

## ELEMENTS OF THE PLAN

1. *Analysis of the Problem*

THE reader who has persevered thus far will begin to realize that when one sets out on the discovery of a form, an orderly mental procedure should dictate the course. If one sails before the winds of whim and fancy one may, by good luck, sooner or later find the island; but one may waste a lot of time and cover oceans of paper, quite unnecessarily, in doing so. More likely, one will be diverted and find something quite different from what one is in search of, put it in the waste-paper basket and resume the course anew in great confusion as to what is now the point of departure. A rigid control of the courses is essential. The designer is not in search of any island at all of a kind on which no one has landed before, but of an island where such and such things grow or lie buried in the soil, or where the weather is of a certain nature: otherwise one is a fool to outfit the ship and embark. The discoverer of form does not know just where he is going, but he does know to what archipelago to direct his course. He is looking for something, perhaps unique, but something of a certain kind—something that will fulfil the requirements.

In this search one proceeds by courses, or to vary the simile by steps, each related to those behind and to those to follow. Design does not involve mental processes of those higher orders which distinguish philosophers, physicists, and astronomers from the rest of mankind; but it does demand a mental discipline of a very rigorous kind. Otherwise there is loss of control of the sympathies and understandings and imaginings and prejudices. By so failing an architect serves his client ill; and he uses himself worse.

An analysis of the highly complicated relations of the commonplace requirements for a house will serve to make all this clear. Let it be an ordinary one, neither cottage nor mansion. Just the kind of habitation most civilized modern people aspire to but do not achieve—a two to three thousand pound house, which a householder with an income of from eight to twelve hundred pounds might venture on, if content to spend modestly on food and raiment

and amusements and not to educate his small family too expensively. It is a very favoured land in which 10 per cent. of the population are as well housed as that; and it is a backward country in which 50 per cent. of the population do not aspire to be so housed.

## 2. List of Requirements

The first thing to do is to ascertain the requirements, which may happen to be: larder, *kitchen*, pantry, dining-room, *living-room*, study, *own bedroom*, children's bedrooms (say three), spare bedroom, maids' bedrooms (say two), bathrooms (say three), laundry, *furnace-room*, tool-house, garage, and storage-places (five kinds). Now it will depend on the idiosyncrasies of the inhabitants whether the kitchen group, the living-room group, the bedroom group, or the furnace-room group require further subdivision and elaboration, or can, with advantage, be simplified. For example, if the servants eat in the kitchen, a scullery may be desirable, or there may be the question of a servants' hall. And how much housework does the mistress do, and is she interested in cooking? Can the dining-room, living-room, and study be amalgamated, or can any two of these be joined? Are any of the bedrooms to have private bathrooms? Expense precludes there being a bathroom for each. What is the relation of the children's quarters to the 'own bedroom' and to the servants' quarters? Must the furnace-room open to the outside without any passage through the laundry? What storage has to be taken account of—wine, vegetables, jam, trunks, linen, clothes, toys?

These and a host of other questions must be decided before the various rooms and groups of rooms can be broadly conceived, or even dimensioned. The answers will incidentally throw light on the circulation, or connexions, required; but it is still too early to let the mind's eye visualize these things, or to commit anything to paper. If that is done too soon the whole skein will tangle for a certainty.

## 3. Circulation

One may perhaps decide at this stage that there will be the following elements comprised in the circulation—back door and porch, front door and hall, back stair (up and down), front stair (up and up again) and passages on all floors, furnace-room with outside and inside doors and possibly a garden door from the living-room.

If the kitchen group and the living-room group are to be on one floor, that entire floor of rooms could be contrived with no passages. The connexions may be dealt with on any one of three principles,

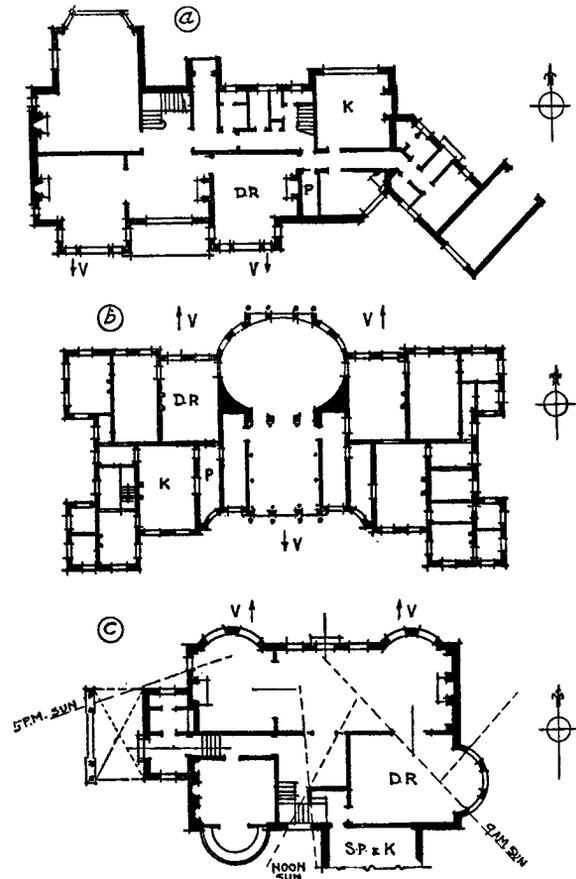


FIG. 118. Three types of house planning for prospect and aspect. a. Closed, English. View to S. b. Suite, French. Views to N. and S. c. Open, Canadian. View to N.

or by mixed methods. By *closed-planning*, where the disconnexion is given equal importance with the connexion. That is the English way; each room has its doors and its draught-provoking fireplace, and passages are essential. By *suite planning*, where the connexions are from room to room in logical sequence. That is the old French way and is based on the assumption that privacy is not the most

important thing in life. By *open planning*, where connexions are achieved by the omission of enclosures wherever possible. That is the American way and results largely from overcoming draughts in winter by the distribution of heating apparatus. A judicious mixture of these three methods is generally advisable.

Two principles for the location of passages may be mentioned. The passages may be made most efficient by placing them centrally, so as to serve as many rooms as possible with as short a length as possible. That is the way to deal with them in an English or North American house. But in a West Indian bungalow there would, for climatic reasons, be a surrounding piazza, or gallery, off which most of the rooms could open, with an occasional internal room-to-room connexion. This latter is an economic form of passage-way, for it only comes into existence when it is wanted, traversing an element of the plan, otherwise essential, without detriment to its use.

#### 4. Analysis of Plans

A plan may be analysed with respect to effective areas, circulation area, and walls, flues, and lost space. The areas of all the nameable rooms comprise the effective area; the areas of all porches, halls, passages, corridors, stairs, and stair-landings constitute the circulation area; the walls, partitions, chimneys, and so on make up the balance. Economically speaking (and there is not much money to spend on this house) the best plan is that with the highest ratio of effective area. But effective area is sometimes more apparent than real. On each side of every much-used door there is an area which is really passage-way: usually twice as much on the side to which the door opens as on the other; say anything from 9 to 25 square feet according to circumstances. A short length of plain honest passage often achieves twice its area elsewhere in really effective floor space.

#### 5. Diagram of Relations

At this stage a list may be made in writing, or by diagram, or in one's head, of all the rooms wanted: representing them all by circles the same size in a row, each with the name of a room on it, is a good way. The next step is to determine their approximate minimum sizes—dining-room, 14 ft. × 18 ft., own bedroom, 16 ft. × 13 ft., study, 11 ft. × 13 ft., and so on, and set them out in a row to scale.

Now one probably gets a little frightened at seeing how much effective floor area there is, and how great the cubic contents will turn out; also how economical one will have to be with the connexions.

So far there is a row of circles, all of a size, and a row of parallelo-

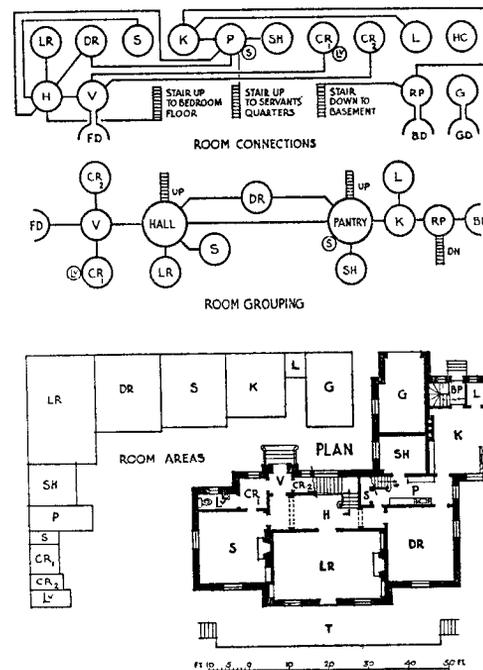


FIG. 119. Successive steps in solving a problem of planning.

grams to scale, each row thus representing all the rooms. Next one may draw in lines and loops among the circles to show the connexions one is asked to provide, or those that one thinks appropriate: a line from the kitchen to the pantry and another from the pantry to the dining-room, and one from the living-room to a half circle some distance away marked 'front door', running through the circle marked 'main hall', and off this a zigzag or barred line marked 'front stair', and leading to a line of any necessary length and curvature with little twigs off it connecting to the several bedrooms one may wish to place on the other floors.

In this way one gets all the essential connexions laid out in a tangle among the circles. Next the circles should be regrouped to simplify the diagram. The organism is now displayed before one. The plan at this stage is like a medical student's dissected animal, with all its organs neatly spilled out and some of the connexions stretched, but none broken. Now, keeping the organic elements of our plan all properly related, they have to be put inside a skin consisting of walls and roof. As yet one has no idea what shape the skin will take beyond perhaps knowing that the roof will be pitched  $40^\circ$  and the walls be vertical. As one can't put the puzzle together all at once, one must do so bit by bit and taking account of the sizes of the rooms in doing so.

So the next step is to take the probable ground-floor rooms and start laying them out with their connexions, direct room to room and indirect from passages or landings, taking, first the kitchen series—back door to dining-room—and then the living-room series—front door to dining-room. Now the thing begins to look really organic in places and one sees what doorways, halls, and passages are needed and also whereabouts they are likely to come so as to solve the circulation problem. Before going farther the other floors should be organized, each in its own best way, and still diagrammatically. One now has the separate elements; one has their dimensions; one has their arrangement among themselves in principle; and it is time to look outside and around.

### 6. Topography, Prospect, and Aspect

The site may have been found first, or one may be about to find a suitable one now; and in either case it has to be studied before one can go any farther with the plan. What size is it? Is it big enough for a garden and a separate garage, and is it flat or sloping? What views does it give? Just the road in front and the flanks and backs of other houses, or can one see a turn of the nearby river and some blue hills far away to the left front as one comes in from the road? And, most important, how does it lie—north-east or south-west of the road which runs north-west out of the town? With the topography, prospect, and aspect of the site clear in one's mind one can decide in what direction the more important rooms should face. The dining-room to the east, because sunshine in winter is so nice at breakfast-time; the living-room to get the view and also some-

thing of the garden, and, if not both, then which? The garden will flourish best to the south-west of the house. Then again, the

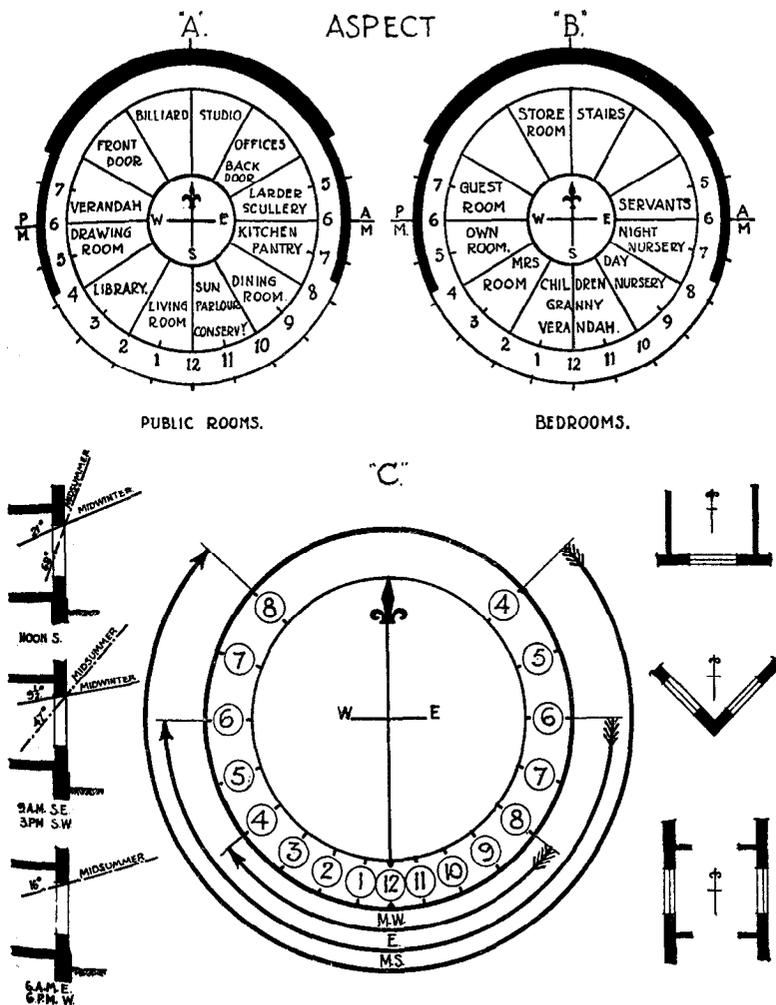


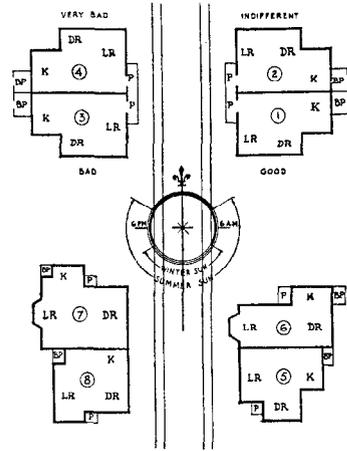
FIG. 120. Sunshine in the house.

children's rooms must get plenty of sun, but not at 4.0 a.m. on summer mornings, or they will wake up too early and sing, and be cross by 3.0 p.m. And the spare room, which will be used least, may as well go to the north and have a bleak exposure, provided

the outlook is not over the owner's or some one else's back-yard—and so each room is in turn considered.

Now the compromise begins. Every room cannot have the best view and the exposure most appropriate for its use. Some can, perhaps, and others are bound to these by organic functional relations and may get the good things too, or just miss them on that very account. And now the thing begins to take shape, and one has the ground floor laid out, and the slope of the land admits happily of a lot of good well-lit accommodation in the basement. So one lays that out tentatively and some things won't work, so one leaves them over, keeping a note of all the loose ends. And now it is time to lay out the first floor, on which the bedrooms are mostly located; and one finds that one can no longer devote one's whole attention to purpose, and the refinement of purpose, but must begin to think also of material and technique.

FIG. 121. The problem of aspect in semi-detached houses. 1. 2. 3. 4. Plans repeated regardless of aspect. 5. 6. 7. 8. Plans varied regardless of prospect.



to another, and need not get carried away out of sight exploring over new horizons. If there is a serious crux one must follow the late Mr. Hessel Tiltman's favourite instruction: 'If you can't find a way, make one!' One should be quite happy and fatalistic about it. *There is always a solution.*

It is a case of retracing some steps of the argument as far as one must, but no farther than one can help. There it is! There was bad judgement in a small matter. They can't have their living-room chimney at the end of the room; it goes at the side. Now one can get on upstairs where the difficulty was, and the roof will be all right too. Eureka—solution and synthesis. And so the thing grows, and, if one has to consult one's client about alternative arrangements here and there, one at least knows what they are and what they imply; and that is the business of a designer or architect.

So now the whole thing hangs together and the heights of the walls and the slopes of the roof and the position of the main ridge and of subordinate ridges and gable ends and chimneys establish themselves. One begins to see what the little house is going to look like and might, if pressed to do so, make a rough sketch for the information of any one else who is interested.

The process is still far from complete, but one has discovered the general form—the main implications of these requirements for that particular site, embodied in the selected materials, wrought in accordance with their several natures. By setting out sections one can find out quite a lot more about the discovery—not all to one's liking perhaps. Then with dimensions in length, breadth, and height broadly determined it is time, perhaps, to set up elevations, inside and out, and to study the form by projection in perspective, as seen from certain points of view. But that sort of thing is outside the scope allotted to the present chapter.

### 8. Designing from the Wrong End

It will be more useful for an understanding of the issues here under consideration, if, instead of letting our impersonal architect complete the design in detail with its windows and their panes, and the chimneys with their tops, we proceed to inquire where he would have got to had he proceeded otherwise. What would happen if he had begun by making a mental image, or a perspective sketch of the little house, and had then proceeded to pack the required contents into it. The likelihood of getting a plan that would satisfy the

### 7. Materialization

The solution in space has to be made to fit with the solution in bricks and mortar and joists of economic size. The first floor has to be carried by the ground-floor walls and must in turn carry (and perhaps be partly contained in) the roof. The roof is to be of slate and must be so pitched as to deal adequately with rain and perhaps snow; if there is going to be much snow the shape of the roof becomes very dominantly important.

But in all this sudden confusion of new subordinate problems, if one has followed a logical procedure so far one knows just where one is. Part of the arrangement won't work for material, or technical reasons; then it must be changed and, if one can't change it a little, one may have to change several things quite a lot. But one is by this time master of the requirements and their relations, one

conditions and requirements would in that case have been negligible. The chances would have been about as good as those for a collision between two stars.

'But', it may be argued, 'an experienced specialist would not have to take all those steps. He would have known from the start what the form would be.' Well, he might jump a step, or two, here and there. If he had solved very similar problems many, many times, he might even jump several; but that does not mean that he would not have to tread each, but only that he had done so already and therefore did not need to tread them again.

The besetting sin of all young designers, and many old ones too, is to jump at conclusions by allowing themselves to visualize, or imagine, or even draw their little house as soon as possible after they know they are going to work it out. In doing this they are relying on all their past experience of little houses, which may be very little, or quite a lot, but is not necessarily all applicable to the case in point. Then, having made up their *minds*, not *how* their little house is going to *look* (that can only be found out by designing it step by step), but *what* it is going to *look like*, they proceed to elaborate it in detail of plan and construction. They then inevitably begin to distort and derange the premature image they have conceived. If, by keeping at it, they do eventually get a habitable house out of it at all, they will certainly have lost much time, and almost as certainly have missed the proper organization of the several parts of which the whole is made up. Quite certainly they will have arrived at some compromise form, very different from the image they started out with.

### 9. *Evolution*

The technique of designing such highly organic things as little houses is not unlike the technique of Nature. The little house has its ancestors, all modified by their ways of life in their several environments. Thus a great many little houses, built in the last four thousand years, have a say in any little house designed to-day. That say manifests itself partly through selection, as when one's little house is influenced by the other little houses one knows about from the outside only, yet assumes to have been good little houses inside. But that say is far more potent through the social experience which determined how people have lived in little houses. That experience, which belongs to society at large, is what really deter-

mines the programme of requirements or list of rooms, their sizes, for their several uses, and, most of all, their relations each to each. This determination is very like the relations in a tree, or a cat, between its several limbs and its internal organs, with respect to structure and interior economy. The outside of the tree, that a landscape painter paints, and the outside of a cat, that an animal sculptor models, are determined by the inside of the tree in the one case and by the inside of the cat in the other. A representative artist cannot deal with the outside of either intelligently unless he knows a good deal about the inside, it is true; but he deals with external appearance.

The designer is in an altogether different position. He may be as interested in the appearance of the outside of his little house as the painter is in that of his tree, or the sculptor in that of his cat, but in a quite different way. For he designs and, in a sense, creates the appearance, discovering the form of his thing, while they are busy apprehending and appreciating form discovered or created by other agency.

Now the mental process of discovering the form of the little house, taken as an example, is the mental process for all design, be the subject a dog-kennel or a palace, a canoe or a liner, a spoon or a steam-engine, a sock or a coronation robe. First the enumeration of the organic parts, second the determination of their dimensions, third the investigation of their relations among themselves, fourth their arrangement. This last connotes and implies a due respect for external considerations, as well as those arising within the organism of the object. When all this is accomplished, purpose is under mental control, and materialization, in its double aspect of stuff and method, then comes into play. The problem, whatever it is, can now be solved and form results.

The form thus arrived at will be imperfect precisely by the measure of its failure in synthesis. Such failure is nearly always due to faulty procedure—that is to say to disorderly thinking engendering a wrong assembly of premisses—rather than to a faulty deduction from the premisses assembled.

'But where', it may be asked, 'does the art come in? Surely this is just engineering.' To the last observation we may answer, 'Yes and no'. It is just space and traffic engineering. As the problem selected for the illustration of the mental process of planning was a house, and as good planning is the basis of the architect's claim to

professional status, we may say, of course, that we have engaged in an architectural, rather than an engineering, exercise; but that is only a name.

Of architecture as an art something will be said later on; and various architectonic phenomena have already been referred to in earlier chapters. But not to leave the matter entirely at a loose end at this juncture a few remarks on the subject may be in order.

### 10. *The Completion of the Design*

The solution of a problem was brought to the point where the positions and dimensions of all walls, openings in walls, roof surfaces, and chimneys were determined, not necessarily finally, but at least consistently. What still remains to be done may be designated as composition. The little house is already composed in the broad general sense of the word, but in the more technical sense we have not yet spent a moment on 'composition'; we have made no determination of its scale and its proportion, beyond ascertaining the crude dimensions on which these must be based. Neither have we as yet considered any optical illusions that may arise from the disposition of the several parts—whether remediable, or to be made the best of. We have not yet given thought to the functional modification of its several structural elements, and we have so far ignored any sentimental, or cultural, preoccupations and proclivities either of the owners, the users, or the builders of the little house. And, most important of all, we have thus far ignored all question of the mood—sad, mad, or glad—with which the architect, as artist, has it in his power to invest a child of his imagination, through his way of dealing with all these hedonic and expressional matters just mentioned. This is where the art comes in; not in the plot but in the telling of the story.

At this stage of the inquiry it is sufficient to have given due emphasis to the absolute need of a logical consecutive process in elaborating the plot or plan. This may have many and great artistic possibilities, or they may be few and of little consequence, but, in either case, it is equally imperative that they arise out of the plot or plan and not fortuitously. Inspiration comes from the theme, not from the sky.