lamps of clay, stone, and metal, while the Phoenicians used an open, sea shell lamp. The utility of these lamps was enhanced by suspending them from walls or ceiling or by raising and lowering on pedestals. Greeks and Romans used oil lamps, candelabra, and tripods. The first oil lamps with wicks were developed about 500 B.C. but beeswax and tallow candles were used throughout the Christian era (Sturrock and Staley, 30). Later, open flame gas burners, kerosene lamps, and the Welsback mantle were developed. In the evolution of lighting the portable lamp sought to bring light upon some seeing task in a particular area (13).

In 1809 Sir Humphrey Davy connected battery terminals to

two pieces of charcoal and produced light. Between 1820 and 1870 several inventors patented small lamps with platinum or carbon burners, but they were expensive and short lived. To Thomas Edison goes the credit for inventing the first commercially practical incandescent lamp. Carbon filament which proved to be inefficient was used first, and later, tungsten filaments were developed even though they were costly and extremely fragile. High quality lamps were made possible by making drawn wire filaments of ductile tungsten and filling the bulb with gas instead of having a vacuum in it. In succeeding years numerous improvements were made in lamps (Sturrock and Staley, 30).

From the prehistoric torch to the contemporary electric table lamp new developments have appeared with the changing needs of mankind.

Purpose of Lamps

Lamps must serve both a decorative and utilitarian purpose, for they must contribute pleasant light and an attractive appearance to the area and provide adequate glareless light for the seeing task. Portable lamps should enable quick and easy seeing, minimize eyestrain, and contribute beauty and individuality (Faulkner, 6). The design must be correct in both quantity and quality of light for the specific task (Kraehenbuehl, 9).

The quality of light depends upon light control. The usual means for controlling light are as follows:

- (1) Reflection--light rays leave the surface at the same angle which they fell upon the surface.
- (2) Diffusion--light rays leave the surface in all directions.
- (3) Transmission--passage of light through a material. Spread transmission--part of light is spread from the direct path.
- (4) Refraction--bending of light rays occurring when passing from air into a denser medium.
- (5) Absorption--light is taken in.

Most translucent glass materials transmit, reflect, and diffuse the light and are desirable for use in undershade devices. Bowls made of plastic or glass are available in a variety of sizes, shapes, transmitting, and reflecting qualities. Maximum diffusion and transmission properties are desirable, for the more diffused the light the less shadow there will be. Various types of glass such as opal, opalescent, alabaster, matte surface, configurated, prismatic, and antique are available as diffuse bowls. The White Indirect-Lite Bulb may also be used to obtain comfortable, glare-free light as the sides have a heavy white coating to diffuse the light that falls downward. The quality of light will depend to a certain degree upon factors in the seeing task such as the size of the objects, background and object brightness, and time of exposure (Kraehenbuehl, 9).

The adequacy of light is influenced by the color and character of the illuminated surfaces. The effect obtained depends upon the way the surfaces reflect and absorb light. Therefore, walls, ceilings, and floors play a major part in lighting design. Reflectance is the percentage of light reflected from a surface in proportion to the light falling on it. The more light reflected the more the rooms will seem spacious and airy. The Illuminating Engineering Society suggests the following range of reflectances for homes:

Table 2. Reflectance values (Comery and Stevenson, 3).

Surface	Per cent of reflectance
Ceilings	60-90 per cent
Walls	35-60 per cent
Floors	15-35 per cent

Pure colors except those in the yellow region have low reflectance and more wattage is needed in rooms of these hues and rooms with low color values (6). The color of light is affected by the room surface as well as the light source and the diffusing or reflecting shade (Faulkner, 6).

For proper lighting direct glare must be eliminated and reflected glare reduced to the minimum. Glare is any brightness within the field of vision causing discomfort, interference with vision, or eye fatigue. In direct glare the light strikes the eye directly from the source of light, while in reflected glare light is thrown back from shiny surfaces into

the eyes. Glare may be caused by 1. high brightness of light sources 2. high contrast between source and background 3. location of source in field of view 4. total volume of light entering the eye 5. time of exposure to source of light (Kraehenbuehl, 9). The brightness ratio of the seeing task to the surroundings should not exceed ten to one, while a ratio of three to one is desirable (4). What may seem like too much light is actually glare or brightness seen from out of darkness (Langewiesche, 13).

Illumination on a work surface is measured in terms of the number of lumens per square foot of area. A lumen per square foot is called a footcandle (Sturrock and Staley, 29). Candlepower expresses the intensity of light in one direction, while the lumen expresses the total quantity of light given off by a source regardless of direction. The footcandle meter measures illumination but not quality. The amount of illumination in a room depends upon the utilization factor which is determined by the size of room, character of light distribution from equipment, and color of finish on ceiling and side wall. In obtaining an adequate amount of light on a particular area the Inverse Square Law must be considered. This states that for a given point source of light the level of illumination decreases as the square of the distance from the source (29). Therefore, the further the task plane is from the light source the greater the lumen output required from the lamp or the higher the lamp wattage.

To obtain a certain level of illumination in a general or

localized area bulbs of correct wattage and type must be selected. Every lamp buyer should investigate the diversity of lamp bulbs as only about one-tenth of the types available are commonly purchased. The parts of the incandescent lamp are the glass bulb which prevents air from reaching the filament, the base which in common use in this country is of the screw type, and the filament which consists of a coiled tungsten wire (Fahsbender, 4). Various finishes have been applied to incandescent bulbs: clear, inside frost, white bowl, inside sprayed, silver bowl, outside colored, colored glass. In 1947 the R-40 reflector lamp bulb was offered in 150 watt and later in a three light operation 50-100-150 watts. In 1948 a silica coating was added to three-light lamps to soften shadows and improve the quality of lighting. The most recent lamp (October, 1955) has two filaments (30 watt and 200 watt, respectively) and carries the name "High-Low" (19). All of these coatings act as a shield to protect the eye from the lamp filament. In buying and using light bulbs certain factors should be considered:

- (1) The rated lamps voltage should be the same as the voltage supplied (110 volt bulb, 110-120 volt socket).
- (2) Lamps blackened on the inside should be replaced or placed where efficiency is not important.
- (3) The outside of the bulb, when cool, should be cleaned with a damp cloth.
- (4) Whenever practicable use one large lamp rather than

two or three small ones. One 100 watt gives as much light as two 60 watt bulbs, and there is a 20 per cent saving of electricity.

- (5) Incandescent lights should be turned out when not needed. Lamps commonly used have an average life of 1000 to 750 hours.

In the fluorescent lamp ultraviolet energy activates a coating of fluorescent material on the inside of the tube. These phosphors transform the short ultraviolet waves into longer waves of the visible spectrum (Kraehenbuehl, 9). The advantages of fluorescent lamps lie in the high light output-- six or seven times more efficient than incandescent; coolness; daylight quality; two and one half times longer life than incandescent; variety of colors--Daylight, White, Standard Cool White, Standard Warm White, Deluxe Cool White, Deluxe Warm White, Soft White. The fluorescent lamp, a large area low brightness source, is ideal for providing a continuous line of light often utilized in contemporary interiors. Less frequently used for more light and flexibility are circular fluorescent lamps in portable luminaires.

Proper distribution of light on the task and in the surroundings depends upon placement of the lamp which has the desired illumination level, proper dimensions and type of lamp parts.

Lamps must be considered in relation to the specific task they are to light. Light upon a work surface should be above

the line of vision. Although the correct height of placement depends upon use, lamps should be low enough to group with furniture and placed at the same level in the room (Goldstein and Goldstein, 8). A portable lamp should be comfortably viewed at both the standing height and the seated position (13).

Some of the common activities requiring light from portable lamps and recommended illumination values are as follows:

Table 3. Recommended illumination values (Fahsbender, 4).

Visual Task	: Footcandles on Task
Reading	
prolonged--small type	40
casual--large type	20
Study	40
Writing	20
Hand Sewing	
Dark fabrics (fine detail)	150 or more
Prolonged periods	80
Occasional (light fabrics)	40
Occasional (coarse thread-high contrast)	20
Games	10

A good reading lamp must be equipped with a diffusing bowl or a White Indirect-Lite bulb, have a shade open at the top to give upward light, and give a good spread of light (Faulkner, 6). A table lamp should be placed 20 inches to the right or left of the center of the reading material and 16 inches back at a right angle. The shade center should be above

this point and the base about in line with the shoulder. The height of the table plus the lamp base should total from 39 inches to 42 inches, while the distance when using a floor lamp may be 49 inches. A floor lamp is placed 15 inches to the right or left of the center of the reading material and 26 inches toward the back of the chair (28).

A lamp for studying or writing should provide a diffuse light. It is best to locate the study center against a wall that is plain and light in color. A large pastel blotter on the desk avoids distracting contrast with lighted papers or books (28). The center of the lamp should be 15 inches to the left (right handed person) of the work center and 12 inches back from the front edge of the desk.

Sewing which involves small visual objects and a low degree of contrast is a difficult task and requires the best and most carefully applied lighting of any work done in the home. Relatively low values of illumination properly directed could give the task the same visibility level as a greater quantity of light less effectively directed (Fahsbender, 15). For satisfactory lighting to sew, a lamp should provide as high a foot-candle level on the work as is practicable, some direct component, and freedom from glare. The lamp should be placed 15 inches to the left of the center of sewing (right-handed person) and 12 inches (floor lamp) or 6 inches (table lamp) to the back at a right angle.

General living room illumination should be five footcandles.

Balanced general lighting should be used for television viewing to avoid eyestrain caused by strong contrast between the bright television screen and dark surroundings. Portable lamps should be placed so they do not form reflections in the screen (28).

The height of the lamp base is of considerable importance in light distribution. The smallest serviceable lamp will have a 15 inch base. The base must be high enough to situate the lower edge of the shade approximately 15 to 18 inches above the table top. Bases are made in a variety of forms and from various materials such as pottery, brass, bronze, pewter, iron, wood, leather, glass, and plastics.

A good shade must meet several requirements: 1) It must be deep enough from top to bottom to conceal the socket and lighted bulb or reflector when seated. 2) It must be wide enough to produce a satisfactory spread of light. 3) It must be open at the top to provide some upward light. 4) It must be dense enough so the light bulb cannot be seen through the shade. 5) It must be lined with white or light colored material, for dark colored linings absorb about 50 per cent of the light (Fahsbender, 4). The basic shapes of the shades are the Empire which gives the best light distribution, drum, oval, cone, cylinder, and bell. The minimum shade dimensions for a table lamp used for reading or desk work are--top $8\frac{1}{2}$ inches, bottom 16 inches, depth 10 inches (28). Lamp shades may be made from

parchment, fabrics, plastics, mica, paper, or spun glass. Translucent materials are more applicable for shades than opaque as they will help to diffuse the light. Opaque shades cast light upward and downward in a focal glow and confine light in a specific area.

Both quality and quantity of light are affected by under-shade devices. If a reflector bowl is not used, devices such as washers, uno bridge fitters, chimney rings, clamps, or harps (narrow or wide) are used (Fahsbender, 4). Reflectors may be made of plastic or glass. Their purpose is to conceal the lamp bulb, break up downward light, and control light. The sizes popularly used are 6 inch, 8 inch, 9 3/8 inch, and 10 inch. An 8 inch or 10 inch diffusing bowl is recommended for reading or studying.

Most specifications for residence lighting have been developed from extensive research and tests performed by committees of the Illuminating Engineering Society. To understand progress in lighting standards made by this society a summary of past and present developments follows.

In 1927 Fixture Performance Specifications by the Society and Association of Edison Illuminating Company were (1) illumination qualities (2) construction finish (3) appearance for lighting fixtures. In the early 1920's an indirect reflector appeared inside the shade of a limited line of both table and floor lamps. With the development of the reflector elements

progress in lamp design stepped forward in the early thirties. In 1934 the I.E.S. study lamp was made. An 8 inch glass bowl was used for diffusing the light. The shade was 10 inches deep, 10 inches--top diameter, 17 inches--bottom diameter. This was the first time for writing a complete set of specifications for a table lamp. "The dominant feature of its specifications was illumination along the horizontal plane of the desk top. Shade brightnesses were held down to a low value and the shade linings were white" (19). Later, in 1940, the Society's Residence Lighting Committee classed fixtures by types of light distribution and by decorative or utilitarian value. After operating for ten years the I.E.S. program stopped July 1, 1945, and the use of the I.E.S. insignia on certifying tags was discontinued. Several portable lamp manufacturers wished to carry on with performance and style quality lamps, so they organized a new program, "The Certified Lamp Manufacturers." In 1946 the Society developed the Recommended Practice for the Performance of Portable and Installed Residence Luminaires. This included glare evaluation based on both the size of the luminous area as well as the brightness and the most desirable locations for placing portable lamps. This conformed with the specifications of Certified Lamp Makers. In present specifications for Certified lamps 105 separate points are covered. Forty-eight of these are concerned with construction--quality of materials, methods of assembling, and tests they must withstand. Thirty-seven deal with electrical characteristics to

provide safe, trouble free wiring, prevent excessive heat, noise, or radio interference. Twenty of the specifications control lighting performance, to insure more light where it is needed, to protect the eyes from glare, and to avoid shadows on shades (Commerly, 22).

The Edison Electric Institute also launched specifications for portable lamps which are tagged and identified as "Beauty-Plus Lamps". Specifications include lamps with open bowl diffusers, C.L.M. lamps, and lamps with wide harps for use with R-40 diffusing bulbs.

The design of a lamp must grow out of its purpose. A lighting fixture cannot be beautiful if it does not fulfill its utilitarian purpose, regardless of the gracefulness of its lines or of its expressiveness as a work of art (Luckiesh, 10). The organization of a lamp must grow out of the materials from which it is made as well as out of its purpose. It should be unified by a dominant idea expressive of its function but enriched and varied for interest.

Creating a beautiful design involves the selection and organization of forms, lines, colors, and textures.

Form is three dimensional; it describes the structure or shape of an object existing in space. Basically forms are rectangular, cylindrical, spherical, conoid, or pyramidal. The character of the material and the processes and tools from which an object is made will determine the character of the form.

Ornament is directly related to form. It must bear a strict

relation to the size of the basic form, and it must emphasize and clarify it. Ornament should also grow out of the nature of the material; it should be in harmony with the object's function; it should be significant and expressive (Faulkner, et al., 5). Ornament may be either structural which comes from the materials or processes or applied. Applied ornament may be naturalistic which represents human forms, animals, plants, or objects; stylized which involves simplification and conventionalization of these forms; abstract which is created by man. It must be vital in itself as well as enhancing to the form and in harmony with the function.

Line may be a contour, may suggest mass, or it may enrich a surface. A line may be straight or curved, bold or delicate, wide or narrow, dynamic or weak, but it always suggests movement which produces an emotional reaction (5). Usually several kinds of lines are used in a design to add varying degrees of harmony and contrast.

Texture is the surface quality of an object. Each material has its own characteristic texture and properties. Some of the materials used in lamp bases and their characteristics are as follows:

Ceramics are classed as either earthenware (coarse surface--made from shales and clay), stoneware (finer clay--fired at higher temperatures), or porcelain (high grade--high temperature firing). Decoration on ceramics may be either overglazed or underglazed. Underglazed decoration includes incising (design

is cut into the clay), excising (background is cut away; design is in relief), piercing (design is cut through the body of the piece), sgraffito (coated with slip different from body and design is scratched through the outer layer) (5).

Glass may be blown, pressed, or molded and decorated by cutting, engraving, etching, or enameling (5).

Wood should be used so the grain shows. It shows warmth and friendliness. Metal bases should be designed to show the property of tensile strength. Plastic bases should utilize the properties of flexibility, translucency, toughness, and lightness (Faulkner, et al., 5).

Lamp shades are made from a variety of fabrics-- from fine silk crepe and taffeta to rough textured fabrics or grass fibers. Textiles which have a two dimensional continuous surface must direct attention easily and pleasantly over the total area (5). Plastic shades may vary in surface quality. Spun glass, paper, or parchment may be used, but all materials must be in keeping with the lamp base.

Color is another consideration in choosing lamps, for they must be harmonious with the color scheme of the room. Color has three dimensions: Hue which is the name of a color; value which indicates lightness or darkness; intensity which is the degree of purity, strength, or saturation of a color. Several factors should be considered in using color: 1. Colors should be chosen and organized purposefully. 2. Colors should be related to form, space, and materials. 3. Colors should be

organized coherently. 4. Large areas of color should have low intensity, while small areas may be bright. 5. There should be variations in the amounts of color used (5). Lamps that blend in with the background color of the room are a good choice if there are color accents elsewhere (17). If several lamps are used, the colors should be alike or similar in hue. Lamp shades of pale colors such as yellow beige, straw color, pinkish beige, creamy white are the best choices. Red, blue, and green are wasteful colors because they absorb a high percentage of light (11).

The elements must be used with regard to the principles of design--proportion, balance, rhythm, emphasis, and harmony.

Proportion is concerned with space relationships. Scale, one aspect of the principle of proportion is important in selecting and placing table lamps. All the elements making up the structure of the lamp must have a pleasing relationship to each other and to the whole. The size of the lamp must be consistent with the objects that surround it. Pleasing proportions in a table lamp may be obtained if the bottom diameter of the shade is equal to approximately two-thirds the height of the lamp from base to top of the shade (Fahsbender, 4). The size of the lamp must have the proper relationship to the table size. This will depend upon both the table height and the area of the table top. Pleasing proportions grow out of moderation, simplicity, and comprehensibility (Faulkner, 6).

Balance involves grouping shapes and colors around a central point to obtain equal attractions on each side. Balance may be symmetrical in which one half of the object is the mirror image of the other or asymmetrical in which weights or attractions on each side are equal but not identical. Radial balance is formalized with many repetitions around a center (Faulkner, et al., 5). Formal balance is most successfully employed in table lamp design. Balance may also be considered in the relation of the base to the shade. The base should be designed to stand firmly.

Rhythm or continuity in design, usually achieved by repetition of line, form, or color or by progression of sizes, gives intensity and vitality by attracting and holding attention (5). Rhythmic pattern can be a potent force in emphasizing ideas from which the object was developed. Organized movement in lamp design is necessary to achieve harmony.

Emphasis is created by limiting dominant points, using a variety of sizes, using intense colors, using unusual elements, or grouping elements to give each of them greater strength. There should be equal emphasis upon the base and shade.

When consistent objects and ideas are selected and arranged to produce a unified whole, harmony has been achieved (Goldstein and Goldstein, 8). Shapes, sizes, textures, and colors must be combined to express ideas similar in nature.

Maintenance of Table Lamps

Since a table lamp is usually a long term investment, cost as well as function and appearance is an important consideration. Since the shades go out of style more quickly, less money should be put in them than in the base (Brandt, 1). However, it is the current consumed in producing a required amount of light which is the principle factor in the cost of light. The design most economical as to initial cost and operation demands few and large lamps, but to obtain uniformity it is necessary to place lamps close together. This requires a large number of small lamps. Therefore, spacing and lamp size must produce a satisfactory compromise between the two opposing factors. The cost of the lamp bulb is a small part of light cost being generally less than 10 per cent of the total cost. The energy consumption represents 90 per cent of the light cost (Kraehenbuehl, 9). Wiring, alone amounts from 2 to 4 per cent of the total cost of the house. Convenience outlets in the living room should be no more than 10 feet apart in unbroken wall space and 6 feet apart in broken wall space. An efficient lighting system will deliver the maximum lumens possible for the minimum original investment and lowest operating cost (9).

It is estimated that clean reflector bowls, clean lamps, and clean shades will give from 20 to 50 per cent more light (20). Depreciation results from blackening of lamp bulbs,

accumulation of dirt and dust upon lamps and equipment, and discoloration, and fading of paint or other finish in the room. "Results of an early investigation show that 60 per cent of users did not clean lamps, 33 per cent cleaned them at frequent intervals, and only 7 per cent cleaned them at regular intervals. By merely wiping the lamps 68.6 per cent light increase was noted and washing gave an increase of 86.3 per cent based on initial lighting as found before cleaning" (Kraehenbuehl, 9). All parts should be cleaned regularly for better illumination and economy.

METHOD OF PROCEDURE

The data for this study were secured from certain selected residents of three Manhattan areas: Gross Addition, Phelps Addition, and Bellehaven Addition. The lots in these areas were numbered on a map of Manhattan and selected by using a list of random numbers. The names of persons owning these lots were found in the Office of the County Clerk. Their addresses were secured from the city directory and telephone book.

A return postcard was sent to each person. This was followed later by a telephone call when there was no reply or when the reply was indefinite. A personal visit was made to 94 homes with approximately one-third of the homes in each area. In each home the last living room table lamp purchased of a direct and/or indirect type was checked giving a total of 102 table lamps.

The first page of the schedule was filled out by the person being interviewed, while the remaining four pages were completed by the author. A footcandle meter was used to determine the quantity of light in the various areas and the reflectance values of the room surfaces.

These data were tabulated, analyzed, and evaluated according to the recommendations of the Illuminating Engineering Society and General Electric residential lighting research scientists.

FINDINGS

Of the 145 families contacted in three Manhattan areas-- Gross, Phelps, Bellehaven additions --94 or 64.9 per cent were interviewed, 35 or 24.1 per cent refused to be interviewed or could not be contacted, and 16 or 11 per cent had no living room table lamps (Table 4).

Table 4. Manhattan residences.

	Number	: Per cent
Interviewed	94	64.9
Having no table lamps	16	11.0
Refusals or could not contact	35	24.1
Total	145	100.0

Thirty-two families were interviewed in Gross addition, 8 had no living room table lamps, and 10 could not be contacted

or did not wish to be interviewed. The total number contacted in this addition was 50 (Table 5).

Table 5. Residences in Gross Addition.

	Number	:	Per cent
Interviewed	32		64.0
Having no table lamps	8		16.0
Refusals or could not contact	10		20.0
Total	50		100.0

Table 6. Residences in Phelps Addition.

	Number	:	Per cent
Interviewed	30		61.1
Having no table lamps	6		12.3
Refusals or could not contact	13		26.6
Total	49		100.0

In Phelps addition 30 families were interviewed, while 13 refused an interview or could not be contacted. Six families had no table lamps in the living room which gave a total of 49 (Table 6). Of the 46 families contacted in Bellehaven, 32 were interviewed, 2 had no table lamps, and 12 refused or could not be reached (Table 7). Although no comparison was to be made of the various areas, the three additions chosen were in differ-

ent sections of Manhattan to select families of various social and economic status.

Table 7. Residences in Bellehaven Addition.

	Number :	Per cent
Interviewed	32	69.5
Having no table lamps	2	4.3
Refusals or could not contact	12	26.2
Total	46	100.0

Since most of the houses were built from one to five years ago (Table 8), it was not unusual to find that of the approximate total of 246 lamps purchased in the last 15 years 168 or 68.3 percent of these lamps were purchased from one to five years ago.

Table 8. Year house was built.

	Number :	Per cent
1 to 5 years ago	80	85.1
5 to 10 years ago	10	10.6
10 to 15 years ago	-	--
15 to 20 years ago	1	1.1
20 or more years	3	3.2

Only 13.4 per cent of the lamps were purchased from 5 to 10 years ago, while 18.3 per cent were purchased from 10 to 15 years ago (Table 9).

Table 9. Number of lamps purchased.

	Number	Per cent
1 to 5 years ago	168	68.3
5 to 10 years ago	33	13.4
10 to 15 years ago	45	18.3

Table 10 also corresponds with this fact as 52.0 per cent of the lamps checked were purchased from 1950 to 1955, and 29.4 per cent of the total were purchased from 1955 to 1957. The number diminishes rapidly in the preceding years.

Table 10. Year lamp was purchased.

	Number	Per cent
1955 to 1957	30	29.4
1950 to 1955	53	52.0
1945 to 1950	11	10.8
1940 to 1945	3	2.9
1930 to 1940	3	2.9
1920 to 1930	2	2.0
Before 1920	-	--

It seems consistent that 70.6 per cent of the lamps were harmonious with the style of the living room (Table 11) as the author observed that the interiors in the new homes were decorated in contemporary styles and many of the lamps purchased recently were of modern design. The evidence that more lamps are being purchased in recent years suggests that greater attention must be given to designing table lamps for function and beauty.

Table 11. Design of lamp harmonious with room.

	Number	Per cent
Yes	72	70.6
No	30	29.4

Comery and Stephenson (3) stated that most living rooms need at least five portable lamps. However, only about two living rooms contained this number of lamps (Table 12). Less than half of the living rooms had two table lamps, while 21 per cent had three table lamps. Twenty-seven per cent had only one table lamp which did not provide sufficient local light. Of course, portable lamps include floor and wall lamps, but it was noted that two was the greatest number of either floor or wall lamps in the living room. Therefore, even with the addition of floor lamps the localized lighting was insufficient for the average living room.

Table 12. Lamps in living room.

	Number	Per cent
1	26	27.6
2	39	41.5
3	20	21.3
4	7	7.4
5	1	1.1
Over 5	1	1.1

Even the tables indicating the number of lamps purchased in the last fifteen years substantiate this fact (Tables 13,14,15). It can be seen that the largest single percentage of people did not purchase any lamps at all suggesting that table lamps were made or received as gifts. Next, it is indicated that two table lamps were purchased by 25 per cent of the people within the last five years, 23 per cent within the last 10 years, and 19 per cent within the last 15 years. Throughout the 15 years of those who purchased lamps two table lamps remain highest on the list.

Table 13. Lamps purchased in last five years.

	Number	Per cent
0	29	30.8
1	17	18.1
2	24	25.6
3	13	13.8
4	1	1.1
5 or more	10	10.6

Table 14. Lamps purchased in last ten years.

	Number	Per cent
0	23	24.5
1	13	13.8
2	22	23.5
3	15	15.9
4	6	6.4
5 or more	15	15.9

Table 15. Lamps purchased in last fifteen years.

	Number	Per cent
0	23	24.5
1	13	13.8
2	18	19.1
3	17	18.1
4	8	8.5
5	4	4.3
6-10	8	8.5
10 or over	3	3.2

Locally purchased lamps were found the most frequently although 37.2 per cent were purchased in a nearby city (Table 16). Six or 6.4 per cent had been purchased out-of-state. The importance of well designed lamps selected by the local merchants can hardly be stressed enough.

Table 16. Where table lamps were purchased.

	Number	Per cent
Locally	41	43.6
Nearby city	35	37.2
Out-of-state	6	6.4
Mail order	3	3.2
Do-it-yourself	9	9.6
Received as gifts	16	17.0

Even though only 9.6 per cent of the lamps checked were made at home, 21.3 per cent of the people interviewed had at one time made one or more table lamps (Table 17).

Table 17. Table lamps made.

	Number	Per cent
Yes	20	21.3
No	74	78.7

Of this group, 9 or 45 per cent made one lamp, 3 or 15 per cent made two lamps, and 20 per cent made four, five or more lamps, as indicated in Table 18. The number seems significant to emphasize ways of making simple, functional, and well-designed lamps in magazines and other literature as well as through demonstrations.

Table 18. Number of table lamps made.

	Number	Per cent
1	9	45.0
2	3	15.0
3	-	--
4	4	20.0
5 or more	4	20.0

It is interesting to note that 100 per cent of the people interviewed considered design and general appearance of living room table lamps important (Table 19), while several of the questions involving design factors did not indicate good taste in choosing table lamps.

Table 19. Selection factor--design and general appearance.

	Number	Per cent
Important	94	100.0
Little importance	--	--
Not important	--	--

The design of about one-third of the lamps was not harmonious with the living room although the greater number of lamps conformed to the period style (Table 11). Goldstein and Goldstein (8) state that the design of a lamp should suggest its purpose: it must be functional as well as decorative. How-

ever, the interviews indicated that only 31.4 per cent of the lamps seemed suited to their purpose (Table 20).

Table 20. Lamp suited to purpose.

	Number	Per cent
Yes	32	31.4
No	70	68.6

Over one-half of the lamps showed unequal emphasis upon the base and the shade (Table 21). Lamps are accessories and greater emphasis on one part distracts the eye leaving an impression of disunity.

Table 21. Equal emphasis on base and shade.

	Number	Per cent
Yes	46	45.1
No	56	54.9

Both the shade and the base should conform to one idea with a consistency of line, form, and color. These elements must make a unified whole that corresponds to the style of the living room. The table lamps that were checked showed that only 42.2 per cent had continuity of design, while 57.8 per cent did not illustrate this principle (Table 22).

Table 22. Continuity of design.

	Number	Per cent
Yes	43	42.2
No	59	57.8

The design principles illustrated in the table lamps showed greater evidence in other aspects. Seventy-three per cent of the lamps appeared to give a feeling of stability or balance although about one-fourth did not (Table 23).

Table 23. Lamp balanced.

	Number	Per cent
Yes	75	73.5
No	27	26.5

It follows that 70.6 per cent of the lamps had shades in proportion to the base. This would undoubtedly enhance the stability of the lamp. The remaining 29.4 per cent of the lamps did not have shades in proportion to the base (Table 24). Fahsbender (4) states that proportion is most pleasing if the bottom diameter of the shade is equal to approximately two-thirds the height of the lamp from the base to the top of the shade.

Table 24. Shade in proportion to the base.

	Number	Per cent
Yes	72	70.6
No	30	29.4

Proportion must be considered in the relationship of the table lamp to other furnishings in the living room, particularly the table on which it is placed. It was desirable to find that 78.4 per cent of the lamps were in scale with the table on which they were placed (Table 25). It was observed by the author that if the lamps were higher than the tables, the tables would have a large surface area to insure a feeling of balance and good proportion.

Table 25. Lamp in scale with table.

	Number	Per cent
Yes	80	78.4
No	22	21.6

Just one person indicated that color of the lamp was of little importance, while 93 persons checked color as being important in selection (Table 26). This seems to correspond with the data obtained which indicate the colors of 72.6 per cent of the table lamps were harmonious with the respective

Table 26. Selection factor --color of table lamp.

	Number	Per cent
Important	93	98.9
Little importance	1	11.1
Not important	--	--

rooms according to the author. Twenty-seven per cent were not harmonious in color (Table 27). This is evident when the single predominating wall colors are light gray, cocoa, and light green (Table 53), and the predominating lamp colors are warm pastels and white shades with neutral and gold bases (Tables 63 and 71).

Table 27. Color harmonious with room.

	Number	Per cent
Yes	74	72.6
No	28	27.4

The activity performed in a certain area determines the requirements for the quality and quantity of light in that location. Table lamps were used primarily for reading as indicated by the 79.4 per cent in Table 28. Decoration was at least one of the purposes of nearly one-third of the lamps. Handsewing came second with 31.4 per cent, while television viewing was next with 29.4 per cent. Still less important

were table games, 12.6 per cent; writing, 6.9 per cent; studying, 5.9 per cent; and piano playing one per cent.

Table 28. Activities.

	Number	Per cent
Reading	81	79.4
Handsewing	31	30.4
Writing	7	6.9
Studying	6	5.9
Table Games	13	12.6
Television viewing	30	29.4
Decoration	32	31.4
Piano playing	1	1.0

The placement of the table lamp is often the determining factor of a sufficient or insufficient amount of light (Langewiesche, 18). It is not difficult to place lamps correctly, but the required measurements must be made known to the public so proper adjustments can be made. Average reading lamps should be placed 20 inches to the right or left of the center of the book or paper and 16 inches back from this point (28). Measurements of the locations of table lamps for this activity indicated that only 12 lamps or 13.7 per cent were placed properly to the right or left according to recommended standards. Sixty-two or 76.4 per cent were placed over 21 inches which would cut off

the greatest area of light for reading (Table 29). Eight lamps were placed under 19 inches to the right or left which would be much more desirable than too far from the activity. This might be necessary if handsewing were done here, also. Only 16 lamps or 19.7 per cent were placed from 15 to 17 inches back from the left or right position (Table 29). Reading with ease and comfort is best maintained by placing the lamp so the light falls over the shoulder. Forty-six or 56.8 per cent of the lamps were placed under 15 inches to the back making reading more difficult. Those placed over 17 inches composed 17.3 per cent of the lamps. Very little light would be obtained on the reading surface from these lamps unless they were very tall lamps. In this case, it would be permissible. Five lamps were placed to the front which would be undesirable. One lamp was placed in the ideal location in this respect.

Table 29. Placement of lamp for reading.

	Number	Per cent
To the right-- 19 to 21 inches	5	6.2
over 21 inches	29	35.7
under 19 inches	3	3.7
To the left -- 19 to 21 inches	7	7.5
over 21 inches	33	40.7
under 19 inches	5	6.2
To the back -- 15 to 17 inches	16	19.7
over 17 inches	14	17.3
under 15 inches	46	56.8
To the front	5	6.2

The height of the table for the lamp was adequate in most cases depending upon the height of the lamp base. A lamp table should be from 23 inches to 27 inches high if a 15 inch base is used and from 20 to 23 inches if a 19 inch base is used (28). Fifty-eight per cent of the lamp tables were from 20 inches to 25 inches high and 35.7 per cent were over 25 inches high (Table 30).

Table 30. Reading--Distance from floor to table top.

	Number	Per cent
Under 20 inches	5	6.2
20 inches to 25 inches	47	58.1
Over 25 inches	29	35.7

A factor of greater importance, however, is the distance from the floor to the bottom of the shade. Ideally, this is 40 inches (28). Many of the locations in this respect seemed undesirable as 41.9 per cent measured less than 39 inches and 24.7 per cent were over 42 inches. About one-third of the lamps for reading were located properly in regard to height (Table 31).

Table 31. Reading--Distance from floor to bottom of lampshade.

	Number	Per cent
Under 39 inches	34	41.9
39 inches to 42 inches	27	33.4
Over 42 inches	20	24.7

Lighting research specifies the minimum levels of light necessary for various visual tasks in units called footcandles. A footcandle meter which contains a light sensitive layer of cells to generate current that is measured by a microammeter was used to determine the footcandle measurement. Although these instruments are simple and convenient to use, there are still possibilities of inaccuracy. Some meters read accurately only in a particular type of illumination and are not color sensitive. The light may strike the cell of the meter obliquely causing reflections or shadows on the cover plate giving an inaccurate reading. It is also possible that the light sensitive cell may not have had a long enough period of adaptation to record the accurate amount. As many precautions as possible were taken to avoid these inaccuracies (Sturrock and Staley, 29).

For casual reading done in most of the homes a minimum of 20 footcandles is necessary (27). The average illumination upon the reading surface in 24 instances was only five to nine footcandles (Table 32). This was the amount found most frequently. Twenty per cent measured from 10 to 14 footcandles which was still inadequate. Fourteen cases showed that 15 to 19 footcandles fell upon the surface. Those measuring only one to four footcandles or 16.7 per cent are decidedly detrimental to the eyes. Only thirteen out of a total of eighty-one lamps used for reading provided sufficient light for the task.

Table 32. Reading--Average illumination in footcandles.

	Number	Per cent
1 to 4 footcandles	13	16.1
5 to 9 footcandles	24	29.6
10 to 14 footcandles	17	20.8
15 to 19 footcandles	14	17.3
20 to 25 footcandles	9	11.2
Over 25 footcandles	4	5.0

Even occasional sewing requires twice as much light as casual reading (27). The most desirable lamp for handsewing is a double swing arm floor lamp as only the shade, not the base, needs to be moved forward (28). If a table lamp is used, the lamp should be placed 15 inches from the center of the sewing task to the left if the person is righthanded. From this point to the right or left the center of the shade should be only six inches back. Only two of the lamps were placed in an acceptable position to the right or left of the user. Most of the table lamps or 64.3 per cent were placed over 21 inches to the right or left which, in itself, would make the seeing task very difficult. About 29 per cent were located from 19 inches to 21 inches to the right or left of the task. This, too, indicates improper placement (Table 33). Just three of the lamps were placed from four inches to eight inches back from the left or right position. It is important

to note that these three lamps were not placed in the correct position to the right or left resulting in inadequate light for sewing. Over one-half of the lamps were placed from nine inches to 14 inches back from the sewing activity. Two or 6.5 per cent were placed from 15 inches to 17 inches and eight were placed over 17 inches back from the center of the activity. Two were placed to the front of the activity.

Table 33. Placement of table lamp for handsewing.

	Number	Per cent
To the right or left		
19 to 21 inches	9	29.2
over 21 inches	20	64.3
under 19 inches	2	6.5
To the back		
4 inches to 8 inches	3	9.6
9 inches to 14 inches	16	51.6
15 inches to 17 inches	2	6.5
over 17 inches	8	25.8
To the front	2	6.5

The desirable table height for a lamp used for handsewing is from 21 inches to 25 inches (28). Most of the table heights were acceptable in this case as 64.2 per cent measured from 20 to 25 inches (Table 34). Nevertheless, the distance from the floor to the bottom of the lampshade was inadequate. Seventeen or 54.8 per cent of the 31 lamps used for sewing measured less than 39 inches from the floor to the bottom of the shade. Only six or 19.4 per cent measured from 39 to 42 inches which

is the suggested measurement. Eight of the lamps were over 42 inches from floor to bottom of shade which would be more desirable than under 39 inches (Table 35).

Table 34. Handsewing--Distance from floor to table top.

	Number	Per cent
Under 20 inches	1	3.3
20 inches to 25 inches	20	64.2
Over 25 inches	10	32.5

Table 35. Handsewing--Distance from floor to bottom of lampshade.

	Number	Per cent
Under 39 inches	17	54.8
39 to 42 inches	6	19.4
Over 42 inches	8	25.8

Ordinary sewing requires at least 40 footcandles illumination (27). None of the lamps provided this amount of light and only six or 19.2 per cent gave adequate light for easy sewing such as basting. The remaining lamps furnished insufficient light for this seeing task. (Table 36). In special research done by Fahsbender (15) it was concluded that higher values are more desirable. This study recommends 40 footcandles for occasional sewing, 80 footcandles for prolonged sewing, and 150 or more footcandles for sewing on dark fabrics or fine detail.

In comparison to these figures the light for sewing in the residences studied was poor.

Table 36. Handsewing--Average illumination in footcandles.

	Number	Per cent
1 to 4 footcandles	2	6.5
5 to 9 footcandles	9	29.1
10 to 14 footcandles	7	22.6
15 to 19 footcandles	7	22.6
20 to 25 footcandles	3	9.6
Over 25	3	9.6

Although writing and studying require different amounts of illumination, placement of a table lamp used for desk work is the same (28). The center of the lampshade should be 15 inches from the left of the work center if the person is righthanded. Four of the lamps used for writing were placed under 19 inches. These measurements varied from 13 inches to 16 inches (Table 37). Two of the lamps or 28.5 per cent were placed 12 inches or less from the front of the desk. The remaining five lamps were placed to the back which would prove unsatisfactory for writing conditions.

Table 37. Placement of lamp for writing.

	Number	Per cent
To right or left --19 to 21 inches	2	28.5
over 21 inches	1	14.3
under 19 inches	4	57.2
To the back-- 15 to 17 inches	2	28.5
over 17 inches	1	14.5
under 15 inches	2	28.5
From front of desk--12 inches or less	2	28.5

Out of the six lamps used for studying four or 66.6 percent of the lamps were properly placed under 19 inches to the right or left. The remaining two or 33.4 percent were placed over 19 inches (Table 38). These would not provide enough light for studying. Only one-third of the lamps were placed 12 inches or less to the front of this activity. However, of those placed to the back, one-half were located under 15 inches. Just one lamp found in this study came near to meeting the requirements for horizontal placement. This lamp was located 14 inches to the left and eight inches to the front of the desk.

Table 38. Placement of lamp for studying.

	Number	Per cent
To the right or left --19 to 21 inches	1	16.7
over 21 inches	1	16.7
under 19 inches	4	66.6
To the back --15 to 17 inches	1	16.7
over 17 inches	-	--
under 15 inches	3	50.0
From front of desk--12 inches or less	2	33.3

Study desks should be from 29 inches to 30 inches high (24). Seven desks were used for writing. Of this number it was found that four or 57.2 per cent were satisfactory heights for writing, while three or 42.8 per cent were too low (Table 39). But only three were the proper height from the bottom of the lampshade to the floor (Table 40). The desirable distance here is 44 inches (24). The same was true of lamp placement for studying as four or 66.7 per cent were of the correct desk height, and three or 50 per cent were the proper distance from the lampshade bottom to the floor (Tables 41, 42).

Table 39. Writing--Distance from floor to table top.

	Number	Per cent
Under 20 inches	--	--
20 to 29 inches	3	42.8
29 to 30 inches	4	57.2

Table 40. Writing--Distance from floor to bottom of lampshade.

	Number	Per cent
Under 39 inches	1	14.4
39 to 42 inches	3	42.8
Over 42 inches	3	42.8

Table 41. Studying--Distance from floor to table top.

	Number	Per cent
Under 20 inches	-	--
20 inches to 29 inches	2	33.3
29 inches to 30 inches	4	66.7

Table 42. Studying--Distance from floor to bottom of lampshade.

	Number	Per cent
Under 39 inches	1	16.7
39 to 42 inches	2	33.3
Over 42 inches	3	50.0

Twenty footcandles of illumination is desirable for writing (27), and four lamps or 57.2 per cent out of seven met this requirement. The specific number of adequate footcandles ranged from 23 to 34. The three remaining amounts were inadequate (Table 43).

Table 43. Writing--Average illumination in footcandles.

	Number	Per cent
1 to 4 footcandles	-	--
5 to 9 footcandles	1	14.3
10 to 14 footcandles	-	--
15 to 19 footcandles	2	28.5
20 to 25 footcandles	3	42.9
Over 25 footcandles	1	14.3

Studying requires 40 footcandles (27), and only one lamp came near to supplying this need. This lamp provided 34 footcandles of illumination. The greater percentage or 83.3 per cent provided an inadequate amount of light (Table 41).

Table 41. Studying --Average illumination in footcandles.

	Number	Per cent
1 to 4 footcandles	-	--
5 to 9 footcandles	-	--
10 to 14 footcandles	-	--
15 to 19 footcandles	3	50.0
20 to 25 footcandles	2	33.3
Over 25 footcandles	1	16.7

The other activities such as table games, television viewing, and piano playing listed in Table 28 did not receive adequate light either. For example, of the 13 table lamps used for table games only one provided the recommended amount of ten or more footcandles (27). Easy scores in piano playing require at least 20 footcandles, and only five footcandles were available at this point. Television viewing requires the same amount of light as general illumination (Fahsbender, 25). Lighting in the room reduces the contrast difference between the screen and the room and relieves eyestrain. Adequacy for this activity may be checked in Table 48 under general illumination.

It is clearly evident that the homemaker needs more information about lighting requirements for various activities done in the home. Many of the existing conditions could be improved by knowing where to place table lamps. The amount of light falling upon the work surface varies according to placement (Fahsbender, 4). Nevertheless, the findings stated previously do not correspond to the information given by those interviewed about the selection of table lamps. Eighty-four of the ninety-four persons interviewed checked that the activity for which the lamp would be used was important (Table 45). Apparently, many of the homemakers were not aware of the proper lighting requirements.

Table 45. Selection factor--activity for which the table lamp will be used.

	Number	: Per cent
Important	84	89.4
Little importance	5	5.3
Not important	5	5.3

Other factors involved in lamp placement are the number of convenience outlets in the living room and the total appearance of all the portable lamps in the room. In this case, the number of outlets did not affect placement adversely as 89 or 94.7 per cent reported having sufficient convenience outlets, while only five or 5.3 per cent found the outlets inadequate

in number (Table 46). For the most pleasing appearance of the living room the lamps should be placed at approximately the same level (Brandt, 1). This, too, is desirable for activities as most lamps should be placed about 40 inches to 44 inches from floor to bottom of shade. Of the 68 households

Table 46. Convenience outlets sufficient.

	Number	Per cent
Yes	89	94.7
No	5	5.3

having more than one living room table lamp, 36 or 52.6 per cent of the lamps were placed at the same level, and 32 or 47.4 per cent were placed at different levels. (Table 47).

Table 47. Table lamps placed at the same level.

	Number	Per cent
Yes	36	52.6
No	32	47.4

To produce comfortable seeing conditions, light must be distributed properly in the surroundings as well as upon the task. General illumination requires a variety of fixtures and portable lamps to provide five to ten footcandles illumination (27). Table 48 shows that 90 or 94.7 per cent of the living rooms had inadequate general illumination and only four or 5.3

per cent were adequate. During personal visits to the homes the author noticed the absence of ceiling fixtures in a large proportion of the living rooms. This might well be the cause of the low levels of illumination. Table 12 also corresponds with this finding as most of the living rooms had an insufficient number of portable lamps.

Table 48. General illumination in footcandles.

	Number	Per cent
1 to 2 footcandles	26	27.5
2 to 3 footcandles	28	29.1
3 to 4 footcandles	25	26.5
4 to 5 footcandles	11	11.6
5 to 6 footcandles	-	--
6 to 7 footcandles	3	4.2
7 to 8 footcandles	-	--
Over 8	1	1.1

High brightness of a task and comparatively low brightness of the surroundings is undesirable. The brightness contrast of task-to-immediate surroundings of no greater than three to one is most acceptable. The ratio of ten to one must never be exceeded in any visual field (Comnery, 12). Of the eighty-four lamps providing local illumination for a task, 39 or 46.7 per cent were properly accompanied with sufficient

general illumination. Thirty-eight or 45 per cent would be acceptable but not desirable. Exceeding the brightness ratio limit were seven or 8.3 per cent of the table lamps in comparison to the surrounding area (Table 49). Direct glare from the lamps was noticed in only 18 or 17.7 per cent of the lamps, while in 82.3 per cent it was not evident (Table 50). Similar results were found in seeing the lamp bulb in normal movement about the room. (Table 51).

Table 49. Approximate brightness ratios between activity area and general illumination.

	Number	Per cent
Ratio of 1 to 1	10	12.1
2 to 1	16	19.1
3 to 1	13	15.5
4 to 1	12	14.3
5 to 1	8	9.5
6 to 1	6	7.1
7 to 1	6	7.1
8 to 1	4	4.7
9 to 1	2	2.3
10 to 1	-	--
Over 10 to 1	7	8.3

This, however, may not give a true picture as the author observed that improper placement often resulted in lamps placed

Table 50. Apparent glare from lamp.

	Number	Per cent
Yes	18	17.7
No	84	82.3

near the periphery of the room out of the area of general circulation of the home occupants.

Table 51. See lamp bulb in normal movement about room.

	Number	Per cent
Yes	18	17.7
No	84	82.3

Since all areas of a room absorb and reflect light, the room becomes a secondary lighting source. The reflectance value is the proportion of light reflected from a surface to the light falling on it (27). The author determined the reflectance wall values by measurement with a light meter. By determining the brightness of a square of blotting paper, then removing it and reading the wall brightness, the reflectance of the wall may be determined by direct proportion (Starrock and Staley, 29). Ceiling and floor reflectances were resolved by using samples of known reflectances. A wide variation of textures in floor coverings, which affects the amount of light a surface reflects, resulted in estimated reflectances from this area.

The recommended reflectances for walls are from 35 per cent to 60 per cent (27). Amounts higher than this often result in excessive wall brightness, while amounts below this will require more wattage in lamps to achieve higher illumination. Approximately 72 or 76.4 per cent of the living room walls had proper reflectance values. The sixteen ranging from 50 per cent to 55 per cent in reflectance might be considered the most ideal. Three or 3.2 per cent had very high reflectance values, and 14 ranging from 60 per cent to 70 per cent were high, also. Those below thirty per cent, 14.9 per cent of the total number of living rooms, are undesirable (Table 52). It is interesting to note that the largest percentage is within the median range of reflectances. This seems

Table 52. Wall reflectance in percentage.

	Number	Percentage
70 to 75 per cent	3	3.2
65 to 70 per cent	2	2.1
60 to 65 per cent	12	12.7
55 to 60 per cent	12	12.7
50 to 55 per cent	16	17.0
40 to 50 per cent	23	24.4
30 to 40 per cent	21	22.3
20 to 30 per cent	8	8.5
10 to 20 per cent	6	6.4

consistent with the results in Table 53 as the largest percentage of walls were light gray or light green. The group listed under red were often tints of red having relatively high reflectances. Various shades of popularly termed "cocoa" were used frequently although many of these shades have low reflectance values. It was agreeable to find that only 11 of the colors used on the walls were of very low values.

As the recommended figures for ceiling reflectances is from 60 per cent to 90 per cent, all but one of the ceilings came within this standard (28). It was also gratifying to find that 52 or 55.3 per cent were in the range from 70 to 75 per cent reflectance, and 33 or 35.1 per cent had reflectances from 75 to 80 per cent (Table 54). Over half of the ceilings were white or off-white. Both reflect a maximum of light. Ivory was found on 24 or 25.5 per cent of the ceilings. This color is also high in reflectance. The eight remaining colors reflected less light (Table 55).

Table 53. Wall color.

	Number	Per cent
Reds	18	19.1
Yellows	4	4.3
Orange (light)	5	5.3
Cocoa (medium)	18	19.1
(dark)	1	1.1
Blues	5	5.3
Greens (light)	15	15.9
(dark)	6	6.4
Violet	1	1.1
Neutrals (light gray)	22	23.4
(dark gray)	4	4.3

Table 54. Ceiling reflectance.

	Number	Per cent
75 to 80 per cent	33	35.1
70 to 75 per cent	52	55.3
65 to 70 per cent	3	3.2
60 to 65 per cent	5	5.3
55 to 60 per cent	-	--
50 to 55 per cent	1	1.1
Below 50 per cent	-	--

Table 55. Ceiling color.

	Number	Per cent
White	22	23.4
Off-white	40	42.5
Ivory	24	25.5
Gray	3	3.2
Other	5	5.4

Floors should reflect from 15 per cent to 35 per cent of the light falling upon them (28). Only two or 2.1 per cent of the floors did not meet this recommendation (Table 56). The greatest number which was 38 or 40.4 per cent was from 30 to 35 per cent reflectance. This would be most desirable with relatively light walls and ceiling. Most of the floors were carpeted with neutralized colors--beige, dusty rose, tan--as can be seen by the 39.4 per cent in this group. Neutrals, mostly grays, were popular in carpeting, also (Table 57). It was observed that a number of homes had background areas keyed to one color.

Table 56. Approximate floor reflectance.

	Number	Per cent
45 to 50 per cent	0	--
40 to 45 per cent	7	7.5
35 to 40 per cent	18	19.2
30 to 35 per cent	38	40.4
25 to 30 per cent	13	13.8
20 to 25 per cent	3	3.2
15 to 20 per cent	13	13.8
10 to 15 per cent	2	2.1
Below 10 per cent	--	--

Table 57. Floor color.

	Number	Per cent
Neutralized warm	37	39.4
Neutralized cool	16	17.0
Neutral	21	22.3
Floral (both cool and warm)	9	9.5
Varnished oak	11	11.7

Most table lamps used for an activity should total at least 25 inches high (28). Forty-two or 41.2 per cent of the table lamps were from 21 inches to 25 inches high (Table 58). Many of these would be too low to use on an ordinary 25 inch table. But 41 or 40.1 per cent of the lamps were from 26 inches to 30 inches high, and the senior table lamps measured from 31 inches to 35 inches. If placed properly at least one-half of the lamps would be of a desirable height.

Table 58. Height of lamps.

	Number	Per cent
15 inches or under	--	--
16 inches to 20 inches	12	11.8
21 inches to 25 inches	42	41.2
26 inches to 30 inches	41	40.1
31 inches to 35 inches	7	6.9

The height of the lamp base will depend upon the height of the table upon which it is placed. It must not be less than 15 inches, but it may vary from 15 inches to 19 inches. Over half of the lamp bases were from 12 inches to 16 inches high. Many of these are not high enough to provide adequate light. Only about one-fourth of the 102 lamps had bases of adequate height. Fifteen or 14.7 per cent were below standard with heights below 12 inches (Table 59).

Table 59. Height of lamp base.

	Number	Per cent
Under 8 inches	1	1.0
8 to 12 inches	14	13.7
12 to 16 inches	63	61.8
16 to 20 inches	22	21.6
20 to 24 inches	2	1.9

Table 60 indicates that 65 or 63.7 per cent of the lamp bases were cylindrical in form. There was such a wide variety of shapes found within this group that it was difficult to define the variations. About one-third of the cylindrical lamp bases showed adaptations from the kerosene lamp base (Plate I, Fig. 1), various kinds of turnings, or both combined. Nearly one-fourth of these bases were vase shaped, many being 18th Century adaptations (Plate I, Fig. 2). The straight

cylinder with little variation was seen in about one-fourth of this group. Of the sixty-five about one-sixth were composed of rods in various arrangements (Plate II, Fig. 1). Conical shapes were combined in various ways in 12 or 11.8 per cent of the bases. Next came abstract shapes with 11.7 per cent of the total. Occasionally, the base was completely spherical, but more often a portion of the sphere was combined with another form. The smaller numbers were found in the hexagonal, pyramidal, rectangular, animal (Plate II, Fig. 2) or human figures. All types of lamp bases from bowling pins and jugs to elaborate Dresden China were seen. Of the various shapes and sizes 52 or 51 per cent were designed with good proportion, while 50 or 49 per cent could not be considered in good proportion (Table 61) as observed by the author.

Table 60. Basic forms of lamp base.

	Number	: Per cent
Cylindrical	65	63.7
Spherical	8	7.8
Conical	12	11.8
Hexagonal	2	1.9
Pyramidal	5	4.9
Rectangular	4	3.9
Animal or human figure	4	3.9
Abstract	11	11.7

EXPLANATION OF PLATE I

Fig. 1. Table lamp with kerosene lamp base adaptation.

Fig. 2. Table lamp with base of 18th Century adaptation.

PLATE I

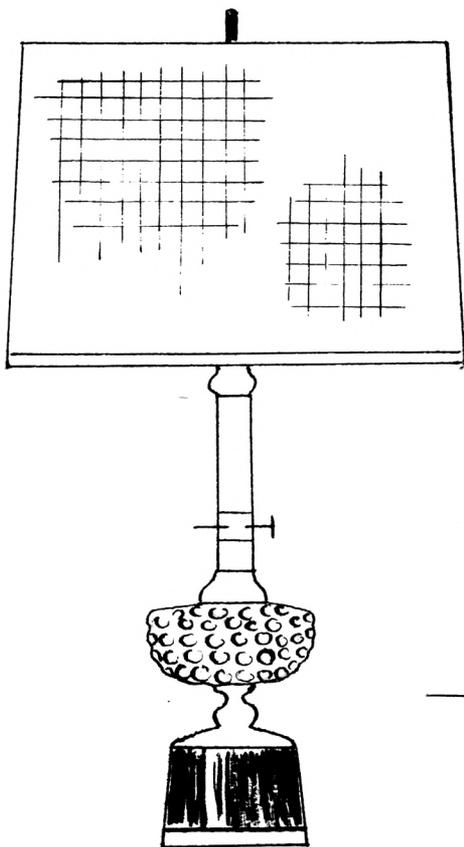


Fig. 1

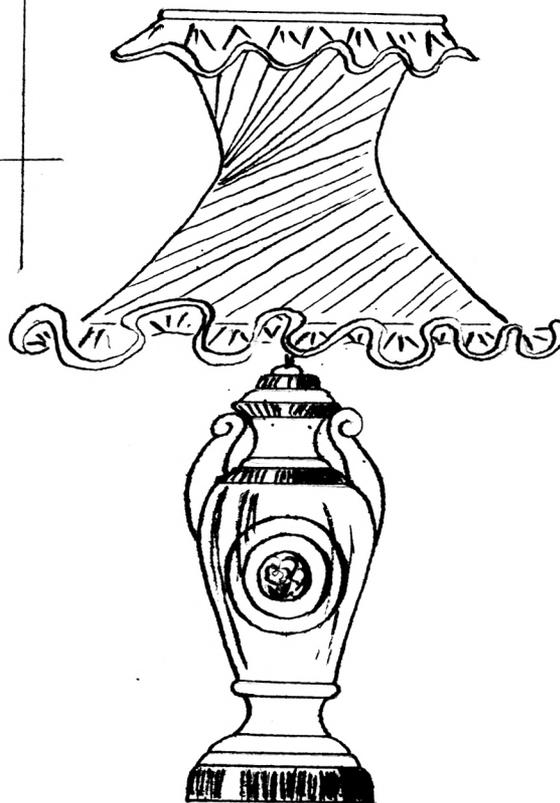


Fig. 2

EXPLANATION OF PLATE II

Fig. 1. Table lamp with base of wrought iron rods.

Fig. 2. Table lamp with base of animal form.

PLATE II

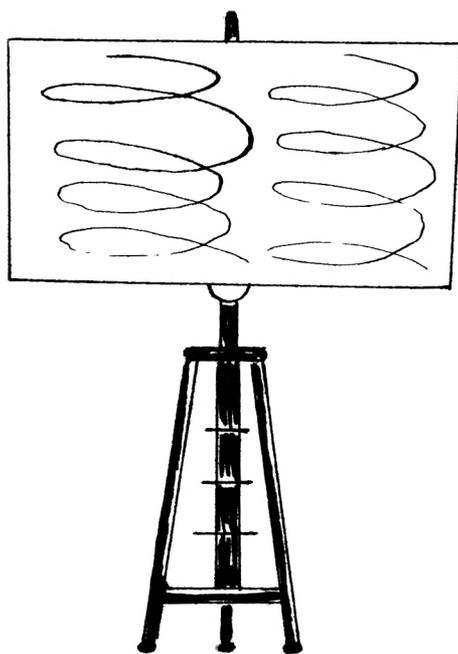


Fig. 1

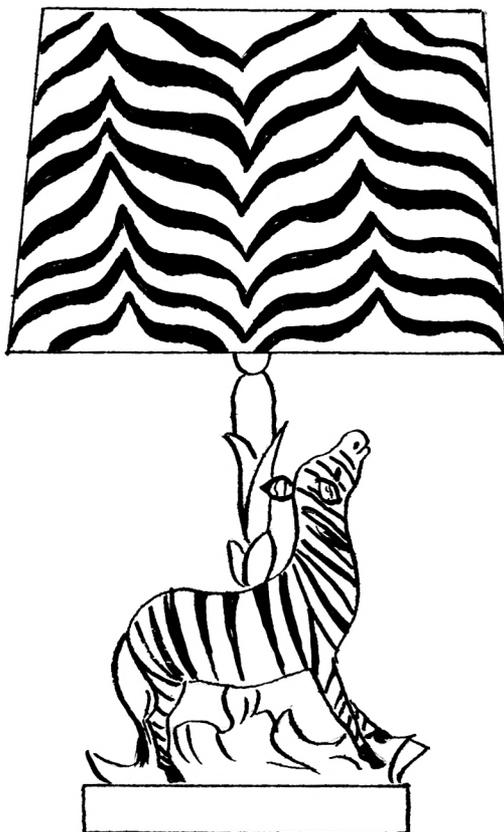


Fig. 2

Table 61. Lamp base in good proportion.

	Number	Per cent
Yes	52	51.0
No	50	49.0

Metal was found on nearly one-half of the lamp bases. Of the various kinds used, brass was the most popular composing 29.4 per cent of the total. Pottery was used for 29 or 28.4 per cent of the 102 bases, while of this number wood and glass comprised 15.7 per cent and 14.7 per cent, respectively. Porcelain, plastic, and leather took positions of lesser importance (Table 62).

Table 62. Material of lamp base.

	Number	Per cent
Pottery	29	28.4
Porcelain	8	7.8
Metal	48	47.1
Brass	30	29.4
Bronze	2	1.9
Iron	17	16.7
Aluminum	2	1.9
Wood	16	15.7
Glass	15	14.7
Plastic	2	1.9
Leather	1	1.0

The frequent use of gold and black on lamp bases may be seen in Table 63. Browns and white are quiet and versatile for use in a variety of schemes. These were found to be used in the next place. Thirteen of the lamps had bases of varnished wood. Various shades of green were used on thirteen lamps. The other colors took positions of lesser importance. Violet was not used on any of the bases.

Table 63. Color of lamp base.

	Number	Per cent
Gold	41	40.2
Black	23	22.6
Browns	23	22.6
White	17	16.7
Greens	13	12.8
Varnished woods	13	12.8
Yellows	7	6.9
Reds--(light)	5	4.9
(medium)	6	5.9
(dark)	5	4.9
Gray	3	2.9
Multicolor	3	2.9
Blues	1	1.0
Violets	-	--

Sixty-seven or 65.7 per cent of the lamps had ornament on the base, while 35 or 34.3 per cent had no ornament (Table 64).

Of these 67 table lamps, 42 or 62.8 per cent had ornament which was related to the size of the basic form. In thirty-two lamps or 47.7 per cent the ornament seemed to grow out of the nature of the material. This was not evident to the author in 35 or 52.3 per cent of the lamps. The same percentage was found when checking whether or not the ornament was related to the shape of the form. Only 22 or 32.8 per cent of the lamps had ornament that seemed harmonious with the function of the lamp, while 45 or 67.2 per cent did not show harmony (Table 65). This shows a need for greater understanding in the use of moderate, simple ornament that is expressive of the function of a table lamp according to the tenets of good design.

Table 64. Ornament on the lamp base.

	Number	Per cent
Yes	67	65.7
No	35	34.3

Table 65. Requirements of good ornament.

	Number	Per cent
Related to size of the form		
Yes	42	62.8
No	25	37.2
Related to the shape of the form		
Yes	32	47.7
No	35	52.3
Grows out of the nature of material		
Yes	32	47.7
No	35	52.3
Harmonious with function		
Yes	22	32.8
No	45	67.2

The lamp shade is important for both light distribution and beauty of the whole lamp. Although the Empire or conical shade (Fahsbender, 4) gives the best light distribution, the drum type of shade is preferred for a wider upward distribution of light (28). Forty-two or 41.2 per cent of the lampshades were of this type (Plate III, Fig. 2). Empire shades were found on twenty-two or 21.6 per cent of the lamps (Plate III, Fig. 1). Next was the bell type of shade with 14 or 13.7 per cent of the 102 lamps (Plate III, Fig. 3). Cylindrical shades were found on 13 or 12.7 per cent of the lamps (Plate III, Fig. 4). The oval and hexagonal shades were variations of the cylinder. The rectangular or square shade was a variation of the drum type of shade. The three latter types were not found as frequently (Table 66).

Table 66. Type of lamp shade.

	Number	: Per cent
Bell	14	13.7
Empire	22	21.6
Drum	42	41.2
Cylinder	13	12.7
Oval	2	1.9
Hexagon	2	1.9
Rectangular or square	7	6.9

The minimum size of shade for any living room activity

EXPLANATION OF PLATE III

Fig. 1. Basic shape of Empire shade.

Fig. 2. Basic shape of drum shade.

Fig. 3. Basic shape of bell shade.

Fig. 4. Shape of cylindrical shade.

PLATE III

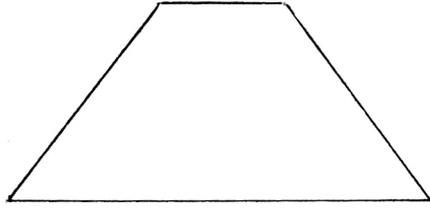


Fig. 1

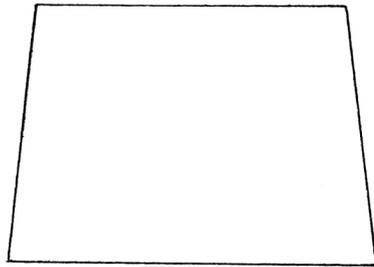


Fig. 2

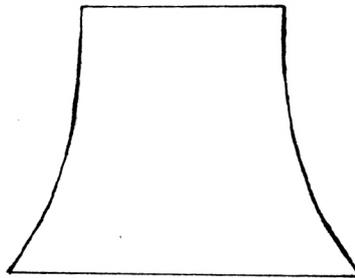


Fig. 3

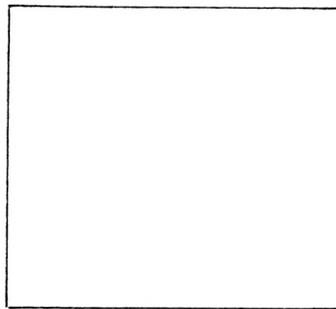


Fig. 4

is top eight inches, depth ten inches, and bottom 16 inches (28). A senior table lamp having a shade that measures 14 inches at the top, 13 inches in depth, and 16 inches at the bottom is even more desirable. Most of the shades were satisfactory in regard to the top diameter. About 54 per cent or 55 lampshades measured from 10 inches to 15 inches at this point. Seventeen were even wider than this. The shades measuring from five inches to ten inches at the top numbered 29. Some of these would be inadequate. All of these measuring less than five inches would be undesirable (Table 67).

Table 67 also shows that the bottom diameters were consistent with the former measurements as 63 or 61.8 per cent measured from 15 to 20 inches. Six were from 20 inches to 25 inches which would be satisfactory on a lamp 30 inches to 35 inches high. Thirty-four or one-third of the lampshades measuring under 15 inches bottom diameter would not provide sufficient light distribution for activities.

Although over one-half of the lampshades were of the proper depth, those measuring from five inches to ten inches might be too shallow to conceal the socket and lighted bulb (Fahsbender, 16). About 42 per cent of the lamps were in the latter group. Two lampshades were 15 inches to 20 inches deep. These were satisfactory since the lamp bases were tall enough to give a sufficiently wide spread of light.

Table 67. Dimensions of lampshades.

	Number	Per cent
Diameter of top		
1 to 5 inches	6	5.9
5 to 10 inches	29	28.4
10 to 15 inches	55	53.9
15 to 20 inches	17	16.7
Diameter of bottom		
5 to 10 inches	5	4.9
10 to 15 inches	29	28.4
15 to 20 inches	63	61.8
20 to 25 inches	6	5.9
Depth of lampshade		
5 to 10 inches	43	42.2
10 to 15 inches	57	55.9
15 to 20 inches	2	1.9
20 to 25 inches	-	--

Generally, translucent shades are the most usable as they cast a soft glow of light rather than sharp shadows (Comnery and Stephenson, 3). In some cases, such as television viewing or desk work, an opaque shade may be best. If a bright or dark color is desired in a shade, the opaque quality may be the answer. These should be used only against a dark wall to avoid excessive contrast. About three fourths or 77 lampshades were translucent, while the remainder were opaque (Table 68).

Table 68. Material of lampshade.

	Number	Per cent
Translucent	77	75.5
Opaque	25	24.5

Fabric was used frequently in lamp shades. Of the forty-five fabric shades, one-third were of rayon crepe, while the other materials were used less frequently (Table 69). Thirty-seven of the 102 shades were made of paper, while 25 were spun glass.

Table 69. Type of lampshade material.

	Number	Per cent
Fabric	45	44.1
Rayon crepe	15	33.3
Shantung	8	17.8
Organdy	-	--
Taffeta	6	13.3
Chintz	2	4.4
Linen	5	11.2
Homespun	9	20.0
Satin	-	--
Plastic	9	8.8
Mica	-	--
Spun glass	25	24.5
Paper	37	36.3
Other	6	5.9

In choosing a material, harmony with the lamp base as well as with other materials in the room must be considered (Faulkner, 6). According to the author eighty-three or 81.4 per cent of the lamps had harmonious base and shade materials. Those that did not appear harmonious composed 18.6 per cent of the lamps as seen in Table 70. In addition, the material

chosen should not fade and must be cleaned easily.

Table 70. Harmony of base and shade materials.

	Number	: Per cent
Yes	83	81.4
No	19	18.6

The most desirable color for a lampshade is a warm pastel (Goldstein and Goldstein, 8). Thirty-five or 34.3 per cent of the lampshades were of this type as shown in Table 71. White shades composing 31.4 per cent would be satisfactory. Warm colors predominated in the lampshades. Only 11 of the shades were of cool colors.

A shade lining should be white or ivory for maximum light reflectance (Fahsbender, 4). Seventy-four or 72.5 per cent of the lamps met this requirement. Nineteen linings were too dark to reflect light satisfactorily (Table 71).

Trim for lampshades must be used in moderation and must blend with the color of the shade (Faulkner, et al., 5). Metallic and colored trims were found to be the most popular as shown in Table 71. The author noticed colored designs that did not enhance the structure of the shade or express its purpose.

Up to this point little has been mentioned about the quality of light. It must be realized, however, that the quality is affected by the type and color of room surfaces

Table 71. Color of lamp shades.

	Number	Per cent
Outside		
White	32	31.4
Pastel-cool	2	1.9
Pastel-warm	35	34.3
Medium-cool	8	7.8
Medium-warm	23	22.6
Dark-cool	1	1.0
Dark-warm	2	1.9
Lining		
White	34	33.3
Ivory	40	39.2
Tan	4	3.9
Colored	15	14.8
Trim		
Metallic	27	26.5
White	12	11.8
Black	18	17.7
Colored	28	27.5

which may diffuse or reflect the light and the type of shade that is used (27). Probably of greatest importance is the type of diffusing device beneath the shade. Inner glass or plastic bowls may be used to diffuse the light, increase the light source size, and give relief from heavy shadows and distracting reflections (Sturrock and Staley, 29). It was found, however, that of the 102 lamps checked only 11 had such a diffusing device. The remaining 91 or 89.2 per cent were provided with a direct light bulb and no reflector (Table 72).

Table 72. Type of lamps.

	Number	Per cent
Direct	91	89.2
Indirect	11	10.8

Most of the direct lamps had a regular harp as seen in Table 75. Oftentimes, this places the bulb too high in the shade. Four were provided with wide harps which makes it possible to use an R-40 White Indirect bulb for greater light diffusion. Washers, clamps, chimney rings, and bridge-type fixtures were used less often than harps.

The two most frequently used diffusers are the CLM (Certified Lamp Makers) glass diffuser which shields the bulb from top viewing and the bowl shaped glass diffuser. The author observed that all but one which was a CLM diffuser were bowl shaped. It is interesting to note in this instance that the CLM Tag was considered of little importance by 24.5 per cent, not important by 62.8 per cent, and important by only 12.7 per cent of the persons interviewed (Table 73). The I.E.S. Tag which is no longer used followed this pattern closely (Table 74). Very few were acquainted with either tag.

Table 73. C.L.M. Tag (Certified Lamp Makers)

	Number	Per cent
Important	12	12.7
Little importance	23	24.5
Not important	59	62.8

Table 74. I.E.S. tag (Illuminating Engineering Society).

	Number	Per cent
Important	10	10.6
Little importance	24	25.6
Not important	60	63.8

All of the diffusers were made of glass. Nine were of white glass and two were configurated. White glass is preferable (28) (Table 75).

Table 75. Undersshade devices.

	Number	Per cent
Washer	7	6.9
Harp--regular	70	68.6
wide	4	3.9
Bridge	1	1.0
Chimney ring	3	2.9
Clamp	6	5.9
Reflector	11	10.8
Plastic	--	--
Glass	11	10.8
White glass	9	81.8
Configurated glass	2	18.2

If incandescent bulbs are used, the inside frosted type with three lighting levels is best (28). Sixty-one or 60 per-

cent of the bulbs were regular frosted bulbs, and 33 or 32.1 per cent were inside frosted three-light bulbs. Decorator bulbs may be white or tinted and only five of these were found in the table lamps. Clear bulbs are undesirable, but three were being used as shown in Table 76.

Table 76. Type of bulbs used in table lamps.

	Number	Per cent
Incandescent	102	100.0
Clear	3	2.9
Inside frosted (regular	61	60.0
Decorator	5	4.9
Three-lite inside frosted	33	32.1
R-40	--	--
Fluorescent	--	--

At least a 150 watt bulb should be used for reading and a 300 watt bulb is better (28). A bulb of 300 watts must be used for sewing. There was only one Three-Light (100-200-300) watt bulb in all of the table lamps that would meet this recommendation. Smaller bulbs did not add up to this amount. Table 77 shows that 30 lamps contained Three-Lite (50-100-150 watt) bulbs, while only nine contained 150 watt bulbs. Bulbs of 100 watts were found in 21 lamps. Various combinations of 25, 40, 60, and 75 watt bulbs were in the remaining lamps.

The most desirable location for the lightbulb in relation to the shade is centrally located vertically and slightly below

Table 77. Wattage of bulbs.

	Number	Per cent
25 watt	2	1.9
40 watt	8	7.8
60 watt	18	17.7
75 watt	13	12.8
100 watt	21	20.6
150 watt	9	8.8
50-100-150	30	29.4
Other	3	2.9

center horizontally (13). Table 78 shows that most of the bulbs were too high in relation to the shade. This is undoubtedly the result of frequent use of the regular harp. Only 13 or 12.7 per cent were located below the center. Ten were centrally located horizontally, but not vertically, while 13 or 12.8 per cent were not centrally located in either respect.

Certain factors besides the actual quality and quantity of light a lamp produces are influential in lamp selection. Cost, for example, was considered important by 79.8 per cent of the people interviewed and not important by only 2.1 per cent (Table 79). Nearly 80 per cent of the people considered construction important, while about 20 per cent thought it was not very important (Table 80).

Table 78. Location of bulb in relation to lamp shade.

	Number	Per cent
Centrally located vertically and horizontally	38	37.2
Centrally located vertically, above center horizontally	28	27.4
Centrally located vertically, below center horizontally	13	12.7
Centrally located horizontally, not vertically	10	9.8
Not centrally located vertically or horizontally	13	12.8

Table 79. Selection factor --cost.

	Number	Per cent
Important	75	79.8
Little importance	17	18.1
Not important	2	2.1

Table 80. Selection factor --construction of table lamp.

	Number	Per cent
Important	75	79.8
Little importance	13	13.8
Not important	6	6.4

The manufacturer's tag was important to only 18 persons,

and 43 thought it was not important (Table 81). Magazines and literature appeared to have limited importance for these people as 38 or 40.4 per cent said they were of little importance, 40 or 42.5 per cent of no importance, and just 16 or 17.1 per cent important (Table 82).

Table 81. Selection factor --manufacturer's tag.

	Number	Per cent
Important	18	19.2
Little importance	33	35.1
Not important	43	45.7

Table 82. Selection factor--magazines and literature.

	Number	Per cent
Important	16	17.1
Little importance	38	40.4
Not important	40	42.5

Written material is, perhaps, one of the simplest means of educating the public concerning proper lighting standards, but if this sampling of information is significant, the results present a problem in finding ways to educate the public effectively. Personal contacts through others besides salesmen might be recommendable, as 88 of the people considered what the salesman said of little or no importance (Table 83).

Table 83. Selection factor--what the salesman says.

	Number	Per cent
Important	6	6.4
Little importance	35	37.2
Not important	53	56.4

Proper lighting design must be applied to the individual family's needs--the height of the family members and the size of the furnishings. But certain minimum size dimensions and maximum placement dimensions must be considered as well as the type of lamps and lamp bulbs. In general, data for this study showed that 49 or 48.1 per cent of the table lamps were satisfactory for use, while 51.9 per cent were unsatisfactory (Table 84). This would indicate the need for improved table lamps in this area. Lamps can be both decorative and functional and still express the taste of individuals using them.

Table 84. Lamp satisfactory for use.

	Number	Per cent
Yes	49	48.1
No	53	51.9

SUMMARY

Ninety-four families were interviewed in three Manhattan areas--Gross, Phelps, Bellehaven additions-- concerning their

living room table lamps. Selection factors for the table lamps as well as quality of light and quantity checked by a footcandle meter were determined.

Most of the houses in which these families lived were built within the last five years, and the greatest number of lamps were purchased during this time, also. This may have been an important influencing factor in room harmony, for the findings show that over 70 per cent of the lamp designs and colors were harmonious with the room.

The number of lamps presently in the living rooms were inadequate, for even the greatest number of lamps purchased by most of the individual families was three during the past fifteen years. Many people do not realize that one portable lamp will adequately light only an area of 40 to 50 square feet (Commerly and Stephenson, 3). The author observed that many times a pair of lamps was purchased-- one for either side of the sofa. This was assumed to be an adequate number of table lamps although light was insufficient, and according to the author the choice of lamps lacked originality.

Most of the lamps were purchased either locally or in a nearby city showing the importance of the quality of table lamps selected for sale by merchants in this area. Home construction of table lamps seemed to show increasing popularity. People interested in making their own table lamps must have access to the proper dimensions for a table lamp as well as a

basic knowledge of design. There is much to be done in presenting adequate information that will reach these people.

Of the design principles considered, balance, proportion of lamp parts, and scale of the lamp in relation to the table were seen in the greater percentage of the lamps. On the other hand, over one-half of the lamps did not show continuity of design or equal emphasis on the base and shade. Seventy of the 102 lamps studied were not suited to their purpose.

Improper placement of table lamps for the activity was evident in most cases. It is possible that this was one significant cause of an inadequate quantity of light upon the various seeing tasks. Since placement is usually quite flexible, considerable improvement could be made in lighting local tasks if people would acquire and use the recommended distances for placement. The findings indicate, however, that people do not realize that they have placed their table lamps improperly or that their choice is not suitable for the activity.

General illumination was considerably lower than the requirement, emphasizing the finding that the number of table lamps as well as the bulb wattage was frequently insufficient. Although contemporary light conditioned interiors feature architectural lighting rather than a ceiling fixture for general illumination, many average homes cannot afford built-in lighting and, consequently, any type of fixture for general light is omitted. Even though the brightness ratios were satisfactory in most instances, it must be realized that both general and

local illumination were inadequate according to the recommended standards. Glare was not apparent in generally low levels of illumination and close brightness ratios.

It was encouraging to find that the greatest number of living rooms had the recommended wall, ceiling, and floor reflectances. The predominating single wall colors were light gray, medium "cocoa", and light green, while the ceilings were mainly off-white, ivory, or white. Neutralized cool or warm colors and neutrals comprised the largest number of floor covering hues.

Most of the lamps ranged from 21 to 30 inches high, the taller table lamps being more desirable. Sixty-three or 61.8 per cent of the lamp bases were from 12 to 16 inches high which would be too low to allow the shade to distribute sufficient light. The cylindrical shape with a multitude of variations composed the largest percentage or 63.7 per cent of the base shapes. Metal was found on 47.1 per cent of the bases while pottery, wood, glass, and porcelain followed in order. Gold, black, and brown were highest on the list of lamp base colors. Sixty-seven of the bases had ornament but less than half of this number could fulfill the requirements of good ornament.

The shapes of many of the shades were satisfactory as 22 shades were of the Empire style and 42 shades were drum shaped. Furthermore, most of the shades had the proper dimensions as

55 measured from 10 to 15 inches at the top, 63 measured from 15 to 20 inches at the bottom, and 57 were from 10 to 15 inches in depth. Over three-fourths of the shades were translucent with fabric, paper, and spun glass composing the largest number of materials. Sixty-nine of the shades were either of white or pastel colors, while 74 had white or ivory linings desirable for reflectance of light. Although 81.4 per cent of the lamps had harmonious base and shade materials, it is evident from these findings that the bases needed greater improvement in design and selection than the shades.

It is important to note that nearly all tasks require diffuse light and only 11 of the 102 lamps checked were indirect which would produce this type of light. The remaining 91 lamps were direct, many of which were constructed with a regular harp. Even though 4 lamps contained a wide harp, they did not have an R-40 white diffusing bulb in them. Even if a reflector cannot be placed in a lamp, a wide harp can usually replace the regular harp to provide an inexpensive source of indirect local light. All of the indirect lamps had glass reflectors and nine of these were made of white glass.

All of the lamps contained incandescent bulbs, and only three of these bulbs were clear. The remainder of the bulbs were frosted inside. Of the 102 lamps 33 had Three-Lite bulbs which were usually 50-100-150 watts. Sixty-six of the bulbs were placed too high in the shade to obtain the maximum light

upon the work surface. This is oftentimes the result of the esthetic desire to conceal the light socket even though the utility of the lamp is hampered. A more desirable solution would be to recess the socket into the base so the bulb may be slightly below the center and the lamp will retain a pleasing appearance.

Selection factors for table lamps showed that design, general appearance, and color were important to the greatest number of people. The activity for which the lamp is used, the cost, and construction were next in importance. Only 18 persons thought the manufacturer's tag was important, while 16 were influenced by magazines and literature. The salesman, I.E.S. Tag, and C.L.M. Tag were of the least importance to many of the people. Most of the people were not acquainted with either tag. Since magazines and literature, tags, and information given by the salesmen are unimportant to a large percentage of the people, it seems that personal contacts through adult classes or other means might be an answer to the problem of lighting education.

ACKNOWLEDGMENT

Appreciation is expressed to Prof. Dorothy Barfoot for her guidance and help in preparing this thesis; to Prof. O. D. Hunt for his assistance on the subject of lighting; and to the families in Gross, Phelps, and Bellehaven additions who made this study possible.

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APPENDIX

POSTAL CARD

Art Department
Kansas State College
Manhattan, Kansas

Dear _____,

A study is being made in the Art Department of Kansas State College on living room table lamps. Your name has been secured from the Statistical Laboratory by random sampling. If possible, I would like to arrange an evening interview with you during the week of _____. Please fill in the information requested on the enclosed card and return it to me. Your co-operation will be appreciated.

Sincerely,

Head of Department

Graduate Assistant

REPLY CARD
THIS SIDE OF CARD IS FOR ADDRESS



Miss Joanne Malicky
Art Department
Kansas State College
Manhattan, Kansas

POSTAL CARD
(reverse side)



THIS SIDE OF CARD IS FOR ADDRESS

I am willing to be interviewed. Yes _____ No _____

I have _____ living room table lamps.

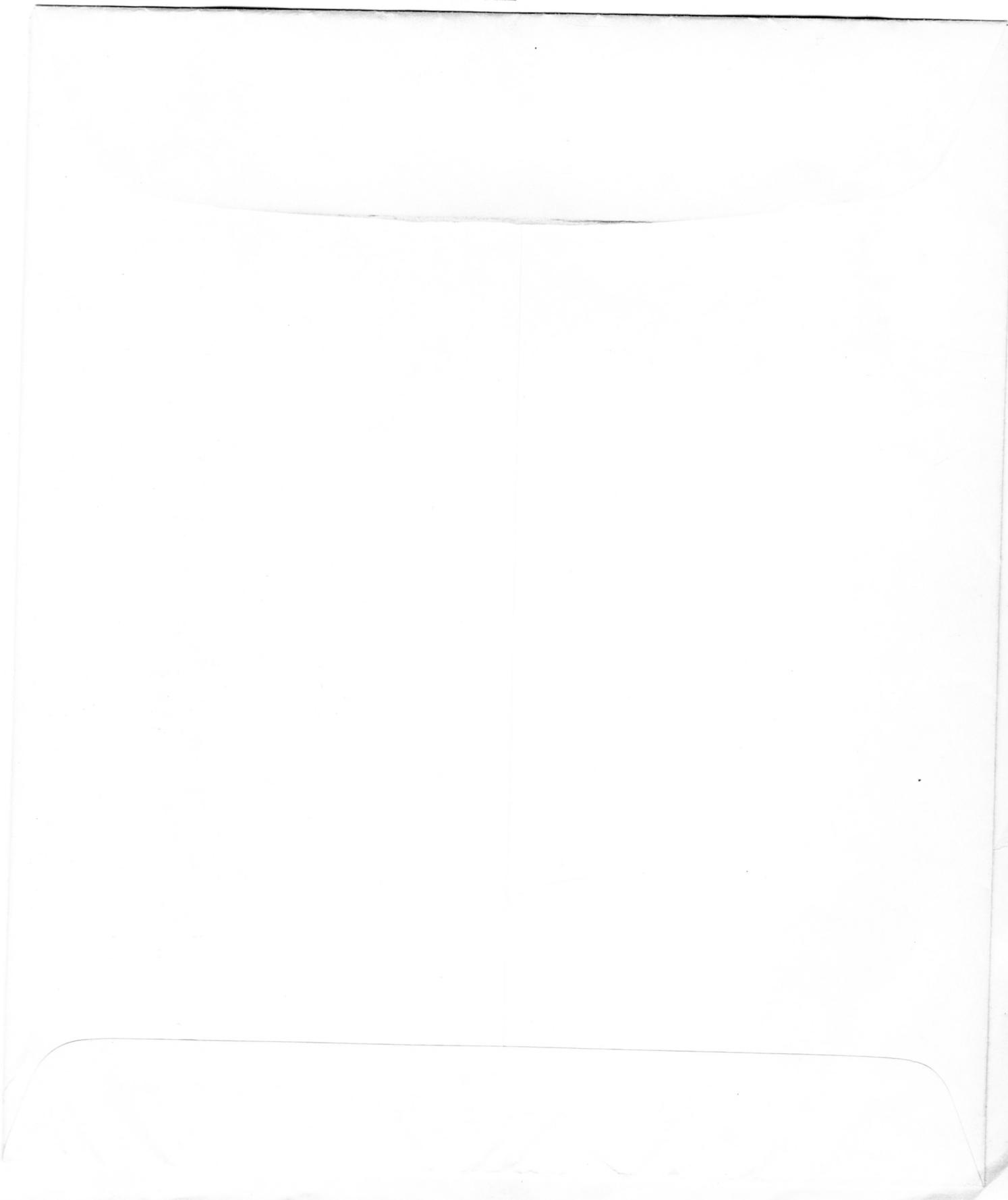
The stated week is satisfactory. Yes _____ No _____
If not, state an alternate week. _____

I would prefer the interview on M T W Th F (circle one)

Name _____

Address _____

SCHEDULE



SCHEDULE

Living Room Table Lamps

1. Name _____
2. Address _____
3. When was the house in which you are living built? (1 to 5), (5 to 10), (10 to 15), (15 to 20), (20 or more) years ago.
4. How many table lamps do you have in your living room? _____
5. Have you ever made a table lamp? _____ If so, how many? _____
6. How many table lamps have you purchased in the last 5 years? _____
10 years? _____ 15 years? _____
7. When selecting table lamps what factors do you consider of greatest importance?
(check)

	Important	of Little Importance	Not Im- portant
a. the design and general appearance			
b. color			
c. cost			
d. construction			
e. manufacturer's tag			
f. I.E.S. tag			
g. C.L.M. tag			
h. magazines and literature			
i. activities for which it will be used			
j. what the salesman says			

8. Where did you purchase your last two table lamps?
 - a. locally _____
 - b. nearby city _____
 - c. mail order _____
 - d. do-it-yourself _____
9. Are there sufficient, convenience outlets for your table lamps? Yes ___ No ___
10. Are the table lamps placed at the same level in the living room? Yes ___ No ___

DATE FOR LAST LAMP PURCHASED

Type of Lamp: direct or indirect

Lamp No. _____

1. When was this lamp purchased? _____ (year)
2. Is the design in harmony with the style (period) of the room? Yes ___ No ___
3. Is the color harmonious with the room and its furnishings? Yes ___ No ___
4. Is the lamp in scale with the table on which it is placed? Yes ___ No ___
5. Is the size of the shade in proportion to the base? Yes ___ No ___
6. What is the total height of the lamp? _____
7. Are the materials of the base and shade harmonious? Yes ___ No ___
8. Does the overall organization of the lamp seem well suited to its purpose? Yes ___ No ___
9. Does the lamp appear to be balanced? Yes ___ No ___
10. Is there equal emphasis on the base and the shade? Yes ___ No ___
11. Does the whole design have continuity? Yes ___ No ___
12. Is this lamp satisfactory for its use? Yes ___ No ___
13. Is there apparent glare from the lamp? Yes ___ No ___
14. In normal movement about the room do you see the lamp bulb? Yes ___ No ___

A brief sketch of table lamp:

30"					
24"					
18"					
12"					
6"					
0"					

Quantity Of Light and Lamp Placement

Activity	Average foot candles taken at center of activity and two extremities	General illumination taken at 4 points of room and averaged.	Dist. from floor	Location from center of activity			
				inches to right	left	back	front
___ a. reading							
___ b. handsewing							
___ c. writing							
___ d. studying							
___ e. table games							
___ f. TV viewing							
___ g. decoration							
___ h. others (list)							

What is the reflectance value of the following surfaces?

	Wall	Ceiling	Floor
Color - - - - -	_____	_____	_____
Per cent - - - -	_____	_____	_____

LAMP BASE

1. Height of lamp base (inches) _____.

2. Basic form of base

_____ a. cylinder

_____ b. sphere

_____ c. cone

_____ d. cube

_____ e. rectangular solid

_____ f. other (list) _____

3. Material of base

_____ a. pottery

_____ b. porcelain

_____ c. metal: ___brass, ___bronze, ___pewter, ___iron, ___aluminum

_____ d. wood

_____ e. glass

_____ f. plastic

_____ g. Leather

4. Color of base: _____

5. Is the lamp base in good proportion? _____Yes _____No

6. Is there ornament on the lamp base? _____Yes _____No

If so,

a. Is it related to the size of the form? _____Yes _____No

b. It is related to the shape of the form? _____Yes _____No

c. Does it grow out of the nature of the material? _____Yes _____No

d. Is it in harmony with the function of the lamp? _____Yes _____No

LAMP SHADE

1. Type of shade

- _____ a. Bell _____ c. Drum _____ e. Hexagonal
_____ b. Empire _____ d. Cylinder _____ f. Octagonal

2. Dimensions of shade

- a. diameter: top _____ inches bottom _____ inches
b. height _____ inches

3. Material (check one)

- _____ a. translucent _____ b. opaque

I. Kind of material

- _____ a. parchment
_____ b. fabric: _____ silk, _____ shantung, _____ organdy, _____ moire taffeta,
_____ georgette, _____ chintz, _____ linen, _____ homespun, _____ satin
_____ c. plastic
_____ d. mica
_____ e. spun glass
_____ f. paper

II. Color of material

- a. Outside _____
b. Lining _____
c. Trim _____

UNDERSHADE DEVICES

1. Type of fixture

- _____ a. washer _____ c. harp (wide)
_____ b. harp (regular) _____ d. bridge type
_____ f. bowl reflector
material: _____ (1) plastic
_____ (2) glass: _____ opal, _____ opalescent, _____ alabaster

2. Type of bulb

- _____ a. incandescent
_____ (1) clear _____ (4) silvered bowl
_____ (2) inside frosted _____ (5) Three-Lite
_____ (3) decorator bulb _____ (6) White indirect R-40
_____ b. fluorescent
_____ (1) daylight _____ (5) white
_____ (2) standard cool _____ (6) Deluxe cool
_____ (3) standard warm _____ (7) Deluxe warm
_____ (4) soft white
c. wattage of bulb or bulbs _____
d. location of bulb in relation to lampshade
_____ (1) centrally located - both vertically and horizontally
_____ (2) centrally located vertically, above center horizontally
_____ (3) centrally located vertically, below center horizontally
_____ (4) centrally located horizontally - not vertically
_____ (5) not centrally located vertically or horizontally

THE DESIGN AND FUNCTION OF LIVING ROOM TABLE LAMPS IN
SELECTED RESIDENTIAL AREAS OF MANHATTAN, KANSAS

by

JOANNE MALICKY

B. S., University of Nebraska, 1955

AN ABSTRACT OF A THESIS

submitted in partial fulfillment of the

requirements for the degree of

MASTER OF SCIENCE

Department of Art

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

1957

It is evident in both portable lamps and fixtures that modern lighting has lagged far behind the numerous improvements in homes today. Since nearly one-half of the total light in the living room comes from portable lamps, it was essential to investigate the adequacy of living room table lamps in function as well as design. In the Manhattan area little research had been done concerning the design and function of table lamps. The purpose of this study was to determine the adequacy of table lamps in various activity areas, the extent to which table lamps meet the established principles of design, and the factors that influenced the selection of table lamps.

Numerous references upon the subject of lighting were reviewed which included the history, the utilitarian and decorative functions, certain specifications, and the maintenance of lamps.

The data for this study were secured from certain selected residents of Gross, Phelps, and Bellehaven additions in Manhattan, Kansas. Each person selected by random sampling was sent a return postcard and/or contacted by telephone to arrange for an interview. All of the 94 persons visited filled out a schedule cooperatively with the author. In each home the last living room table lamp purchased of a direct and/or indirect type was checked giving a total of 102 lamps. A footcandle meter was used to determine the quantity of light

and surface reflectance values. The data were tabulated, analyzed, and evaluated according to recommended standards.

Of the 94 families interviewed concerning living room table lamps, approximately one-third were in each of the three Manhattan areas. Most of the lamp designs and colors were harmonious with the room, for many of the homes had been built and the table lamps had been purchased within the last five years. Local purchasing of lamps was most commonly found in this study.

The number of lamps in the living rooms were inadequate for proper lighting. Improper placement of table lamps for the various activities was evident in most cases as well as an insufficient quantity of light upon the seeing tasks. General illumination in the living room was considerably lower than the requirement. Since light at the activity area was low, the brightness ratio between this area and the general illumination was satisfactory in most cases.

The greatest number of living rooms had the recommended wall, ceiling, and floor reflectances as many of the surfaces were neutralized, light values of colors.

Balance, proportion of lamp parts, and scale of the lamp in relation to the table were in the greatest percentages of the design principles considered, while design continuity, equal emphasis on the base and shade, and suitability to purpose were not evident as frequently, according to the author.

The largest number of lamp bases were of inadequate height. Of the base shapes, cylindrical variations were used frequently, and of the materials used, metal composed the largest number. Over one-half of the bases having decoration could not fulfill the requirements of good ornament as observed by the author. The shapes and dimensions of most of the shades were satisfactory. The largest number of lamp shades were translucent. Of the materials used for shades, fabric was in the greater percentage as were white or pastel colors.

Even though nearly all tasks require indirect or diffused light, only eleven of the 102 lamps contained a reflector to produce this type of light. All of the table lamps contained incandescent bulbs, and most of these were inside-frosted. Over one-half of the bulbs were placed too high in the shade to give the maximum light upon the work surface.

The selection factors for table lamps as rated from greatest to least importance by the persons interviewed were as follows: design and general appearance, color, activity for which it is used, cost, construction, manufacturer's tag, magazines and literature, C.L.M. Tag, I.E.S. Tag, what the salesman says. Thus, it is evident that it is difficult to educate the public concerning proper lighting standards.