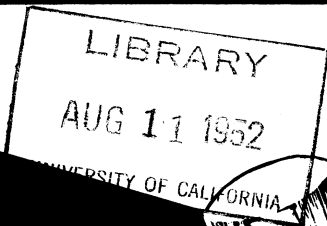


Better Home Lighting

LIFE SCIENCES
LIBRARY



Cir. 439

EXTENSION SERVICE
Shawnee Brown, Director
Oklahoma A. & M. College
Stillwater, Oklahoma

BETTER HOME LIGHTING

EVELYN FUNK
Home Management Economist

Good illumination, like air, food and water, is necessary for good health. Correct lighting makes the home more attractive, safeguards eyesight, promotes good health and a cheerful disposition, decreases accident hazards and promotes safety.

There is no need and little reason for a home being poorly lighted. Adequate and convenient lighting can be obtained by careful planning and a reasonable expenditure of money.

PLAN FOR LIGHTING

Good lighting does not just happen. Someone spent time, thought and study to get good lighting in the home. In planning and buying, consider the cost of equipment, the amount of money available to spend, the family's activities, the principles of good lighting and the appearance of lighting equipment.

Buying fixtures for the home means an expenditure of a considerable amount of money. It is important to make a good selection the first time so that a change in equipment is not needed soon.

In more normal building times, home management economists teach that 2 or 3 percent of the total cost of a house should be allowed for lighting fixtures and about the same amount or more for wiring. Ceiling fixtures give general illumination which is not enough light for reading and other close seeing tasks, so the budget for lighting should include floor lamps, table lamps and wall lamps.

Provide adequate wiring for the amount of equipment to be used in your home. Make a plan that will include an adequate number of switches, convenience outlets and lighting outlets.

ESSENTIALS OF GOOD LIGHTING

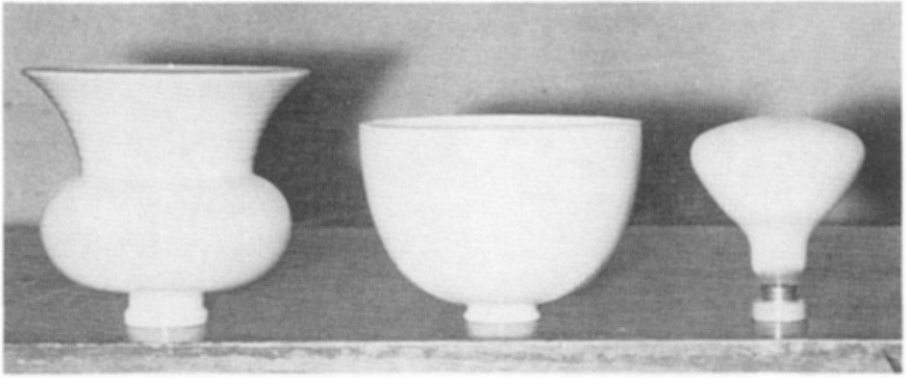
(1) Proper Amount of Light:

Furnish enough light for general and close seeing tasks. Use large enough bulbs and tubes and have them in enough places.

(2) Good Quality Light:

In addition to having the proper amount of light, good quality light is essential to insure comfort, safety and satisfaction for the family's eyes. Good quality light should be softly diffused, well shaded and well balanced. With a glass or plastic diffusing bowl under the shade of a portable lamp, (Ill. 1 and 2) the light is

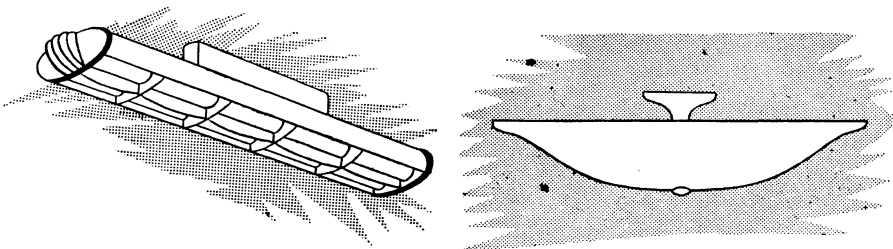
broken up and diffused throughout the area of the bowl. This softens shadows and is easy on the eyes. Light may be diffused by reflecting it against walls and ceilings with dull finishes. If shaded, a white indirect-light R-40 bulb is satisfactory without a bowl. (Ill. 3). In the case of prolonged studying the brightness is high. It reflects uncomfortable light from the shiny paper into the eyes.



Ill. 1, 2, and 3. Diffusing light for portable lamps.

(3) Well Balanced Lighting:

There should be balance in the amount of general lighting, from the ceiling fixtures, and special lighting for close work, from the portable lamps. A good proportion for general light in the room is one-tenth as much as is on the page you are reading under the portable lamp. To read in a small amount of bright light completely surrounded by darkness strains and tires the eyes. (Ill 6).



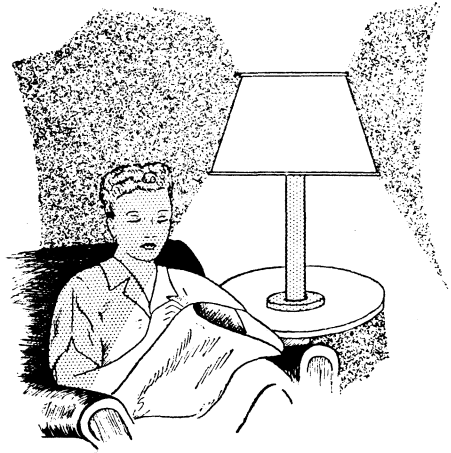
Ill. 4, 5. Diffusing light for ceiling fixtures.

(4) Freedom From Glare:

Glare is sometimes defined as light wrongly directed or poorly distributed.

Direct Glare comes from bare bulbs or from lamps and fixtures with shades too transparent to diffuse the light, and it shines directly into the eyes.

Indirect Glare is the result of diffused light striking a shiny surface; mirror, varnished table top, glossy paper or highly polished metal.



Ill 6. Glare by contrast—hard on the eyes.

Glare by Contrast is produced with only one lamp turned on in a dark room. General lighting helps lessen glare by contrast.

MEASURING LIGHT

Light can be measured in much the same way that water, cloth, and temperature can be measured. The unit used for measuring light is called a foot-candle. The instrument used for measuring light is called the light meter.

On a clear day in midsummer in open spaces, the sun supplies 10,000 foot-candles of illumination on the earth. On a bright day under a shade tree the illumination would probably be 500 to 1,000 foot-candles; inside a building a few feet away from the window, 200 foot-candles.

The amount of light that will be needed for ease in seeing is determined by several factors. Three of these factors are: (1) the type of work, (2) the length of time required for accomplishing the task, (3) the amount of light reflected from the surrounding areas. The following table, approved by the Illumination Engineering Society, *may be used as a guide to help provide the correct amount of light needed for various tasks.

Level	Foot Candles	Seeing Tasks
A	70-150	For difficult seeing jobs: fine needle work, sewing on dark material.
B	30-70	For moderately critical jobs: reading small type, writing, studying, average sewing.

*"Recommended Practices of Home Lighting," Illuminating Engineering Society.

Level	Foot Candles	Seeing Tasks
C	15-30	For average seeing jobs: reading large type, dressing, periodic sewing on light material.
D	7-15	For general seeing jobs only: card playing.
E	3-7	For rough seeing jobs only: walking through house, general lighting in dining room, halls, or stairways and stair landings.

The Home Demonstration Agent or a representative of the local power company may have a light meter to use in measuring the light in your home. If you cannot use a light meter to actually measure the amount of light at the various centers of activity in your home, then the next best thing that you can do is to be sure the light is comfortable to your eyes.

SELECTION OF FIXTURES FOR COMFORTABLE SEEING

General Purpose Lighting: "Ceiling fixtures provide general lighting in a room. They supply the softening effect or 'sky area' necessary to well balanced lighting. General illumination furnishes light for moving through a room, for games, for talking and listening. It adds light for close seeing tasks which are done under portable lamps. The ceiling fixture provides a uniform light which coordinates or ties together the light from all the lamps in the room. Ceiling fixtures give general purpose lighting for convenience, safety and greater eye comfort."

Special Purpose Lighting: The chief function of portable lamps is to bring light close to the user to provide light for special seeing task. Portable lamps of recommended design contribute light for special tasks. Too often portable lamps are selected solely for their decorative qualities at the expense of their primary function. Both must be considered in their selection.

Lamps are equipped with diffusing bowls that soften the downward lighting and direct some light to the ceiling. This is not of sufficient quality to serve as general lighting.

SIZE OF FIXTURES

"The diameter of a round fixture should be at least as wide in inches as the width of the room in feet, or preferably at least as wide as the room diagonal in inches. The width should never be less than 12 inches in any main-used room. The larger the size or area of the glassware the less its brightness and the more comfortable lighting is given. In brief, the larger the fixtures, the better it is, and also the more fashionable."

*Rural Electrification Administration, "Co-op Electrification Adviser Training Outline"

RELATION OF SIZE OF BULB TO BOWL

*"The size of the bowl or reflection surfaces should be large enough for the size bulb needed inside it, otherwise, the brightness is too great. For halls and storage rooms you can use as a minimum basis in your figuring—"one watt per square foot of floor space" to determine the size incandescent bulb or bulbs needed in a ceiling fixture. Thus, a hall 4 by 15 would have 60 square feet in it and would use at least a 60 watt bulb in its ceiling fixture. "Two Watts per square foot" is suggested for utilitarian fixtures in work rooms. And to this add local light at main work areas. There is also a relationship between fixture size and size incandescent bulb that is to be used in the fixture.

In single-bulb fixtures, incandescent bulb wattage should correspond with fixture diameter as follows:

Fixture diameter in inches	Lamp bulb wattage in fixture
3 1/2	40 or 50
4 or 5	40 or 60
6 or 7	60 or 40
8 or 9	75 or 60
10	100 or 75
12	150 or 100
14	150 or 200
16	200 or 300
18	300 or 500
22-24	750 or 1,000

The wattage given first above is the more desirable one but the second one may be used depending on the glassware and the background color. Wider diameter fixtures (16, 18, 22, 24) can use lower wattages than these given above. The figures given opposite 18, 22, and 24 inch fixtures apply to non-residential interiors. Wattage for home use would not be higher than 300 to 450 watts."

SPECIFICATIONS FOR GOOD READING AND STUDY LAMPS

Type of Lamp	Height in inches of lamp from bottom of shade to floor	Diameter of bottom of shade	Diameter of reflector	Bulb Size
Floor Senior	49	18 1/2-20	10	three-lite bulb 100-200-300
Swing-arm	47	16 minimum	8-9	three-lite bulb 50-100-150
Table (End Table)	15-17 (to table top)	16	8-9	three-lite bulb 50-100-150
Dressing Table (seated)	15-16 to center of shade (to dresser top)	9 minimum		three-lite 30-70-100 or 100 watt

Type of Lamp	Height in inches of lamp from bottom of shade to floor	Diameter of bottom of shade	Diameter of reflector	Bulb Size
Dressing Table (standing)	21-22 to center of shade (to dresser top)	9 minimum		three-lite 30-70-100 or 100 watt
Reading in bed	20 above mattress	16	8-9	three-lite frosted bulb 50-100-150
Wall a. (single lamp reading in chair)	48	13	8	three-lite bulb 50-100-150
Wall b. (two lamps for studying)	15 above desk	10	6	100 watt frosted bulb
Wall c. (single lamp for reading in bed)	30 above mattress	13	8-9	three-lite bulb 50-100-150
Kitchen Under Cabinet Fixture	50-58	What to use: 20 watt fluorescent tube for each 25-30 inches of work counter.		
Above Stove	58	What to use: 1. Shielded unit with 25 or 40 watt fluorescent tube. 2. Shielded unit with two 60 watt lumiline tubes (end to end). 3. Shielded unit for two 60 watt frosted bulbs spaced 18 inches apart. (Lamps are mounted parallel to wall).		
Above Sink		What to use: 1. An unshielded surface fixture (behind valance board) using two 25 watt fluorescent tubes. Alternates are a 75 watt flood light bulb or a 150-watt standard lamp bulb in a 12 inch enclosing globe.		
Laundry	Ceiling Fixture	12-14	metal reflector	150 watt silvered bowl bulb
Bathroom	Three fixtures are recommended: One fixture placed on each side of the mirror (using either fluorescent or incandescent lamp shaded bulbs). The third is mounted on the ceiling above mirror.			60 watt incandescent 15 watt fluorescent

RECOMMENDED TYPES OF LIGHTING FIXTURES

LIVING ROOM

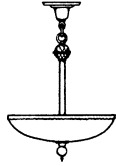
For General Lighting:



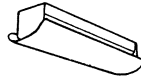
Semi-Ceiling
2-150 Watt
Bulbs



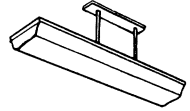
Drop Style
2-150 Watt
Bulbs



Drop Style
2-150 Watt
Bulbs



Semi-Indirect
Fluorescent
Min. Watts 40



Semi-Indirect
Fluorescent
High Ceiling
Min. Watts 80

SPECIAL LIGHTING:

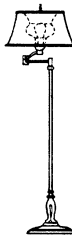
Portable floor lamps and table lamps



Floor Lamp
Incandescent-
Fluorescent
Height 60"
32" Watt Cir-
cular Fluor-
escent Tube
100-200-300
Watt
3-Lite Bulb



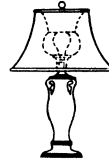
Floor Lamp
Incandescent
Height 60"
100-200-300
Watt
3-Lite Bulb



Swing-Arm
Lamp
Height 56"
50-100-150
Watt



Table Lamp
Wide Beam
Height 23"
50-100-150
Watt 3-Way
Bulb



End Table
Lamp
Height 25"
50-100-150
Watt

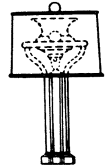


Table Lamp
Incandescent-
Fluorescent
Height 28"
50-100-150
Watt

DINING ROOM

For General Lighting



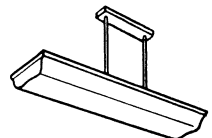
Semi-Indirect
Diffusing Bowl
100-200-300
Watts



Semi-Indirect
Diffusing Bowl
Min. Watts
150



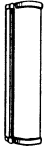
Semi-Ceiling
2-150 Watt
Bulbs



Semi-Indirect
Fluorescent
High Ceiling
Min. Watts 80

BEDROOM

For General Lighting:



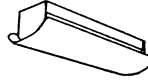
Bracket
Fluorescent
20-40 Watts



Semi-Direct
120 Watts
Filament

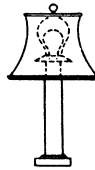


Indirect
Silvered Bowl
150 Watts
14" Dia.



Semi-Indirect
Fluorescent
Min. Watts 40

Special Lighting:
Lamps for dressing table



Dressing Table
Lamp
Height 19"
30-70-100
Watt Bulb



Dresser Lamp
Height 26"
30-70-100
Watt Bulb

KITCHEN

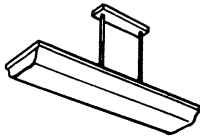
For General Lighting:



General Dif-
fuse
Globe-Fila-
ment
Min. Watts
150
Dia. 12"



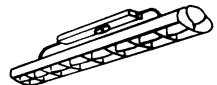
Wall Bracket
Filament
Min. Watts 60
Dia. 4"



Semi-Indirect
Fluorescent
High Ceiling
Min. Watts 80

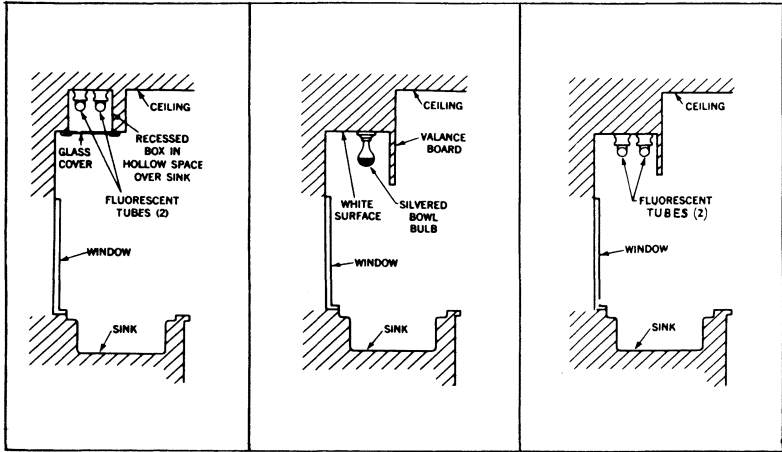


Wall Bracket
Fluorescent
10 Watts per
Running Ft.



Semi-Direct
Fluorescent
Min. Watts 80

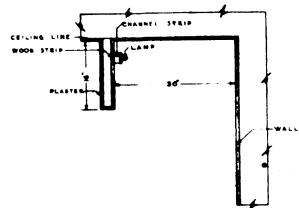
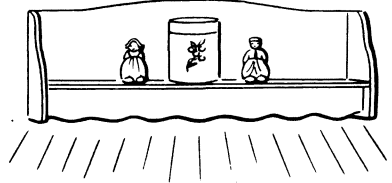
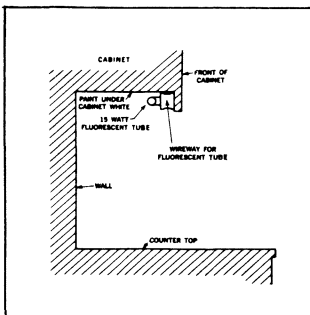
For Special Lighting:
Above Sink



Soffit Lighting over Sink—2—20 watt fluorescent tubes. Ceiling Fluorescent Fixture—2—40 watt tubes. Counter Lighting—Fixture holds 1—20 watt fluorescent tube. Available also in size to hold 1—15 watt tube.

Shelf Above Stove

Above Kitchen Counter



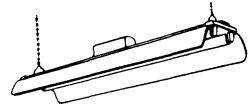
Construction Detail of 30 watt fluorescent tube mounted inside the hood.

LAUNDRY

Special Lighting:



Direct Filament
Silvered Bowl
Bulb
Min. Watts
150



Direct Fluorescent
Min. Watts 40

BATH

General and Special Lighting:



Wall Bracket
Filament
Min. Watts 60



General Dif-
fused
100 Watts
10" Dia.



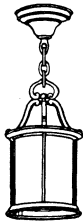
Wall Bracket
Fluorescent
150 Watts
Tube Dia. 1 1/2"

ENTRANCES AND HALLS

General Lighting:



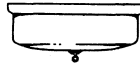
Lantern
Bracket
Min. Watts 40
Dia. 6"



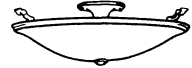
General Dif-
fused Lan-
tern
60 Watts
Dia. 8"



Ceiling Lan-
tern
Filament
Min. Watts 40
Dia. 6"



Semi-Direct
Min. Watts 80
Dia. 12"



Semi-Indirect
Filament
Min. Watts 80
Dia. 12"

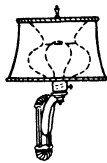
UTILITY

Special Lighting:

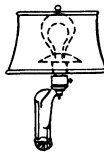
Studying, Sewing, and Reading



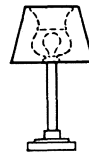
Bridge Lamp
Height 56"
50-100-150
Watt Bulb



Pin-to-wall
Lamp
50-100-150
Watt Bulb



Pin-to-wall
Lamp
100 Watts
For dresser
lamps use
two



Study Lamp
Height 25"
50-100-150
Watt Bulb



Adjustable
Pin-to-wall
Lamp
100 Watts

COLOR AFFECTS LIGHT

The quantity of light available for seeing in a room depends greatly on the colors and finishes of the walls, ceiling, and woodwork. Dark colors and finishes absorb light, while white light ones tend to reflect light.

REFLECTION FACTIOS OF PAINT, PAPER, AND WOOD FINISHES FOR INTERIORS*

<u>Color</u>	<u>Percent of Light Reflected</u>
Light Wall Finishes	
Cream	75
Gray	75
Yellow	75
Buff	70
Green	55
Blue	55
Medium	
Yellow	65
Buff	63
Gray	55
Green	52
Blue	35
Dark	
Gray	30
Red	13
Brown	10
Blue	8
Green	7
Wood Finish	
Maple	42
Satinwood	34
English Oak	17
Walnut	16
Mahogany	12

Excessive dirt, dust or grease on lighting fixtures or ceiling and walls wastes light. Keep all light fixtures, ceiling and walls clean to get more light for your money.

LAMP SHADES

Every portable lamp should be shaded. The amount of space to be lighted depends on the height of the lamp, the size and shape of the bulb and the size and shape of the shade. The higher the wattage of the lamp, the

*"Recommended Practice of Home Lighting"—Illuminating Engineering Society, New York

larger should be the shade. Lamp shade sizes are designated by the diameter at the bottom of the shade. To select lamp shades, keep these points in mind:

- Deep enough to hide light source
- Wide enough to let light spread
- Thick enough to prevent spottiness
- White, dull lining for efficiency
- White, ivory, pale yellow, light tan if unlined
- Low brightness for television viewing
- Open at top for general lighting
- Well constructed
- Proper height for chair and person nearby
with lower edge of shade at eye level

TELEVISION LIGHTING

The mistake is often made by darkening a room for television the same as for a movie. This is not correct because the television screen is both brighter and smaller than a movie screen.

The use of good lighting avoids eyestrain caused by the contrast between the bright light of the television screen and the dark surrounding area.

It is important to have balanced lighting in the room. This may be achieved by using the floor and table lamp that is in the room normally. These may be turned to low or medium level if they are a three-lite bulb. Wall to wall valance lighting is effective when located back of viewer.

Place the lamps so that direct light will not fall onto the television screen. Locate lamps some distance away at left and right of set. Avoid exceptionally bright spots on walls near the television set.

Arrange chairs so viewers sit at a distance at least ten times the width of the screen (about 8 feet away for a 10-inch screen, 10 feet away for 12½ inch screen, etc.)

VALANCE LIGHTING

In rooms where ceiling fixtures are not used built-in valance lighting for general lighting purposes may be used. Strips of fluorescent tubes can be mounted behind the window valances. If the frame of the window is ten inches below the ceiling height, leave the top of the valance open. This allows the light to be directed toward the ceiling. If the window frame is closer to the

ceiling, close the top of the valance to avoid too intense a light on the ceiling. With the top of the valance closed, the full quantity of light will stream down the draperies, curtains, or Venetian blinds into the room. The lighter the colors of your draperies or blinds, the more light will be reflected into the room.

CLEANING AND CARE OF LAMPS

Diffusing Bowl:

*As a part of the regular weekly cleaning dust glass, diffusing bowl and bulbs in your lamps. Diffusing bowls should be washed often. To clean a glass or plastic diffusing bowl: disconnect lamp from outlet; let lamp cool; remove light bulb; loosen screws and remove diffusing bowl; wash bowl in warm soapy water; rinse well, wipe glass of light bulb with damp cloth; dry diffusing bowl inside and out; examine socket, remove bugs by upending lamp or by using a vacuum cleaner; replace bowl and tighten screws; replace light bulb, connect and turn on to check.

Shades:

*As a part of the regular weekly cleaning of the house, clean the shades of the lamps by one of these methods: brush with soft clean brush, or use a shade cleaning vacuum attachment, or wipe off with clean bath towel; wash brushes and towel before using again.

When shades are badly soiled it may be necessary to wash or dry clean them. The following may be helpful: Dust with brush, vacuum cleaner or bath towel. Dry clean the following types of shades: Glued silk, glued rayon, chintz, linen, appliqued fabric, printed fabric. Wash stitched silk or rayon shades. Use gum eraser on fabric covered paper. Wipe parchment, spun glass, or plastic with sudsy cloth; rinse with clean, damp cloth; let dry. Remove cording, decorations from plastic shade before cleaning, clean separately, replace. Use plastic wax on plastic shades to lessen dust-catching problems of plastic material.

Lamp Bases:

With good care the base of a lamp will outlast several shades. The following suggestions may be helpful:

*Dust regularly with clean, soft cloth.

Avoid scratching or rubbing harshly.

Metal: Apply wax thinly, except on chromium.

Washing or furniture polish ruins lacquer.

Avoid abrasives which scratch finish.

Wood: Clean with furniture polish, wax.

Others: (glass, pottery, marble, onyx):

Wash with warm soapy water, rinse, dry.

Do not get cord or socket wet. Wipe dry.

*"Co-op Electrification Adviser Training Outline," Rural Electrification Administration, U. S. Department of Agriculture.

Acknowledgements

Acknowledgements are extended to the following for many of the ideas used in the preparation of this bulletin:

- "Recommended Practices of Home Lighting," Illuminating Engineering Society, New York
- "Co-op Electrification Adviser Training Outline," Rural Electrification Administration, U. S. Dept. of Agriculture, Washington, D. C.
- "See Your Home in A New Light," Lamp Department, General Electric Company, Cleveland, Ohio.
- "Eyesight Protection Through Adequate Home Lighting," Westinghouse Electric and Manufacturing Co., Lamp Division, Bloomfield, New Jersey.

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