XIX

ORGANIC PLANNING

1. *The Plan as an Expression*

A THOROUGHLY effective plan is not necessarily a work of art, but it must inevitably be an expression of the function of the thing planned. It may, as we shall see later, be a good deal more than that; perhaps this 'good deal more' is just Mrs. Browning's 'little more and how much it is'. It is not the theme of the plan, any more than it is the theme of the story, that makes its exposition in structure a work of art, but something in the handling of the theme. In this chapter we are still only dealing with the basic logic and grammar of planning.

Five highly specialized types of buildings will be employed for the demonstration of the organic principle with respect to these factors.

2. *Daylight in Building*

Fenestration is a very important part of architecture, but it is in reality an almost purely engineering problem. The uses for which the various parts of a building are designed determine the fenestration; for, in spite of all the great advances made in artificial lighting, windows still remain, and probably always will remain, the main device for light within doors. Now it is quite extraordinary how much crass ignorance prevails among owners, users, and designers of buildings as to the nature of daylight. The common assumptions are that about 10 per cent. of the floor area of a room will be the proper area for the windows of the room; that windows may be regarded as sources of illumination like lights, so that their light diminishes in intensity as the square of the distance from the glass; and, commonest error of all, that light suffuses space in the same way as a teaspoonful of tea suffuses water in a teapot. This leads to the erroneous conclusion that if the light outside of the windows is of a certain strength and the windows occupy a third of the outside wall of the room the strength of the light in the room will be a third of the light outside.

Light to see by is not something in space, but something travelling to the eye through space, either from a concentrated primary source—the sun, or a lamp—or from a bright object reflecting the image of that source, or from a more widely distributed secondary source such as the blue sky, diffusing clouds, or a white ceiling. In many cases all these kinds of light are involved together. The fact that the eye is so contrived that clear vision is possible within an enormous range of light, from one to many thousands of 'foot-candles', is the source of most of our illusions on the subject.

In arranging for daylight within a building it is flux of light from the sun, or less directly from the firmament, or the clouded sky that one is primarily concerned with. When the light falling on the book one is reading, or the work one is doing, is as low as one foot-candle, what is called the 'grumble point' has been reached. For easy working vision and the fullest differentiation of colour from 12 to 20 foot-candles is best. The planner's problem is to get light of this moderate strength on to tables where people work, or the walls where pictures are hung for inspection. But that is not enough; the exclusion of direct sunlight is often of great importance. If the field of vision contains even a spot of strong sunlight reflected from a shining object, or a strip of sunbeam on the floor or wall, the eye then adapts itself to this strong beam of light and ceases to function properly for the 12 to 20 foot-candle light which would otherwise be most convenient and agreeable, and which the planner may have been at pains to provide.

Then there is the question of the colour or tint of the light. Sunlight is variable, tending to yellow, orange, or even red, when the sun is low, especially when the light is filtered through smoky haze. North light from the clear sky is slightly blue; a well-balanced white light (revealing all colours fully) can be got by a mixture of clear sky light with some reflected midday sunlight, but best of all from a thinly clouded sky. Thus climate has much to do with the quality of light usually available.

Now a beam of direct sunlight traversing a room may be a very agreeable thing, both directly and by associations either simple or complex. Its hygienic value need not here be stressed. Such light has a very distinct place in the home and in the hospital. For reasons above given it is not a working light. How can one keep it out, where it is not wanted, while other light is required? If vertical windows are in question direct sunlight can only be kept out by so orienting the room that during working hours the sun

does not show outside the windows; that is, by having an exterior wall facing north or north-east. If roof lighting can be resorted to a saw-tooth roof will answer with the glazed faces square to the north on plan, and set at an angle parallel to the direction of the

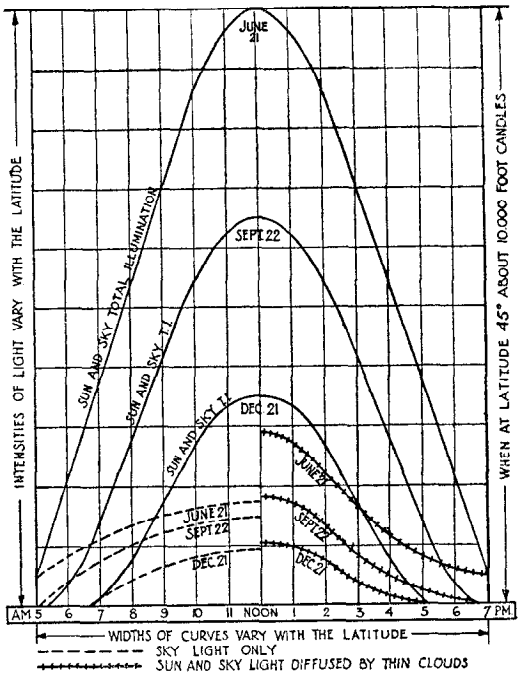

FIG. 122. Strength of sunlight and skylight throughout the day and the year.

Compiled from data in the Society of Illuminating Engineers' Transactions (American).

midday midsummer sun at the latitude where the building occurs.[1] Where roof-lights for one reason or another must be of such a form that direct sunlight will penetrate all day long, or part of the day, the direct sunlight can be dealt with by screens and blinds. Some ingenious devices have been perfected in America with this end in view, the effect of which is to convert direct sunlight into what is practically diffused firmament lighting.

Henceforth the word sunlight will be used when direct sunlight is meant, and light when firmament lighting is meant. Out of doors

[1] See Fig. 126 below.

when both are present at midday the sunlight is so much the stronger that the effect of the light from the sky is negligible, but when the sun is low they may approximate in strength though varying more pronouncedly in tint.

Having caught the flux of light through window or roof-light, a great deal can be done to divert its direction to the place where it is wanted by the use of prism ribbed glass, usually set in an inner sash, or ceiling-light. Thus light may be brought a hundred feet down a shaft from a roof-light and be thrown against the walls of a room below by means of a ceiling-light, as is done with success in certain picture dealers' premises in the City of New York.

A word on the weather. North light on a cloudy day is usually stronger than north light on a clear day because the diffused sunlight from the clouds more than counterbalances the lost light from the blue sky beyond the clouds.

A window derives light only from such part of the sky as is unobstructed by the reveals of its head and jambs and by buildings, or other objects above its sill outside; hence the windows of lower floors facing on narrow streets with high buildings get little light, and what they do get is confined to a small area of the floor or even to the sill. At the best only half of the hemisphere of the firmament is available to light a window. Roof-lights are more efficient for their area. A double-pitched roof-light has, of course, the whole hemisphere of the firmament at its disposal and a weaver beam roof-light has at least the half-hemisphere, and that unobstructed.

Generally speaking, artificial lighting is not a factor of prime importance in planning. Most accommodation is planned for daylight, and it is for the lighting engineer to devise the best substitute he can. His main difficulty is to provide a flux of light without its source obtruding on the field of vision and thereby neutralizing his achievement. This difficulty he often neglects to overcome.

The plans of certain specialized types of buildings can now be studied after establishing what has to be seen in their interiors—work, things, or the interiors themselves. Form discovered on a drawing-board is not necessarily form discoverable through the eye of him who contemplates an executed work. The arrangement of the interior lighting has its bearing on things that are made to be seen. To be seen may indeed be the prime purpose of an interior.

The planning of libraries, fire stations, picture-galleries, and churches will be discussed in that order, restricting attention to those elements which are most distinctive and dominate the general solution.

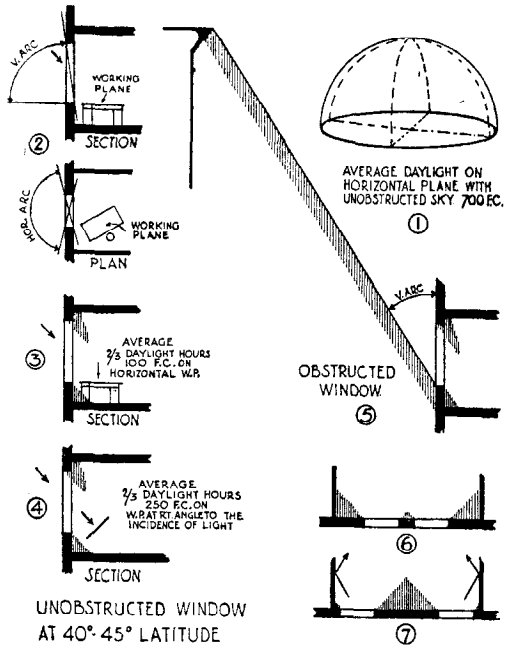

FIG. 123. Light from the sky entering windows. Rough working average.

3. *Libraries*

A public library usually comprises the following elements: the storage of books in the stack, distribution of books by lending for removal, or for use on the premises (both requiring the borrowers' counters), the reading-room or rooms, and the management. This includes the receiving, cataloguing, withdrawal, and mending of books and placing them in the stack—all which we may call preparation, requiring working space directed to the actual distribution. The books, like food, come in by the back door and are prepared. The readers, like guests, come in at the front door and are served. The books and the readers meet at the counter as the food and the guests meet at the dining-table.

The arrangement of stack, counter, reading-room, and working

space is further complicated by the question of economic supervision. Certain famous libraries with magnificent façades and very splendid reading-rooms are grossly extravagant in the matter of the staff required to run them. In some libraries it takes an un-

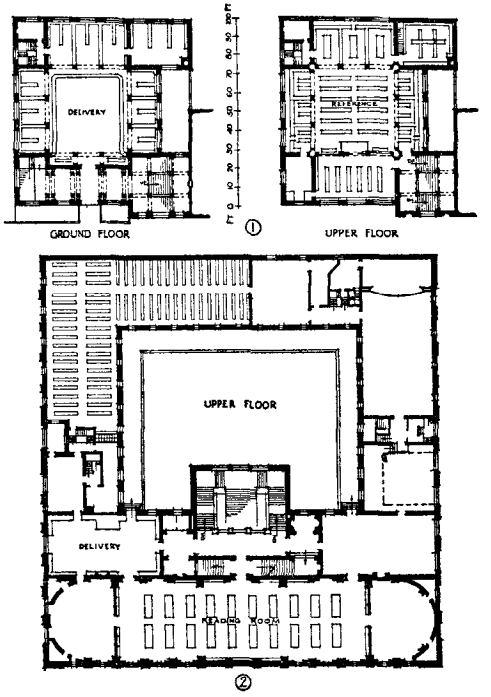

FIG. 124. 1. Carnegie Library, Edinburgh (Washington Browne). 2. Boston Public Library (McKim, Mead, and White).

conscionable time to borrow a book—usually in those that are heavily staffed. In these particulars the all-round efficiency of the Carnegie Free Library in Edinburgh, designed by Sir George Washington Browne, may be favourably contrasted with that of the Public Library in Boston (Mass.) by McKim, Mead, and White. How much credit or blame attaches to the designers it is difficult to say. Each may have solved the problem, as presented to him, to perfection: yet skill in planning may do much to promote efficiency in administration and management.

A good test of any plan with regard to its practical efficiency is this. Can a person, with a sound knowledge of the routine of management with respect to which the plan is conceived, read it

when set before him on paper with no designations for the several rooms? Can he imagine the whole thing in being and at work? The pellucidity of the Edinburgh plan is amazing, notwithstanding the very great difficulty of the site.

Book-stack area is a matter of simple calculation. The assistants can pass between the book-cases if their centres are from 4 ft. to 4 ft. 6 in. apart; their height must be such that a girl can reach to the top shelf; that admits of 8 shelves of normal-sized books; such books run about 8 to the foot of shelving. Book-cases are usually built in 4-ft. sections—the length suitable for a loaded hardwood shelf without undue sagging. Ranges of book-cases over 20 or 24 ft. long are inconvenient for several reasons and are too long to be well lit from the ends by daylight, in view of the low internal ceiling heights within the fabric of the stack. The central aisle must be wide enough for two persons to pass each other, each with an armful of books; and for one to pass where the short flights of steps occur from floor to floor of the stack. Wall aisles are very convenient and need be wide enough for one person only.

It is thus a matter of a few moments occupied in simple arithmetic to establish a ratio between square feet of floor and number of books for any practical width of stack, with or without side aisles. For any given case the length and number of stories in the stack can soon be determined once the number of books to be housed is stated. The fenestration of the stack can then be related to the book-cases, say at 4 ft. 6 in. centres, with the piers occurring opposite the book-case ends; but 9 ft. or 13 ft. 6 in. centres would do. The structural wall bay and the stack bay should be related, otherwise there will be uneven distribution of light. What is to be the relation—one to one, one to two, one to three? That depends on what the wall is made of, and how it is made—framed or not. It is not necessary to go into further detail, for the form of the stack is now seen to be a synthesis of purpose, material, and technique.

So with a reading-room. If windows can be got on both sides, or if ceiling light can be obtained, the readers may face one another. If the light is all from one side they will be more comfortable all facing one way with the windows on the left. There is not much difference in the amount of floor per reader either way. The length of the rows of readers will depend on the height of the window head, or vice versa. Twenty readers in a row would need a ceiling at about 24 ft. above the floor. The ceiling might be much lower

with readers facing each other and their tables set across the room and lit from both sides of the room, or from above. But extravagance in height might be more than compensated for by lighting the room from one side only, in view of other economic considerations of the plan; and sunshine in the reading-room, where it is never wanted, might be avoidable if the room could be lit from the north or north-east only.

The borrowers' counter may now be considered. Its length depends on the number of attendants on one side and the number of borrowers on the other at rush hours. If it takes four minutes on the average, instead of one minute, to find a book asked for, there will be four times as many borrowers hanging about as there might be, and four times as many attendants all busy. The method of numbering, cataloguing, and placing the books that are most frequently called for thus affects the counter space.

The area for the borrowers' lobby is similarly affected. It is an expression of the answers to the joint questions: how many borrowers come in between 5 p.m. and 6 p.m., how long do they take to ascertain the correct name and number of the book they want, to find out whether it is in or not, and to get it from the counter? The system in vogue and the number of borrowers determine the area.

We need not investigate the calculations for area of all the parts of a library—there are several good books on the subject—but may now exemplify the planning process by looking into the arrangement of the parts, assuming these to have been fully enumerated and dimensioned. First, what are the traffic lines for a book? It is delivered in a box, heavy with other books, unpacked, and then dealt with in the catalogue room. Thence it goes to the stack and thence over the counter and back again till withdrawn through the cataloguing room for mending. Its entries and removals from the stack are recorded at the public catalogue adjoining the counter. The catalogue-room workers have thus much business at, or near, the counter, so there must be ready access.

Then there are the movements of the clientele. They come in to borrow and go out, and the less time they take about it the less space need be provided for their peregrinations; so the shorter the route the better. Or they come in, borrow at a different counter perhaps, sit down and read, return their books and go out. If the reading is serious they need quiet. There may be several classes

of readers dealt with in different reading-rooms. The placing of these rooms—for children, for news-readers looking for vacant jobs, for magazine readers, for serious students—is important for each class. The relation of each of these rooms to the rest of the building will be determined largely by the answer to the question, 'What kind of readers use them?' but also by considerations of supervision. A small library with, say, 25,000 volumes and three moderate reading-rooms can, if well laid out, be fully supervised by one person behind the counter at quiet times of the day, although it may need as many as six attendants at the rush hour. If not well laid out in this respect it might need four attendants at slack time.

The library is a place where thousands of books are stored against the needs of a few hundred readers who, for the most part, come bustling in at certain times of the day and go bustling out again. They do not leave in a body as from a stadium or a theatre.

4. *Fire Stations*

Now consider fire stations, buildings in which there is no pronounced activity most of the time beyond shining up equipment and being on duty. But when the alarm goes, what a change! The men assemble, sliding down poles or doubling through doorways, buckling their belts as they come, then seize their helmets from the engine-room wall and jump to their places on long ladder, fire-engine, and hose-cart. If there are horses, a pull on one cord opens the great folding doors, drops their collars, and opens the duty stalls, and off they go to their positions, and a turn of the wrist completes their harnessing. The motor vehicles are always ready and a touch on a lever sets them in motion. The several pieces of equipment are out of the doors, with the men clambering to their places setting their chin-straps, and, as the wheels pass from the run-out to the street, the gongs begin their warning clatter.

Then, when the fire is all over, they return—reeking horses, men with grimed faces, vehicles with muddy wheels, and wet and damaged hose, and perhaps, here and there, a head in a bandage and an arm in a sling. But the engine-room is no place for all this mess. Cleaning up must be done in a yard, whence the vehicles, bright and shining again, go to their positions to await the next call.

In cases where the firemen live above the station, one watch in their homes and one watch on duty, the organization is very like

that of a ship in certain respects. When this is so, the upper part of the building is an apartment house. The entrance to the stair is then through the engine-room past the duty-room door. Except when the trucks are returning, the back door is never open. The women and children pass swiftly and silently through the great glittering engine-room on their lawful occasions. The whole building is planned for a cataclysmic dramatic moment—the *get-away* of, say, three vehicles with their crews in seconds, not minutes.

To make this possible a great deal of consideration has to be given to the traffic routes in the building. These, needless to say, should be as short as possible and must not interfere with one another. The men on duty are in the engine-room, or hard by, or in the recreation-room. They man the first vehicle and are off by the time the others are pouring to their stations on the other vehicles. Evolution goes on rapidly in fire-station design. The substitution of motors for horse traction has involved many alterations in old engine-rooms and long ladder sheds. Better ways of doing things in a fire station and better ways of making gear and constructing accommodation are always being found. Improvements in doing things within the building affect the planning; and vice versa. There is a constant synthesis going on of purpose, material, and technique, resulting in form which we apprehend with the help of our eyes.

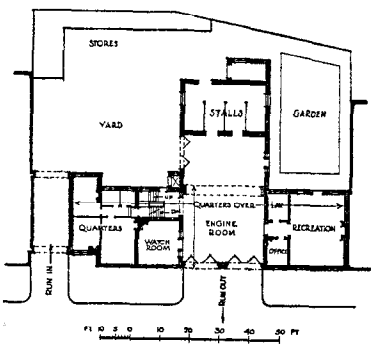

FIG. 125. Highbury Fire Station, London; 1905. (L.C.C. Architect.)

Before the days of telephones, the top of the hose-tower, where the hose are hung up to be dried, was used for a look-out and signal station from which to see the smoke of a fire and signal other look-outs of its location and magnitude. A red flag meant a general alarm. The tower remains as a characteristic adjunct of nearly all fire stations as hose are still dried in that way, but it has lost its patrol gallery with mast and yard. An atrophied organ, if you like. Man has not yet lost his once useful vermiform appendix, but he is losing it, and that is why it gives so much trouble; so would significant but unused flag-hoists on fire-towers.

A building with a tower, small-scale residential accommodation above, and the great portals of a large room at ground-level comes to be readily recognizable as a fire station. Most fire stations are more or less like that. These things come to be expressive of the cataclysmic moment above described, even to people who don't understand which window is which, and how a difference of practice or equipment explains and expresses itself on the outside of a building, as well as in the plan of the interior.

5. *Picture-Galleries*

Picture-galleries have something in common with libraries. They are storehouses to which people resort and they require a staff to deal with the contents and the visitors. But the stored objects are displayed to the utmost advantage instead of being stowed away in a stack with the utmost compactness consistent with their being readily found. Also the number of objects stored and the number of visitors are not of the same orders of magnitude as in libraries. In picture-galleries it is the lighting, not the dispatch of business, that is of paramount importance. Nobody is in a great hurry and everybody—except those charged with supervision—wants to see as well as possible. Only the public galleries and their arrangement need be dealt with here. The administration offices and work places present no outstanding peculiarities.

The prime necessity is to furnish an even flux of light of from 12 to 20 foot-candles on the vertical wall-faces extending from 12 ft. down to 3 ft. above the floor. If the direction of the light is such as to subtend an equal angle with the direction of the beholder's eye from any part of the picture surface, then the sky outside the window, or sky-light, is reflected by the glass or the varnish; on the other hand, should the flux of light come down too steeply against the picture surface, then the grain and texture of the painted canvas, or paper, reflects innumerable points of high light towards the eye and colour loses its depth; also the tiny shadows of the grain combined with these high lights reduce saturation towards broken tones. The even diffusion, the moderation, and the direction of the light are thus of high importance.

The next difficulty is the reflection in glass, or varnished surfaces, of bright objects such as light canvases and gold frames from an opposite wall, and particularly the reflection of persons with strong top-light falling on their heads and shoulders. The latter

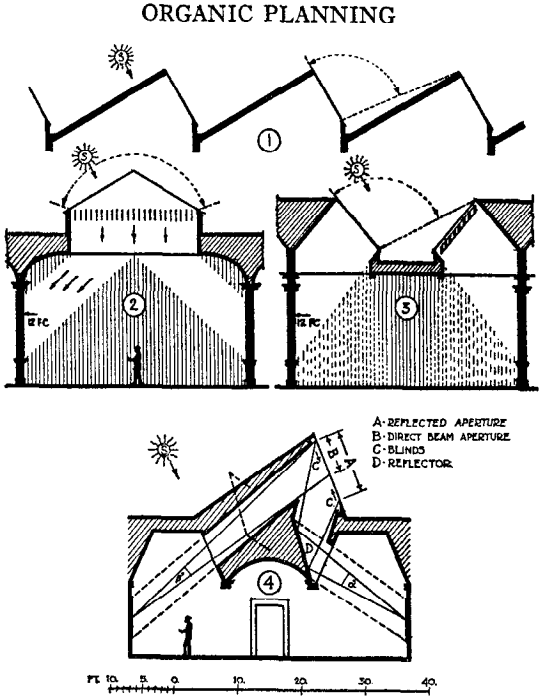

FIG. 126. 1. Sawtooth roof light facing N.
2. Filtered sunlight, Champeau method.
3. Top-side lighting, Seager method.
4. Direct and reflected N. light, Nobbs method.

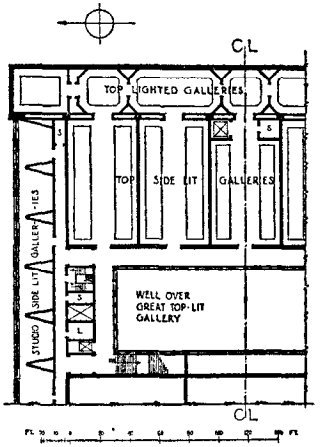

FIG. 127. Part plan for a picture-gallery with varied lighting systems.

difficulty can be partly overcome by reducing the top-light on the visitors till it is negligible as compared with the flux of light on the pictures. The only ways of dealing adequately with reflections from pictures on the wall opposite is to abolish the need for light on that wall by doing away with the pictures, or to set up a screen in the middle of the gallery, which amounts to the same thing. When one considers the quality of pictures as seen on a studio easel, or placed for inspection in the private room of a picture-dealer, the inevitable reduction of this quality in any picture-gallery and the far greater loss suffered when pictures are hung on the walls of rooms in houses, one must realize that perfection of gallery lighting is out of the question. Yet a great deal can be accomplished. As to pictures in houses, it is not too much to say that on the four walls of any room it is unusual to find more than one or two tolerably good spots for pictures—a really good place is rare indeed.

Now the collections of pictures are none of them very old, as the age of art is reckoned. The panel picture, as we know it, dates from the Renaissance. The early collections were made in great houses. The later ones were assembled in the suites of public rooms of disused palaces, and the earlier real picture-galleries (real in intention if not in effect) were architecturally grandiose suites of large rooms with hypethral lighting—that is, holes in the middle of ceilings. There is no more effective method of lighting solid objects out on the floor than this (so long as they are not enshrined in glass cases), but pictures are planes, usually placed vertically, on which objects are represented. To deal adequately with this essential difference between pictures and things, the modern picture-gallery has been evolved. As there is abundant technology on this subject the relative merits of the various systems in vogue need not be evaluated. Each has its advantages and its difficulties and its special suitability for different kinds of pictures.

And here is the really important point. There are many kinds and classes of pictures requiring not only different strengths of light, within the moderate range above mentioned, but also requiring to be seen from different distances. And not only this, but the eye as an instrument does not function at its best for long periods without a change of adaptation. The kind of standardized efficiency which strings a dozen great rooms together in a picture-gallery, each and all lit with a similar flux of light, defeats its own

ends. People often wonder why a tour of a picture-gallery is so devastatingly exhausting. This monotony is a major reason and is as prevalent in some of the new galleries as in the old.

To design a picture-gallery to good advantage a fairly intimate knowledge of the classes of pictures to be dealt with is quite as necessary as a conversant knowledge of the strength and quality of the raw light outside. This differs greatly in Stockholm, London, Paris, and Rome, as also in Ottawa, Washington, and Mexico City. An understanding of how to deal with that light between the outer glass and the wall is the third essential.

As some extraordinarily successful results have been obtained by 'artificial daylight' in galleries, a word on this subject may not be out of place here. The difficulty is to convert the nearby source-light into a flux of light—to make light from a point near at hand behave as if it had come a long way. Individual picture lights as used in houses are of course no solution, as the top of the picture, lit from a source one foot away, will be sixteen times as strongly illuminated as the bottom, lit from, say, four feet away. Besides, the angle of incidence varies and the colour in the lower part of the picture is dulled by the high lights and shades of its texture, as above explained. Large individual pictures can be artificially lit with success by applying the principle of direct footlights all round the picture.

6. *Church Planning*

Among the problems of church planning, not the least is the lighting, but here it presents itself in a very different way from that just considered for picture-galleries. The most radical, iconoclastic atheist must admit that, given the problem of design involved in a place of public worship for a specific form and rite—redolent as such things are of a distinctive view of life—completely adequate solutions are far from uncommon. For it is not, perhaps, too much to say that the very best that architecture has to give has been abundantly bestowed in this connexion for the last five thousand years and more. Egypt, Greece, Rome, Byzantium, the Rhine Valley, the Île de France, the British Isles, Italy, Spain, Holy Russia, the Near and Far Easts, and the Western World all provide ample attestation of this; even if we discount 90 per cent. of all temples and churches as of no account artistically.

From the designer's point of view the expression of the ineffable

grace of God may be just as much a problem for solution in structure as are the dissemination of such knowledge as can be packed between bindings, the setting of the stage for the moment of the fire-alarm, or the revelation of the products of the painter's art. In all alike, human convenience has a great place.

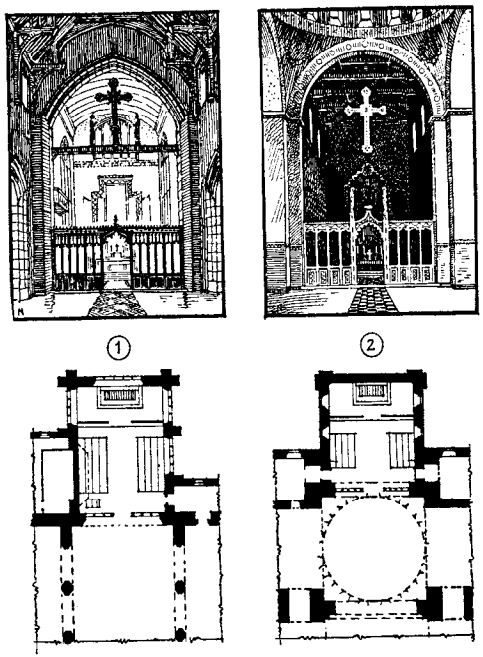

FIG. 128. Planning for effects of lighting.

In the church problem, whether it be a Shinto temple, a Roman Catholic cathedral, or a Presbyterian place of worship, there are always two classes of persons to be considered, the ministrants and the public, and there is always the rite or ceremonial to be taken account of. The spirits in which the ministrant and the public regard one another are enshrined in the rites. The physical requirements of the ministrants are met by providing for their ritual movements about the image, altar, communion table, pulpit, reading-desk, font, or whatever of these or of other apparatus of worship may be in order. The similar needs of the public usually require means for access singly, or in small groups, and for egress in a body, together with accommodation proportionate to their

numbers, whether for kneeling, standing, or sitting, or for all three. These obvious needs require no further comment.

The point of view, or spirit of the rite, above referred to, will determine how far it is important for all within the building to see what is done at the altar, or to hear what is said in prayer, praise, or admonition. The success of the enterprise may depend on an unobstructed view of the altar, or upon the degree of comfort afforded by the seating, or it may not.

Having duly noted the requirements, calculated their spatial dimensions, considered their connexions, and arranged their disposition (much of which may have been already done a thousand years ago and become embodied in tradition), the designer proceeds, as in any less inspiring problem, to pull his plan together and find out how it is all going to look inside and out.

Let us ignore the exterior, remarking only that in no class of problem does the interior form more directly affect the exterior form. The interior of a church is usually a far more interesting affair than the exterior.

Whether, to accomplish the object in view, it is necessary for the designer to be a true believer in the cult, has often been argued with heat. A sincere sympathetic understanding and a modicum of erudition have on occasions amply sufficed. The interior of the fabric and the appurtenances of worship, however conceived, formed, and adorned, will 'waste their sweetness' if they 'blush unseen'. Their not being seen may be due, not to an absence of onlookers, but to an inadequacy of lighting. Inadequacy here needs qualification. It may not be a question of not enough light, but of not the right kind with respect to direction or diffusion. Without shade one can only apprehend silhouette due to colour difference; modelling is lost. Then there is the colour question—pigmentation of masonry, pigment on wall surfaces, stain and transmitted colour in glass.

What of the disposition of light with regard to its strength? Suppose the church is to be of the traditional Christian cruciform type, divisible longitudinally into nave, crossing, choir, and chancel. An east window facing the congregation will only be tolerable, even in a dull climate, if it is filled with heavily toned or richly coloured glass and further mitigated by a considerable flood of light from the chancel clerestory windows. If the chancel is to be dark and mysterious, small windows in the east end will only glare

the more because of their limited size. Some strength in south side lighting, preferably high up, will, on the other hand, reveal all the intricacies of screen and stalls and reredos. Midday sunbeams pouring down upon the altar may not be lacking in symbolic value at the close of the morning service. If the choir and chancel are to be in low light, a contrasting flood of light at the crossing, catching the rood and screen, can be contrived; when light is derived from a lantern over the crossing, strong effects are readily obtained. The great practical advantage of relying on large transept windows is that they introduce light without the glare of the directly seen window occasioning ocular discomfort to the congregation. With glare in one's eyes one cannot appreciate the delicate lights and shades on a ribbed and vaulted roof, far less compose the mind to contemplate the Glory of God which that miracle of light and shade is intended to manifest. The nave can again best be lit from the clerestory and from the west window for similar reasons.

Once the light has come into the building it can be caught and reflected and diffused and thrown about by judicious planning, so that it will do most good with respect to the aim, be that reading of small print on India paper, or the cultivation of a specific mood of receptiveness, of contemplation, of ecstasy, or of praise of 'wonderful works'. Religion may be a glad thing, or sombre, and the associations of light and shade and colour are not the least among the means for enhancing its spiritual character. But a glare in the eye renders cunning workmanship, persuasive eloquence, and the enchantment of the 'holy organ rolling waves of sound on roof and floor' of little account.

In conclusion, a word is due on the use of colour in such an interior as has just been envisaged. Whether glass of a golden, greenish, or other tint, or of full gamut of colour has to be reckoned with, there should be a prevailing hue. Coloured glasses do not necessarily transmit light of the same colour as those seen in the glass. Some do, some do not—a matter of chemistry and physics. Memorial windows of incongruous colour-keys are a most frequent source of disturbance. Suppose that the glass gives a prevailing greenish-yellow light, which is not uncommon. A violet-blue ceiling dotted with stars and an Indian red or terra-cotta wall will then both show as dark and dirty. Perhaps the most lamentable conflict between window glass and paint on walls and ceiling ever

provoked is to be found in the Sainte Chapelle in Paris. With grisaille and silver stain windows powerful colour schemes for wall and ceiling are sometimes in order, but where polychrome glass is in question a very conservative use of paint is advisable. A golden buff wash on wall surfaces, or a slight rustiness, native to the stone, may go far to hold an inconsistent set of windows together. The late Mr. Bodley's sparing use of sage and olive greens in contrast with broken reds was always successful. It is surprising sometimes to see what his greens and reds really are by the white light of day.

Notwithstanding Professor Prior's complaint about the 'tinsel of modern ecclesiology', gilding is, and always has been, a great and powerful means of emphasis when colour is invoked in the service of religion. In French Canada the gilding used to be done by the nuns—full well they knew its possibilities; and right well they laid it on and burnished it. Richly it glows in the temples of the mystic East. Gaily it gleamed in the holy places of the Pagan world, and, if it sometimes glitters too vividly on a Christian cathedral high altar, that is the fault of schismatics who broke the original glass, or of the parsimonious who have built new churches and await fortuitous spasms of memorial piety to enrich their windows. Stained glass, when cunningly devised, can give value to all and everything to which its tempered light can reach, gilding included. For the fullest and most accomplished use of gold one must look to the monuments of faith inspired by the Byzantine tradition. In these great churches windows are few and small and high, for the Mediterranean light is potent; their glare is masked by deep ingoings, for the construction was massive; but, once the light is brought within the fabric, how masterly is the play that is made with it.

As a last word on this subject of the use and disposition and modification of daylight for interior effects designed, not to see to work by, or to read by, or even to see pictures by, but to reveal the fabric and its adornments, it may be observed that from the days of the Pharaohs to the days of the Tudors this has generally been well understood. In our own time Messel and Ludwig Hoffman and Bentley have really grasped the possibilities; but in modern practice, generally speaking, the control of light ranks as a lost art.