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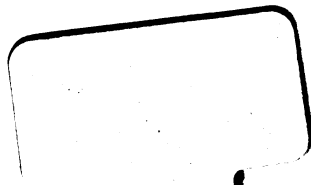
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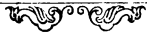
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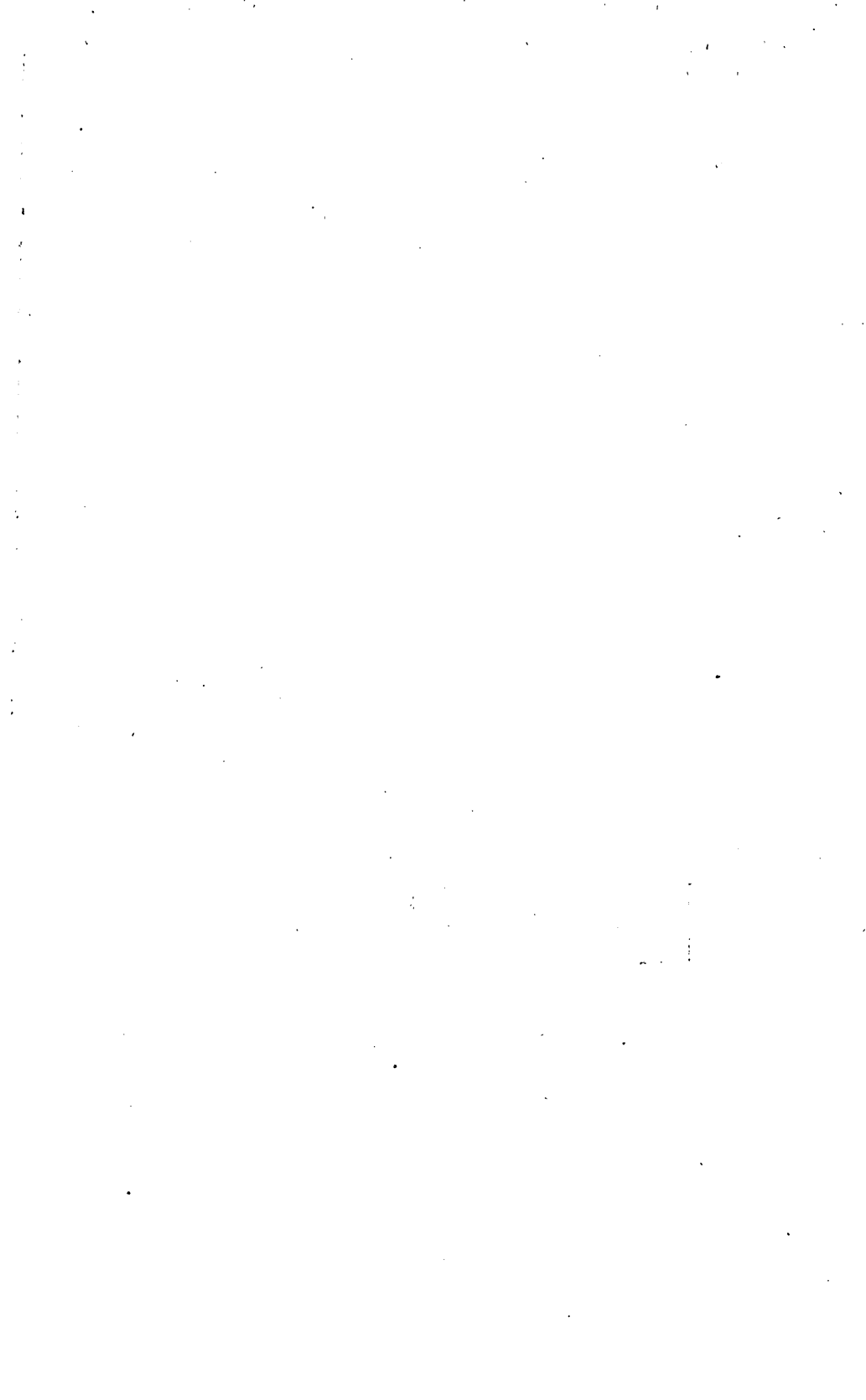
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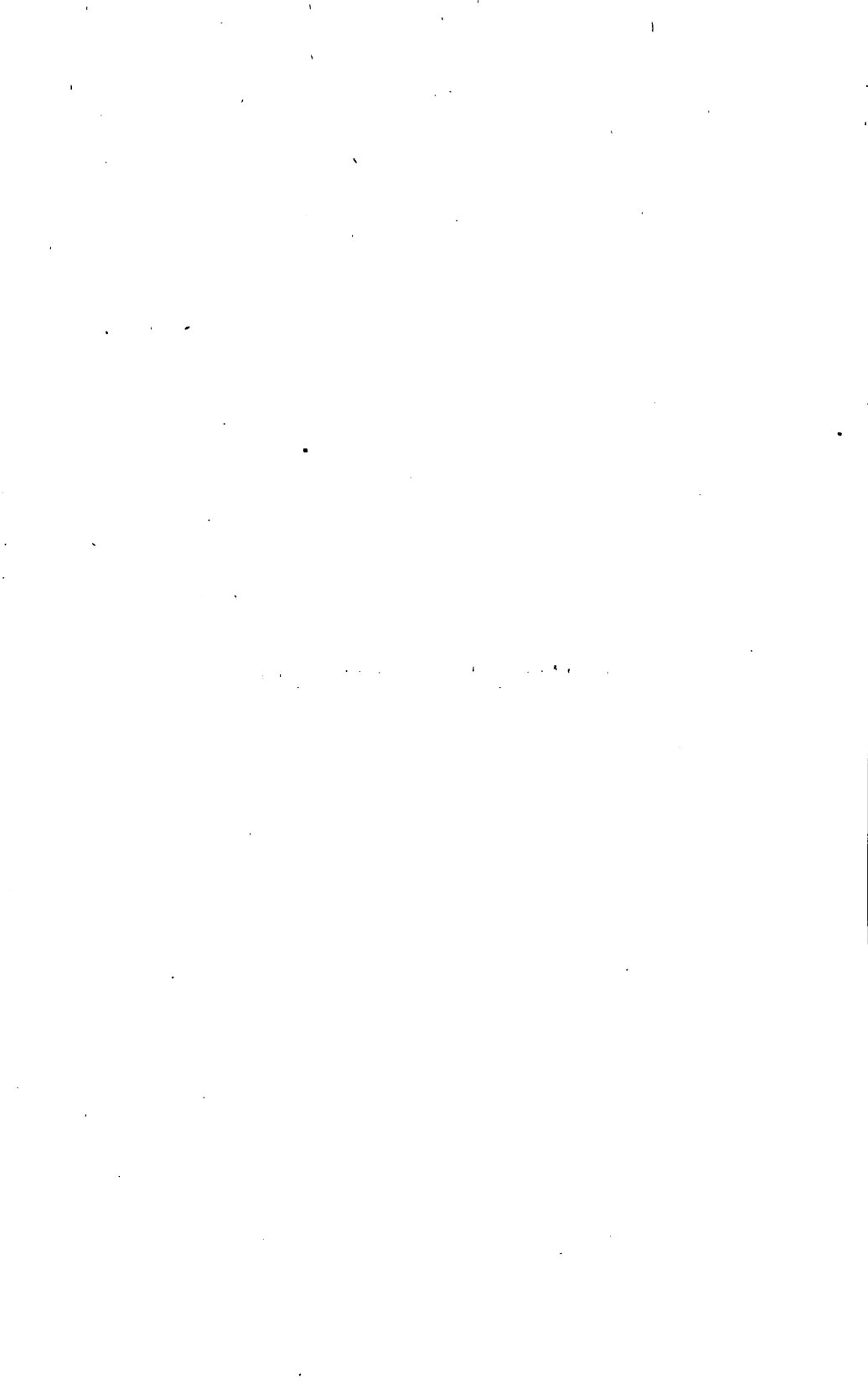
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DECORATIVE ELECTRICITY.



DECORATIVE
ELECTRICITY

Alice M.
MRS. J. E. H. GORDON.

WITH
A CHAPTER ON FIRE RISKS

BY
J. E. H. GORDON, B.A., M. INST. C. E.,
DIRECTOR OF AND CONSULTING ENGINEER TO THE METROPOLITAN
ELECTRIC SUPPLY COMPANY.

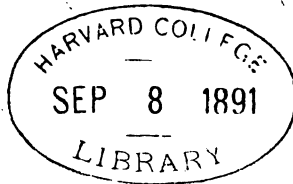
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PREFACE.

PART of this book has already appeared in the February number of the "Fortnightly Review." I have the editor's kind permission to reproduce it, and have added to it many practical details, such as I sincerely hope will be of some slight assistance to anyone wishing to install the electric light in their house.

The drawings have been made by Mr. Fell from fittings which are in actual practical use.

1, QUEEN'S GATE GARDENS, LONDON, S.W.

March 2, 1891.

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DECORATIVE ELECTRICITY.



CHAPTER I.

THE INSTALLATION.

As business and pleasure become year by year more closely crowded into our lives, and as life itself becomes more full of excitement and events, the importance of rest and home comfort increases, and what were the superfluous luxuries of our ancestors become necessities to the overstrained nerves of the men and women of to-day.

In our English climate and with our English habits so large a proportion of our lives is passed by artificial light, that the nature of that light

becomes an all-important factor in matters of comfort and discomfort, rest and fatigue.

The object of this book is to consider how far the new illuminant, electricity, can aid us in our hours of work, and conduce to the comfort and peace of our hours of rest and recreation. In electric lighting, as in other matters, there is a right and a wrong way of doing things, and in the present rage for work to be cheap at any cost—it is no wonder that much electric lighting is unsuccessful, both artistically and mechanically, when every plumber and gas-fitter, a little more enterprising than his fellows, calls himself an “electrical engineer” and competes, in happy confidence in the ignorance of the public, with firms who have reputations to lose and who have given years of attention to the subject.

Electrical firms have had to be patient for many a weary day, while the public were making up their minds whether to adopt the light or not; and now it is the public's turn to be patient, for

the demand at present is greater than the skilled supply.

It is more satisfactory to have the installation put in by one of the first-rate firms who thoroughly understand their business, than to be in haste and put in cheaper and inferior work; as, without care in the instalment, electricity is apt to be a fickle illuminant.

When, after due consideration, it has been decided what firm to employ, an hour is appointed for a foreman to arrive to take orders, and to make an estimate for the work that is to be done.

The young electrician arrives with his notebook, and with the catalogue of fittings belonging to his firm. He knows the practical part of his work thoroughly well, and has the fire insurance rules by heart, and is entirely to be depended upon for the scientific details of his business; but of the requirements of a gentleman's house, and the best arrangement of lights

in a lady's boudoir, he knows nothing. On the other hand we cannot help being sorry for him, for often the master and mistress, having sent for him before previously discussing their plans, not only do not know their own minds, but seldom agree between themselves as to what they want.

The master wishes to get all the light possible, and the mistress to have the light as becoming and pleasant as possible. It is rather difficult to reconcile these two wishes, and after much discussion the master testily exclaims :

“ My dear, what is the good of going to all this expense if you will tie the light up in bags? ”

The electrician, during all this, stands by with “patient inattention,” sucking his pencil, and only wishing that he could get his orders and go to the two or three other houses that his firm have directed him to visit before dinner-time.

When plans are discussed with him, it will generally be found that his ideas are limited to brass and copper pendants and wall-brackets with

cut-glass globes, and he has a superstitious distrust of all novelties in electrical decorations.

It is best to make a rough map of the rooms, with crosses to indicate where the lights are to be placed, before the electrician arrives; this will save time and form a basis upon which to work.

It must be realized that alterations made during the progress of the work, that is to say after the principal mains have been run, frequently involve an amount of expense and trouble entirely disproportionate to their importance. When the circuits have been arranged, a comparatively small alteration of lights may possibly mean an entire rearrangement of the wires and switches.

It should also be noted that the fire insurance rules do not permit the Supply Companies to turn on any electric current to the house, until the whole of the installation work in the house is completed and thus a small alteration in one room often vexatiously delays the lighting of the whole of the rest of the house. No one in any

case should attempt to have the house wired while they are inhabiting it, for various practical reasons.

If the house is about to be decorated at the same time as the electric light is installed, the wooden casing containing the electric wires can be let into the walls and papered over, but in the servants' departments all casings should be on the surface, and have the wooden covers either fluted or otherwise cheaply ornamented. A flat cover, or one flush with the wall, appears to the ordinary servant to be expressly intended for the reception of nails for pictures and Christmas decorations.

A rule should be made, that if ever a nail is found in the casing, the electric current to the servants' departments should instantly be cut off till the electrician has examined the place. A day or two's return to paraffin lamps and tallow candles teaches carefulness.

If the house decorations are already finished,

the installation is not such a simple matter ; but with a careful, responsible firm it can still be thoroughly well accomplished.

In the case of a decorated house the master should himself go into the details of the proposed wiring, that he may understand how it is to be done, and that no unsightly casings, roughly painted or covered with wall-paper, should run up the walls or across the ceilings, and in such a house the firm employed should be made responsible for any damage done to ceilings, walls, or cornices. It is wonderful what an experienced electrical workman can accomplish, "threadling," as it is technically called, the wires round cornices and carved wood-work, and between ceilings, so that when the installation is finished it is impossible for even an experienced eye to detect the path of the electric wires to the lamps.

In undecorated houses the estimate should be made inclusive. The plastering and making good should not be left to the decorator, but the work

should be completed by the electricians themselves. This prevents friction, undoubtedly makes them more careful, and saves a heavy unexpected bill in the end.

It should be noted that what we may call a "plumber-electrician's" estimate is never inclusive, as he, like the jerry builder, lives entirely on his extras, and he trusts to obtain orders by sending in a low estimate, which cannot pay, and to recoup himself by charging for things which were omitted from the specification by his intention, and by his customer's inexperience; his first estimate is therefore much lower than that of the responsible firm to whom the words "inclusive estimate" have an actual and binding meaning.

The "plumber-electrician" will also send in a large account for alterations made during the progress of the work—alterations which as often as not he jesuitically suggests himself to the bewildered master of the house.

The estimate should include all the wiring,

switches, fuses, and sockets, but not the lamp-holders nor the lamps.

These can be decided upon during the progress of the work, and a separate estimate made out for them and for the fittings in the servants' rooms, back stairs, basement, etc.

The ornamental fittings should be left to the very last, as these require much more time and consideration, and no one should decide on them till they have visited all the best shops which design and manufacture them, so that variety may be obtained. The practical reason for not including the holders and lamps, is that these vary in price and quality; some lamp-holders costing much more than others, and ground-glass lamps are often required at the last instead of plain ones. All these changes may give rise to extras and to unpleasant discussions over the bills, which should always be avoided, if possible.

A certain proportion of the switches should be placed just inside the door of each room. If there

are a number, they should be mounted on a small wooden block.

In the drawing-room the switches for the larger ceiling and decorative lights should be placed inside a little wooden cupboard, the panel ornamented with Japanese work, a photograph, piece of brocade, or any other decoration to suit the room. A plain wooden cupboard looks heavy and clumsy by the side of the door.

The mistress can keep the key of this cupboard herself and only unlock it when the decorative lights are required. I consider that a great deal of electricity is wasted by people turning on the light to show their friends.

Lamp-holders should always be so arranged that the lamps themselves are vertical, that is they should point straight up or straight down; if they are fixed horizontally or at an angle the carbon is strained by its own weight, the life of the lamp is diminished, and so the annual cost is increased.

There are a great number of different kinds of

switches in the market, but the most convenient for general use is that shown in Fig. 1, as the light can be turned on or off with a finger, and the handle can easily be found in the dark. It has the further advantage that on looking at it we can see at a glance whether the light is on or off.

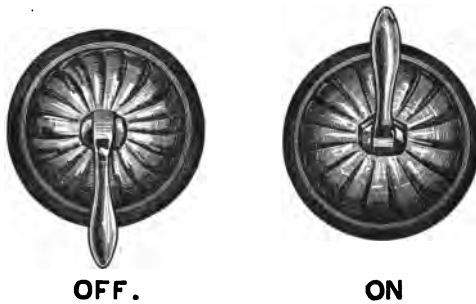


FIG. 1.—SWITCHES.

Many people who feel a pang at wasting things which have cost money, however useless they may be, go to great trouble and expense, and produce an unsatisfactory result in their endeavour to utilize existing gas-fittings.

The actual cost of adapting these in accordance with the fire insurance rules is often at least as

much as that of entirely new simple electric fittings; and it is in most cases better to face the matter boldly at once, and sell the old gas fittings for what they will fetch.

A double-pole switch—that is one that cuts off both the positive and negative wire—should be fixed, so as to be able to entirely cut off the electric light company's supply, should it ever be found desirable to do so.

If real luxury and comfort are desired, a pair of electric wires should be placed round each of the sitting-rooms at the top of the skirting-board, and sockets, sometimes called shoes, should be fixed upon them at intervals, so that any standard can be moved to any part of the room or house, and to facilitate this, all the plugs and sockets in the house should be interchangeable. In winter and summer most people need quite a different arrangement of their sitting-rooms, and it is not easy to say beforehand exactly where the lights will be required.

This circuit should never be controlled by switches placed at the door, but should be arranged so that any portable standard can be attached to it, and each standard should have a separate key-socket placed at the neck of the lamp. It is not safe to have the key-switches placed at the bases of the standards. The wooden casings in a decorated room have generally to be put outside the paper, and the least noticeable place for them is at the top of the skirting-board, when all the wood-work can be painted the same colour.

Sockets should generally be placed just above the skirting-board, as the wires can then run along the floor to the standards. If they are placed higher on the wall the electric wire is inconvenient and unsightly.

Pendant flexible lights should never have key-sockets placed on the necks of the hanging lamps.

Switches should not be placed so high that the lighter has to mount on a chair, sofa, or stool to turn them on. Economy is gained in the burning

by the multiplicity of switches, and also by the proper arrangement of them in the room.

Two switches control three lights in a pendant.

I have indicated at the end of each chapter where I recommend the switches to be placed in the room of which it treats.

Downstairs is the electric meter, on which is recorded monthly the number of electric units burnt in the house.

The master can himself calculate and check each month the expense of his electric light ; and where the servants are not to be trusted, it might be well to have a separate meter for all their rooms, back-stairs and basement.

A unit of electricity costs in London $7\frac{1}{4}d.$ to $8d.$, and will supply an eight-candle lamp for thirty-two hours ; thus the electricity costs about a farthing per lamp per hour.

The cost per lamp per hour is about 20 per cent. more than gas ; but owing to the far greater facilities for switching off the electric light when

it is not wanted, when gas would have to be left burning, the cost per lamp per year is with ordinary care practically less than gas.

In calculating the expenses of the electric light, they should not be compared with the former gas bills only, but with the gas, paraffin, and wax candles, and a small amount added for tapers and matches. If this is done, I feel sure from my own experience that the electric light bills will compare most favourably with the former bills for illumination, without taking into account the saving to health and decorations.

It is very easy to economize when first the installation is carried out; but it is a great mistake to do so. The initial expense is small in comparison to the daily comfort of well-arranged and well-distributed lights, and eventually economy in the quantity of electricity used (which it must be remembered is paid for by meter) will result from being able to light the particular corner of the room in which we wish to sit, instead

of illuminating the whole room from the centre or walls upon every occasion.

We must divide our electric lights into two classes, the practical and the decorative. I shall try in the following pages to give some hints as to the arrangement and the economical burning of the practical lights, and also some suggestions as to what we must aim at, and what we must avoid, if we wish to electrically decorate our houses successfully.

CHAPTER II.

FIRE RISKS OF ELECTRIC LIGHTING.

By J. E. H. GORDON, M.Inst.C.E.

c A GREAT deal of unnecessary alarm has been caused by the occurrence of occasional fires in electrically lighted houses, and many persons have believed that electric light *per se* brings a specially increased risk of fire.

That this is not the case is obvious when it is remembered that the Fire Insurance Offices, who are the best possible judges on this point, make no extra charge whatever for insuring electrically lighted houses, and, in fact, in many cases give certain reductions.

Electric light being a new thing, any possible defects of it are very properly much more keenly

looked at, and excite much more interest and much more newspaper description than corresponding defects in older methods of illumination.

In the early days of railways the same thing occurred. The smallest accident on the railway was universally described and commented upon, while the most serious coaching accident hardly attracted any notice.

The editors of electrical journals have often threatened to publish weekly lists of gas fires in the same large type and with the same head-lines as those under which the daily papers at present publish accounts of electric fires.

Electric light, like every other mechanical aid to civilisation, is dangerous when improperly used. Similarly, the risk of travelling by railway is small, but if we jump in or out of trains in motion, put our heads out of the windows when passing through bridges, &c., we shall probably suffer from accidents, but we should hardly be entitled on account of such accidents to state that railways were unsafe.

A perhaps closer form of the analogy may be found in reading the accounts of recent terrible railway accidents in America, where whole bridges have collapsed with the weight of trains, and terrible loss of life has ensued, in fact *cases where cheap and inefficient work has given way and has caused damage.*

When electric light is properly installed, there is absolutely no risk whatever from fire connected with it; but if certain obvious and well-known precautions are neglected, the houses in which they are so neglected will not probably, but almost certainly, be set on fire.

It would not be fitting in this book to go into the technical and scientific details of the matter, but it will be sufficient to say that the leading fire insurance offices have compiled a code of rules to be followed by the contractors and their workmen who put up the installation.

Copies of these rules are in every contractor's hands, and until they have received a certificate

from a qualified inspector that these rules have been followed the insurance offices refuse to insure the buildings, and the supply companies refuse to supply current.

An absolute safeguard against electric fire-risk for persons without technical knowledge is, before paying for their installation, to insist on seeing the certificates of the fire insurance company, and of the supply company, which are granted to the wiring contractors in due course after inspection.

The way in which electricity can set a building on fire is as follows :—

Electric light itself is produced by the heating to a white heat of filaments of carbon enclosed in glass globes and interposed in the circuit. The current to these filaments is conveyed through the house by means of copper wires, and a certain infinitesimal proportion of current is always wasted in these wires, causing a proportionate, but practically imperceptible rise of temperature. If,

however, the wires are made much too small for their work, the current which would travel with perfect safety through a larger wire will increase the temperature of the smaller wire sometimes to a dangerous degree.

The most common form of accident, however, is what is technically known as a "short-circuit." If the positive and negative wires are not properly protected and separated from each other, they may come accidentally into contact, and then, instead of the small quantity of current which would pass through the filament of the lamp, an excessively large quantity passes through the short-circuit thus created, and if not cut off will in a few seconds heat the conducting wires to whiteness and set the house on fire.

The formation of this short-circuit is provided against in the fire insurance rules, where it is provided that all wires shall be insulated so that they shall pass certain specified tests, and further that they shall be laid in grooved wooden casing,

a separate groove being provided for the positive and negative wires.

In spite of all precautions, however, a short-circuit may sometimes occur. As for instance, if a picture-nail is driven into the casing and accidentally connects the two wires. In this case,

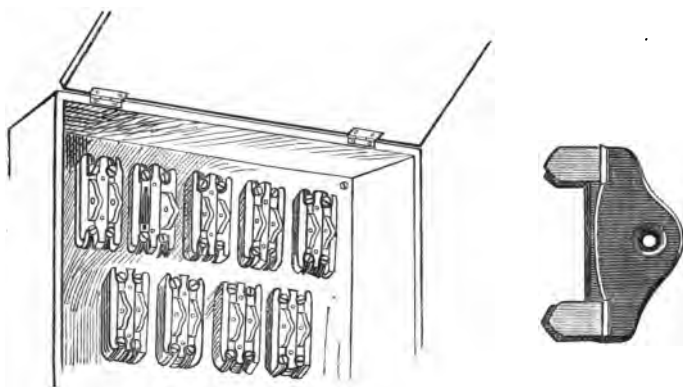


FIG. 2.—FUSES.

in a properly erected installation, absolute safety is given by what is known as the “fuse,” Fig. 2. It is provided in the insurance companies’ rules that at the commencement of every pair of branch wires, that is to say at every point where branch wires leave the main circuit, and also at certain points in the main circuit itself, “fuses” shall be

provided. These "fuses" consist of short lengths of lead or tin, or other suitable metal of such a size that they will melt when the current exceeds its proper amount, and before it reaches an amount that would heat the wire. As soon as the "fuse" melts the damaged circuit is cut off, and the only inconvenience that occurs is the extinction of a few lamps.

For instance, in a circuit carrying four lamps upon it the wire would be of such a size that it would not commence to heat dangerously until a current at least equal to that of ten lamps passes, but the fuse would be of such a size that it would melt with the current of six or seven lamps, and thus a dangerous temperature could never be attained.

The three most common tricks of unscrupulous contractors are: First, to omit these fuses, or often to omit one of them; that is to say, to put a fuse only in one wire.

Second, to provide wire too small for the current it has to carry, and,

Third, to provide a cheap and inferior insulation to the wire. This latter point is one in which a fire insurance inspector or other expert should always be consulted. It will be noticed that he will in inspecting a house have a certain portion of the casing uncovered that he may see the wire.

While wire of good quality for house-work may cost £8 or £9 per mile, it is possible to obtain wire for about £2. 10s. per mile, which nobody except an expert could distinguish from good wire, and thus great temptation is put in the way of a poor or struggling contractor.

The public have only themselves to thank as a rule if they get bad work in their houses, for it happens again and again that tenders are invited, and the lowest is accepted, regardless of the reputation of the firm tendering. A small firm will secure the work at absurdly low prices, and are not worth attacking after the inevitable damage caused by bad work has occurred.

I again repeat that if work is done to the

satisfaction of an inspector of a responsible Fire Insurance Office, that the risk of fire is absolutely nil.

Some very sensational stories have been cabled from America as to risk of life. These stories, even if they were true, need not alarm Englishmen, as under the wise regulations of the Board of Trade no high-pressure current is admitted into any house-wire at all, or into any place where the wires are accessible to others than the servants of the supply company.

It will be noted in America that many accidents have occurred to linesmen, lamp-trimmers, and other employés.

In cases of repairs to wires employed on high-pressure out-of-door lines, it appears to be the habit in America to inform the linesman that no current will be turned on until a certain hour, and to turn on at that hour punctually.

A workman owning a defective watch, therefore, does so at the risk of his life. A typical case

occurred in America a few months ago. It was arranged to stop the current in a certain high-pressure circuit until 4 p.m. At 4.40 p.m. a workman climbed up a high pole, and, having scraped off the insulation with his knife, cut the wire with a pair of pliers for the purpose of making a joint, and was of course immediately killed. It is needless to add how much the accounts of even this unfortunate and deplorable accident were exaggerated.

The practice at all properly managed English central stations is to have brass tallies hung upon the switchboard, under the switches controlling each circuit. On a linesman being sent out to repair any particular cable the switch corresponding to it is switched off, and the linesman takes the tally with him, and the switch is on no account allowed to be put on again until the man has returned and replaced the tally.

This system is analogous to the staff system used in running railway trains on a single track.

I heard a tragic history the other day of "a poor girl who had been killed by the current." On asking particulars I was told that it was "a housemaid at Arlington Street," but the narrator was not quite sure when the accident had occurred. Further inquiry showed me that it was a developed account of the death of the gardener who was unfortunately killed at Hatfield some ten years ago.

Another sensational account was telegraphed from America of an unfortunate negro boy, who went under an electric car to oil it, and was immediately killed and burnt to a cinder. Further inquiry showed that at the time of the accident the car was entirely disconnected from the circuits and had no electricity in it at all. The boy had gone underneath it with a paraffin lamp to oil the gearing. The lamp had been upset over his clothes and he had been burnt to death as reported.

On the other hand a relative of mine, resident in Kensington, recently had a portion of his stables blown up by a gas explosion, which smashed in the

windows of two carriages, knocked down the coachman, broke the windows, blew down the doors, and destroyed part of the staircase, and did a considerable amount of damage. This accident was not mentioned in the London daily papers, nor was it even reported in the local "Kensington News."

CHAPTER III.

THE HALL AND STAIRCASE.

IN the country with a pretty-shaped hall, electric lighting should be delightfully easy, but in London, halls and staircases are not as a rule inviting, and we have usually to consider not so much how to enhance their beauties as how to conceal their defects.

We generally find central pendants in them, but these are undoubtedly a mistake when the space is limited.

Bright centre lights foreshorten distances, and enhance the feeling of narrowness, which cleverly arranged lamps placed so as to lighten the sides and corners should help to dissipate.

Much might be said as to the bare, dismal look that meets us as we enter a London house, where the greeting to our boots, in the 'salve' found on the door-mat, is the only welcoming object our eye falls upon till we reach the drawing-room, though sometimes, if the mistress is more enterprising, the passages and halls are turned into a boudoir annex, where all the china and old vases, not considered good enough for the rooms, are accumulated with stands of dusty pampas grasses, serge curtains and other "high art" atrocities.

Electric light will allow us prettier and lighter decorations—as nowhere does the draught mingling with smoke and dirt from gas so injure the walls and ceilings as in the hall and passages.

To begin with the front door.

An eight-candle lamp can be placed behind the number on the glass, but this is not necessary in a small house, if a light is hung in the centre of the vestibule. It is an economy not to keep this latter

always burning, but to make a rule that the servants light it as they answer the bell.

When there is a conservatory or fernery, a very pretty combination of plants and lights may be arranged. Lights should be hung in the ferns themselves, but the reader may be warned to beware of coloured night-light effects, china flowers and other trivialities.

Beaten iron lends itself well to staircase decoration, and seems more in its place here than in the living-rooms.

Each of the decorative lights should have a separate switch, and they need only be used when required.

The daily lighting of hall and staircase can be controlled by one switch, and I would suggest that when the installation is first put in, a switch should be arranged in the hall to turn on the lights, and another placed on the bedroom floor to extinguish them.

The saving in the light when the master and

mistress spend the evening out, would very soon repay the extra expense of this wiring arrange-

ment; and as I am sure the man does not exist who can carry a bed-candle upstairs without spilling the grease, the saving of the carpets may also be taken into consideration.



FIG. 3.—SMALL BEATEN-IRON PENDANT.

Wooden arches make delightful homes for the electric light, which can be either hung from the centre of the arch or placed behind one of the pillars. It is wonderful, with a little ingenuity, how much can be done with even a London hall.

I think a hanging centre light dangling at the end of a long straight string is a very ugly object, especially when a glass shade is placed

over the lamp, and the little hard light pours its unsympathetic rays down upon us; if, however, owing to the construction of the house a centre light is a necessity, the least objectionable pendant to be found at present is a glass cone, Fig. 3, held by a pierced iron holder, and suspended from a black electric wire cord ornamented with bosses.

Later I shall say more about these wire cords, which are such an important and often such a very ugly part of electric lighting. In all cases



FIG. 4.—SMALL BEATEN-IRON PENDANT.

the colour of them should be most carefully chosen with due regard to the surrounding decorations ; and as they cannot be dispensed with, we must do



FIG. 5.—BRANCH FOR HOLDING PENDANT.

our best to make them help us instead of hindering us in our work.

If centre lighting is decided against, any of these pendants can be suspended from a beaten-iron or copper bracket, Fig. 5.

The lamps on the upstairs landings should be shaded from below, as the light reflected from the ceiling gains in distribution and pleasantness, Fig. 4.

Outside the drawing-room door is a beautiful place for a decorative light. The "Dweller of the Threshold" should be chosen with consideration and great care.

One of the most beautiful I have seen is an old Venetian *hand-pierced* church-lamp (Fig. 6) turned upside down, with a



FIG. 6.—REVERSED CHURCH LAMP.

lamp inside and a narrow frill of laburnum-coloured silk fastened round it. This silk is so easily removed and replaced that it gives but little trouble to keep clean, and it can be renewed by the housemaid every month, if necessary. Fig. 7 is a copy of an old Cairo lamp. Three or six electric lights can be placed inside, and the amount of light regulated by switches placed on the wall, so that one or more lights can be turned on as required; the soft silk hides the lamps that are not in use and softens the light of those that are. If there is a decorated ceiling, a sheet of ground glass should be placed above the lamps, to prevent them casting shadows of the suspending rods upon the ceiling.

In Arabian lamps the form of the carbon in the lamp shining through the coloured glass looks like a luminous Arabic letter and is very effective.

Where there are good coloured-glass windows, electric lamps hung outside enable them to

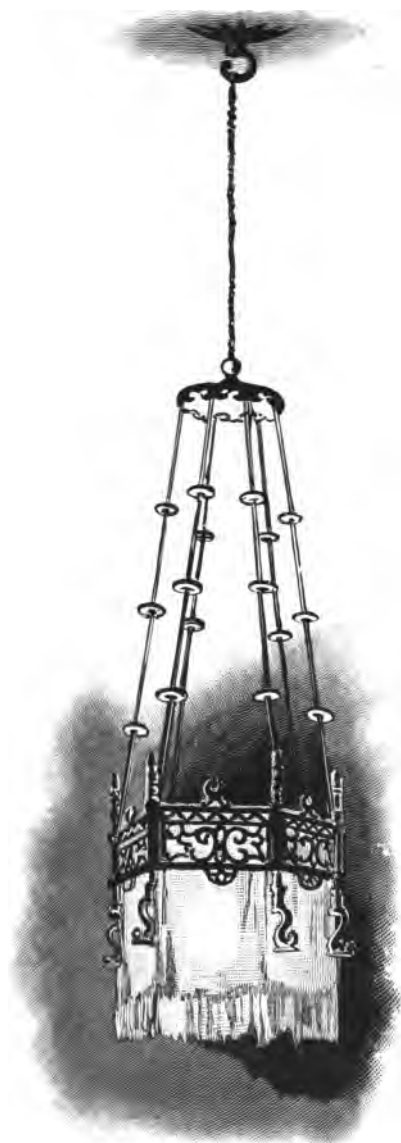


FIG. 7.—CAIRO LAMP.

give their owners pleasure by night as well as by day; but it is not worth illuminating them if the windows consist of old bottle ends mixed with



FIG. 8.—POMPEIAN LAMP.

robin-redbreasts and a certain starlike flower which must be exceedingly rare, as there never was anything seen like it in nature. Fig. 8 is a happy combination of the modern light with antique grace of form. The lamp is made in a special spiral shape, to imitate the flame of the oil lamp.

Bronze figures supporting electric lamps made in this spiral form, are exceedingly effective in alcoves and

corners of the stairs and landing, but are only suitable for houses where economy is not the first consideration.

On the upper landings very simple lights are

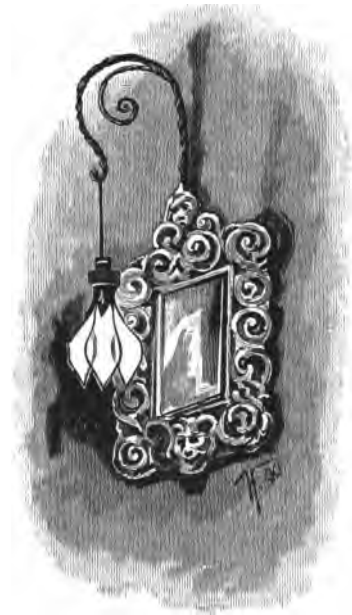


FIG. 9.—ADAPTED CANDLE BRACKET.

the cleanest and best. A wall-bracket for this part of the house can be made out of an old candle-bracket, Fig. 9, the branches for candles being taken away from below and an arm made to

spring from the back, holding a ground-glass lamp. When this has a small looking-glass, the reflection from it is an aid to illumination.

When economy is necessary, it is well to burn lights on every alternate landing, which are enough for ordinary use, but a lamp and switch should be placed on every landing.

On the back stairs a light at the top is generally sufficient, but it is as well here also to have a simple brass bracket and lamp at every stage.

Modern *bright* brass-work should be avoided. I have seen a great deal of it used with electric light, but never with success. Old brass lamps are beautiful, and so are good copies of them. Modern French "old lamps," with their glaring machine-made brass-work and round dabs of common coloured glass, are also to be avoided.

The colour of copper is delightful, and lends itself well to staircase decoration. There is a lamentable want of good and simple designs for

hall and staircase electric lighting; those to be found at present are ungraceful and too heavy for the light lamps that they support, so that after an exhaustive hunt through all the designs to be found at present, nothing seems left to the slender purse but the simple string and pendant.

A very handsome staircase light for large halls has been contrived by the introducing of a white lion's head into the cornice; the light hangs from the lion's mouth.

The vestibule light need not always be kept burning; it may be turned on by the servant who answers the door, or connected after dark with the front-door bell, so that when the bell is rung the light would be mechanically switched on.

First impressions are important, and I knew a dear old gentleman who told me he "had quite given up calling on a lady, because her butler never looked glad to see him." I think he would have been pleased at the cheerful greeting of

light given by the house in instant response to his ring.

An electric cigar-lighter should hang near the front door, which will save the daily hunt for matches, and consequent irritation to the master of the house and his friends.

Electricity may also afford us protection at night, as an ingenious burglar-alarm has been devised, by which, from a controlling switch in the master's bedroom, the whole passage, hall, and staircase can be suddenly illuminated, so that when "the enterprising burglar comes a-burgling" light may be shed on his nefarious practices.

We owe to electricity the banishment of that faint and sickly odour of paraffin that haunts our staircases, after the daily procession of the lamps to the drawing-room, and a probable and certainly most desirable development of electric power may arise in the use of mechanical ventilation, the fan of the ventilator being worked by the electric current. We may hope then to be spared that

odour of dinner past or future which so often distresses us, especially when mingled with the scent of cigars and cigarettes.

HALL AND STAIRCASE.

Switches to be placed

Lamp over door	Near front door.
Vestibule light	By inner door, or half-way between stairs and front door.
Cigar-lighter	Near front door.
Decorative stair lights . .	A separate switch placed near to each.
Every-day lighting of hall and stairs	{ One in front hall, to turn on. One on bedroom landing, to extinguish.
Back stairs daily lighting .	
Lights on landings below .	One switch at the bottom, to control one light at the top.
	Separate switch near each.

CHAPTER IV.

THE DINING-ROOM.

IN the dining-room the first consideration is how to light the dinner-table artistically and comfortably.

It is rather a difficult problem, because what is cosy and comfortable for the quiet family meal is not suitable for a lengthened table.

A suspended light wire frame, round or eight-sided, covered with silk and edged with a frill is the pleasantest to sit beneath. This can contain either two or three lamps. It should be made of a fairly large size, so that the light may not be concentrated.

The wire frame should be light, and should hang from the ceiling with a counterweight, so

that it may be raised or lowered at pleasure. With this the table is brightly illuminated, and there is no glare in the eyes.

Too dark a red should not be used for this shade, as it is heavy-looking and swallows up the light, so that the face of one's neighbour cannot be seen. I have found a reddish pink the most satisfactory; but whatever colour is chosen, great care should be taken as to the reflection thrown from it and through it on the dining-table, always bearing in mind that in the dining-room the dining-table is the most important feature. The proper combination of white cloth, coloured shade, flowers, silver, and electric light requires meditation.

Great taste is displayed, and often the most beautiful effects have been obtained with candles, shades and flowers, but I believe that with time and experience electric light will produce even more satisfactory results.

Some yellows have quite a painful effect when

combined with electric light. In choosing the shade of silk, a pattern should first be seen with a light behind it. The consistency of the silk or material should also be studied, and as a rule bright thin silks are to be preferred even if they have to be used in double thicknesses. The colour of this particular shade is important, and should take its tone from the decorations of the room. A true laburnum shade, orange or flame colour, Indian, pomegranate, and all the brighter tones of red, pale blue, green, coral, and Sèvres pinks, and even a faint copper colour, are all more or less effective for the dining-table pendant. Canary and lemon yellows, fierce pinks, claret, and very dark reds should be avoided. A fringe, however handsome, is not satisfactory.

Another problem is, to hang the light so that it is always in the centre of the table, both when it is small and when it is extended. Dining-rooms differ so much in shape and design that almost every one has its own difficulties to encounter and

surmount. When the centre of the table varies, it is possible to alter the position of the hanging centre frame by passing the electric wires over a hook placed in the ceiling.

All these distances must be carefully measured and calculated when the electric light is first installed; and care should be taken that the pulleys are so arranged that in case of an evening party being given and the table removed from the centre, the frame can be pushed up high enough to clear the heads of the guests. When the light hangs high, a thin veil of silk, or folds of gauze, should be placed below and fastened to the sides of the frame, so as to hide the shape and glare. If this small detail has been forgotten, a good effect may be produced at the last moment with crinkled white tissue-paper. With sensitive eyes it is best to have a thin veil of white or palest coloured silk always hung beneath the lamps, to soften the rather fierce reflection from the table-cloth.

I cannot say too often how important it is in every case to study the reflections.

I was once at a dinner-party, where the lights had been most carefully arranged and softened with due regard to the table-cloth and decorations, but the reflection from the bright surfaces of the various little silver ornaments with which the table was covered was most irritating, as each separate piece formed a little reflector focussing the light into our eyes.

A light silk and lace-covered wire frame is the prettiest dinner-table pendant made at present, but I do not despair of soon finding beautiful glass-work or faintly-tinted china in the place of silk, and this will be much more economical, as it can be simply washed when dirty.

The china shades made at present are much too heavily mounted, and most of the electric light dinner-table pendants look like old gas pendants adapted for the electric light. Not till designers realise the necessity of avoiding this heavy second-

hand look, shall we have light and dainty pendants.

The height of the centre pendant should be carefully arranged at least ten minutes before dinner, to avoid any swinging motion.

This pendant, whatever it is, makes a good centre for the extended table. Now as to the method of lighting the ends. It is possible to have two smaller pendants drawn down from the ceiling, but these look ugly when unlighted, and even when lighted have rather a billiard-table effect, besides the exact position of them is difficult to vary according to the size of the table; so I fear it must be candidly confessed that the only satisfactory way out of the difficulty at present is standards on the table, and these involve a small hole in the table and in the cloth.

I am grieved to think of the feelings of all dear old-fashioned people who love their mahogany and adore their old family linen; but they must not be distressed, as after all only a very small

hole is required, and we may remind them that it is only in the larger damask cloths used for the extended table that it would be required at all.

The plugs for the dining-table standards should be made as small as possible; the hole should be drilled where the slit comes in the dining-table, and the electric wire passed along beneath the cloth to its place, then a slit, three-quarters of an inch long, must be carefully cut, and button-hole stitched in the damask. An old under-cloth is generally kept for use with the extended dinner-table, so the slit in this need not distress anyone.

The electric wires should pass under the floor, and just below the dinner-table a small socket block should be fixed, arranged to take four, six, or eight plugs, according to the number of lights required. This block is let into the boards, below the carpet, and a small trapdoor made in the carpet above it.

When the extra lights are required, the cloth is laid, the tiny plug passed through, first the slit in

the damask and under-cloth, and then the hole in the table; the cover from the wooden block in the floor is removed, and the plug inserted in the same manner as in the wall-socket. It is all much simpler than it sounds, and the results with carefully chosen standards are delightful.

In case of the table being moved to one side or across the end of the room for a supper-party, a second block should be fixed beneath the edge of the carpet, to which the plugs can be attached.

With a narrow table, and a small party of say fourteen people, two standards are enough; the shades of these should match that of the centre pendant in colour and design.

Beautiful dining-table standards can be made out of old candlesticks. We unearthed a silver female figure that we had put away for many years, as being too fragile to support the three heavy candlesticks that she was asked to carry. We cut off the candle-holders, substituted an electric lamp and shade; and she, with the well-

known Mercury, have now the honour of lighting our guests at their dinner. See Fig. 10.

These silver figures have no sham candles, but the lamp is fixed to them by a slight silver rod. Where this is possible, I think it is to be preferred to sham candles; but sometimes these cannot be avoided, and when they are made very thin and coated with *real* wax, which can be renewed when dirty, they are effective on the dinner-table; so search your family plate-chests and cupboards for all the old silver and china candlesticks, or spend some happy days hunting for good specimens in the preserves of the sales and old curiosity shops.

But it is not everyone that possesses stores of old treasures, nor money, time, and inclination for that most fascinating pursuit, curiosity hunting; and for these we must think of other arrangements. Graceful electric-light standards can be made with tall shapes of Venetian glass, and these are specially suitable for dinner-table decorations. In almost all the artistic glass-shops, designs can be

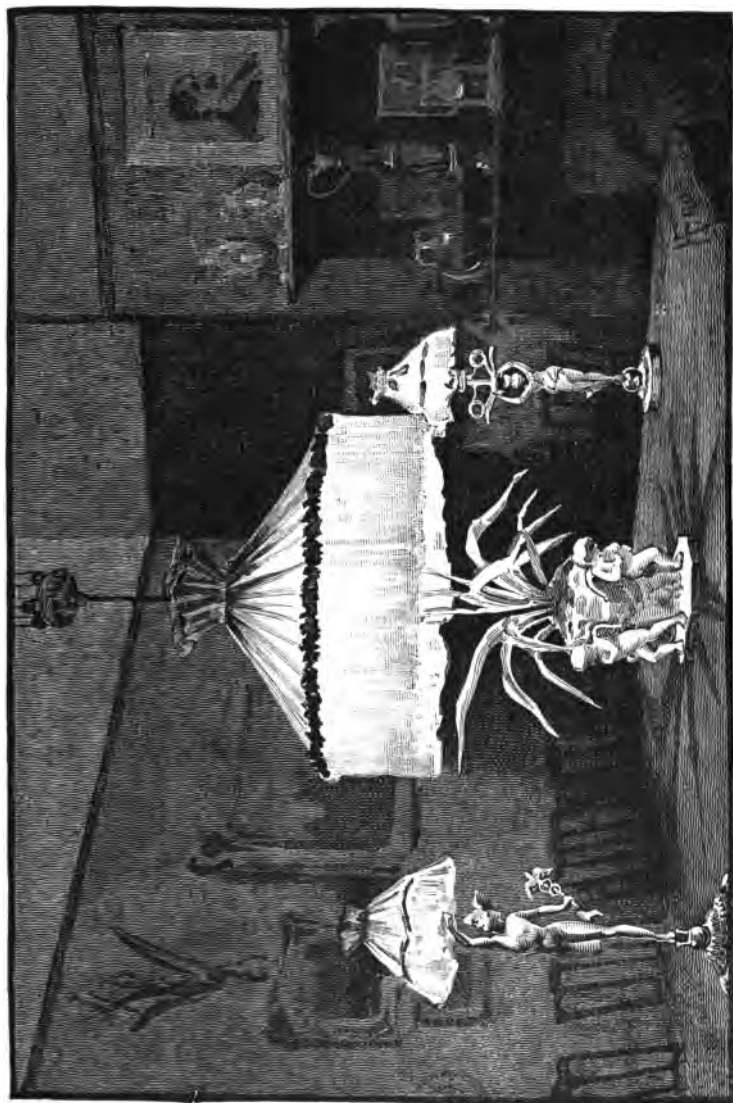


Fig. 10.—PENDANT AND STANDARDS.

found, that with a little taste and ingenuity can be converted into the most delicate and fairy-like electric-light holders, or the convenient little lamps may be lowered as water-spirits into the vases, and flowers arranged above. In all these glasses, designs should be chosen that have a broad base and narrow top. Electric lights may be nestled in the plants themselves; growing strawberry plants look charming with little lights beneath their leaves; so do dwarf orange and lemon trees, the fruit scooped out and the lamp hung inside the empty rind.

Now having considered the dinner-table, let us turn our attention to the lighting of the rest of the room. Three or four ceiling lights are useful in case of a large evening, or supper-party; but I do not recommend their being used for a *dinner-party*, as they interfere with the charm of the light being concentrated upon the table itself.

When the pictures are really good, the whole lighting of the room should be the reflection from

them ; the electric lamp-holders in this case should be as simple as possible, so as not to distract attention from the paintings ; they might look well if designed as part of the frame. But in every case the lamp should be hidden from the room side by a silver gilt or bronze reflector.

The smoke of oil, gas, and candles is very destructive to paintings ; so here again we may point out another most invaluable economy, for which posterity will thank us.

Cabinets filled with silver and old china can be illuminated by electric lamps hidden within.

The *pâte* of Sèvres or Nankin gains enormously by this form of lighting. The electric light is the only illuminant except the sun by which it is possible to appreciate the dark blues of Crown Derby, and Worcester chinas.

For walls, brackets, and pendants, heavy brass-work designs of dragons, dolphins and griffins are to be recommended, Fig.11. There are many artistic models to be found in modern work, that

have the additional merit of being inexpensive. They should always be fixed with the lamp hanging downwards, not put crawling up the wall



FIG. 11.—DRAGON PENDANT.

like poor overladen insects carrying luminous eggs.

Simple and well-drawn brackets of beaten iron, copper or dull-coloured brass can be hung from

the wall, holding convolvulus-shaped glass shades. The long narrow shape should always be adopted, as the other shapes, though pretty in themselves, do not shade the light sufficiently.

Glass shades are clean and suitable for the dining-room ; there are beautiful ones to be found of flame-colour, orange, amber, celadon and soft red, and one in white, the edges tipped with pink, and another called aurora, because it shaded delicately from orange to pink.

All these glasses should have a slight pattern engraved upon them, and the edges should not be straight, but crinkled like the petals of a flower, but they require careful choosing ; there are a few pretty ones and very many ugly ones. Opal glass shades should be avoided ; these are most tempting when seen by daylight, but are disagreeable when lighted. Every shade should be seen with the electric light by night before it is finally decided upon. When two lights come from one pendant, they should not hang on the

same level. In the dining-room it is best to have all the brackets and side-lights pendant.

A bright light in the centre of a back dining-room greatly foreshortens the rooms.

In the sideboard the electric lamps should if possible be worked into the design ; if it is old oak, by a branch of bronze or beaten iron springing naturally from the carvings ; or if it is Chippendale, a delightful design can be carried out by adding to the brass-work at the back two or more stems, garnished with leaves or tendrils bending over and holding the electric lamps, and shaded by a flower-like glass shade of a tone to harmonize with those of the rest of the room, Fig. 12.

You will rejoice the heart of your butler by giving him a good reflected light over the carving table.

An electrical cigar-lighter, mounted in silver, ivory, or china, should be placed on the table at dessert.

These branches and glass shades are not expen-

sive, but in small houses where every shilling is of consequence, a pleasant light can be had and a good effect produced by the cheapest form of white china shade, with crinkled paper or a hand-



FIG. 12.—SIDEBOARD DESIGN.

kerchief thrown over it; the four points of the handkerchief might each have a glass or ornamental bead sewn to them, to keep them in their place. A piece of silk cut like a star-

fish, each point ending in a large bead, is very graceful.

One sixteen-candle light over the dining-table, and one eight-candle light by the door (only to be used if necessary) would be light enough for the small dining-room of a cottage or villa.

Most of the electric light found at present in dining-rooms, is very glaring and disagreeable, and fully justifies the remark I so often hear made by ladies, "I never will have the electric light in my house, as it gives me a headache whenever I dine by it;" and I am not surprised if they have been accustomed to a light similar to that by which we ate our dinner and tried to converse a short time ago. There was a round table seating ten guests, and ten lamps with lemon-yellow shades were hung just above their eyes, so that the light was focussed into the eyes and face of everyone sitting at table, like a horrid detective little bull's-eye, showing up every wrinkle and line in the face.

No one over the age of eighteen should be asked to sit beneath such a light !

Though I feel sure that their lighting must have been most unsatisfactory, I delight in the descriptions of ancient banquets and feasts ; the sparkle, glow, and colour must have been entrancing, and Dumas' account of Fouquet's and other fifteenth-century entertainments enable us to realize the value of decorative accessories.

By the artistic gourmet of both, dinner and conversation are enjoyed with keener relish by a bright though softened light ; and the pleasing acidity of our modern good talkers is the better appreciated by our minds, when our bodies are comfortably seated, and our senses attuned by harmonious surroundings.

DINING-ROOM.

Switches to be placed

The ceiling lights	} Just inside door on wood panel, or inside small ornamental cupboard.
Side lights	
Picture lights.	
Centre.pendant	
Dinner-table standards . . .	
China or plate cupboard. . .	Within the cupboard.
Sideboard lights	On wall close to sideboard, or on sideboard itself.
Carving-table	On wall above carving-table.

CHAPTER V.

THE LIBRARY.

THE electric lights in this room should be the servants of our books; and the lamps and their shades should be as simple as possible; anything fussy, smart, or even very ornamental, is out of place here, and has a common appearance. Three or more lights can be fixed on the ceiling with copper reflectors, but should not be lighted except upon such occasions as when the room is not used as a library; a brightly lighted ceiling is not pleasant in a reading-room. Standards with pendant lamps and shades, as Fig. 13, should be placed on the tables near the most comfortable seats, Sockets can be put in round the wall, and the standards moved about as required; or if the

positions of the most comfortable chairs are ascertained, the wires can be brought up through tiny holes in the carpet.

A small hanging light is to be preferred for the writing-table, as it leaves more room for papers.



FIG. 13.—STANDARD LAMP.

A leaf and twisted vine-tendrill (Fig. 14) is an inexpensive, pretty, and suitable design. It is convenient to have one or more lights with a long wire hung on the wall; they should be provided with a convenient handle, and shell reflector, so

that they can be carried about to search for books on the shelves. The length required for this wire, so that it may reach comfortably to the end

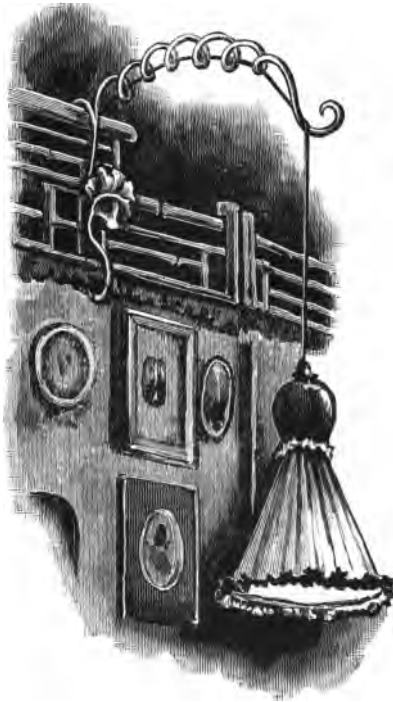


FIG. 14.—WRITING-TABLE PENDANT.

of the bookcase and to the topmost shelves, should be measured before-hand.

Many libraries contain statues or bronzes set in

niches and alcoves among the books. These are best lighted by hidden electric lamps. I recently saw a statue so illuminated, and the effect was superb, for the beautiful figure seemed alive, so

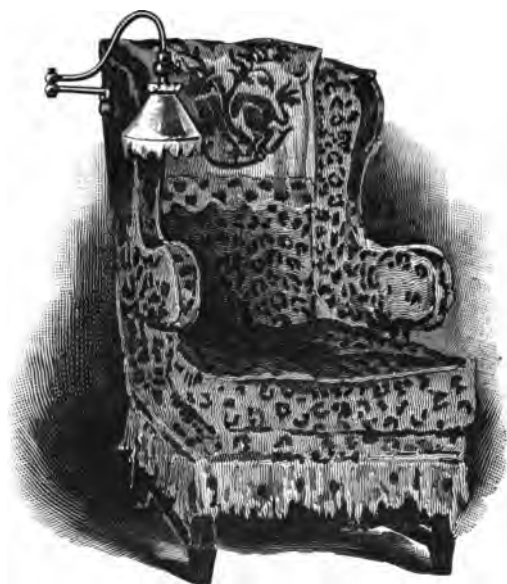


FIG. 15.—ARM-CHAIR WITH LAMP.

radiant was she with the glow of the soft reflected light.

A delightful nook for reading may be contrived with a high-backed chair, Fig. 15, and an electric light placed behind the projecting ear and so

arranged mechanically (with a ball-and-socket joint) that the angle can be altered at will. A funnel-shaped shade should be placed on this lamp, so that the light may be focussed on the book that is held in the hand or propped on the book-rest. The switch for this lamp should be fixed on the chair itself, so that the light can be extinguished in case the reader wishes to meditate on what he has perused, or take a refreshing little sleep that might be detected if the light were brighter.

The newspaper and magazine table is always an important spot in our modern households, where the news and opinions of the hour are considered to be of such vital importance.

A convenient form can be made with a light three-shelfed table, Fig. 16, on which the daily papers and the magazines can be attractively displayed. Across the top of this table a light wooden handle is fixed, and from this a shaded electric lamp is suspended, and, like the chair-light, arranged to be altered to any angle.

This table is so light that it can be lifted about and placed beside any seat, and the flexible wire and plug attached to the lamp fixed into the nearest socket.

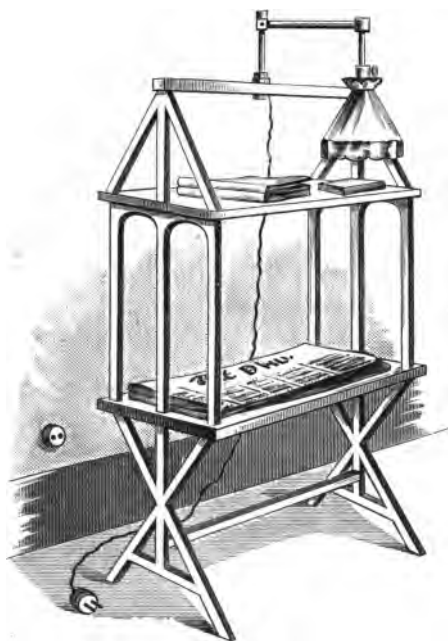


FIG. 16.—LIGHT TABLE WITH LAMP.

I believe that chairs and tables on the above lines would be an untold comfort to elderly gentlemen at their clubs, judging from the way one hears them grumble at the electric light; that

is, unless they have been on the electric light committee themselves, when they always think it perfect !

Green and orange paper shades are pleasant for reading ; but when many people use the same room *green* is preferable, as in the semi-darkness of a library any shade of yellow makes an unpleasantly bright spot.

For students with the microscope, the new illuminant is a real aid ; indeed I have been assured "that it is only those who have tried painfully and wearily to trace the wriggles of microscopic animalculæ that can fully appreciate the steadiness and coolness of the electric light."

I would suggest to collectors of scientific specimens, gems, coins, intaglios, and other precious objects, that they should have a bracket fixed at the side of the cabinet containing them, and the electric lamp mounted on a ball-and-socket joint, so that it will dip straight into the drawers themselves.

When the library is inhabited by the sons and younger members of the family, pendants with counterweights are best, as standards with flexible wires are hardly safe, during the constant "colley-shangles" that must inevitably take place.

A billiard-table requires extravagant lighting to be successful, and I gather from good authority that six green shades, containing each three eight-candle lamps, in all eighteen eight-candle lamps, are what is to be recommended.

Switches at the door must control these lights, so that a less number can be burnt when the younger members of the family are practising.

An electrical cigar-lighter should be hung on the wall near the fire.

The small back downstairs-room of a London house often serves as library, den, and smoking-room for the master, and candidly it must be confessed that as a rule it is a dingy little hole.

Drawing-room, boudoir, and bedrooms, are

thought out with care, but anything is considered good enough for the abode of the father of the family and its bread-winner. Indeed if it were not for his old leather armchair, and his cherished pipes, he would probably rebel.

One writer on the art of furnishing "from attic to cellar" advises "Angelina" to annex even this little room for herself. Her poor neglected "Edwin" is to write in the dining-room after the dinner is cleared away ; and his smoking is to be kindly but firmly discouraged.

This little den, which is chiefly used after dark, can be much brightened with electric decoration, and a pendant and a standard covered with red silk will give it a bright and cosy look when its master returns.

But after all, it will most likely be found that the master does not "quite fancy" all the little arrangements made for his comfort and convenience ; so the best suggestion I can make to women is, that they should discover with dis-

cretion and sympathy what their men-kind really do want, and then try to give it them, even if it involves the electrician coming several times to alter the fittings.

THE LIBRARY.

Switches to be placed

Ceiling lights	} On board just inside door.
Bow-window light	
Reading standards	Key switches on them.
Reading chair and table lights	On chair or table, or within very easy reach.
Collector's cabinet	On the lamp itself, or on cabinet.
Light for statue or bronze .	Inside door, or near the statue.
Portable search-lights for book-shelves	On the wall near where they hang.

CHAPTER VI.

THE BOUDOIR.

THE decorative lighting of the mistress's private boudoir and sitting-rooms depends on whether they are work-rooms or play-rooms, or a happy combination of both.

If the mistress is a sternly domesticated woman, pendant reflected lights should be used, so as to leave the tables free for work, whenever she may wish to cut out Tommy's pinafore or Mary's frock. But I question greatly, if she would not make a better mother to both Tommy and Mary if she left the cutting-out to their nurse, and spent the time thus gained in furnishing and bracing her mind, so that when her children are older, and



come to her for guidance, her judgment will have had some training, and she may possess some knowledge of her own to help her in her delicate and difficult task ; but all this, as Mr. Rudyard Kipling would say, “ belongs to another story.”

In the sitting-room in which we live, there should be two kinds of light ; a faint shaded light to read, talk, and think by, and a brighter light to “ play ” by.

With a bright light meditation

FIG. 17.—PENDANT CUPID.

will not be fertile, and with a dim light play will not be vigorous.

A pendant should hang from the ceiling, under which a steady table used for cutting-out, pasting, or any other useful occupation can stand. A counter-weight and shade would look very clumsy in the boudoir, so we must carefully decide before-hand as to the height we require the light above the table.

A flying Cupid in Italian carved wood-work, holding an electric lamp, Fig. 17, makes a very pretty pendant for the boudoir; the best shade for this is a rather large lace handkerchief, or a square spotted net edged with lace, and lined with silk, of any pale colour.

A large wire frame should be placed beneath, to hold out the silk and distribute the light over the table. White birds or grey gulls can be substituted for the Cupid. A pretty pendant can be made with a light wire frame, covered with the petals of artificial flowers sewn on a silk foundation of the same colour.

The Cupid, bird, or pendant frame should be hung by a soft silk scarf from the ceiling, which besides looking well, serves to hide the hanging wire of the electric lamp. The wire should be of the same colour as the scarf. A pendant light is pleasant to work by, as anyone knows who has experienced the annoyance of a heavy oil lamp right in the middle of the table. Two or three lights can be placed inside the wire frame, and one or more used as required ; or if this arrangement makes the pendant look heavy, a sixteen-candle lamp can be used for ordinary lighting and a thirty-two candle lamp substituted upon special occasions.

It is astonishing how people shrink from changing the candle power of their electric lights, and yet it does not give a tenth part of the trouble that cleaning and lighting a paraffin lamp requires.

On each side of the fire, a socket for a standard reading-lamp can be fixed. Where there are

children, many standard lights should be avoided, unless they are on tables close to the wall, as little feet trip over the wires, and though very likely only the plug comes out of the socket, it may happen that bruises and tears ensue, or a favourite standard be dragged from the table and broken.

But if there is a long wire attached to the standard, it is safest to coil it up in the daytime, with an elastic band over it, and to hang it on a conveniently placed little hook; or better still, to keep the standards in a cupboard or downstairs, and not to fix the plugs into the sockets till the children have gone to bed.

Over the writing-table another pendant should be fixed; here also standards take up valuable room. It can hang out from the side of the desk, or be suspended from the ceiling in the same manner as the other light. Very thin white silk, powdered with flowers, makes a pleasant bright shade to work by. Glass or china vases

would make suitable standards for the boudoir. But a heavy base should always be contrived with a piece of lead, or some shot placed in the bottom of the vase.

I had some little Cupids made into standards for my boudoir, but I did not find them satisfactory; their toes, fingers, and wing-tips were too fragile. In all cases where carved Italian wood Cupids are used, they should be kept in their natural colour, and not spoilt by being gilded or whitewashed.

The dinner-table standards can be used in the boudoir, as when a dinner-party is given reading-lamps are not generally required in the ladies' private sitting-room. The silver figures described in Chapter III. make beautiful and steady reading-lights, and are less fragile than glass. They should have two sets of shades if used for both purposes.

An enticing cosy corner can be made, with an old spring mattress tufted and nicely covered with

velvet or brocade, and a heap of big soft pillows placed on it. If this divan is placed in the corner of the room, a three-shelved corner bracket should be fixed just above it, and an arm made to spring from the top shelf of this bracket, holding a lamp and handkerchief shade, where Tommy and his mother can have a most comfortable nest in which to study "Struwel-Peter," or any other nursery class-

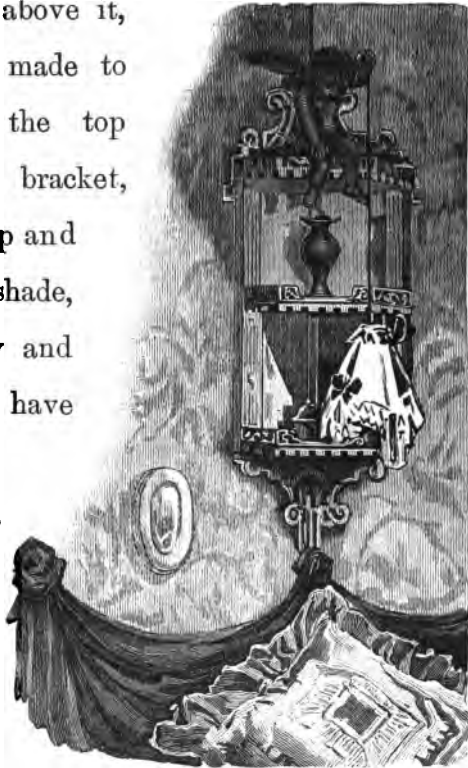


FIG. 18.—CORNER BRACKET WITH CUPID.

sic. A little carved cherub with wings, Fig. 18, can be made to sit on the top shelf, holding from his outstretched hand a pink electric wire cord, and

a handkerchief shade lined with the same pink. On the outside of this shade, two or three pink butterflies might be placed ; so that Cupid may be made to look as if he was busily fishing for them.

Key-sockets should never be fixed on flexible pendant lights, as, however carefully they are turned on, the motion of doing so must set the pendant lamp swinging for a few seconds.

I called on a friend a short time ago, to inspect her electric lights. A pretty shaded pink lamp hung above the sofa. To turn on the light she sprang on the sofa, and her smart little French heels went crack through the tightly-strained brocade with which it was covered. The moral of this obviously is to have all the switches placed within easy reach on the wall.

Extra bright lights in the boudoir are best obtained by pendant brackets. These brackets are usually fixed on each side of the fireplace, but this is a mistake, as the light then shines directly in the eyes of any one sitting facing the fire,

and on the back of any book or paper held by them.

Delicate pendant brackets can be made in designs of carton-pierre, the leaves and stalks bending over and the flower made of an electric lamp with soft white silk covered with lace.

Talc should be placed inside the silk to save scorching. The luminous flowers in these pendants look like part of the design itself and are most harmonious, a quality in which



FIG. 19.—CARTON-PIERRE
BRACKET.

many of the electroliers are wanting at present, the electric lamps appearing as if they had been

stuck on or hung on as an after-thought. A three-shelved table with lights as described in the library would be very useful in this room, to hold papers, fashion journals, children's paper books, and other light articles; and if there is a large cupboard containing old letters and other treasures and memories of the past, a light such as described for a collector's cabinet would be a great comfort, and on a foggy London afternoon some happy hours could be spent in sorting and arranging its contents.

Many boudoirs are now decorated in the French style, and for those rooms nothing could be more suitable than old, or good copies of old Louis XV. and Empire designs for candle-brackets. I have lately seen some most beautiful adaptations of these with small lamps fixed at the top of sham candles. The shades for these were made of wood veneer as thin as paper. The shades were on the room side only, and the light was reflected from the walls. These French

adaptations are beautiful in French decorated rooms, but I think it is a mistake to put Louis XV. and Empire designs into rooms to which they are not adapted, however tempted we may be by the intrinsic beauty of the model itself.

The shades for electric lights require as I have already pointed out great consideration and care.

As a rule lamp and candle shades do not adapt well for the electric light. Electric light shades should be designed by some one who can try the effect of the shades on the electric lamps themselves.

Bright thin silks are best for shades, even if they have to be used in double thicknesses. I advise that rather good lace should be used; this can be cleaned several times, and cheap lace has always a tawdry appearance. Soft white silk powdered with flowers gives a pleasant light to read or write by. Talc placed round the top of the shade prevents scorching; and in no cases should the silk, lace, or paper be ever placed touching the lamps. Another

difficult problem is to order the exact size of wire frame required, and it will be found that almost each lamp and shade needs a separate-shaped wire, some narrow, some wide, some fitting close and tight, and some with large wide bases to disperse the light more. Some wires require fitting from below the lamp and some from above. To have electric decorations successful, all these points must be carefully attended to.

Soft thin silk, *crêpe de chine*, and good imitation lace, all make successful shades. Ordinary chiffon has been a disappointment to me; but a substance called, I believe, "Arachne gauze," is perfect for draping electric lamps softly. The simpler a shade is in design the better; elaborate ones are not generally effective. Ruches are dusty and common-looking, unless used as a slight heading to lace; fringes should always be avoided; combinations of beads are sometimes successful.

In London, silks and laces require renewing so

often that they become rather a serious expense. I think for this reason it is best to have these delicate shades only in the sitting-rooms, and there should always be two or three sets of shades for each lamp: the best for parties; the second for summer, visitors, and bright weather; and a common one for London fogs. The best can descend in due course of time to be second best, but for the third paper is to be recommended; dirty fine shades, even in a fog, have a very dreary and forlorn appearance. Pretty paper shades can be made with narrow strips of paper, two or three rows being fastened one over the other to make a thick bushy fringe.

In London electric wire cords covered with *light-coloured* silk should not be used, as they so soon get soiled.

The manufacture of electric light shades is an industry very suitable for ladies to take up and develop; as shades will be always more successful and more artistic made one by one, and with

personal care and attention devoted to each, than when made in large numbers to sample in a factory, even by the best workmen.

THE BOUDOIR.

Switches should be placed

Central pendant and bow-	
window pendant . . .	Just inside door.
Writing-table pendant . . .	On table, or on wall near
	table.
Reading standards . . .	Key sockets.
Cosy corner hanging light .	On wall behind cushions.
Pendants on walls . . .	Close to the mistress's fa-
	vourite seat.

CHAPTER VII.

THE DRAWING-ROOM.

ALTHOUGH much beautiful work has been done, we must confess that much of the electric lighting we see at present in drawing-rooms is not conducive to comfort and repose, and hinders instead of aiding conversation, by its unsympathetic glare.

The engineers have supplied the electric current to the house, and it becomes necessary to consider how to arrange, clothe and decorate the lamps so that the light from them may be a source of pleasure to us and not of irritation.

So far the artists have not kept pace with the engineers, and most of the pendants and electroliers found at present are singularly wanting in imagination and grace. They are too heavy and

clumsy for the light lamps they support ; the lines and curves are ungraceful, and the lamps are often so placed that they shed their light directly in our eyes, instead of reflecting it from the objects that should be illuminated by them.

So far, designers of electric light fittings are too much the slaves of precedent, derived from their experiences with gas, candles, oil, and other relics of the Middle Ages, forgetting that the shapes of the holders of all these lights are determined by the necessity of leaving a clear space above them for the escape of hot and foul air, and also by the condition that they must be within reach of the taper or match used for lighting them.

Not till they realize fully their freedom from these two limitations will designers begin to appreciate properly the artistic possibilities of the new illuminant, and give us original designs of flying figures, birds, and carved Cupids, delicate chain work, faintly tinted glass, and china powdered with flowers.

I do not propose to give an exhaustive account of all the designs that I have in my mind's eye. I shall only hope to indicate what Mr. George Meredith calls, "the first tadpole wriggle of an idea" of the scientific use of the imagination required to produce good and artistic results.

Grace, simplicity, and beauty of form and colour are to be sought before anything. Decorations should be the measure of the owner's taste and imagination, and not of his purse.

Every pendant, bracket, and shade should be chosen after seeing the light behind it, and we should take into consideration how much the electric light differs from other illuminants in its effect upon colours, and also the different shades that the same glass and silk will show with transmitted or reflected light respectively.

I would furthermore suggest that brackets, glasses, and pendants should never be finally decided upon till they have been seen in the places they are intended to occupy. If they do not look

at home, they should be at once discarded, however beautiful they may be in themselves.

People who have old family cut-glass chandeliers and side pendants can have them adapted for the electric light; and they are very effective if the shades of the electric lamps are well designed and carried out. Cut-glass chandeliers should *never* be used with unshaded lights. They become then most glaring and painful to the eyes. I recently saw a most successful adaptation of an old glass chandelier, the electric lamp shades of which were made in three tones of yellow. I think they would look well with soft white lace shades, for balls or evening entertainments, when a flood of light is required.

I have seen an effective design consisting of an Adams chandelier turned upside down, the electric lamps being underneath the little cut-glass drops, which break up the rays of light into many colours.

Celadon and other shades of pale green, if skilfully chosen, are more effective with electric

light than with other illuminants. Venetian glass chandeliers, with different coloured flower-



FIG. 20.—LARGE STORK STANDARD.

shaped shades of the exact tints of the glass itself, are soft and pleasant to the eyes.

For drawing-room standards, tall bronze storks or cranes, holding the light down from their beaks (Fig. 20) are very convenient. The bronzes can be either tall enough to stand on the floor, holding the light at the proper height, or small ones can be mounted on old oak stools. They should in either case be furnished with castors, so that they can be moved about the room near any chair. A most delightful retreat in cold foggy weather can be made in front of the fire with a comfortable armchair and one of these large cranes standing by it, and a screen placed behind it to cut off the draught from the window or door.

China and glass vases can with a little ingenuity be made into beautiful electric light standards (Fig. 21). Designs that are broad at the base and narrow at the top should for practical reasons be preferred. The shades should be chosen of the same tint as the glass or china, or if the vase is of a dark colour, of a paler tone of the same.

Many of the dealers will offer to adapt the vases,

glasses, and bronzes for electricity before sending them home, and will assure purchasers that they have a skilled electrician on the premises. No credence should be given to this statement, but the things should be purchased as they stand, and should be sent for adaptation to a regular electrical firm.

It is necessary, though brilliantly lighting our guest-rooms, so that dresses and jewels may look effective, to remember

that the electric light by itself is a hard light, and that ceiling lighting *alone*, without side-lights, is very unbecoming.



FIG. 21.—VENETIAN-GLASS
STANDARD.

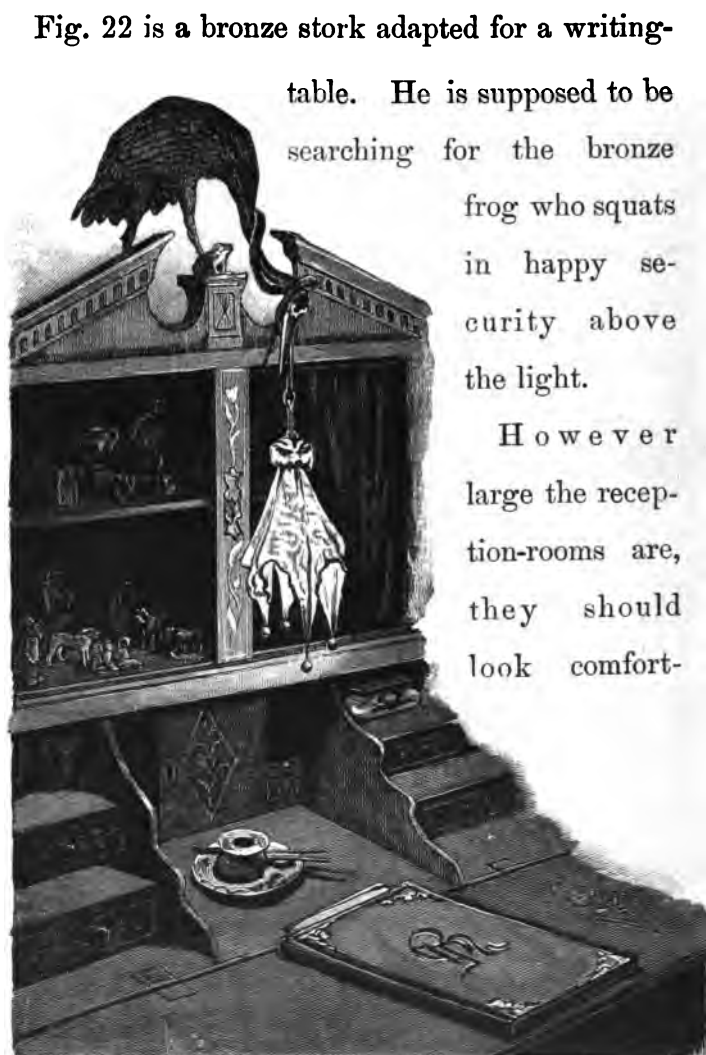


FIG. 22.—WRITING-TABLE.

able, and every effort should be used to get



FIG 23.—SUMMER FIREPLACE WITH ELECTRIC LIGHTS.

rid of that "best-parlour look" that haunts the drawing-room when the mistress of the house makes the boudoir her principal sitting-room.

In summer-time, when the fireplace has such a dismal look, and we are forced to stick in one of those dreadful bazaar-made ornaments, or spend some guineas in banking up the chasm with hot-house flowers—which, to my mind, always look out of place in front of the coals,—the following electrical decoration is much to be recommended:

A large Benares brass tray should be stood in front of the grate, and a fern, palm, or brass dogs placed on each side of the fireplace. Behind these plants or brass dogs two electric lamps, with reflectors, should be hidden. The light from these will make the brass tray glow again with light, and give one the pleasant impression of a fire without its heat, Fig. 23.

Here I may point out the advantage of extra sockets round the drawing-room, for Mr. Gordon

contrived this electrical decoration, with two standards from the bedrooms, at the last moment before an evening party in summer, when we were lamenting the heavy, dismal look of the fireplace. Similarly, we have sockets near all the windows, and when a ball or "at home" is given, Japanese lanterns, with electric lights inside, are hung on the balcony, and beneath the awnings outside. Both these electrical decorations are invaluable in case of a ball, and the glowing fireplace cheers the inevitable mournfulness of the first quarter of an hour.

With time and experience, I have no doubt many most delightful electrical decorations will be developed, but novelty should not be too eagerly sought after for its own sake.

Too many bright-coloured lights in groups or strings have a Cremorne-like effect, and an ostrich egg with a light in it, though novel, gives an unpleasant idea of the liveliness of the unhatched chick inside! but after all, even unsuccessful

attempts after novelty are better than the continual imitation of gas-brackets and candlesticks, of which we see so much.

I greatly dislike the cheerless look of the windows on a foggy afternoon, and to raise our spirits in the winter we contrived a little window just over the cosy corner seat in the drawing-room. It is filled in with Cairo lattice-work, and outside in the balcony, a powerful electric lamp is hung in a lantern like that used in front of shop-windows, with a dark side to the street, and painted white inside. There is a switch just above the seat, and if the afternoon is dreary and desolate, we switch on the light, which gleams through the lattice, making it look like wooden lace-work. If a lamp of sufficient candle-power is used, books can be read by it, but as a rule it is better to have some lamps, with reading-shades, hung from the cosy corner at an angle convenient for reading.

This outside light is well worth the few

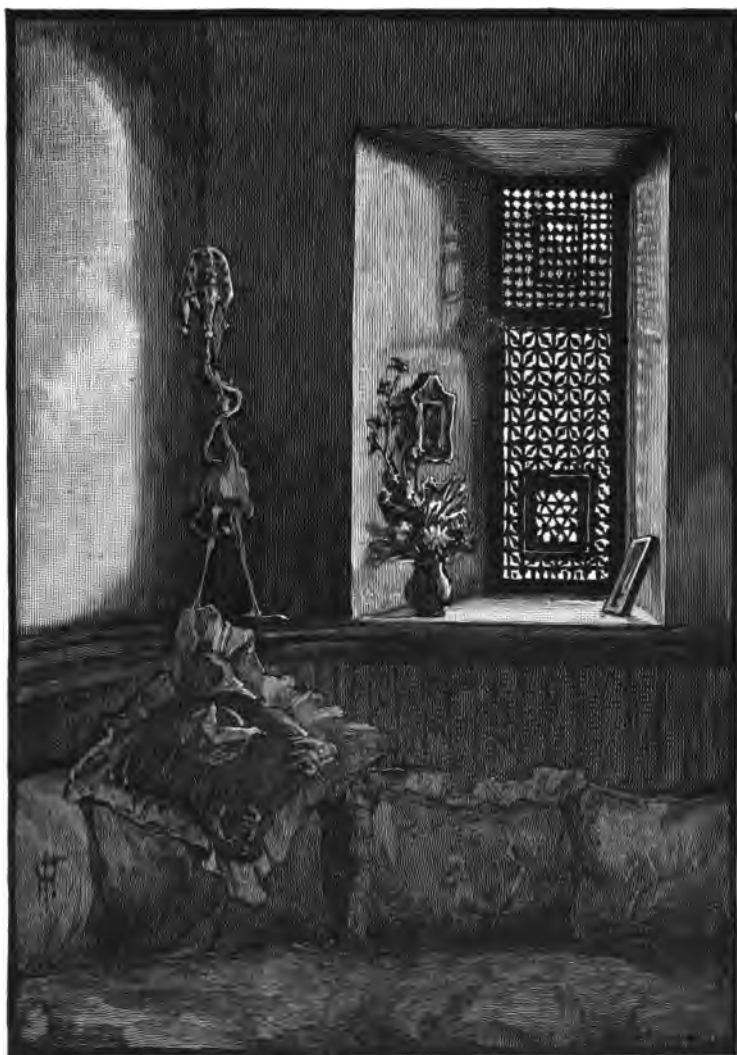


FIG. 24.—IMITATION SUNLIGHT.

shillings' worth of electricity that it uses during the winter months. It will cheer the spirits on a foggy afternoon, and make five o'clock tea quite a little feast in the cosy corner. It is of no use to burn this outside window-light when the whole room is illuminated. It must be kept as the cheerer of dull, wet, and foggy winter afternoons.

I have suggested the use of outside window-lights on the hall and staircase, and our own little window-light has given us so much pleasure that I do not see why window-lighting could not be carried out on a large scale. Imagine a beautifully-decorated room with the shapes of the windows altered, and the windows themselves filled with richly-coloured glass, no heavy curtains, hideous curtain-poles, nor aggravating blinds. Behold, as soon as the daylight fades, we turn a switch, and the room is flooded with a new daylight of our own.

It sounds like a dream of Haroun-al-Raschid, but I do not see why the dream should not be

realised. Houses in London streets would not be spoilt by having some of their street-views obscured, and the saving in our "expensive and handsome" window-curtains and blinds would go at least half-way towards the cost of the coloured windows, the art of designing which seems to be reviving so greatly. It would in any case be necessary to add a few ceiling and bracket lights as well. Light must be distributed to avoid dark and unbecoming shadows.

Tapestry makes a good drawing-room wall-hanging; it is apt to look heavy with insufficient light, but with the electric light it is well worth the trouble and expense of putting it up.

Dull gold softens electric light, and is also a perfect back-ground to people and ornaments; it has, moreover, the charm of not wearying the eye, like the yellow-and-white and floral French papers, which the need of lightness has introduced to such an extent.

In this grey and chilly climate of ours we long

for colour, and we may perhaps in the future thank electricity for sparing us these fussy modern French floral papers and restoring to us a more harmonious background, which, while beautiful and dignified in itself, will give full value to every scrap of beautiful colour in the room.

For the drawing-room I believe that, whatever the illuminant used, the light of the future will be a reflected light. What we have to aim at is, that the room should be flooded with a warm, soft radiance, and that we should be unconscious of the source from which it proceeds.

This can only be attained by the use of reflected lights; but when it is remembered that powerful electric lamps can be placed within a few inches of the most beautifully decorated ceilings without risk of injury to them, and their direct rays intercepted by silk or any other semi-opaque substance, it will be seen at once what opportunities electricity affords for the effective illumination of our drawing-rooms. It

makes it possible to use decorations on the ceilings which any combustion light would destroy in a few months.

Light like sympathy should be unobtrusive to be pleasant, and soft reflected rays fall more kindly than direct light on tired eyes and on the faces and figures of those who have passed the "half-way house of life."

Most of the light we receive from the sun is reflected, and now that we have such a powerful illuminant as electricity, surely we may take some hints from Nature herself.

As we learn as much by our failures as by our successes, I will describe for the benefit of my readers the history of the reflected ceiling lights in our own drawing-room.

We had four 100-candle lamps placed under a cone-shaped reflector, see Fig. 25. The angles at which these mirrors reflected the light were most carefully calculated. The whole apparatus was hung up beneath the ceiling.

The walls are a dull gold and the ceiling gold Japanese brocades in panels. The light reflected from them was most successful and pleasant, the gold just tinging the white light a soft yellow, so that it was almost like sunshine; but the apparatus itself was most hideous.

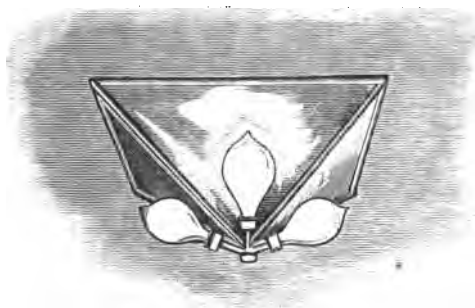


FIG. 25.—CEILING LIGHTS WITH SHADE REMOVED.

And now began tribulation! First we hung up a board beneath the mirrors, and tried to drape it; but the edges of the board refused to be draped, and stuck out through all the folds with hard and uncompromising stiffness.

Oriental wood-work, and pierced iron, brought down the ceiling on our heads.

My imagination longed for a winged eagle or a magic roc, but failing to find either of these. we hung up various kinds of poultry till the room looked like a provision-shop.

Some one suggested an owl. Never shall I forget the cold dead eye of that owl, as he hung dangling helplessly and seeming to reproach us for placing him, the bird of night, beneath those fierce glaring lights; so we abandoned the birds, and we had made for us a beautiful design of graceful acanthus leaves, which were to be hammered out in copper by cunning artificers. We rejoiced when we saw the beautiful drawing, and said, "This will be the end of our trouble."

We waited two weeks in happy expectation; then on coming in one afternoon, I saw in the front hall a mass of old metal like all the old kettles and preserving-pans broken down and rolled into plates, which I naturally concluded were on their way to Mr. Gordon's laboratory; but on remonstrating at

their being left in the front hall, I was informed that they were the new drawing-room centre lights, that had been left in the hall for me to see before they were erected.

THOSE my graceful springing acanthus leaves!

Half an hour later they came and hung the "thing" up. And now my drawing-room was turned from a poulterer's into an old ironmonger's shop.

I went upstairs, sadly resolving to abandon electrical decorative reflectors and content myself with a simple glass chandelier, and in a virtuous and domestic frame of mind sat down to read Hans Andersen to the children.

We read the story of the Swan Princes carrying their little sister over the seas to their home; and my thoughts wandering from the story to my unsuccessful drawing-room, I sketched out a scheme for shading the lights by a sheet carried by flying swans, as in the story we were reading.

Next morning I started early and came back

with a carriage full of storks and a heap of soft-coloured silks. Having telegraphed to the electrician to meet me, we started afresh.

A long square of pinkish red silk was draped across beneath the lights, and each corner finished with a gilt ball, and held in the beak of a flying stork. Directly under the lamps a larger stork was fixed, holding in his beak a small Arabian glass bottle, with a sixteen-candle lamp inside (for every-day use, and to avoid a dark patch under the screen when the large lamps were lighted). The silk was lined with a layer of white tissue paper, to soften the light, and to keep the upper surface clean.

The silk was suspended about fifteen inches below the ceiling, so as to allow the light to fall directly upon the ceiling and upon the upper portions of the walls.

Now all this was infinitely better than anything we had attempted before; but I had imagined a rush of birds bearing the light

along, and alas! these birds will not rush. The centre stork is dignified, and looks well with his bottle of light, but the four corner ones are the most aggravating fowls, as they will not make up their minds which way they will fly, but face each other as in a quadrille. We are only waiting till the fogs of winter are over to try some further improvements.

An artist has suggested sunset tints of flame-yellow and orange silk, and herons, or darker birds, instead of storks, as by daylight white birds look rather spotty against the golden ceiling, and it is one of the principal difficulties of decorative lighting, to design fittings which are beautiful both by day and night.

The same scheme of lighting would, I am sure, be successful if carried out in white. The ceiling in this case should be raised carton-pierre, or good Tynecastle tapestry tinted a soft parchment white, and the screen below the lights should be of white silk of the same tone as the ceiling.



FIG. 26.—CEILING LIGHTS.

If there is a window guarded by heavy curtains that seem to need relief, a large ornamental glass vase or bottle can be hung with the lamp inside it (Fig. 27).



FIG. 27.—PENDANT ARABIAN
GLASS VASE.

Wonderfully little light is absorbed by these glasses if carefully chosen, and the rays will look like the imprisoned genii of the "Arabian Nights," and will delight the imagination as well as the eye.

People with small drawing-rooms make a great mistake in buying a "handsome centre electrolier."

I lately saw a small room lighted with such a one, the lamps being placed on it at right angles; the

room being small, it was impossible to escape from the lights.

Fig. 28 represents a graceful and inexpensive wall bracket.



FIG. 28.—LION AND SCROLL WIRE DESIGN.

If central lighting is desired, it could be attained by a small copper centre flower, with a large lamp above and a small lamp beneath.

Any of the simple designs given in the foregoing chapters are suitable for small drawing-rooms.

In decorative matters it is a strange fact, but true, that people with slender purses generally make small rooms look much more artistic and harmonious than rich people. Expensive electroliers and electric fittings have a specially parvenue appearance when stuck into a small drawing-room.

I have seen many rooms spoilt that were simple and tasteful, though perhaps a trifle worn, by the introduction of smart new brass and cut-glass electroliers, the alien appearance of which almost makes the owner's friends wish for the return of the familiar shade and paraffin lamp.

For electrical, as for all other decorations, it is difficult to give general directions, as they may fail in application to particular cases: what looks beautiful in one room, will look a decided failure

in another, and the tastes and habits of people differ greatly, which is an excellent thing for trade, and for the development of variety in design.

So the best thing for the master and mistress, after reading and duly studying this book, and seeing all the electrical decorations in their friends' houses and in the shops, so that they may have something to judge from, is to order just what they like and admire themselves, and not be guided too much by what I, or other people like and admire.

THE DRAWING-ROOM.

Switches should be placed

Centre pendant reflected lights, or ornamental chandelier, and all decorative occasional lights.	In small locked cupboard, near door.
One or two lights for daily use	} Switch outside cupboard, near door.
Wall pendants	
Outside window light . .	Near window.
Standards, or bronze storks .	On the storks and standards themselves.

All pendant reading and writing lights. Near the place where they are used.

Extra fireplace light and Japanese lantern, &c. Need no switch, as they are used so seldom that they can simply be lighted by putting the plugs into the sockets.

CHAPTER VIII.

THE BEDROOM.

WHEN Tennyson wrote—

“~~The shimmering~~ light is rich and warm,
And moves not on the rounded curl,”

he described an ideally-lighted bedroom. The whole lighting of a bedroom should be warm and soft rather than brilliant.

Electricity solves the long-standing struggle between conscience and inclination, as it enables us safely to read in bed.

A hinged bracket lamp (Fig. 29) should project from the wall over the bed, and the light should be shaded from above with silk, lace, or crinkled paper. This lamp should be provided with one of the new switches made to rest in three positions,

namely—off, on, and half-light.* This half-light position is invaluable in case of illness. The switch could be made with a flexible wire



FIG. 29.—BED AND READING-LAMP.

to lie beneath the pillow, but personal experience leads me to advise that it should be fastened just

* This light is arranged with a second lamp, used as a resistance only, and enclosed in a brass box under the bed. The first position of the switch breaks the circuit in the usual way, the second puts the two lamps in series and gives half-light, the third position short-circuits the resistance lamp and gives full light.—J. E. H. G.

above the pillow on the back of the bed, when it can always be found in the same place.

The shade of this bed-light, on which so much nightly comfort depends, should have a thin veil of gauze or silk beneath the lamp, as a powerful reflected light on the top of the head is not pleasant. The bracket holding this lamp should have at least two joints, so that it can be moved into any position required, or fold back against the wall.



FIG. 30.—BED-ROOM STANDARD.

Pendant counterweight shades are often used for bed-lights, but personally I find the bracket more comfortable.

Near the wash-stand another bracket-light should be fixed either across the corner or to one side.

In case of real illness this is most useful, as a light screen can be placed round the wash-stand, and all medicines, etc., prepared behind the screen, and this light will most likely make a pleasanter all-night light than the one above the bed, which, however, can be turned to half-light when the patient requires food.

There should be two sockets, one on each side of the fireplace, and one reading standard (Fig. 30). Bed-room standards should be made of simple design and very heavy at the base.

When a light is required near the sofa, it seems usual to carry the standard and place it on a table, but this is in some cases rather clumsy, and the cord is apt to trip up people walking about the room. If the sofa is only used occasionally, it does not much signify ; but if, as is sometimes the case, the mistress retires daily for rest, I strongly advise

that either a socket or a pendant reading-light should be fixed at the head of the sofa or against the bottom of the bed, and the wire brought up through a tiny hole in the carpet.

The toilet-table should never have a lamp in front of the glass, or Madam will see the reflection of the lamp instead of her own hair; it is best, therefore, to hang or fix it at one side.

In a large room it is preferable to have two toilet-lights (Fig. 31), one on each side of the glass, fitted with counterweights, so that they can be drawn up and down and placed at any level. Each light should have a switch, as it is often unnecessary to burn both.

Pretty combinations of lace and silk can be evolved for these lights, but for London bedrooms I prefer crinkled paper, that can always be kept fresh and clean, and renewed every week if necessary. Butterfly yellow, if it suits with the rest of the decorations, is satisfactory for these shades. A white china shade should be above



FIG. 31.—TOILET-TABLE PENDANTS.

the lamp, and the paper shade fastened over that again with a bow of ribbon, as in Fig. 31.

A light brass handle should be fitted beneath these lamps to draw them up and down.

Electrical hair curlers ought to reduce the Fire Insurance.

Dress decorations can be carried out with tiny one-candle electric lamps, fed from a small secondary battery concealed in the dress, but perhaps now they are only suitable for fancy balls, as dress electric lights have become common since the theatres have adopted them; but years ago, when electric lights were quite new, we derived a great deal of amusement and also some tribulation from experiments on them.

Mr. Swan very kindly presented me with three or four dainty little lamps each the size of a large pea.

These looked fairy-like inside the petals of real flowers.

To illustrate the necessity of well considering the effect of the electric light, I will relate a little tale of misfortune that befell me.

One day when I was going to a fancy ball, I thought I would have the tiny lamps arranged behind a diamond head-dress. The wires were carried up inside my hair, which was carefully dressed so as to hide them; the three small lamps were fixed behind the three principal ornaments; a tiny switch controlled the lights. I turned it on, and seeing a look of horror on the face of my maid, rushed to the glass, to subside into a fit of helpless laughter, for nothing was to be seen but the gold wire setting of the diamonds, which stood out in a background of green light.

It was too late to re-dress my hair, so the wires were cut, and I went out without my little lights, feeling much like a glow-worm who had lost its glow.

In those days batteries were difficult to manage. Once the case was upset on the floor and the acids burnt a hole in the carpet. Sometimes the battery heated, and leaked, and once I well remember, the old lamps having worn out, I had some new ones

given to me that were a wrong resistance for the battery. It heated, and we had barely time to cast the battery into the bath before the gutta-percha sides gave way, and the acids poured out, taking off all the paint. So having spoilt a dress, a carpet, and a bath, I abandoned personal electric light decorations. Now-a-days, with secondary batteries, the matter is much simpler.

In a gentleman's dressing-room, Fig. 32 represents a very convenient pendant; the cords carrying the counterweight go round four pulleys instead of two, and the light can be drawn out to a considerable distance, and hung upon hooks fixed by the fire or bed to read by, and by the looking-glass to shave by, so that one electric light will do all that is required.

I think that all mothers will agree with me that reading and bed lights are not to be recommended for young people's bedrooms. A pretty glass centre pendant should be hung in the middle of the room. A socket can be placed near the

bed and fireplace, and in the case of illness, or the room being used for visitors, a standard can be brought from another room and fixed as required.



FIG. 32.—MULTIPLE PENDANT.*

If a child is put into a large room, and it is desired to economize the light, it is best to take out all the lamps except one.

* The hooks would be placed much further apart than can be shown in the drawing.

In small spare bedrooms one pendant near the looking-glass is enough, and two sockets, one near the fireplace and one near the bed, so that one standard can be used for either as required.

THE BED-ROOM.

Switches should be placed

Pendant toilet-light . . .	Near door.
2nd Pendant toilet-light . .	Near dressing-table.
Standards	Key sockets.
Bed reading-light	Above or below pillow.

THE DRESSING-ROOM.

Near door.

CHAPTER IX.

SCHOOL-ROOM AND NURSERY.

IN these rooms our endeavour should be to make the electric light as safe as possible, and for this reason there should be no standards with long cords trailing about, certain traps for little feet. The electric lights should be made pendant, and a good pattern is shown in Fig. 33, by which the light can literally be tumbled about at any angle. The top part of the shade should be white china with a frill round, so that the upper part will light the room as well as reflect down on the table.

This pendant, containing three lights controlled by two switches, should be enough for any ordinary-sized school-room; but I think it would be kind

to provide the governess with a comfortable reading-standard, that could be brought out after the children had gone to bed, and placed on the table near the fire in winter, or by the open window in summer. She need not then burn the centre lights.

When much practising is done, it is best to have a piano light for evenings and dark foggy days.

During the long winter months the electric light in the school-room undoubtedly makes a vast difference in the health of children. The darkness is trying enough of

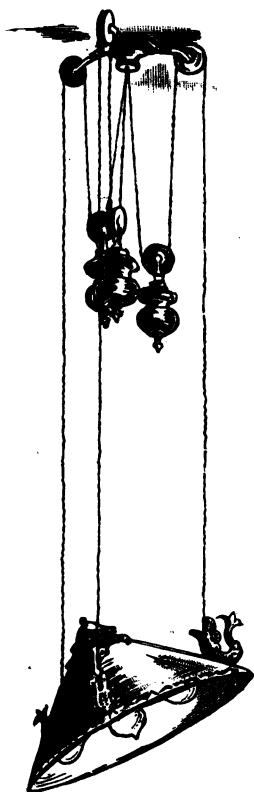


FIG. 33.—SCHOOL-ROOM
PENDANT.

itself, without the addition of the foul air produced by gas and lamps. Electric light mingles with half daylight better than other illuminants, and

when we consider how easily we obtain extra light by turning the little switch, I think after some experience we shall find that we use it a great deal during the winter, and for slight fogs, when in the days of gas and paraffin we should have been content to do without artificial illumination.

With the use of electric light our ideas as to the amount of illumination necessary to comfort expand, and certainly these two points ought to be taken into account, when we receive our electric lighting bills after the winter months' burning.

The nursery should have one or two pendant lights over the centre table, made with counter-weights.

A very useful pin-searcher can be made of an electric lamp, fixed at the end of a long wooden handle, and protected by a wire case, which can be held close to the floor and carried all over the room ; so that every needle and pin can be brought to view. Stray needles are often the cause of serious mischief to children's bare feet and knees.

This electric searcher (Fig. 34) is very useful in a house, as, if any small object is lost, the searcher can be connected to any socket in the house, and carried about, and poked under all the sofas and chairs; so that, if in the room, the lost treasure is sure to be discovered. The lamp-holder should be made so as to be easily detached from the wooden handle, then it can be thrust into the back shelves of cupboards, raised on a window-pole to the tops of wardrobes and book-shelves, and is a fine discoverer of cobwebs and dust.

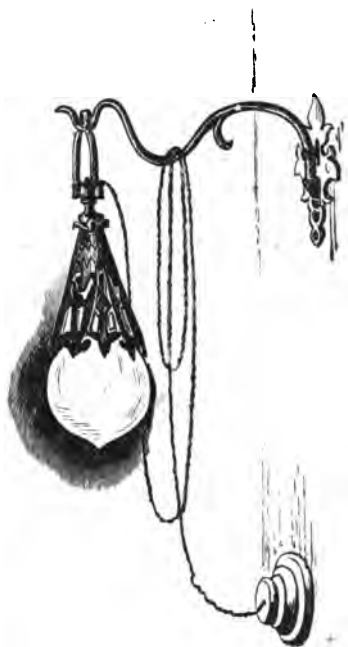


FIG. 34.—SEARCHER LIGHT.

A small installation for the doll's house is a surprise for Christmas Day, with a tiny one-candle

lamp in each room—this is a most fascinating plaything for children ; as they can have all the joy of playing with fire and none of its danger, and on dark foggy afternoons, the dollies can have grand parties. The switch for this should either be locked up, or made so that the handle will take off, so that the lighting can be turned on only as a special treat.

Christmas trees can be lighted with electric lamps, hung among the branches, with more safety than with tapers, to the dresses of the dolls and the more fragile presents. I have seen it several times, but must candidly own that I do not consider it nearly so effective as the little candles ; but magic lanterns work most brilliantly if the searcher lamp is placed inside. A cheap 3s. 6d. toy becomes quite effective, and the children can be allowed to play with it by themselves. and can arrange long illustrated stories.

In the case of Tableaux Vivants and theatricals, the safety of the electric light is a great recom-

mendation, and coloured glasses placed in front will throw a lurid light on the goblin's cave, or a moonlight radiance on the fairies' glen. A good theatrical fire can be made with an electric lamp covered with red gelatine paper, with one or two real pieces of coal placed among it.

Fairies can have electric lamps on their hair, or on their wands, connected to the nearest standard socket, and if cleverly managed the wires will not show behind ; while the sudden lighting and extinguishing can produce all sorts of lightning and magic effects.

Matches lying about in an electrically lighted house are inexcusable ; their proper place is in the housemaid's box.

The switches should be placed high in the nursery and school-room, and strict rules should be made that the children do not meddle with them, as they will climb on chairs and footstools, and electric switches, as I have found from personal experience, are perfectly irresistible to little boys.

SCHOOL-ROOM AND NURSERY.

Switches should be placed

Centre pendant	Two switches near door.
Standard	Key socket.
Nursery	Switch near door (high up).
Electric searcher	Simply connected to socket when required.

CHAPTER X.

SERVANTS' DEPARTMENTS.

WHEN electric light is being installed in the house, the extra cost of having it in the servants' departments is not a serious consideration, as only the plainest fittings will be used. If it is burnt with care it will be as cheap as gas, and the annoyance of having two bills for electric light and gas will be spared.

It is necessary to impress on the servants the need of invariably turning out the lights whenever they leave a room, even for a few minutes.

If the switch is placed handy for them near the door, extinguishing the light on leaving the room will soon become mechanical, and an act of "unconscious cerebration," as is sometimes proved to

us by the servants turning out the lights as they leave the room, and forgetting that we are in it.

Servants, as a rule, appreciate the electric light as much as any one; and they will become quite miserly over it, if (after they have had a few weeks' experience of it) they are told that it will be cut off from their departments if the electric light bill exceeds what it should be, after careful calculation of the time of year, fogs, and the darkness of the basement; but the advantage of having a separate meter for the servants' departments is obvious. No science can compete with carelessness nor the feeling among many servants and uneducated people that because they cannot see or smell electricity that it cannot matter how freely they burn it.

Lately, when passing down a street near my house on a misty, but not a foggy morning, I noticed the front-door of a house open, and a small scullery-maid scrubbing an outer hall, 10 ft. by

8 ft., by the light of two sixteen-candle lamps that she had turned on for the purpose. Most likely in that house the master complained later that electric light was a very expensive luxury.

In the early days of electric lighting, in 1886, Mr. Gordon had lighted a very large station and offices; and the load during the busiest part of the day was very heavy for the capacity of the machinery, and a little anxiety was always felt between dark and 6 P.M., the time when the clerks left, and the bulk of the office lights should have been extinguished. After a few days it was reported that the heavy load, instead of going off the machinery at 6 P.M. was frequently on till nine. On investigation being made, the engineer in charge discovered that three charwomen were in the habit of turning on 1500 lights to clean out the offices by. It is reported that they were on the top floor when he made this discovery, and that he at once switched off the whole of the

offices at the main. I have never heard what became of the charwomen.



FIG. 35.—MAIDS' WORKING
COUNTERWEIGHT PENDANT.

In large establishments the lighting of the younger maids' rooms should be controlled by a switch placed in the housekeeper's bedroom. This switch she can turn off at a given hour, and on dark mornings she can turn it on again to wake them up.

One eight-candle light is enough in each servant's bedroom, and when there are two small rooms adjoining each other, they might be lighted by a lamp placed in the wall between them, on the same principle as railway carriages.

The lady's-maid's room and the work-room should

have pendant lights with counterweights, and the lamps covered with white china shades (Fig. 35). The maid should hang a piece of white crinkled tissue paper over this, if she wishes to save her eyes and focus the light down on her needle-work.

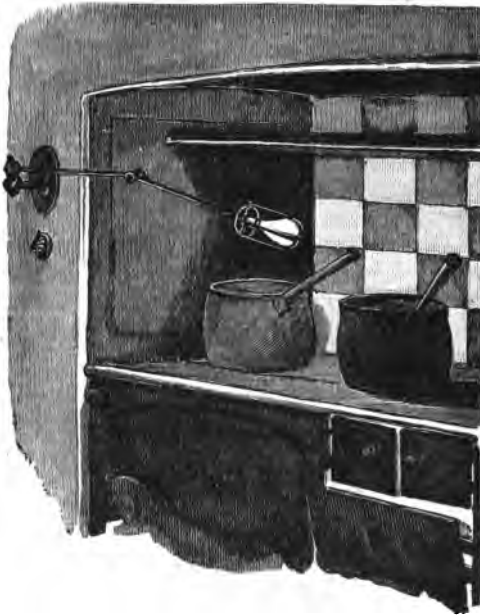


FIG. 36.—KITCHEN GRATE WITH LIGHT.

In the kitchen there should be fixed, according to the size of the room, one, two, or three pendant lights with china shades.

In the scullery there should be one light, with a bracket over the sink ; every larder should have a lamp ; and a bracket and lamp should be fixed over the refrigerator.

Near the kitchen range a two or three-jointed bracket (Fig. 36) should be fixed, and arranged to work, with a ball-and-socket joint, so that the lamp can be dipped right into any saucepan ; with this there is no excuse for the least particle of grease in the soup or gravy.

The pantry will want a good bracket over the sink, and if large a ceiling pendant as well.

The servants' hall should have a pendant or two over the dinner-table, and another light, with a counterweight, in the bow window, or near the fire, for the maids to work by.

I think the switches which are made to control two lights, so that either, but not both, can be used, are to be recommended for the servants' departments.

The switch for the footmen's bedroom should

be placed outside their room, so that the head servants can see when they are turned on; or their light can be controlled from the butler's bedroom.

It is impossible to over-estimate the daily comfort of having electric lamps fixed in all the principal cupboards, linen and housemaids' closets, coal and wine-cellars, bath-rooms, lavatories, &c. The working cost of these is not worth considering, owing to the short total of hours that each burns in the year.

The box-room and cistern-room in the attic should have a light in the centre of the ceiling, fixed high up with a tin reflector.

Linen closets if large should have a pendant lamp inside, or be provided with "a searcher" that can be put into each shelf.

For the housemaid's closet a bracket and lamp is best over the sink.

In the bath-room there should be a bracket lamp over the bath.

In lavatories, a ceiling light shaded from below.

Large hanging dress and cloak cupboards can have a small lamp inside them, or a searcher light can be used.

Wine-cellars should be provided with a centre pendant and tin reflector, and if large with a searcher lamp in a wire case, to put inside the bins.

Coal-cellars should have one reflected light just over the door, not on the ceiling.

The boot-hole should have a light over boot-cleaning bench.

I have often heard people object to cupboard lights, for fear the door should be shut upon them and the light perhaps left burning for several days and nights unobserved; but this can be obviated either by placing the switch outside the cupboard, so that any one passing can see when it is turned on, or by making a small round hole at the top of the cupboard door and filling it with ground glass or talc, so that the light can be seen shining through it.

All the lamps in the house should be wiped with a damp cloth once a week in winter, and once a fortnight in summer. Complaints that the electric supply is getting steadily worse, are often caused by the gradual obscuring of the lamps by accumulated dust.

SERVANTS' DEPARTMENTS.

Switches should be placed

Bed-rooms.	Inside door.
In housekeeper's room . . .	Controlling switch for maids' rooms.
Kitchen	} Inside door.
Scullery	
Pantry	
Servants' hall.	
Kitchen-range light . . .	Under bracket.
Footmen's bedroom . . .	} Outside door.
Wine-cellar	
Coal-cellar	
Box-room	
Linen-closet	
Housemaid's closet . . .	
Bath-rooms and lavatories . .	Inside door.

CHAPTER XI.

SHOPS AND PUBLIC BUILDINGS.

AN examination of the window lighting of most of our principal shops, will show us how much the art of illumination needs developing, for the lamps seem placed more with the intention of exhibiting themselves than the objects in the window.

Shop-owners do not realise the superior illuminating power of hidden lights.

Theatre managers, accustomed to the effects of footlights, have realised this in a greater degree, and consequently the electric lighting of our London theatres is artistically far in advance of that of shops and houses.

Some progress in a right direction has undoubtedly been made during this winter; but

at first those who were enterprising enough to install the electric light were naturally most anxious to have the credit of it. All honour be to them for their spirit; but now that electricity is no longer a novelty, and every one is accustomed to the sight of the little pear-shaped lamps, it would be well for exhibitors to reconsider their arrangements.

When we enter a shop from the darkness outside, the large naked pendant lamps dazzle and annoy us and quite prevent our seeing the goods; and when the arc light is used, all this difficulty is increased.

A jeweller's shop can be most artistically lighted with real scollop shells used as reflectors. On the street side a faint pink light shines through them and gives a pleasanter effect than can be obtained with a perfectly opaque reflector.

In clubs most of the lighting is very hard and ungenial, and I do not wonder at the frequenters' constant grumbling at the electric light, that is

unless, as I said before, they were on the electric lighting committee themselves, when they generally think it beautiful!

Successful illumination is an art requiring experience, artistic perception, and scientific knowledge; but the electric light committee of a club generally consists of members, often of high scientific attainments, but amateurs in electric lighting, who themselves prepare a specification on a subject of which they have no practical knowledge, and then accept the lowest tender for carrying it out. I wonder what the feelings of members would be if the same policy was followed in the kitchen and wine departments.

I think that armchairs and tables furnished with electric lamps, as shown in Chapter V., might be a great comfort to elderly gentlemen at their clubs.

All the church electric lighting at present is simply beyond comment. It is astounding to think how and why the congregations endure it.

The preacher often has a powerful electric lamp placed on the pulpit, so that the glare of the light entirely prevents the congregation seeing the expression of his face.

Perhaps in the future some of the beautiful stained-glass windows may be utilised by placing lights outside them, their glow and colour would then give as much pleasure by night as by day.

It is difficult to devise a satisfactory scheme for church lighting; but I would suggest that spotty lights dotted about should be avoided, and that a dim religious light is conducive to devotion. When the hymns are being sung or during the psalms, when the congregation require to see their books, extra lights can be switched on.

It must be remembered, however, that to obtain a given quantity of illumination with artistically shaded lights requires a greater number of lamps and a greater hourly consumption of electricity than with uncovered lights. Churches are often

short of funds, and further all money spent by them for such a purpose must be withdrawn from other pressing objects, while money similarly spent on a shop or theatre may be regarded as an investment, and can therefore be spent more freely.

In concert-halls surely something might be done to make the electric light more becoming. How trying and unbecoming it can be, to even the very youngest and prettiest among women, can be studied when a lecture or concert is given at any of our principal lecture-rooms and concert-halls.

Wherever there are large ceiling-lights alone, with reflectors *over them*, women must be content to look their worst. Ceiling-lighting is most uncompromising to a woman's age, and causes dark shadows under the eyes, which accounts for the haggard and worn look of most people at concerts. A few side-lights mixed with ceiling lights in a right and judicious proportion do away with these shadows.

Large public halls should undoubtedly have

ceiling lights as well as side-lights, as the effect is more cheerful, and people hardly realise enough how much more vivid and vigorous dancing and enjoyment is with bright attractive lighting.

I imagine, however, that women are supposed not to think of their looks when they are listening to sweet music, or to a scientific discourse. And I am aware that the lighting of public halls is a heavy expense already, and to make it pleasant would most likely involve a heavier outlay than the owners of such places would care to undertake, not only at first, but continually for the extra quantity of electricity required to compensate the loss of light which is caused by decorative treatment. Then, on the other hand, the theatres have been able to make it pay, and most of the theatres lighted by electricity are exceedingly pleasant.

The Savoy is charming, with its three-light ground-glass pendants dispersed all over the theatre, lighting it up in every corner, yet never

making a bright spot that catches the eye unpleasantly.

The Garrick, with its beautiful centre chandelier and red-shaded side-lights, the Gaiety, Criterion, and others, may be studied with advantage by people in search of ideas.

Electricity has opened quite a new field for stage effects in scenes representing banqueting-halls, ball-rooms, etc.

In the opera at Vienna there is an effective arrangement of foot-lights, where there are three times the necessary number of lamps, one third white, one third red, and one third blue. By an arrangement of switches and resistances any one group of these can be lighted or extinguished instantly so that the colours can be changed; or the strength of each or all of them can be varied slowly or rapidly, so that the colours can be mixed in any desired proportion.

In visiting hospitals, even of the best type, I am often struck with the exceeding discomfort of the

lighting arrangements, the unshaded light shining and glaring right into the eyes of patients, the gas flaring and winking, and seldom arranged so that the convalescent can read with comfort, while to feverish and nervous cases it must be most irritating and unendurable.

The lighting of hotels needs development. Some artistic and good specimens are to be found, but at present these are the exception, and most hotels and refreshment-rooms are very crude in their lighting arrangements, the proprietors not having yet realized the advantages of shaded lights.

I went to see some friends this winter, who were staying in an electrically lighted hotel. They had switched off the electric light altogether, and were reading with a shaded paraffin lamp, which they had asked the proprietor to procure for them. I inquired the reason, and they told me that they found it impossible to read by the bright, glaring, unshaded light of the central electrolier.

The little standards with shades, that are used on the small tables of some more enlightened hotels, are most agreeable and pleasant. I saw one recently, with an enamel shade of lapis lazuli blue, that I greatly admired.

For reading, writing, talking, and dining by, shaded standards are the pleasantest form of illumination. For dancing, playing, and society, the large reflected lights described in Chapter VII., combined with a few side-lights, are most to be recommended; but if these are not possible, then let the light throughout the hall or room be well diffused—but no lighting should be undertaken without “reflection” in both senses of the word.

It has been stated that the electric light is bad for the eyesight, and this I believe to be the case when it is used without a shade, not because it is an *electric* light, but because it is a powerful unshaded light, and because it is concentrated in a small, brilliant point most distressing to weak eyes; but this is not the case when it is diffused

and distributed with well-designed shades and reflectors.

We should never dream of putting powerful unshaded paraffin lamps all over the room; if we did so, I am certain they would be equally distressing to the sight.

Shaded lights concentrated down upon the book or work are a powerful aid to weak sight, and I know a friend who had used spectacles for some years, who has abandoned them since she has provided herself with an electric reading-lamp.

In refreshment-bars I am often sorry for the unfortunate girls who have to work in them with the ill-designed lighting arrangements. They have bright electric lights just above their heads, with white china reflectors above, and these hard, trying lights reflect up again from the white marble counter, and from all the drinking-glasses and cake-covers with which it is covered. No wonder that these girls complain, after a long, dark winter, of injury to their sight; but it is not

the electric light that harms them, but the way in which it is arranged. It would be so easy to arrange it otherwise, but at present this, like most other evils in this world, is wrought by want of thought.

CHAPTER XII.

SOME PERSONAL EXPERIENCES.

THE public who through long winter evenings, and longer London fogs, sit reading by the cool and steady light of their electric lamps, but who are most indignant if by any chance it flickers or fails them, do not realize how intense the struggle has been for those pioneers of electric lighting who have toiled so hard and incessantly to surprise yet one more of Nature's secrets; and

“To wring from iron those drops of golden light.”

Perhaps no one but an electric engineer's wife can truly judge of what that struggle has been.

In all other branches of science, the experiments are carried out in private, and generally with

friendly assistance, and when the day's work is done, the experimenter can rest till morning and start refreshed on another day of toil. In the development of the public distribution of electricity for lighting purposes, from the very nature of the problem involved, every experiment has had to be made in public, and every failure has been immediately exposed to the criticism, not only of friends but of an indifferent public, and of those who, for various reasons of their own, desired failure. Further, the work has been as continuous day and night as it is necessary for a public supply of electricity to be.

Many an engineer's wife knows how common it was four or five years ago for their husbands, who had come back late at night worn out and exhausted, to be fetched again by the message that there was "something wrong at the Works." We could all of us tell stories of difficulty and danger, of new and untried machinery that had *got* to work right, of difficulties that had to be overcome

and met by new inventions before the businessmen had had time to find out that they existed; of engineers deserted by their men, and doing single-handed the work of a whole staff throughout a winter's night, though happily these latter cases were rare, and none know better than engineers what they owe to the loyalty and courage, the nerve and skill of the workmen in their employ. As in other conditions of life, workmen will always follow, but they require to be sure that their chiefs know how to lead.

The pioneers of a new faith, or a new science, pour their life into its development. Health, pleasure, and home-life are cheerfully sacrificed to help it on its way; and all engineers' wives can tell of the entire absorption of mind and ideas involved, which, though it is a price they readily pay for their share in their husbands' ambition, is no less a price and a very heavy one.

I trust I shall not be considered egotistical if I

write of some personal experiences; they may perhaps obtain a little public interest as being types of those of many others working in the same field.

Our early married life was spent in the country, where we owned a large laboratory and a small house attached. In those days I was bottle-washer and laboratory assistant to my husband, money for experimenting was scarce, and the makeshifts adopted in the laboratory were sometimes more ingenious than conducive to the comfort of the rest of the house. Well do I remember my dismay on finding one morning that all the kitchen crockery was full of acids and villainous compounds, and the cook informing me with an injured air "that we could have no more pastry till we released her rolling-pin," which was then covered with tin-foil and adjusted as one of the principal conductors in an experiment that I well knew would last many weeks.

We went over to Paris in order that Mr. Gordon

might make some experiments in a French atelier. I thought that I spoke French with tolerable fluency, but after some attempts to translate or even give the sense of such phrases as : "The plumber-block wants shifting, for fear the belt should slip off the counter-shaft"—"The armature core of the dynamo is not sufficiently laminated"—my vanity received a severe blow, as my husband sorrowfully remarked : "My dear, I thought you knew French."

Mr. Gordon himself plunged into scientific debate with the happy reflection that he knew a language and a quarter, while the French inventor knew but one language, and with such energy that the Frenchman frequently remarked : "*Monsieur votre mari parle Français avec beaucoup de courage.*"

Walking to and from the atelier, the discussions were animated as to the future and possibilities of electric lighting, and I well remember one wet afternoon, when we were walking along and

discussing the number of revolutions per second that could be forced out of high-speed machinery, a French working man in a blouse thrust his head beneath the umbrella, and remarked in a quite indescribable tone: "Mais quelle intéressante histoire!"

With the possible development of electric lighting our country laboratory became inadequate, and we moved up to a small house in London. Then began the real struggle of our engineering life. Mr. Gordon worked at a factory at Wharf Road.

It would take a long book, and is far beyond the scope of this chapter to tell of all the hopes and fears and disappointments of those two years. Many other engineers were, with great patience and courage, striving to overcome difficulties. They also could tell of all the trials of a career begun in the patent office: and many of their wives, like myself, have hated the look of the patent agent's envelope, with its well-known

contents, stating so politely that a fresh instalment of fees was due.

There has been much unnecessary litigation about electric light patents by persons who forget that obtaining possession of a patent, without obtaining possession of the inventor, is at best a barren victory. For the patent divorced from the inventor's co-operation and assistance is but the corpse of the invention without its soul.

The records of the patent office and the scientific papers of 1880, contain an account of an incandescent iridium lamp, invented by Mr. Gordon, and which in October had attained about as much perfection as an iridium lamp was capable of, and arrangements for its manufacture on a large scale were nearly completed.

On the night of November 24, 1880, a paper was read at the Society of Telegraphic Engineers, describing a new lamp, the invention of one Mr. John Wilson Swan. By a curious coincidence, I

was dining that night with friends, and sat next the member for Newcastle. He began to tell me of the discovery of the new glow-lamp by one of his constituents. He described the filament made not from a costly metal, but from common carbon ; and I knew at once that iridium glow-lamps were things of the past. When I returned from the dinner-party, and Mr. Gordon came home after hearing the lecture, he was filled with enthusiastic admiration at the new discovery, which could at that time only be shared by those equally competent to understand its value.

To a real worker in the field, with genuine enthusiasm for his work, it matters little who does the work so long as it is done ; but to the wife it is different, and she perhaps may be allowed to drop a silent tear over the invention child that she has watched from its birth, and which she sees her stronger-minded husband abandon on the road-side, simply without a pang.

There is no time in our short span of life for inventors to mourn over the still-born children of their brains. Human progress moves on relentlessly if slowly, and no man can say it nay. It is a car of triumph to him who sees the world from its summit; but he who will not press closely in its track is lost and swallowed up in the vague crowd behind.

Now, all Mr. Gordon's attention was turned to dynamo-machines, and to the perfecting of the manner of making and distributing the current to the electric lamps.

I have often regretted that I am not a "sewing woman." Observation in life leads me to notice that the sewing woman feels anxiety less keenly and vividly than her less domesticated sister. The mechanical action of the fingers relieves the tension of thought and soothes the mind of woman, in the same manner as smoking calms the mind of the sterner sex.

Well I remember one afternoon, when the

anxiety became simply unendurable, driving down to Wharf Road with my little girl. Almost as soon as I entered the factory, the song of the high-speed machinery reached my ear—a high, strident tone.

The rattle and throb of the dynamo made the ground shake beneath our feet.

I did not need to ask any questions, the scream of the machine worked beyond its endurance, and the pale faces of all engaged in the experiment told its own tale. But next day early in the afternoon I heard the quick slam of the front door, which always cried “successful day” to my waiting, listening ear. Mr. Gordon’s first words were: “The whole machine has gone to bits; they are taking it up in a shovel.” But his next words were: “It has worked for ten minutes, and demonstrated success.”

He began at once to make designs for a new and much larger machine, on the same electrical principle, but better constructed mechanically.

This was put in hand within a fortnight, and when completed entirely fulfilled even the inventor's anticipations, and is at regular work to this day.

On the success of this machine being demonstrated arrangements were made to light Paddington station, and the plans for the first large electric supply station in England were put in hand.

The Paddington Passenger-station known to the public is but a small portion of the district that had to be lighted, which comprised also the large offices running from Praed Street to Bishop's Road; the Great Western Hotel; the Goods-station, which is larger than the Passenger-station; the Locomotive-station; Westbourne Park and Royal Oak stations, and the lines between, making a district of about a mile and a half in length.

The quantity of electricity that had to be generated for the supply of the arc and incandescent lamps would be equal to the supply of 30,000 of our modern glow-lamps.

Engines and boilers of nearly 2,000 horse-power in all were erected, and three dynamos, weighing forty-four tons each, were designed and built for the purpose. Eleven miles of iron troughing were buried between the lines, and in this some 500 miles of insulated wire were laid.

The winter of 1884-5 was one of the wettest seasons on record, and the loose earth excavated from the trenches was converted into mud indescribable; and in this, engineers, foremen, and workmen stood from dawn till dark for some four months. They seldom had more than sixty seconds of undisturbed work, owing to the passing trains. The monotonous iteration of the warning cry, "Up line" or "Down line," was very trying to the nerves. Mr. Gordon personally superintended every detail of the work and of the rules that were formed for the safety of the men; and the arrangements were so fortunate that no life or limb was lost; but Mr. Gordon himself had a very severe, though happily short,

illness, resulting from cold and over-strained nerves.

Early in 1886, as the works were still incomplete, the business men concerned in the enterprise almost lost heart, and called in one of the best known electrical experts of the day to advise them on the question as to whether the Works should be proceeded with or abandoned. His opinion was entirely unfavourable, and concluded with the words, "I will stake my professional reputation that these Works, even if started, cannot run for a month." Mr. Gordon being asked what reply he had to make, suggested that as the Works were so near completion they should be finished, when he would accept the expert's challenge to run them for a month on trial, and would abide by the result.

This trial commenced at six P.M. on the 21st of April, 1886, and is not yet concluded as the Works have run continuously and successfully from that day to this.

After this came eight months of harassing litigation by occupants of houses near the works, to obtain an injunction to stop them. One ingenious gentleman swore an affidavit to the effect that the meat in his larder was turned bad by the electricity in the air! while every dish or jug, broken by a careless servant within a radius of half a mile had been "jumped off the shelves by the vibration of the dynamos."

The works, however, were never stopped for an hour for this or any other cause; though it is only fair to say that some thousands of pounds were spent to make alterations in such portions of the machinery as it was considered would cause real annoyance.

Soon after the Paddington electric light station was fairly under way, Mr. Gordon had occasion to go to America on business, for three months: these three months were my very hardest personal experience. Mr. Gordon naturally felt the keenest anxiety about the works, and the impending law-

suit ; and in order to send him news, I visited the station regularly.

In spite of the anxiety, the details of the working of this station were of the greatest interest. I always felt as if the dynamos were sentient beings, and they all had characteristics of their own.

No. 1 was not quite dependable, for her shaft, which was eight inches in diameter, and eleven feet long, had been sprung a sixty-fourth of an inch out of truth in transport, and required incessant nursing for the first few months, and consumed enormous quantities of castor oil. However, with care, her constitution recovered, and she is now working as steadily as her sisters.

Incessant trouble was caused at first, by injury to the mains, from the hot water discharged from the locomotives, and some miles of these had to be uncovered and a layer of clay put above them, after which the gravel was replaced and no more trouble was experienced.

I remember being told of a young workman

who had a perfect genius for electricity; unfortunately, as so many other intelligent workmen, he was afflicted with a passion for drink. The manager told him that at the next offence he must leave. A week later the man was found quite drunk, but pleaded as an excuse that his wife had just had twins. Some sympathy was felt for him, and he was granted a reprieve. Three weeks later the same thing occurred. His excuse, that during the night one of the twins had died, was not accepted.

During Mr. Gordon's absence, it was often said to me that the Paddington works were constructed with seven volcanoes, any one of which might explode at any moment. By day I had faith, but by night, I must confess that the suggested seven volcanoes caused me many and many a sleepless hour.

It was the same feeling that made the child exclaim: "*I don't believe in bears, but please don't talk about them after dark.*"

Electrical life in later years has not been less exciting than before, but it is not possible to judge of the proportions of experiences when we are in the midst of them, and happily neither Manchester Square, Rathbone Place, nor any of the more modern stations have involved the same anxiety as their elder brother at Paddington.

The fathers and mothers of England seem to think that electrical science has been especially designed by Providence to afford openings for their superfluous sons. Judging from my experience, they seem to think that all engineers walk about with good appointments and salaries in their pockets, and that if their sons show but the slightest taste for playing with electrical machines, and giving shocks to their brothers and sisters, that they are entirely qualified for them. Practically, a considerable proportion even of those who are admitted after the most careful selection, find that they have not sufficient nerve and physique for the work, and have to leave it.

I heard a well-known engineer give an amusing account of a boy whose mother thought him a second Edison. He remarked "that he was good for nothing but to hold one end of a wire, while another man wound it on a reel, and," he added meditatively, "a hook driven into the wall did it better." But all must have a beginning, and the mind of a youth starting on his career in life is rather like an unhatched egg, of the contents of which nothing is known till it expands and breaks the shell; and there is a story we have all loved, of an ugly duckling and his trials, and he became a Swan!

There is nothing like the responsibilities of a new science for developing rapidly the resources and possibilities of character.

The development of applied electrical science in all its branches has been astonishing. The life-work of Faraday, Clerk-Maxwell, Siemens, Swan, Edison, and many others has brought it to its present state of development; nor must the

financiers be forgotten, whose enterprise, courage and patience have made this development possible; and now that the Electrical Supply Companies are covering London with their network of underground mains, and supplying light to all the theatres, clubs, and houses, in the districts that Parliament has allotted to them respectively, I think we may drop the monotonous reiteration of the remark, that "electric lighting is still in its infancy," and own that it has grown to healthy manhood.

Science, civilisation, and thought move on.

We are but one among many others, carrying bricks to the same pyramid, and each have their own tale to tell. The end of toil comes not in life, and "nothing is ever quite so bad, nor quite so good as we anticipate."





APPENDIX.

A LARGE number of the lights installed in a house are only occasional, or decorative lights.

I have given in this appendix a list of the lights used daily, and of those used occasionally in our own house. I have counted the drawing-room and boudoir lights as being both in use every day, which they seldom are; but to balance this I have counted the spare bed-room and dressing-room, and all the cupboards, &c., as occasional lights.

The decorative lights are only used when we have parties, which is not unfrequently, and we certainly have used a great deal of electricity in experiments and in exhibitions; but the amount of three quarters' bills from April to the end of December, was less than that of our bills for gas, oil, and candles for the corresponding period of the previous year in a smaller house. But it must be noted that we are all exceedingly careful to extinguish the lights when we leave the rooms even for a short time, and that the question of economy in distribution of lights and in arrangement of switches has been most carefully studied throughout the house.

	Daily.			Occasional.		
	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.
<i>Hall and staircase.</i>						
Over front door . . .	..	..	..	1	8	8
Vestibule	1	16	16			
Hall	1	16	16	2	16	32
Half stairs . . . . .	..	..	..	1	16	16
Drawing-room lobby .	1	16	16	6	32	192
Half stairs . . . . .	..	..	..	1	16	16
First bed-room floor .	..	..	..	1	16	16
Second " " . . .	1	16	16			
Third " " . . .	..	..	..	1	8	8
Back stairs, top flight	1	16	16			
Three storeys below .	..	..	..	3	8	24
Basement passage . .	1	16	16			
	6	..	96	16	..	312
<i>Dining-room.</i>						
Centre pendant . . .	3	16	48			
Ceiling lights . . . .	..	..	..	3	16	48
Dining-table standards	..	..	..	4	8	32
Pendant dragons . . .	1	8	8	3	8	24
Fireplace standard . .	..	..	..	1	8	8
China closet . . . . .	..	..	..	1	8	8
	4	..	56	12	..	120
<i>Library used as school-room.</i>						
Pendant	2	8	16	1	8	8
Ceiling lights . . . .	..	..	..	3	16	48
Standards	1	8	8	1	8	8
	3	..	24	5	..	64

	Daily.			Occasional.		
	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.
<i>Boudoir.</i>						
Centre pendant . . .	1	32	32			
Brackets . . . . .	..	..	..	4	8	32
Cupid pendants . . . .	..	..	..	2	8	16
Standards	2	8	16	1	8	8
	3	..	48	7	..	56
<i>Drawing-room.</i>						
Large centre lights . .	..	..	..	4	100	400
Pendant light	1	16	16			
Pendant crocus shades	2	16	32	1	16	16
Cairo lamp	1	16	16			
Small lamp . . . . .	..	..	..	1	8	8
Picture light	1	16	16			
Arabian glass vases . .	..	..	..	2	16	32
Large " "	1	16	16			
Smaller " "	1	8	8	1	8	8
Outside window light.	..	..	..	1	32	32
Standards	1	8	8	1	8	8
Plugs for decorative extra ball-room and balcony lights . . . }	..	..	..	8	8	64
	8	..	112	19	..	568
<i>Bed-room.</i>						
Toilet light	1	16	16	1	16	16
Bed reading light . . .	1	8	8			
Washing-stand	1	8	8			
Standards	1	8	8	1	8	8
	4	..	40	2	..	24

	Daily.			Occasional.		
	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.
<i>Dressing-room.</i>						
Toilet lights . . .	2	8	16			
Wash-stand light . .	..	..	..	1	8	8
	2	..	16	1	..	8
<i>Daughters' room.</i>						
Pendant centre . .	1	16	16			
Plugs for standards .	..	..	..	3	8	24
	1	..	16	3	..	24
<i>Spare bed-room.</i>						
Toilet light . . .	..	..	..	1	16	16
Bed reading light . .	..	..	..	1	8	8
Standard . . . .	..	..	..	1	8	8
	..	..	..	3	..	32
<i>Spare dressing-room.</i>						
Multiple pendant . .	..	..	..	1	16	16
Bed reading light . .	..	..	..	1	8	8
	..	..	..	2	..	24
<i>Governess's room.</i>						
Pendant	1	8	8			
Standard . . . .	..	..	..	1	8	8
	1	..	8	1	..	8

	Daily.			Occasional.		
	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.	No. of Lamps.	Candle-power of each Lamp.	Total Candle-power of Lamps.
Nursery	1	16	16	1	16	16
<i>Servants' department, &c.</i>						
Maids' work-room . .	1	16	16			
Maid-servants' rooms .	3	8	24			
Man-servant's room .	1	8	8			
	5	..	48			
Bath-room and lavatories . . . . .	..	..	..	3	8	24
Cupboard and nurse-maid's closet . . . . .	..	..	..	4	8	32
Larders . . . . .	..	..	..	2	8	16
Cellars . . . . .	..	..	..	3	8	24
Kitchen	2	8	16	2	8	16
Scullery	1	16	16			
Servants' hall	1	16	16	1	16	16
	4	..	48	15	..	128

SUMMARY.

	Daily.		Occasional.	
	No. of Lamps.	Total Candle-power.	No. of Lamps.	Total Candle-power.
Hall, front and back staircases, passages, and basement }	6	96	16	312
Dining-room	4	56	12	120
Library	3	24	5	64
Boudoir	3	48	7	56
Drawing-room	8	112	19	568
Bed-rooms and nursery (counting spare room and dressing-room as occasional lights)	9	96	13	136
Servants' bedrooms	5	48		
Kitchen, scullery, cellars, &c.	4	48	15	128
	42	528	87	1384

This is equal in 8 c.p. lamps to 66 daily and 173 occasional.



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