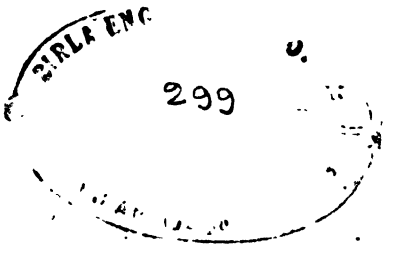
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PLANNING AND DESIGN

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TEACH YOURSELF BUILDING BOOKS

Prepared under the Editorship of E. G. Warland M.I.Struct.E.

BRICKWORK
ROOFING
CONSTRUCTIONAL DETAILS
PLANNING AND DESIGN
JOINERY
PLUMBING
QUANTITY SURVEYING
HOUSE REPAIRS
ELECTRICITY IN THE HOUSE

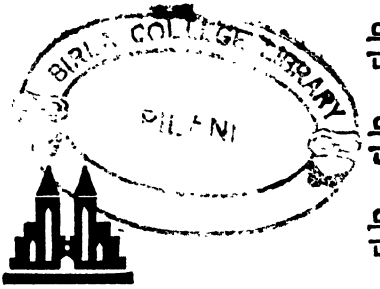
PLANNING AND DESIGN

By

J. WATSON CABRÉ

F.R.I.B.A., M.I.Struct.E.

Liverpool Arch. Soc. Travelling Student 1906



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GENERAL EDITOR'S FOREWORD

THE AIM of the Teach Yourself Building Series is to assist those who are desirous of acquiring information concerning building methods and practice.

It is not intended that these books will take the place of textbooks or recognised courses of study at Technical Colleges, but they should appeal to all students of building because each volume has been written by a specialist in his own particular subject.

The series covers almost every branch of the building crafts and allied professional practice.

In placing before the public this comprehensive work on Building, no apology is necessary for continuing to describe and illustrate traditional methods of building construction, because it is of vital importance that the layman who desires to become acquainted with building technique should be instructed in the basic principles of building.

There is really very little difference between traditional methods of building and the form of construction which has been developed to meet the requirements of the immediate post-war era. As pre-fabrication and standardisation will be the main features in the construction of post-war buildings, these materials and methods have been described and illustrated within the framework of this series, but no attempt is made to theorise on their comparative values. The problems concerning the planning and design of buildings are discussed in this volume in an interesting and unusual manner which should appeal to the layman who desires to become acquainted with fundamental principles. The object of the book is to encourage the reader to appreciate the many difficulties that arise during the process of evolving an idea into a thing of beauty to be seen and lived in.

PREFACE

NATION-WIDE interest in the work of the architect and his co-workers in the building crafts has never been more to the fore than is the case today. Yet even so, very little is known as yet of the position and guidance of the architect; so that in the hope of tearing aside the veil of secrecy that surrounds him to some extent, and to increase the interest in architecture, in its planning and design for good building, this little book is written for the general public and the tyro who aspires to be among the elect either by his scholarship or the thrift of his parents, and even to the architect in practice in his less arduous hours of war-time practice or of facing the annoying problem of high costs and slowly falling values of the future, for the second time in so rapid succession.

Interspersed are some of his trials and tribulations, human interests and attainments, to produce the knowledge necessary for the fulfilment of his design, requiring more than carcase plus stability; for the priority of the architectural whole is design, including as it does the planning of the project, the construction to be used and the fine art itself.

Humour hastens appreciation and the solution of problems of architecture as in all else, and its use perhaps among ourselves will necessitate a fuller study of the analogies of design, and may also dissipate the fear to criticise the architectural planning, construction and design of the past, the ever-pressing and stormy present, and it may clarify anticipatory appreciation of the future aims and possibilities for us all, as we are already situated with our pocket linings fully extended beyond our attire.

The illustrations are simple examples of my own, and criticism is therefore easier. The general references to present-day architecture are given freely without hurt, and any presumed near-miss at insincerity or Roman decora-

tiveness extant should be disregarded in a general effort to finally forget the styles in the architecture of today.

If, like Herodotus of old, I have wandered from the path direct or reiterated a point more than twice, may it be hoped that the more novel form of reading presented will obviate the far too common reaction to the accidental purchase of a textbook pure and simple.

AUTHOR.

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(Photographs by Stewart Bale, Liverpool)

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CHAPTER I

A PREAMBLE

I WILL write for the days beyond the timber shortage. During the latter the inhabitants of coastal districts in these isles collected driftwood, dunnage or scantlings, such that slipped past the ports dockmen, whose job it was to salve post and plank that fell overboard from ships loading, unloading or reconditioning hurriedly, and before they were swept out into tidal water.

With this varying supply augmented by bits and pieces from derelict habitations not yet gone for firewood, long forgotten boxes and even fungoid-ridden timber from the local authority's (or should it be Whitehall's ?) timber trench and basement shelters of the earlier days of war, thought sufficient unto the day that was far too far away for these shelters' short span of life—with this egregious collection, a little chicken wire and some linoleum oddments, many a man, primitively, planned and designed his henhouse and run, to accommodate one more hen than he could feed, that is officially.

Add the guidance of a good pamphlet costing but three denarii, and our friend set out to complete his task, and then surveyed it off and on between other emergency tasks, those nearby.

It had every convenience and pleasure for the hens, save one to play " Say little hen, when, when ! when ! ! "; for it included a sick bay, a non-spill water-bucket and a staircase, shortened later, to the raised house under which was the sandy shelter from rain, buried limestone and, subtlety upon subtlety, some provided unconsciously through shortness of or rotten material, plus, of course, some deficiency in labour and supervision, by this one-man organisation, the primitive architect.

After one or two midnight prowls, not always in fire-

watch or N.F.S. attire, to find the missing members new to the family circle and a trail of rice through the gardens of neighbours, the flighty bipeds would be enticed back to their home, and a brick was placed against the unsuspected subtlety, until morning, or later.

These crossbreds were high fliers—the wire was raised and the run lengthened and their wings shortened.

Yet the Heath Robinson-like appearance of this hen-house was more satisfying to the eye than probably three-quarters of the pall of ghastliness of past building (save the word architecture) that smothers our towns and at some period in the lives of all provides the urge to get away, even through it each day and thus adding to the town planners' problems, to where this man-made disease is less virulent and sparse enough to be softened, but not smothered, by the sky dome of blue and the trees, though even the latter are too often ill planned for road, copse and garden.

Albeit, the Briton has improved beyond recognition in his gardening approach, through interest and some study. What could be done with a system of real technical guidance simply cannot be imagined; though, as the Chinese would say, Teacher must manage child before teaching him better ways, and, I would add, the parents made responsible by fines.

It would of course require half a generation to train John Downie crab-apples over your ugly suburban house; but their flowers, followed by the clusters of large clear orange-coloured fruit, of crab-apple jelly fame, larger and brighter than usual through wall reflection of heat, would soften and make interesting its elevation. Add, say, a few Malus crabs of smaller size with their fiery, ethereal yellow bronze-red green foliage against the wall. Train these to fill and cover its brick surfaces, which are probably hard red brick (now termed engineering brick), so that for all the year in and out, and until the last yellow crab drops from the early pink flowering floribunda, your attention will be held and your amusement kept at concert

pitch by the remarks of passers-by, who will call the coloured crab-apples, quite confidentially, by the queerest of names—"Yes, it's been a good plum year" was the 1942 winner, describing the red Aldenhamensis and the wine-coloured Eleyi, the Lemoine and the Purpurea of the grey-bronze leaf, and their classification as copper beeches by a passing blonde was duly noted.

THE HENHOUSE ONWARDS

But what of our all-in-one man of the henhouse, its client, architect, quantity surveyor, clerk of works, builder, craftsman and labourer, who in such haste built the henhouse that gave me more pleasure than all the yellow and red-brick houses, and most roughcast also, in our legacy of low-begotten effort of the nineteenth and twentieth centuries?

What a post-war removal to undertake! The henhouse could be put away in an hour, and yet the other must go; though man and child, particularly the latter, will still be imperfect, it must go.

It is the duty and pleasure of all to rid the land of its defacement of bad building from the design, construction and the non-amenity points of view.

It is the answer of the age-long cry of the "thin red line" of architects and their supporters in the past that is to fructify, even though it takes a hundred years and more, and by that time the extreme box-type "functional" architecture, white when clean, will have passed through its transition and progressed to culmination, with colour, shape, refinement, cleanliness, and be at ease with the garden and countryside.

Is it a wonder that the engineer would seem to compete with the architect for the mistress art, or that one had an uncomfortable feeling on entering a block of flats that it was just sacrilege to be wearing conventional attire? Where all convention had been removed, to form a honeycomb of sunlit balconies in white, a nudist occupation was the only

function which could be given to the building with a hope that the aroma of functional cooking, close proximity and noise would not too rapidly empty this human hen battery of flats. Shades of the past, warehousing the people, sixty houses to the acre, or back-to-back as in Victorian England, or as temporarily erected for the craftsmen builders in ancient Egypt, in villages surrounding sites where large buildings, tombs, palaces, art and technical colleges were to be erected, you may see them still if you dig—each with their little garden in front, for it was a high civilisation even then. Superfluous hair spring tweezers in bronze for the young ladies, and kitchen dressers for those not so young, even to all known utility specifications. Whilst razors and mirrors in bronze for the men can be seen in the museum today, or tomorrow. Truly, how the cycles of civilisation do return, or are interrupted, never to finish.

There are still problems. What of the soot which coats our buildings even more effectively than it destroys the onion-fly? Could we glaze all our buildings, in colour, with thin double walls? Even if everyone in our land invested in the new post-war rebuilding, averaging £100 each, and by taxation, of course, the £400,000,000 resulting would be but a grain in the ear to the sum required. State building on a covering rental for loan, maintenance, interest and repayment is an ideal. Can it be done? Some authorities have approached to within a small percentage of this; therefore it should be done. Let the architect study and function in economics; for unless attained, a subsidy of, say, fifteen shillings upwards per annum, from all other privately owned houses must be paid into the common building fund. They call this rates, or taxes; fivepence in the pound on the assessment of your house before this war, mark you! Some authorities build their own estates of houses and flats, by direct labour it is termed, and as they do not include all their overhead charges ,or on-costs (you may call them establishment charges), they would appear to build at a lower cost than private builders.

Again, in addition, when working for the State, as called upon by its various Ministries without ceasing, the on-costs are actually about one-half the proportionate charge that should apply to all works carried out by them, the remaining on-costs having to be carried by the maintenance department for whom the works and stores were originally built.

I can safely speak, I believe, for all in this land, on this point at least, that we do not wish to work one hour more than is necessary to provide money that may be charged elsewhere, if insisted upon sufficiently strongly and often.

CHAPTER II

WHO PLANS, DESIGNS AND BUILDS?

THE henhouse primitive architect who actually did everything had less variety of material than his primitive prehistoric predecessor, for whilst the latter could thatch in straw for his roof covering, the former might not, for his henhouse is not classed as a first-priority building, and it must give way to the farm cattle, for the straw softened in concrete silos as silage becomes an addition to their food ration.

To dip into the past as if it were but yesterday, although it is about 5,500 years ago, imagination pictures the primitive cavemen, and later those who lived in some form of tent. To these tents with their centre poles is said to be due, through Egyptian hieroglyphics, the derivation of our letter /\, or M as we know it. It then represented men. Now quickly we proceed to the high attainment of executed planning and design by the ancient Egyptians, and of that great architect, the master-builder and craftsman of old, Senmut, life confidant, designer and supervisor of all that great reign's monumental building work of Queen Hatshepset and her husband and half-brother Thothmes II, and their young family with whom he was a great playmate. Senmut, like Euclid, who is still up to date, and Moses, with so many others, Greek and Egyptian, was trained at the great Egyptian University of On, a very brief and expressive name. It is now known as Heliopolis and is situated on the delta of the Nile. The library of 100,000 books, all of which were first copies or originals, was destroyed by fire in the siege of the new Alexandria buildings, on the isthmus to where it had been removed, when Cæsar set fire to the Egyptian fleet to save his besieged army, and thus the world lost the accumulated treasures of civilisation, though the

Turks later burnt the remainder. This early architect, whose tomb is opposite to his masterpiece, carried the Golden Axe, symbol denoting his skilled attainments as architect, chief craftsman and overseer of works. At this stage of development the architect (which translated means master-builder) did plan and design, build his creation, select his craftsmen and the labourers required, and supervise the building erection as a clerk of works will do today on behalf of the client who pays him, but takes his instructions from the architect who acts as agent for the client.

Senmut's memorial temple to his Queen is of very original design, and still stands below the vertical rock mountain setting as of old—long ranges of colonnaded galleries, so rare in this period, giving scale to the grand poster effect of the setting, a temple of intercession for the Queen and her father, Thothmes I. This architect, who planned and designed these long-standing buildings, was but one of the forerunners of a long line of architects reaching forward to Sir Christopher Wren, who produced St. Paul's Cathedral under similar conditions of planning, building, supervising and the engaging of workmen. I prefer the word craftsmen to workmen, for Wren also worked, and the result of his brainwork and drawings, the triple dome and stone copula surmounted by the golden ball and cross, still stands in spite of shifting foundations, bored subsoils and the effects of bombing.

Yes, he was some workman, was even called a surveyor, yet so deserving of his and our chief craft of architect, even if we do cavil at the bits and pieces of Roman architectural decoration applied to the building, in common with most of our Renaissance buildings and their resuscitations of our time.

Still later, in the eighteenth century, architects in addition to erecting their designs for private and public clients, speculated in building by erecting a terrace or a square " on spec." Many of these are well known, both in London and elsewhere.

Builders, severed from architects in the nineteenth century when architecture was at a very low ebb, and in the twentieth, that is today, followed the " on spec " lead, and hence the resulting blot of the industrial towns and ports that I have previously referred to. Ugly boxes in terrace form, though the terrace is the best and cheapest form for the small house, especially on the sea front to hold the sand back by reducing wind gulleys between the houses; but the houses were devoid of interest and of poor craftsmanship, with their materials dark and dirtying far too soon. They were packed like sardines to a density of sixty to the acre, which diminished after the first Hun world war to a maximum density of twelve to the acre, but up to twenty-five in factory areas, which lent itself to wirepulling in some cases. And although a cheaper house did result, most of these were nasty tinsel toys of cheap building barely holding together, plumbing and unventilated foundations well below standard. Only the lesser density saved most of them from complete condemnation. Albeit both the terraced and semi-detached were an improvement on the tents of old, as regard amenities.

Actually some can be made very decent and comfortable inside, the better when without silly little bay-windows and mahogany or oak-mirrored fireplaces, etc.

It was all a matter of money—good investment in building houses for the great demand. If an architect was employed, at a low rate, the builder being the client practically did what he liked after the plans were approved by the local council; that is in most cases, for there were some very commendable exceptions. Where there is an estate architect (if qualified in more ways than one), the regulations at least generally kept up the standard, and there was much to be said for the leasehold estate under these conditions. The supervision and deterrent effect of the supervising architect usually kept the standard of planning and design above the higgledy-piggledy variations of a freehold estate, where a client and his architect may look in vain for a site where

speculative building has not ruined both aspect and prospect, *sans recour*, and where only corner sites remain unbuilt upon, owing to the stupid double road charge encumbrance to be met at these corners, with no privacy of a rear garden in addition.

The speculative builder also followed the sewer in the road, always obtaining an option on a dozen or two sites ahead. What chance had an architect among such unrestricted rubbish both in design and construction? Although "ribbon" development on main and arterial and sub-arterial roads is now stopped, this but pushes him into the "precincts" of social centres of development.

Why not remove him altogether, and allocate to all architects, as if upon a rota, all such works of a lesser nature, and to the greatly successful the larger buildings—on the principle of one, not more than two, buildings to any architect at any one time? They may join in partnership if they wish.

By this or similar method all architects would use their education as such wholly for building design, with none in the position to strut about as his firm's advertisement in public life, super-qualified though we are for this career.

Most architects' clients turn to the erection of their final terrestrial home rather too late in life, and their successors, often outsiders, reap at a cheap rate the result of the careful study by both client and architect. The moral to this is obvious: if at all possible to begin earlier, as early as is possible, even on a basis of a life-insurance cum building society mortgage or even a private mortage on your home; for life is short and will not stop for the hesitant or dilatory.

No building whatsoever should be allowed without the design for it being by a qualified architect, and supervised by him; no development or sale of land to a builder for development to be allowed, as this places an architect too often in an invidious position. Are our well-known committee reports still lacking the proper answer to this forceful direction for the people's great good?

An alternative rather tickles me. Why should not the architect alone be able to purchase land for domestic small property and again be allowed to build " on spec," as in the eighteenth century, when design was mostly in their hands and the builder had not broken away to do as he liked? A costly mistake, as the whole country now knows too well. Actually in one case, to my knowledge, of forty-six subsidy houses in two existing streets, two brothers built these in a year and cleared £4,700. All I can add is that an architect in sole control would have perhaps taken £1,000, as the " old-time architect-builder," and put the rest into the property, or reduced the price which had been fixed by the State.

Now, be it thoroughly understood, an architect today plans and designs for his client a balanced and well-thought-out building, created from the requirements of his client, translated by the former into a planned whole, with nothing missed out, for the expenditure to be incurred, that would enhance the effectiveness of the design for the purpose for which it is desired. All architects have idiosyncrasies, but beware of one who puts imitative half-timber (you know, from the past black-and-white Elizabethan wooden houses) on to the walls of your house, and don't ask him to do so. On the other hand, a " modern " must be watched who would so forget his alphabet of construction, and the results therefrom, by putting his half-round gutter, or rather yours, hard against the walls of the new house, just because it was *de rigueur* at his school and that he didn't want the shadow under it. And, again, wait until he has imbibed all the tricks necessary to circumvent trouble with a flat roof, be very careful that you do not have to pay a window cleaner fifteen shillings a week to clean one hundred glass bricks with concrete bars between them in your staircase window.

With these there might be a circular staircase, of perfectly charming and inoffensive appearance in the single flight of sixteen steps each, it is to be hoped, of 11 in. or more in tread at 18 in. from the handrail. And if you are still

alive in your seventies, after overcoming the constant centrifugal force and eye astigmatism therefrom, it might be safer to finish your days by reverting to a tray descent, as in childhood's days, with the carpet against the wall and another on the wall as a dado; or your architect, if still in practice, might fit you up with a monorail car hung from the hand-rail. Though, again, the lines and shadows cast by a circular staircase are simply too delightful to be missed; that is the alternative, and I like it.

THE QUANTITY SURVEYOR

After receiving the client's instructions and the resulting design has been completed in sketch and working drawings, the complexity of modern building now requires the architect to engage a quantity surveyor to measure all the materials and labours from your drawings that are required in making and building the house.

For these typed bills of items necessary for building your house, which are called the quantities, you as client are charged 3 per cent., plus cost of their printing, on completion or pro rata on same, should you for some insurmountable reason decide to cease the procedure necessary to build a house. Otherwise, all being well, a number of builders are asked to quote their price or tender for the building, pricing each item to produce their tenders.

Your quantities save each builder from wasting his time and money by employing a quantity surveyor or costing clerk to take out quantities; that you would not see in any case, but would have to pay for, without any resulting advantages.

Think of it! Say six, or twelve builders for larger buildings, if desired, each taking out quantities, whilst only one would be called upon to build your house. Very wasteful, and your competition of builders falls flat in many ways; for you would be reverting to a bygone and interim method, before the single quantity surveyor came into being, introduced by and under the ægis of the

architect. The builders, prior to this, did arrange for one costing clerk to take out quantities for all, and incidentally also who was to do the work, and very naturally, too; so the price was not competitive and there was no reciprocal contract between client and builder. There is definitely full competition when quantities are available. In fact, builders today are restricted in quoting in competition for work without quantities provided by the client, unless you give them your job without competition, and then you just step right into trouble, if there is no architect. Although the architect was once the builder as well, the builder today is not an architect; for now divided expert specialisation holds sway.

No fully educated prospective client would go direct to a builder in the short time remaining when such a course will be permitted by the law, it is earnestly hoped; for you can point out the cheap speculative builder's house and its make-up of bad design as you walk along any thoroughfare, excepting only those who employ architects either on their staff or privately.

The priests of the University of On taught architecture, art, building and much more. This is not the case today, or perhaps we might still be building pyramids; if it were so, one would be a pair of " semis."

Supposing, however, that instead of asking only the successful builder to build, whose tender is the lowest (for you do not invite any that you cannot trust with the work), the client decides to allow all the builders who tendered to build the same job on different sites, the experiment from twelve sets of drawings, specifications and quantities and the architects' supervision would be twelve buildings exactly the same, so much so—reader—that you could not tell which was which as regards the names of the various builders.

But there was only one architect ! Yet, funnily enough, some of you would believe that you only have to run round to a builder to build a house like the one he built for so and

so, yet so and so employed an architect. Well, the result will be what you deserve, a builder's house, and no expense on furniture, Persian carpets or tulips will obliterate your mistake. No glory falls from the previous house by an architect on to yours, for he holds the copyright and ability for it.

You do not think or understand much about this business, even with all the twenty centuries that have gone before, and more.

Each generation dies out with its hard-won knowledge by experience, with little more overlapping of the generations at understanding age than if they were the closely falling leaves of a tree; it is up to each one of us to pass on knowledge back to life.

To obtain greater contact and to pass on skilled knowledge and ways, attendance at university, technical college and school are necessary, and upon leaving these nurseries only lifelong study and experience will fit you for the profession of architect, quantity surveyor, engineer, or builder and craftsman.

THE ENGINEER

The engineer is required for some types of building, to calculate the strengths of the steel or reinforced concrete framework, now an additional section temporarily dropped from the architect's specialities; first the builder, now the engineer, and he is paid on the cost of this framework, at 5 per cent on its total cost. The architect instructs the engineer as to the layout and the loads requiring support, the position of the stanchions; whilst the quantities may include the measured items of steel to be priced, or it may be included as a provisional sum after competitive prices from steel contractors have been obtained.

Though many architects are content to obtain their steel and calculations from a steel contractor who has served them well in the past, their constant practical experience usually keeps weight of steel low, and with the fixed cost of steel per ton, seldom is anything lost in the total cost of the

latter method, in comparison with any other more competitive method.

Do not imagine that every architect will produce a goodly result for the invitation (it isn't so in any sphere of life's activities), and at the moment the profession is closing its ranks in the hope that it may soon obtain the second phase of parliamentary support in an Act to require architecture, which is the art of building properly, both architecturally and constructionally as inseparable parts of one and the same art, although every construction is not necessarily good architecture; far from it, this architecture to be the whole work of architects alone, and not just anybody providing only that he does not call himself an architect.

The architectural profession is both ready made and qualified, and be it noted that, for what it is worth in the whole question, they are the originators of the modern kitchen in its various forms and quite spontaneously throughout the universe of civilised, and other, peoples.

CHAPTER III

THE CLIENT ENTERS

LONG ago in Victorian days just when it was found that a scale of 8 ft. to 1 in. was a better working scale than the then customary 10 ft. to 1 in., a lady of the land entered an architect's office, and a boathouse to cover and house her river-boat was the result.

Now, Junior got this to worry over, and, as is common with such, did not add the scale to his drawing when he left for his holiday.

Pupil " Number Two " added the scale in 8 ft. to 1 in. instead of 10 ft. still clung to by Junior.

Result, the houseboat stuck out of its house by nearly one quarter of its length, and I will give you one guess as to who paid for the widening and lengthening of the boathouse.

Again, another of that ilk drew out, or as we say detailed, the staircase for a vicarage, and one day when the general clerk of works paid a visit to the building, the staircase had been fixed, and he had to crawl under part of the stair to reach the floor above; there was no headroom. Now a builder is not supposed, that is legally, to build anything from a drawing that is so obviously quite wrong; but being a small country builder, he could not be expected to know this, so the Royal Axe Man again met the cost, and it began to dawn upon him that he had better employ none but fully qualified men, or cover against some form of inexperienced staff party risk.

Of course, he did sign the drawings before they were posted, but these things can happen in hasty moments.

It was a good device for architects' assistants, whether in private, State or council offices, to be associated in name with the works that they do.

All too often the man most concerned with the planning

and designing of a building is not, and cannot ever become, known to the outside world at large. To the younger architect I would say, avoid having to associate with a consulting architect, unless you starve otherwise, for if the result is goodly to view, the profession will dub you a useful hack, and the result of your keenest effort will be but to see your legitimate halo go to enlarge the diameter of his already fairly large one.

The architect will readily admit that he is still learning all through his life, long after his school and institute qualifications have been bestowed.

Now his client, or eventual client, also obtains some knowledge in building, too often from personal experience, for it must be remembered that he has had no training in appreciation nor in perception of things essential. His first urge, on or before marriage, is probably to purchase a builder's speculative house—you know, one of those things that you want to rebuild in post-war days and of which not one in ten thousand should be allowed to deface our restricted soil area, little merit in plan and still less in design. reeking of pebble-dash, cheap woodwork in porch and in the ever-present gable, the pediment forsooth ! The windows and silly little bay-windows are heavy with timber on the eye level, and the plans on both sides of the street are the same. The aspect of the rooms on one side cannot but be wrong, for the sun's position is all important.

An eventual client had removed inland, but found that he and his family could not sleep, and put this down to the new district. Finally he returned to the coast and gave his experience, exhibiting the builder's draughtsman's drawing of his inland bungalow.

Just one glance at the plan. His bedrooms all faced due west and received the full penetration of the late horizontal sun. Everything, including walls, floor and bed, would be hot and radiating or passing heat on by convection, so that at 2 a.m., and even throughout the night, the heat must have been suffocating in summer.

So, in the new bungalow his bedrooms face east and the family rise each morning with new worlds to conquer.

Mind you, a house does present a greater range for room aspect than is possible in the case of a bungalow. For you may have a southerly aspect for double the number of rooms; one over the other, bedroom over lounge for example.

The drawings and illustrations of a simple bungalow will indicate neither eclecticism from the ancient nor the ultra-modern alternative.

Remember that for compactness, good heating and lower initial costs in building and upkeep, double planning is better than single planning.

The former infers that the rooms are one behind the other, and none, therefore, are capable of window lighting on each end, and in spite of the absence of " pretty " effects we do thus avoid cold, draughty rooms and waste of fuel in war and in peace.

Single planning was the custom up to the days of good Queen Bess, and double planning afterwards. The earlier single plan exposed more of its stone walls to the outside air, and the cold air not only cools the walls but it comes through them, so much so that they were hung with heavy linen in folds.

Tests made recently by the National Physical Research station proved that 8 cu. in. of air will penetrate a 9-in. plastered-one-side brick wall in an hour, with a wind velocity outside of 15 m.p.h. Now whilst an 11-in. cavity wall would very greatly reduce this, if we increase the wind blast to a bomb blast, this type of wall being less stable suffers much more than the 9-in. solid wall; this is by the way. So the linen gave way to oak panelling, with a little linen-fold carving in its top panels, as a reminder of the extra comfort then provided; an early amenity.

Now, I am fully aware of the craze for single planning by the moderns, *in extremis*, today, for the sake of some more happy proportion obtained by increased length of building

that no one appreciates more than the author. So you have been warned, cost, cold and a larger site are the recompense, and this in spite of the modern pressure towards high tenement flats to produce a greater ground area of unbuilt-upon spaces.

Where blocks of single-planned buildings are placed well apart and unconnected with each other on a site, aiming at sunshine in all rooms, there is, in spite of this advantage, a multitude of drawbacks, of greater cost both initial and in upkeep, larger site, annoying spread of building requiring other people's land surrounding the built-up area to provide the spatial setting otherwise provided on its own site in double-planned connected building. A larger staff is required, internal telephone and dictaphones, large umbrellas or connecting covered ways, the stoæ of the ancient Greeks—theirs against sun, ours for rain protection.

All rooms do not require the sun, the operating theatre and the architect's drawing office are the first two to mind.

Very few of the inhabitants of these isles can resist a crossword or even a jigsaw puzzle, and to its logical conclusion, if they were all architects, they would enjoy our sketch planning.

Planning all kinds of buildings, large and small, according to the requirements of your client, is an intriguing science which leaves the general public's game quite cold and spineless.

The Thumb-nail Sketch

With a small block of smooth inlaid notepaper having a sheath on its back to receive the cast-offs, negative or successfully progressive, a seat in a long-distance train in peace-time, and many a building has had its birth; or in an armchair by the fire in winter, the first grip on a problem in plan and design is made; squared paper is an advantage for concentration.

Sketch Plan and Working Drawings

After that a more accurate one-sixteenth scale plan and section is made, all the time bearing in mind the building's use and its appearance; the latter is kept vividly in mind in the early moulding of the scheme. Finally the completed sketches for approval; followed by the working drawings, usually to one-eighth of an inch to one foot, plus all necessary half-inch to one-foot details to clarify both for quantities and for building. All these working drawings are made upon transparent paper, or cloth for large important buildings, so that copies can be made from these negatives on opaque cloth for the local authority's building surveyor representing the health committee and by-laws; also a set to a town-planning committee in but a few cases. Some councils demand two and even three sets of these expensive coloured cloth drawings and return one set when approved. To save any further waste than is absolutely necessary, the second returned set might be used for the signed contract drawings.

Local Authority and Other Approval

After approval is obtained—often, though, only after preliminary or counter approval—a fully coloured set of all drawings must be handed to the quantity surveyor, either with fully specified materials, etc., noted thereon, or a separate specification must be prepared to accompany them.

Even prior to this, cheap copies are sent out to all the specialists, to the engineer should his services be required, and their works should be brought into the scheme in order to see that all drawings are correct from the beginning, so as to accommodate thereon any minor variations before depositing plans with the council; just as you will discuss the supply services with an electrical engineer or sub-contractors in competition only—the gas, water, lift, steel casement and multitudinous additions depending on the

job that is being moulded into a first-class architectural whole.

Eventually the course is set fair for prices or tenders from certain invited builders upon the hard, fixed basis that has now been reached, and the quantities containing all the job measurements and other details are now posted to the builders.

CHAPTER IV

THE BUILDER

BUILDERS estimate from unit prices that they can work to, and then tear off one of the two quantities tender forms upon which their tendered price is entered, and this figure not only includes their own shop and building work, but all other trades not included in their firm's work, such as plumbing and glazing, slating and plastering, painting and decoration, maybe. On a fixed date, probably ten days later, these tender slips, properly signed, will be posted to the architect, or to his client, all as previously arranged, and they include the 3 per cent. for quantities plus their printing charge. The architect may receive a hint from one of the contractors that his tender is £100, £5,000 or £20,000 above the hoped-for figure, depending on the size of the job, that you have assumed from a cubic-foot calculation of the building at a shilling or three shillings, according to class of building.

It varies also when the game of others, war, so reduces our paper money that agricultural labourers' cottages cost £1,000 each instead of less than £500. High wages mean high prices, and the levelling-down will be a difficult period to face after the war.

You will imagine that so-and-so's tender will be less; past experience, you know. Actually, a builder that is new to you sweeps the board, and you look almost sorrowfully and reproachfully at the list, with your last favourite (who is now the highest tenderer) at the foot of the list. You wonder why. Perhaps you worked too much into the quantities and labours, for your client's sake and your professional standing of course; but more probably he lost money in quoting as lowest tenderer then. However, you soon find the new winner serves you just as well, and in the meantime, to comfort your client, who also wanted even somebody

else, you tell him the tale of the twelve builders who each and together built the same building on twelve sites so that neither client nor architect could find their favourites, and the former wondered how they could all possibly build the same building, exactly the same.

Here you ape Tarzan and, fist thumping your expanded chest, cry, " Behold the architect "; for you will be well understood and appreciated then, until the extras tot up as the job proceeds.

Now, whilst double glazed-door architects might allow themselves but one job per client, there must be none of this about you, for you are a detriment to the profession in proportion to the extras that you incur, and whilst 5 per cent. is passable (just, only just), 10 per cent., whilst possibly legal if you have taken all reasonable care, may lead to your loss of a valuable client, and a chase through the law courts for your fees; there are, however, some exceptions.

A contingency fund for unforeseen omissions in your contract is usually included in the quantities and tenders, as it is quite impossible to cover every labour and material item, and the customary inclusion is 5 per cent., which the builder includes.

Payments to Builder

Now a word as to builders and the treatment thereof.

For as you do unto others so they may do unto you. Your quantities are hard measured, and you watch for every possible minute omission that you can put into writing immediately as a saving, your detailing puts the maximum labour into each item, and you hold back the retention amount of 10 per cent. from each builder's valuation automatically, to the experienced man the valuation was both low, and held up far too long by you, before certifying for payment.

Local authorities are very prone to this, and the result in peace-time is only to be expected; whilst in war I do know of

one from whom cash is now being demanded by suppliers, I am pleased to say.

There is a black list of architects, and others, who develop these lax financial idiosyncrasies, and I well remember a joint meeting of architects and builders when this was verified. And everyone wished to know their fate, for up to 7½ per cent. may be added against you.

The Signed Contract

The builder must live, and the contract (the contract form of the Royal Institute of British Architects, made with the Institute of Builders and others) is meant to be read equitably from both sides—by architect and builder.

The builder pays 4¼ to 5 per cent. for his overdraft on his securities, and in peace-time his property deeds are usually held by the bank as securities for the loan or overdraft; although in some cases 10 per cent. of the builder's gross turnover may be a maximum loan or overdraft, without full covering by securities.

He has calculated to receive your payments according to the contract, the same as you will require him to build to; so you should keep at the bottom of the black list, on the 0 per cent. addition level. You will thus save yourself a lot of trouble and get things done for you the more readily. Finally your client would not like to think that you had a high-tariff percentage charge against his pocket before beginning work, in spite of your known myopic saving prospects that may or may not make up this leeway. On the other hand, a proper balancing of accounts is not a myopic procedure, it is just business sanity. And the quantity surveyor will wish to balance on this proper basis with the builder who will not charge for the extra courses of brickwork in your building (caused by some adjustment at the wall plate and the eaves), if you do not demand a rebate for the omission of some branch drain. But do keep full job notes.

CHAPTER V

PLANNING

Now, although so many architects say that they prefer to plan and design a commercial or even a warehouse building, as the dealings with the client are more impersonal and some imagine less trying than a house or bungalow to accommodate man and wife—truly an exacting proposition and one that usually commences the practice of a young architect, he must not demur at any time, as if he had other and larger interests on his mind, using tactfulness and a finely guided instinct in all circumstances, for his commercial building and warehouse together might come from this very source before many years are past.

So, as I have said, the architect sits down to begin his next job, and instead of large shipping offices or a modern school, the auditorium of cinema or theatre, he will as readily pull the sketch-block out again for a house or bungalow, large or small, or even for the smallest modern cottage with its telescoped human requirements, or a terrace of such reduced habitations as all aspire to later in life when family days are over.

So be happy, young architect. In your chair some night dream out the little house or bungalow, just as the crossword puzzle solver works, but without a dictionary or any copy—nothing but the real urge of achievement that prods you on unconsciously [*sic*] towards some payment of fees coupled with a small but permanent advertisement, very hush hush, of your ability; and to safeguard your halo place your name on the builder's board, not more than 2 in. high, the statutory height beyond which you may not trespass. It does do a little to prevent the builder from being troubled by a queue of prospective clients outside his office on the completion of this your first job.

Whether the design is in a flat, stark, functional manner

or of a non-eclectic treatment not so antagonistic to the countryside setting, your rooms will conform as far as possible with the sun ("aspect" it is termed) at some time of the day. The other term ("prospect") covers the possibility of your habitation being spoiled by later development, be it by smaller closely packed houses, factories, chimneys or even a school; and the architect has already seen to this possibility and will have assured you.

He will first mark upon the scribbling-block your north point, the first guide to success; for you should avoid a true southerly aspect, as this will necessitate a northerly aspect on the opposite side of the building.

Twist the plan a little, so that you will obtain some degrees of east with your north and thus a similar proportion of west with your south side.

This is no doubt difficult when building on a prescribed building line, but a good architect knows the answer and the give-and-take in all planning and the modelling of it all. Your entrance hall and front entrance should generally face north-west; the setting sun on these pleases any client arriving home, from his less exacting trade or profession, in the early evening. A bright and attractive return and close to the workaday existence, with the sun shining on flower, berry, plant and trained traceries of well-selected climbing wall shrubs.

The lounge or drawing-room should take the south-west corner, whilst the dining-room aspect would range from north-east to south-west, depending entirely upon its use, which varies so greatly in each family. A study may fill a gap in the plan between east to south in a more secluded position, where this is possible.

The one-time necessity, the billiard-room, had a cleverly arranged aspect, the length ran from north to south so that its lantern top-light and table could do the same. By this method the horizontal sun from east and west is prevented from reaching the table, as it shines mostly on the raised drum of the lantern and a little reaches the long sides of the

room or its floor beneath these walls. The north gable of the lantern would be glazed but the southern would be solid, as the sun would, at 57½ degrees, make table lighting impossible and sliding lantern curtains a necessity always. The kitchen, scullery, larder and pantry fill the remaining north-east aspect, with the first named east if used as a maid's sitting-room or as a rushed breakfast-room—even a south-east aspect is pleasant.

There are so many combinations possible in this part of the plan that only a study of ancient and modern development can give full conversancy with the subject, and this approach keeps the architect alive and open to quick inception to improvement.

Historical Development

As an illustration of what does occur in the gradual historical development of our living-room and kitchen quarters (which are the suite of business rooms for so many of our womenfolk), we start in ancient Greece, through Europe, on to Britain with the Greek megaron or living-room which has a central hearth of brick raised above the floor level and kerbed in oak. Simply, the fire cooked the ox and the smoke did its best to pass out through the hole left in the roof (and the smell was lovely) from B.C. days to King Hal. The latter, his family and important guests sat at a table raised upon a dais; other guests and retainers at two other tables below, one on each side of the smoky cooking arrangement, and the bones were thrown to the dogs running about.

On the dais there were two doors leading to the withdrawing-room, where the ladies would retire to before the king began his after-dinner effort as a raconteur, which would no doubt bear a similar relationship to the atmosphere at about that time.

This produced the eventual drawing-room as some of us knew it in Victorian times, and for myself I would prefer to stay with the king rather than sit with the aspidistra. But

perhaps I am regrouping the periods to some excess, for many charming drawing-rooms lay in between. Slightly later than the introduction of the withdrawing-room, a separate kitchen was introduced at the opposite end of the large living-room, which would be the banqueting-hall in the palace.

The open hearth also disappears, and in its place we find the large open chimney against the wall, which got rid of free smoke in the rooms and was so advantageous with a first floor over. Logs and peat fires ruled, and you could sit on each side of the fire over which the ox still cooks on its spit—or part of it.

So we now have the living-room, the withdrawing-room and a separate kitchen.

In pre-fourteenth-century days you had to go outside to enter the next room, and so at about that time a connecting corridor was introduced, and certainly not before it was needed.

Following this, as you know, the reign of good Queen Bess then introduced double planning, and thus increased the temperature in the house and reduced draughts, by allowing windows in one wall of the rooms only and fireplaces on internal walls where possible, and with less walking about through greater compactness of plan.

The Modern Approach

However, the modern enthusiast of today has a great tendency to ignore all these things and to cry for the sun all round his isolated buildings. There is a rectangular pivoted building somewhere that turns with the sun, or did do so—I believe it is outside Manchester.

With regard to the living-room (which becomes the dining-room) and the drawing-room little more need be said, except that the latter is more often than not called the lounge, and it might disappear in the smaller houses altogether after the war, owing to greater expense of all things.

We continue, however, with the kitchen. In the larger houses the servants were provided with a servants' hall as a sitting-room. In the smaller the servants used the kitchen as a sitting-room, as many families do today in telescoping their requirements more in keeping with labour-saving flat life, and we therefore have what is actually only a small kitchenette facing east, and fitted up like a flush-panelled small room where all utensils and even the sink can be hidden. In this tight little accommodation, a pull-down breakfast and tea table with its two pull-out chair seats is quite common. There were daffodils on the tiled window-sill over the sink fitting, and this is small flat or house perfection; but cleanliness must go with good planning.

The next type of small plan is based upon the old servants' kitchen-cum-sitting-room, and in this the cookery nook (I can call it no other) is small, for the husband can only just squeeze in to dry up, unless the crockery is all left to drain and sometimes to dry.

In addition to this, there would be a small sitting-cum-clothes-drying and ironing-room that may be termed a snuggery—for at its best moments it is one in all respects.

But it is as a breakfast-cum-tea-room, facing south-east, that it reaches culmination—for here it may be said that there is no wall between it and the cookery nook, just simply a huge flush-panelled drawer and cupboard fitting with food locker at its wall end, having ventilation at top and bottom and a slate shelf for milk, butter, etc.

Now this 1-ft. 6-in. deep fitting has cupboards and drawers that open both ways, into the cookery nook and the snuggery; a cupboard forms the hatch inside which the electric kettle boils, and everything is in reach from either side. Perhaps this is not literally true, for at the top and out of standing reach is a jam store, opening only into the snuggery, so as to keep the steam away. As you will have guessed, there is a coal fire in the snuggery, and there may be an angle window to give room appeal and to kill the boxlike appearance. In some small-size and even large

houses the dining-room is but a small annex out of the main lounge or living-room.

The divided cookery-snuggery plan would also have a dining-room and lounge for average requirements of a household, though cost and wish may also telescope these.

Aspect

Wherever the kitchen sink may be (in most cases in the scullery), it should not be under a north-west or west window, as the resultant glare and dazzle will cause many crockery breakages; for distance cannot be judged with that nicety so necessary in dealing with brittle objects in rapid succession, and holding never too secure. The sink must never be less than 2 ft. 6 in. long.

Under so many adverse conditions, is it to be wondered that we are visited by a plethora of uneconomic post-war advisers? The vocal effort will only subside when it is known that money is still money, and so is bankruptcy, whether committed by the individual or by the State.

Pray do not read this book to condemn your home to the demolishers—we have had enough of their work already, and lost capital is generally gross waste. Even the best possible plan cannot contain all the ideal aspects.

On the first floor most of us will place our bedrooms and ancillary devices, and your best bedroom will face south-east or south, with the remainder north-east to south-west, but never west or even due north, as we shall see. The maid's bedroom should be in a secluded spot—if not on the ground floor near the kitchen. In any case its aspect would be east, as the room should be planned so that its bed receives the horizontal sun about 7 a.m. Greenwich mean time, quite the best awakener for members of this now extinct species of help.

Bathroom and W.C. will face north-east (the early sun aids in ablutions), whilst these rooms should be over the hot-water apparatus, whether in kitchen or elsewhere. In small houses every device for economical running and

conservation of heat must be resorted to ; and yet it is just as important in the larger houses, for gone are the days of inefficiency—war taxes will absorb most of our existence money without any further waste.

The Hot-water Supply

The cylinder (whether fire or immersion heated electrically) in the small house or bungalow should be in the linen (or rather, say, the airing) cupboard, and the latter should be entered from the bathroom, for elderly people easily catch colds in a cold atmosphere, and steam plus water excess in a bathroom is the more quickly removed by the slightly higher average temperature thus achieved.

The roof cistern can be placed below the ceiling level in the top part of the airing cupboard, whilst the shelves of the latter should be of the open-batten type to allow the heat to circulate, and the water or steam exhaust overflow from the top of cylinder should be bent over into the cistern and the whole double sheeted over in ply filled with cork chippings, as a lift-off lid.

If you thus keep the exhaust tip (bent over) from freezing, your cylinder will never burst and pour its water into your kitchen on the floor below, nor crumple up like a clenched envelope. This is due to the water escaping as steam each day and that wretched exhaust tip freezing up and closing, so that with the freezing up of the inlet pipe as well (after, say, a week of freeze-up), the amount of steam and water left in the cylinder is too small to keep its sides apart in the semi-vacuum thus created inside the cylinder. This is due to the 1,600-odd water to steam expansion with the fire on in day-time, condensing back to a few drops of water some night, and with all water or even air excluded by frozen pipes, the cylinder then collapses. So shut the hot-water damper and go easy with the fire, but do not turn spartan and refuse to light it at all.

The burst cylinder is easier to understand. There is no outlet from it; there is no tap on, for nothing will come out;

so you forget to leave one on. In addition, all inlet pipes are frozen up, so your fire expands the water in the cylinder until it bursts.

Just the same advice as before, though you will suffer more through wet ceilings and walls with spoilt decoration which cannot be redone for some time—so leave your bath hot tap open (if water will not flow from it) whilst your fire is lit.

Many small general rules in house planning still remain, and of these the water closet or W.C. (which is seldom called a lavatory professionally) should not be planned immediately at the top of the staircase unless it is both sound and ventilation proof. It is ideal only if cut off from the landing by a ventilated lobby.

Tiles

As with the bathroom, the W.C. should be tiled or glazed in cream or colour, and joints should run continuously both ways. Even with second-class tiles they should not be broken-jointed nor broken-bonded like brick joints in a wall. The squared network or reticulation of the joints is the only simple method of design to adopt, whether the tiles or slabs are on the ceilings, walls, floors or when used in fireplace face or hearth in any room and in any building, both outside and inside. This also applies to the larger prefabricated slabs. All pans, W.C., washbasin and bath to be of the same colour, with tiles a proper contrast in tone to these fittings and a warm tone or even a full deep colour—always providing that the subsidiary fittings in faience (which is tile in block) for the soap, etc., over the square slabbed-up bath, and the toilet roll, are made to match the tiles. The toilet cabinet should be built into the wall over the washbasin for the use of its flush mirror and contents.

The pipes could mostly be hidden in the linen cupboard with a hinged flap to guard the linen, and these pipes include the rising main which never again must be allowed to run up an outside wall, where it freezes in the roof at the eaves,

the inaccessible eaves. If you have one of these United Kingdom plumber's specialities, do have the pipe cut and pulled down under the W.C. or other ceiling, where it will not readily freeze or where it may easily be thawed by a spot of heat.

Condensation

Rather more than a word is necessary on the bedroom with a northerly aspect, particularly that small or large one on the corner of the house, screened from sun by the next (and far too near) neighbour's house; especially aggravated should it not contain a fireplace.

I have known of whole streets of difficult rooms facing north owing to this abortion to health—the open air-brick only just removed from the by-laws by an alternative, viz. an opening fanlight over the door to the room, opening into a ventilated staircase or other space. On a cold day, and especially during a cold winter period, these rooms are made really cold—walls, bed, carpet and all.

After the bed has been used for a week or two these cold surfaces and articles become saturated with condensation, moisture from the occupant and from the rest of the house. One person will give off two pints of water or more each day as steam or invisible vapour and, owing to the cold atmosphere not carrying it away and its condensation and absorption in bedclothes, carpet and walls, the effect of long accumulation can be a nasty problem. I have brought in the Medical Officer of Health and shown him the saturated carpet and wallpaper, whilst the bedclothes, much to the annoyance of the tenants or owners, had to be dried before a fire each day. There was no other course than to close the air-brick during frost, and to remove the wallpaper which, although black with moisture, was dry behind with dry and loose dust particles adhering, a perfect alibi against the suggestion of rain percolation through the 9-in. plastered walls. The room was then warmed in the

" KELANI "

Approximate List of Accommodation required by my Client.

Hall	6' x 11' 6" (as St. Andrew's Road Bungalow, roughly).
LOUNGE	No smaller than " Sefton " drawing-room. (Shape, come what may!)
KITCHEN	9' x 9' with fireplace (if with sink a little bigger—without sink could be used as a morning-room and put sink in pantry).
PANTRY	With sink to enable two people to wash up comfortably ; with cupboards and shelves (closed in).
COAL-PLACE	To hold ½ ton coal (as here).
WASH-HOUSE	6' x 6' with shelves and usual bowl and boiler.
TOOL-SHED	To hold 2 bicycles, mowing machine, garden roller and chairs (roughly).
OWN BEDROOM	14' x 13' (or that area).
2nd BEDROOM	12' 6" x 12' 6" (or that area). (Not averse to any being bigger if possible.)
DINING-ROOM	11' 6" x 14' if no bay window. (Certainly not one of these (Author).)
CLOAK CUPBOARD	(Somewhere).
3rd BEDROOM	or Box Room which could take a small single bed if necessary.
BATHROOM AND W.C.	Separate.

LINEN CUPBOARD—if possible heated.

Above all, privacy of apartments.

evening and the window only opened at night, and the solution had been found.

I ordered the building-up of the " model by-law and by-law inlets," thirty in all, for the windows could be opened.

In the worst cases the walls might be lined with asbestos sheets with taped joints and then painted; though in simple cases of condensation a change in wallpaper will do the trick; for the new one, for two years or so, will have a less absorbent surface, as it will be semi-glazed and will only reach the blotting-paper, absorbent condition after this period of time. Painting or distempering walls, even if the plaster surface is not perfect, is quite the best thing to do in all circumstances both practically and æsthetically, especially in these modern days when paper at its best looks rather more than a trifle Victorian, and most of them cannot be described at all.

The panel strips and the tinsel border, you know, the one-time three-halfpence to sevenpence a yard with a penny a yard labour charge to stick it on, all samples in a lovely book that the shop-walker at the decorator's propped up for you on an easel—you were such an artist in those days.

Well, try not to do it again, use oil paint or water paint; it is so much better, and in a class far above papered walls.

CHAPTER VI

THE SMALL BUNGALOW

IN addition to the general notes in the last chapter, there are a host of minor though important details to be kept in mind in the planning—the kitchen to dining-room service being quite the most important, and you will find that old customs die hard.

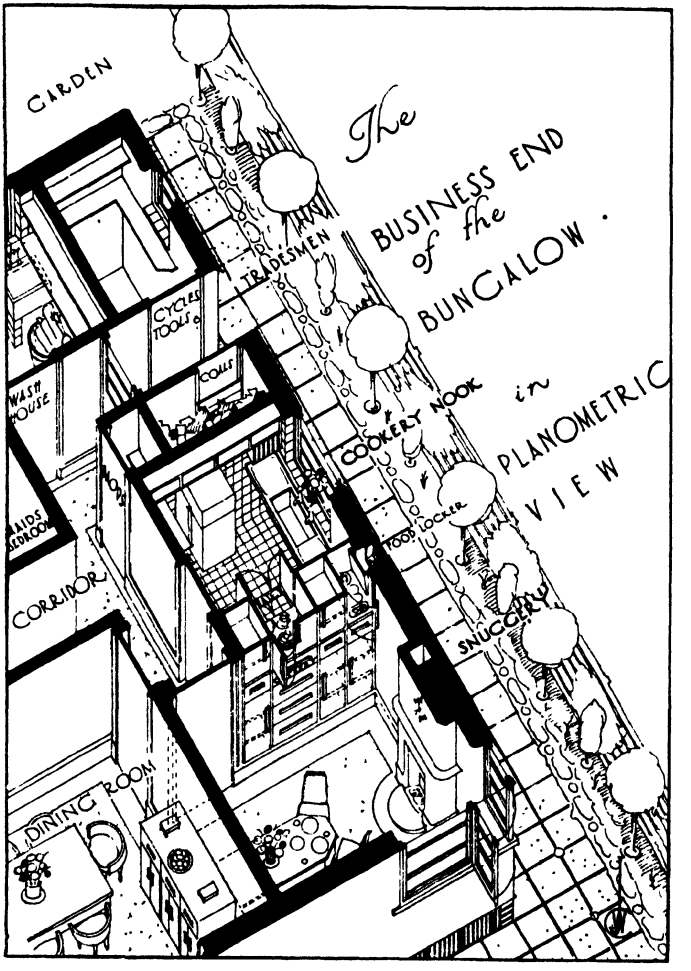
There is a left-hand light to the carver's seat in the dining-room, with the sideboard just behind, whilst the cookery nook is but three strides away across a ventilated 3-ft. passage.

The all-electric cookery nook and the *en-suite* coal-fire clothes-drying breakfast snuggery have been described before, though here it may be remarked that the long joiner-made strip handles on the drawers and cupboards have the advantage of enabling you to get hold anywhere without tearing a circle of nail scratches around the small circular knob alternative. The drawer may also be opened more quickly; try it for a dozen times with some speed. In passing, the tradesmen's boys (also extinct at the time of going to press) put their parcels in at the open angle window in the snuggery when convenient.

At the side entrance is the mop cupboard, coal-place, tool- and cycle-place, a wash-house that is electric, and leads to the rear garden and allotment. Do not forget the two sinks, separated by the mangle, and a drainer to each for the wash-house.

The lounge is at the south-west corner and is of a useful size, in contrast to the minimum of space allocated to all other rooms, for it is 21 ft. long and 16 ft. wide, and it has a pleasant and simple grandeur and a flush coal fireplace.

Two quadrant castle-like towers form cut corners at the hall end to provide a telephone-box at the entrance, and this accommodates the electric meters and some cloaks;



The business end of the bungalow.
(Axonometric.)

whilst the other corner forms a mysteriously curved end to the long corridor where it turns to allow for the wider lounge at the guest's bedroom and best bedroom, with their *en-suite* bathroom and W.C., all to the north-east.

At the end of the bathroom and W.C. block is the linen-room containing the immersion-heated cylinder. But as the bathroom can be heated from the cylinder by the chromium towel-rails on the tiled walls, the linen cupboard flush doors are in the corridor outside. The sanitary fittings are green, and the wash-basin is of the pedestal type, which has the advantage of hiding the supply pipes in the pedestal.

Fire Draughts

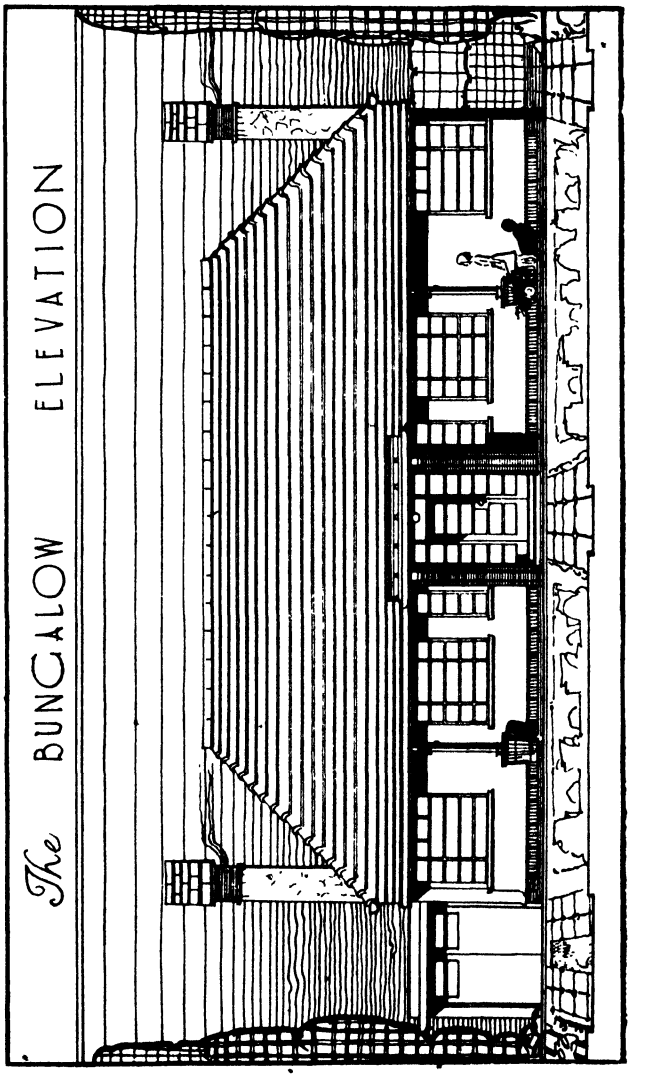
The two coal fires, one at each end of the bungalow, have 4-in. drain pipes from the well-ventilated underfloor to the hearth in front of the fire basket. This prevents fire draughts by providing the cold air, which is necessary to the fire for its chimney flue and smoke, passing in between the seated people in front of the fire. As this cold air must be provided for the flue up-draught, only by this method can cold draughts be prevented. This arrangement also greatly helps the draught and thus stops smoky fires. I would apply it to any badly smoking fire in an existing house, even on the first floor.

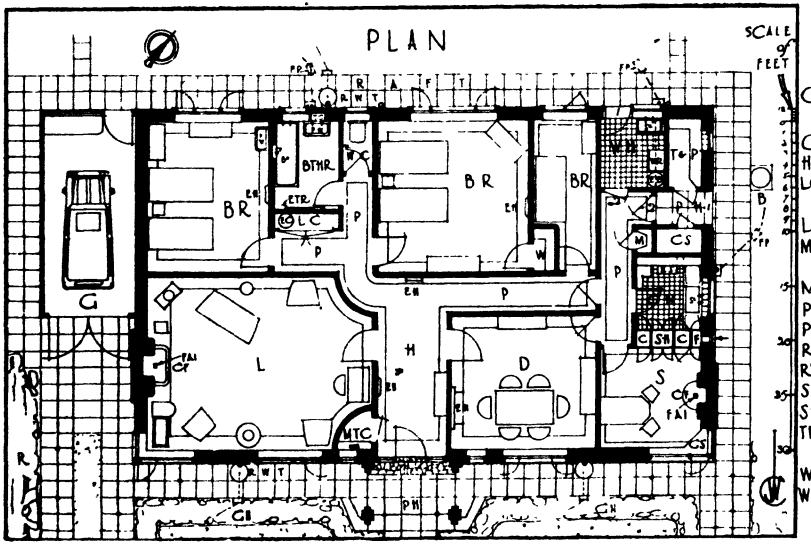
The cold air must otherwise be pulled into the room from the door, where it blows the carpet up if the tile is replaced over the cold air pipe in the hearth.

There is electric heating at each end of the hall, in the bedrooms and dining-room by inset chromium Ferranti units, with pull-up shelves over them. The expense of installing and running central heating is avoided, together with its devitalising effects.

MERULIUS LACRYMANS

Perhaps it would be better here and now to explain the timber floor and its ventilation, for such hollow floors


The BUNGALOW ELEVATION



Key.

C • GARAGE
SHELF
GN • GARDEN
H • HALL
LC • LINEN CUPBOARD
L • LOUNGE
MTC • METERS TEL & CLOAKS
M • MOPS ETC
P • PASSAGE
PH • PORCH
R • ROCKERY
RWT • RAIN TUB
S • SNUGGERY
SH • SERVERY
TP • TOOLS & POTTING
W • WARDROBE
WH • WASH HOUSE
BR • BEDROOM
B • ASHBIN
BTHR • BATHROOM
C • CUPBOARD
CN • COOKERY NOOK
CS • COALS
CF • COAL FIRE
D • DINING
EH • ELECTRIC HEATER
ETR • ELECTRIC TOWEL RAIL
EC • ELECTRIC COPPER
FAI • FIRE AIR INLET
F • FOOD LOCKER
GS • GROCERIES

should be ventilated to the maximum possible. First of all the floor is of ordinary joints and boards, and of spruce, for we could not then afford better, and that was three years before the war.

The ventilation is well provided for below the floor in a course of soldier bricks 9 in. high, every eighth brick a ventilating brick, and these are also 9 in. high. But more important still your eye will not differentiate between the 2¼-in. variegated rustic bricks and the ordinary 9-in. by 4⅛-in. red pressed ventilation bricks, all standing up really vertically on their ends—they just form a pleasant rhythm.

The sleeper walls supporting the wooden joists and floor are honeycombed with omitted bricks so as to give through ventilation without any stint, and there is a damp-proof course under the joists, a good one, for the thin cheap type will not last ten years.

So the under floor allows air to pass freely from back to front and from side to side of the bungalow, for all the house or bungalow walls that divide the rooms are also open built or honeycombed below floor-level.

All timber joists built into walls are twice dipped into creosote, so as to keep out moisture and any contact with small inoculæ of this fungi.

No cold material is allowed on this ground floor. If it was an upper floor this would not matter, and this goes for all rubber or its substitutes as a floor covering, unless all the timber is specially treated prior to building, to ensure its safety.

All the latter form a cold layer on top of the floorboards, to which all outside damp air tries to reach so as to condense upon its surface. To do this it soaks into the floorboards and tops of joists, and then through the nail holes to the cold covering itself; the nails rust and oval rings of damp show around them in time.

But why all this very much required fuss; what is this rot that we dread so much, or should do? Skip the next few pages if you will, but you will have been warned.

The general public should know more about this; for it is continuous, and is not easily eradicated. You can carry it about on your person; have it in your timber store for firewood, your sand or soil, old building material if not guaranteed by the user, and so on.

Beware of the individual who says that he is not afraid of it, and wishes to buy the best of rotten timber taken out, and to sell the residue for firewood.

It is through such persons that whole districts have become contaminated areas in our cities, their suburbs, and in borough and urban districts. Even thirty years ago I well remember a bank being built in such a district, and to safeguard the property the architect had to draw out and specify for the quantities and the builder stating that the building shall be entirely cut off from its neighbours and the ground, by surrounding it with rock asphalte in two layers, 1 in. thick in all. The asphalte was laid with a float on the neighbour's gables, with more limestone dust added to stiffen it for vertical work to prevent sagging. These gables were built against and were joined together across the basement floor of the bank, in between the two layers of cement concrete, by a similar double-layer coating left the more plastic as it was horizontal. Even nowadays little has been done by the authorities, except the few who see that their own experience is not wholly lost in their locality, and require that all architects' plans, and to the country's detriment anybody's, indicate by arrows the exact position of all the floor ventilation bricks, especially in all corners, and that proper through ventilation is obtained.

In order to curtail foot and mouth disease in cattle, slaughter, incineration, fines and imprisonment are meted out, but with this fungoid disease rank callous carelessness prevails. When we talk of a rebuilding epoch by qualified men, should not the soil itself be qualified as fit to be built upon?

Surely, and if so, why not provide the laws necessary to prevent the soil becoming contaminated? The question

will not stand argument or contradiction, for it is ripe and rotten. Once a district becomes contaminated this harm cannot be undone. The disease cannot be grown from its seed or spores; it is even much more difficult to do this outside a laboratory than to grow mushrooms from spawn or spores, as Mr. Beverley Nichols does not do in his delightful *Down the Garden Path.* The rot will, however, grow readily from the smallest splinters or bits of disease-eaten dry timber residue, even the very dust from it.

Now, why does this occur ? Well, there is now no doubt about that, nor was there twenty years ago. The late Prof. Groom spoke of its certainty, and this has been proved only too conclusively in timber-strengthened basement shelters where, finding rot curiously starting in the feet of the posts and sills, I have, when called in, always found the original bit of dry-rot with dry powdering timber from which the contagious particles have disseminated in the form of these small bits and dust that in the course of very little time had found their way and been brushed to all corners of the now wholly affected basements by their attendant shelter marshals.

The dry-as-dust fine threads of wood contained something that is neither spore nor seed, only the self-sealed, dried-up cells of mycelium, the visible size root of the fungus, and the most dreaded of the whole two hundred and seventy odd kinds of fungi. It belongs to the laprophyte class and so can live on both live and felled timber; the latter unfortunately includes that in our homes. Incidentally the mushroom and toadstool are of the parasite class that live on live trees and their roots. It is a pity that all are not edible.

This visible root named mycelium, when magnified, could be described fairly correctly as appearing just like a string of sausages, as in my sketch, but perhaps a little more connected together than this jest-provoking article of food.

The mycelium root strand is only like the foregoing when growing and devouring the lignin, starch, and protoplasm

MERULIUS LACRYMANS (DRY ROT) IN THEORY & PRACTICE
THEORY
PRACTICE
INVISIBLE HYPHAE
INVISIBLE SPORES
VISIBLE MYCELIUM
RHIZOMORPH
GILLS
SPOROPHORE IN HALF SECTION
SPOROPHORE OF IRREGULAR SHAPES (FRUIT BODY)
ENLARGED GILLS
BASIDIOSPORE
STERIGMATA
GILLS OR PLATES
JOINTS OF MYCELIUM
SPORES
ENLARGED
INVISIBLE DEADLY DRY MYCELIUM CELLS IN DUST and ON EVERYTHING
INVISIBLE
HYPHAE
VISIBLE MYCELIUM WHEN GROWING
MYCELIUM
RHIZOMORPH
The PRETTY BIOLOGICAL PICTURE of WHAT SELDOM HAPPENS for ITS SPORES ARE TOO FASTIDIOUS to GROW.
·ENLARGED· DRIED MYCELIUM CELLS
·MYCELIUM· DISTRIBUTED LIKE a NATIONAL
·STRANDS· DEBT to CONTAMINATE EVERYTHING

from good timber in buildings. And whilst it is doing this it attracts water, which forms in large drops on the timber attacked and will hold up on the underside of floorboards even in drops half an inch long against the force of gravity. When the mycelium strands have sucked the timber in its vicinity until there is no food left, the timber dries and so does the root, the presumed string of sausages in miniature, and it is in these dry spots that the furniture legs go through, and human legs. Even a piano and a party of dancers once went down four feet in a badly contaminated area; but hospital cases are fairly rare.

The now dry mycelium divides into separate cells, just as if you cut up the string into separate sausages, and they seal up their ends and lie dormant until the timber is touched, carted, thrown or quietly moved; for it is impossible to prevent dry bits from falling about, and under any reasonable condition for growth each miniature "sausage" (say a dozen in each minute splinter) can grow to maturity, and if not dealt with properly will in time devour all available timber in any building at a rapidly increasing tempo.

Each cell can be carried, brushed or blown about (for in single cells when dry they are invisible), and buildings and soil many miles away can receive the spread millions from one medium-sized disease growth; old houses so far immune though without ventilation should be left in that condition.

The sandbags so much used in the recent past caused the start of these cells' growth in many a property, and I have traced single-strand growth from the sand through the sack to the wall it was protecting, where it spread or fanned out like a hand on its way to window and floor destruction.

The group of cells (or more often the whole small chip of wood or a square piece cut out) is called an inoculum when used for testing speed of growth, and it is placed in position and covered with a piece of glass, iron or other cold material, and adjacent timber rapidly receives new roots from these inoculæ. A few goodly looking joists from a floor that

was to be scientifically treated by an expert had surreptitiously been stored in a coal-place in an outhouse, and it took but a year for dust from the joists to get under the door frame 6 ft. away, and to grow up to its top, also across the rusty hinge into the door itself, and even to the roof spars.

The first roots to grow and spread are quite invisible and are called hyphæ, and in almost every case the builder, unless carefully supervised, will not allow a sufficient area around the hole in the dry bit of floor, and so cuts across the hyphæ area of growth. Even the Ministry of Health only say 1 ft. from the visible rotten timber, without noting that this is for the duration of war and in temporary works.

There was a good example of this in a requisitioned house where growth had gone on all round a 6-ft. square patch, including the patch in the skirting, and the new patch was naturally affected. I would say 5 ft. all round the hole, but the whole floor may be affected; textbooks and often architects and builders say 2 ft. 6 in.

This subject should be treated seriously, and architect, builder, craftsman and building inspector be required to pass an examination set by an outside authority—for over twenty million pounds sterling worth of timber in yard and building is destroyed each year. The replacement in building cost of operations would be over twice that total, with most of it to be redone again in a year or two.

The Remedy

All diseased timber must be burnt in the fireplace of the room from which it is removed or in an incinerator just outside, when the ash from these fires may be used on the fruit trees in the garden. The first method of burning is the better—for the mere fact of carrying the diseased timber outside through a window is dangerous; your soil and paths will get the bits and dust, and you will pay for this later.

To rid your house or other property of this disease (merulius lachrymans, commonly known as dry-rot), all mycelium roots must be carefully dug out of the brick

joints. These are then burnt out with a blowlamp to reach all ends that might very easily be left behind to dry and grow again, eventually to reach timber in a short time. Now, after all old timber has been burnt *in situ* all rubbish should be brushed up and also put on the fire in a bin, including the old brush that you have used.

Then, before building up the new floor add the ventilation before described, and thoroughly syringe all brick and concrete surfaces (and that means the site concrete top now exposed for working upon) with a solution of powdered perchloride of mercury, mixed one ounce to two gallons of water, or the cheaper sodium fluoride at six ounces to a gallon of water in two coats.

The poison is sprayed into every brick joint and crevice and on to the underside of all new timber (when fixed in section after section as the boards are laid on the joists), new joists and any old ones if left in; repoint existing walls after spraying is done.

The perchloride of mercury is purchased under the Poisons Act and is known also as bichloride of mercury or corrosive sublimate, and its white rock crystals require to be crushed by a hammer or weight after carefully wrapping them in a folded newspaper, as the dust easily flies and slightly affects the nasal membrane for some hours. The solution must first be made in an earthenware jam-jar with boiling water, and when there is none left in precipitation pour the solution into the two gallons of warm water left handy, but not in a galvanised iron household bucket. A proper heavy timber trough box must be made, having two wood strips as handles and its joints caulked and wax filled.

The box should be kept handy by builder or architect, for each will have much use for it, and their quite numerous clients will expect them to be fully cognisant of the subject and to be able to differentiate between dry- and wet-rot.

Dry-rot is a fungoid growth and is deadly, but wet-rot is no worse than rusty iron; for whilst it rots when wet and dry alternately, it will stop rotting if left dry by the repair

of the leak whether in eaves, window joint, door frame or greenhouse.

The garden syringe is brought into action for spraying the diluted poison on to walls and timber below floor. But you must wrap the syringe well in brown paper tied with string, as otherwise it will not last very long, and it must be well rinsed out in clean water after each period of using, or a jet in your eye may result in damage to the eye.

Now all this, and more, may happen to you if you build badly. See my articles in *The Builder* and in the *Contract Journal* of March 1st and 3rd, 1944, respectively.

CHAPTER VII

PLANNING DETAILS

IN this year of grace, with but one great thought of good building in mind, there will be published shortly additional volumes by various authors and upon all kindred subjects that have been the special privilege and association of the Royal Axe Man, possibly to beyond even ancient Egyptian days. Even an Atlantis might account for the great similarity of ancient building on both sides of the Atlantic, in the Maya or Mexican, Chimu or Chilian, with the Babylonian and Egyptian.

There must have been a goodly connection between these far-flung designers of Mongol-American stock with their contemporaries the Semite-Babylonian and the Hamite-Egyptian—for pyramids, ziggurats, astronomical temple shrines with signs of the Zodiac did not spring up simultaneously in those B.C. days in lands four thousand miles apart and most of this over water.

The Woodwork

It is easier to return to the simple bungalow once again, where, to enhance the furniture and even its occupants, the rooms are all simply and restfully finished—no cornices or picture-rails, certainly no four-panelled doors, or stained glass in window, door or furniture; no moulding unless a 3-in. by $\frac{3}{4}$-in. round arrissed wood plate that runs around the door jamb (to cover the inevitable crack between wood door lining and the plaster) could be included as such. This plate mitres and runs along its continuance on the top of the skirtings.

All doors are flush ply, and the burglars could not cut through them to turn the key outside, when they entered by the windows.

The decorations are all in water paint, generally a pale

gold ceiling stopping at the one fillet that ended the 3-in. coved top to all walls; whilst the walls were increased in tone from a paler cream on the cove to a deeper almost flame gold immediately at the skirting.

All the woodwork (in door, skirting and border to floors) was rag-roll painted in pale beige tones in consonance with the water-painted walls, ceiling and faience fireplaces. At some later date the walls will also be stipple painted, for the free lime and water content has become chemically inert after two years, and then painting may be resorted to directly upon the plaster without fear of it being cast off.

The Wallpaper

To paper the walls with pattern papers would be thoroughly out of keeping and degenerate, for the effect is petty and small scale, and with each room papered in a different pattern the worst effect possible is realised. Even in the smallest house the plain tinted walls give spaciousness and restful appearance, enhance the furniture and, not by any means least, bring out the attributes of face, figure and dress of the occupants and their friends against the plain sympathetic tones. Not even a photographer in Victorian times would photograph you upon a background of daisies, pagodas, cubes or zigzags—why do you do it? The bright hues of pot, flowers or cushion strike the necessary foil in the room groups of furniture at fire, desk, table or bookcase, and in the latter the brightly coloured book covers are sufficient.

Furnishings

The carpet, whether plain Donegal, Wilton or pale non-aggressive Persian, must harmonise in each room in the bungalow. The windows and their horizontal bars give pleasant shadows on the two quadrant corners of the lounge, whilst the necessary curtains in heavy velvet (with pelmets to cover their sliding mechanism) hardly vary in each room as regards colour.

Plain modern furniture, or even antique, is desirable, but above all the room painting must be quite light in tone. Gone are the days of would-be dark mahogany or oak, whether brush-grained or perfectly done by an artist painter, at any cost. You know it is not what it would purport to be, and its very dark patch divides up the room to make it appear smaller—it is retrogressive.

But your client may not be able to do all that is required at once—for money must be earned and, more important, saved, whether for private or public expenditure, just as we all saved in war and still do. Prices only go higher with heavy expenditure, and there is a very large bill to be paid.

Glazing

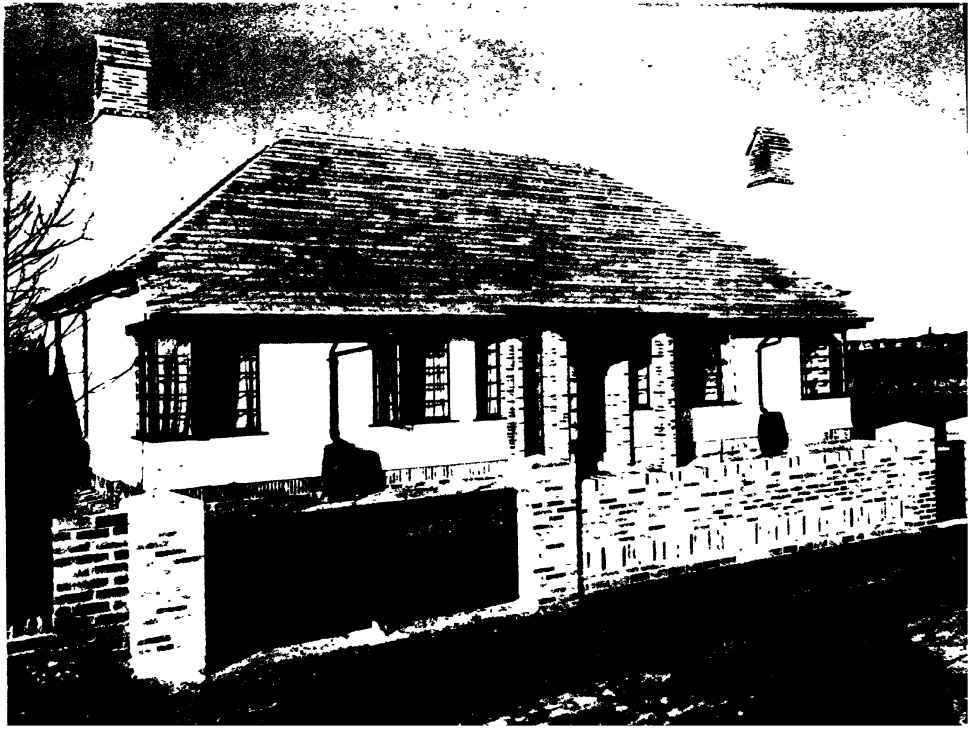
The front door is glazed to its full height in ¼-in. Georgian glass—this is clear square mesh reinforced plate, and the New Year's burglar failed to break through this glass, although he used the coal hammer and deadened sound by intervening the blows with the front-door mat.

He could see the Yale lock inside 2 in. away, and though the hammer smashed the glass to splinters as far as the central passage 16 ft. away, the hole was only ¼ in. in diameter, because only one of the fine wires of the reticulated mesh reinforcement had been broken.

From the buildings of each period of civilisation we register the progress of the world towards its most difficult goal—perfection in their time.

The bungalow cost £1,250 in 1936, and it was certainly not expensive—three builders tendered for its erection. It has a hipped-ended roof of green concrete slabs made of green granite dust which gives the permanent green colour, in lieu of the flighty, here today gone tomorrow, chromium-oxide often used and which quickly washes into the gutters and down spouts.

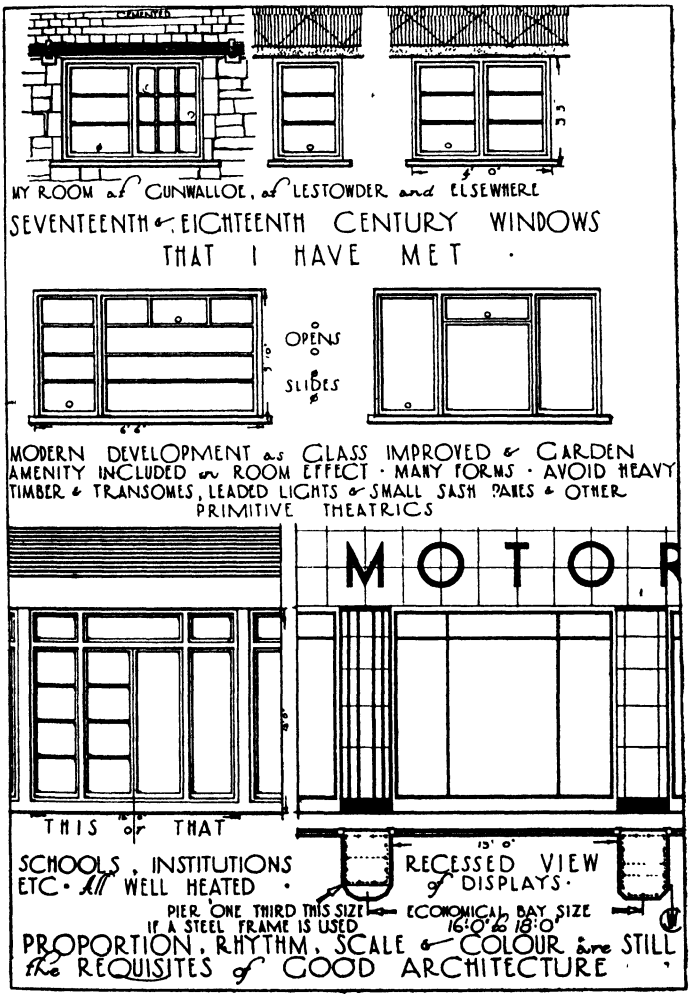
The windows are not modern, although they have only horizontal bars in them; for they are found in Cornwall and elsewhere, intermixed with the small Georgian sash-pane



XTERIOR OF
'HE BUNGALOW

THE BUNGALOW—HALL AND DINING ROOM

THE BUNGALOW—LOUNGE



Window development. Cornish eighteenth century to modern.

that I cannot stand again in this life, except perhaps in the addition to a building already containing them, or to curtail one's interest to the room that one is in, or owing to desolate, dirty ill-kept surroundings outside; then even opaque glass could be used.

Chimneys

The belfry chimney tops—well, they just don't smoke, do not fall, rattle or allow hail to come down in quantity. The flues in these stacks (that is, one in each) were double crippled, or twice half looped in their run from fire to top outlet. This resists any down draught, whilst the chimney top is 60 degrees gabled in green slabs solid bedded in cement and wire tied into same, and the flues have 9-in. walls around them; for the stacks look better, and the extra heat reduces down draught thereby.

The narrow bricks (in, yes, variegated colours of rustic-wire finish) were pointed in gold Cementone, and this brought out the colours in good contrast and combination. The porch piers were reinforced in expanded metal and had two vertical ¼-in. wires through all the sandwiched pieces of mesh.

Whilst the long entrance steps cast in concrete were faced with irregular odd-shaped pieces of any coloured marble from the marble mason's yard; they are brightly clean and modern thereby, and there is a green leather strip mat.

I well remember the clients' first use of the dining-room, when, as it is said, the bungalow was only "joist high." They sat in the open on a joist apiece, with one in between them for a table, thoroughly enjoying their alfresco meals.

Gardening, levelling the soil, removing twitch and couch grass, but never dreaming of the second approach of the age-long apostle of murder, and that, as in most places in our island home in but a few years, a rain of missiles would be dropped around their site, and that even the blades of grass would lie flat radiating away from the blast with a white extension of blade strained from beneath the soil; that bricks

would fly hundreds of yards from one mine to lodge in roof timbers over children's nurseries. Even a more pleasant picture than actuality in most inhabited places.

One of the alfresco diner gardeners, then with friends over the road, has to thank a hall chimney-breast in their bungalow for protection afforded as this bungalow fell in ruins, internal doors planed about, tiles and plaster rained down upon them.

After first-aid (now in the open at Christmas) to those requiring it, including the man who rushed in after seeing the mine descending on its parachute (one of the pair), and who warded off a flying door a few seconds later, the party of five, with little "Rip" falling in behind, crossed the road to the belfried bungalow, from a bad "CB" to a "D" category of war damage in the idiom of the Ministry of Health, the War Damage Commission and the local authority. A sturdy effort on the part of the little bungalow in viridian green and pale cream.

The architectural profession is more closely woven into all the human interests on this earth than is any other section of the community. Upon its success depends the standard of living and good building in the future, that is, what is left of the prospect. Nothing can be done in the planning and design of all the things that we wish to do, until the world foundation is made secure, never again to be built upon the quicksand of the Huns' freedom to destroy man and his home by the tens of millions.

Foundations

Quicksand as a foundation in building has to be stopped from spreading by encirclement of stronger and prepared calculated resistance to any wild collapse over its reduced perimeter or border.

The foundation of the bungalow was pretty bad, but it was not quicksand; it was peat, and it would not take a direct load. So the architect, who cannot allow his designs to slowly collapse either during or after the allotted span

is o'er, makes the foundations secure by spreading the total load equally on the soft foundation and even beyond its intimate area.

A reinforced concrete raft was therefore designed by him. It was 9 in. thick and projected to 3 ft. beyond the outside walls of the bungalow, and thus formed a useful path all round without additional expense.

A large proportion of this expense was recuperated by the foundation only being but 7 in. below soil level; for the raft top is 2 in. above the latter, with a fall of ½ in. away from the walls to the soil beds 3 ft. away.

Even so this low bungalow would sink, and to allow elastic adjustable junctions in the drains, small chambers were left for any future adjustment in one length of 4-in. drain pipe loosely contained in sand and well set up.

The bungalow has sunk half an inch in one piece, but there are many in the vicinity with ordinary foundations that have had over 3-in. fractures filled up after completion, and remain questionable properties for their life's duration. Some have each room's solid floor domed up in their centres, for all walls have sunk under their greater load. The rain-water is run into three green-painted tubs, each complete with overflow to a gully adjoining at edge of raft.

The addition of a garage later was a small problem. Though as it was erected in heavy timber with a green slabbed roof this difficulty was substantially removed; it is certainly not a temporary building.

To avoid the lid appearance of a roof that is hipped at the ends (instead of the cottage gable of simply delightful appearance when built and still more seductive on the drawing), the side gutters were raised 1 ft., as will be seen in the photograph. There is, of course, a reduction in overhang to the side gutters.

As a functionalist, in perhaps a wider sense of accumulated experience, I would always prefer the hipped roof to the gable end; for, as a gardener, there should be strong objection laid against any part of a building that is unneces-

sary, and can be done away with, if it places an obstruction to the sun reaching some part of the garden.

Sunshine

Day by day we are all becoming more out-of-door conscious, and garden area is seldom sufficient—neither is the sunshine. Nor should we make draughty gulleys between our far-too-near bungalows or houses by increasing the vertical heights of building on each side of the party fence. The houses also look too close together in any case, and this must not be exaggerated.

A maximum sun-drenched soil area—in fact the reason that led to the increased distance between the building lines on each side of the road, under the Town Planning Act, each building to obtain sunshine all the year round irrespective of the low angle of the sun in winter.

That the amenity of sunshine shall be enjoyed by all in their front gardens all the year round over the roofs of the opposite houses. And for this reason I fully appreciate and enjoy the flat roof of the modern house, whilst in addition there should be a stair up to it, so that the occupiers may enjoy the sunset, a meal, hammock or a sunbathe thereon—even if a 6-ft. man may not always be able to lie down flat.

There is nothing new in this, for the middle- and upper-class houses of ancient Egypt had this amenity of the flat roof over their central living-room, out of which opened their private rooms, with a stone stair leading to the roof. A lean-to of thatch covered the surrounding rooms. The evenings were cool and refreshing on the roofs of Egypt.

The wadi (or stream) filled the garden pond, and the alluvial soil of the country would grow anything; there was "corn in Egypt."

Their gardens were lovely to look at, as was their architecture and all the things they made, with trained Golden Axe Men and their craftsmen to do these things. They produced a great civilisation and a high peak in building effort

at an early time—in spite of any endeavour to decry the past so as to foster a true architectural interest today in lieu of eclecticism. Their civil moral laws became our commandments through the Israelites, whilst we still plan to suit the constancy, or expectancy, of their sun god, Amen or Rā, which of these will depend on whether you were a north or south countryman of Egypt, before the reamalgamation under one Pharaoh took place, and sometimes Amen-Rā afterwards. They preferred the amenities of life to fighting, and were not unlike ourselves in that respect—and what sane nation does not?

The Assyrians were the torment of that age and seem to have brought it down; for very little had been done since until the Briton came. And the peoples have increased again—the result of safety and freedom.

The more learned Babylonians (or remnants therefrom), together with the Persians, put an end to this Nineveh regime, whose cruelties are not equalled until today—flaying alive, yes, but not extermination.

A final word on "sunshine," for never again are we to feel the real heat of the sun after business hours as we experienced in the all-too-short period of D.B.S.T.

Should the coal shortage ever again give us this great gift, I could not regret its reintroduction—for we shall all eventually miss it in the brighter days to come.

Black nights are reminiscent of unhealthier days, and if full accommodation were made with a lengthier period of acclimatisation, already rapidly taking place even so, most of us would recognise that darkness and sun-starvation are not the normal requirements of health, but a cancerous result of the clock fixation of time.

CHAPTER VIII

REAL STYLE v. ECLECTICISM

As nominally to the man in the street there will be a visible change in architectural planning and design that you, I trust, may have noticed in your travels or even in your home town, or become cognisant of from illustrations of new buildings in your magazines or the small books on this subject.

Simplicity almost bears upon harshness, and if you have been accustomed roughly to classify buildings as Classic, Gothic or Renaissance, Elizabethan or Georgian, specially attractive houses or just those in a builder's row, you will call this new style ultra-modern. The examples will consist of town halls, churches, railway stations, flats, works and factories, many houses and a few exhibitions, shops and cemeteries, both here and abroad.

For quite a number of years architects have begun to free themselves from the copying and adaptations from past styles of architecture. In any case most of them produced poor copy, indicating but little study, but few made their designs scholastically studied and alive works in past architecture, designed in a manner of subdued Classic principles yet wholly modern in all respects, exceptionally free from the ancient restraints governing past styles. And there are many other buildings that cannot be rudely classified as " modernistic," for the reason that they might appear to suggest that their construction is that of reinforced concrete.

After all, one of the big points brought forward to crush further recrudescence of Classic or Renaissance architecture is the cost of the columns and the carving and sculpture entailed, and that for the cost of one such building two could be built.

Concrete Construction

Whilst for some types of building reinforced concrete walls, as well as floors and roof, may be advisable, for by far the greater number a steel-framed skeleton with reinforced concrete floors and roof is much cheaper, on account of the expert supervision, labour and waste of timber shuttering or falsework involved in the former type of construction.

Most of the coming post-war building will actually be of this cheaper type, if I may dare to refer to anything as being cheaper when it is only by comparison. For there must be a dire struggle to return towards the 1939 prices as soon as it is possible; although the way will be hard and to very many terribly disappointing in the comparison of possibility with promise, expectancy and demand.

For those expecting and demanding unfortunately will look twice at these promises, when it really dawns upon them that they must pay by their equal share of income tax (and other) for all these things.

Cheaper building must hold sway, so why criticise long, open modern windows in a steel-framed building? Steel will span farther as a beam than reinforced concrete; both are as equally justifiable from the truth of construction pedestal, so nobly raised.

Reinforced concrete is not by any means a newly found material; nor is it a perfect one, as we shall see in due course. I well remember being connected with one of my then chief's buildings in 1907. It was partly straddling over a 90-ft. deep quarry that had been filled in, so there were 60-ft. span reinforced concrete beams 11-ft. deep of economic design, the steel, bent for shear, being only at the bottom, with simple hangers hooked separately but unconnected at the top. The leading reinforced concrete man, M. Considère, was helically binding beams, piers and piles long before this in France, with reinforced concrete buildings in Tangiers and elsewhere, forty years ago.

Style

In the historic past the architectural styles developed naturally in easy succession and sequence, and it was not until the early and late Victorian era of the nineteenth century that architects (amateurs in the main) failed to give the lead to the public after these Victorian days. And so the tail wagged the dog—industrialists, financiers and builders were free to build anything they wished in factory and small house; and they did it.

In the better-class buildings, including houses, the battle of the styles raged in committee or in private discussion everywhere. Their merits were discussed at length in literary circles, and even the newspapers joined issue, fanned Ruskin in his youth. Finality in the lowest depth touched seemed to have occurred when the scion of a noble house is reputed to have cut up many photographs of the adored Gothic cathedrals of this land, pasting the selected portions together, and suggested in committee that that was the perfect cathedral required in the diocese concerned.

Now, although Ruskin's volumes became the bibliography for the higher realms in building, very few knew that on his sickbed their leader scored out his attacks on the Classic and the Renaissance architectural works, annotating the many corrections with criticisms of his former attitude by reference to the ideas of hot-headed youth. I can just recall the expressed unbelief that was shown by some old architects and their friends at this exposure of the recantation of style by their leader at an allied architectural society meeting when I was a young student.

After many years the bubble of bigotry burst, and the architect, slowly shaking off the shackles of the past, is now free to design without restriction by Classic or Gothic strictures. But that is not to say that architectural history in every way is not a more suitable reader than a modern novel, for the architect will see quite sufficient of human life without joining a lending library.

There are of course many other books as alternatives. Rather co-related I will agree; even so is gardening.

To make the style battle really ferocious, a church alongside St. George's Hall, Liverpool, had been demolished and a Gothic cathedral was to be substituted. It had three tall spires. Quite a chequered approach to the final competition, and the executed design by Sir Giles Gilbert Scott, R.A., on a suitable site. The result is far ahead of the times in which it was designed and built. So much so that even now is there an architect in the land who could produce an acceptable modern equivalent that would not be bizarre and ridiculously transitional in less than a lifetime? Whilst even reinforced concrete from the outside fabric to a large cross on the re-table would not last any longer in reality than red Woolton stone, which may be patched by substitution. And this is more than can be said of the ungilded modern alternative.

But the battle of the styles is on again. This time the Classic is *hors de combat*, speared in deadly combat with functionalism. The struggle recently has been between this almost modern neo-Gothic and the true monkey-house modern of telling foil and grimace.

In the precincts of this cathedral there is an opportunity to provide a wide road up the hill to it, and to centralise this with the central transept entrance and the huge tower behind—a vista of two hundred yards, and no attraction to heavy or through traffic, with the accruing casualties. Two-storey buildings only, such as a library, baths or banks and similar types, might line a triply divided road that should be suitably planted; narrow streets are not an essential for the Gothic picture.

All these, and even the largest buildings to be erected, are planned in a similar manner and to stated requirements of accommodation by the architect concerned or his staff, as was the small bungalow.

Modern buildings are, however, planned, more often than not, to produce an asymmetric design—and that is the

opposite to a symmetrical one. They have no central entrance with equal wings on each side, and generally this produces greater freedom of plan, good sun-traps, a softer more irregular silhouette and when possible a broken frontage, unless it is a shop or similar building, with no spare land but that it must be devoted to a rear yard and motor vehicles. And this would be open to the sky to light the interior of the premises, and supply to the town plan the necessary proportion of building plot area as its quota of breathing air space to the town's requirements.

The Modern Store and Factory

Illustrating this, and a more modern store than is usually found in the suburbs of a city, photographs are here given of an exterior and interior. The canopy over the pavements will in future similar buildings (to replace branches badly damaged by bomb) be fixed at the transom height, with a portion of the window above the canopy. An improvement on the 1936 effort—for protection from the sun would be increased.

The windows will be continuous, in lieu of the dark blue rustic brick in between. Although it is now unnoticeable this rustic-brick surface was badly stained with cement, in spite of the coverings. But after brushing with water to remove the body, the general tone was but little improved until recalling once using one coat of oil solution on a house plinth with success, I got the painters to apply one coat of paint oil, boiled linseed, and the dark blue rustic brick came up better than before the cement stains took effect over square yards of its surface.

So the contrast of the warm blue of the brick with the viridian green painted woodwork produced the livid intensity desired for the colour effects, together with the orange-coloured curtains.

There is a fourth storey on the roof, but as it is zoned back it is invisible in these photographs. The width of the side roads prevented a full top floor.

Even thickness lettering on the three canopy faces will in future prevail over the "Broadway" type used in this instance.

As is so often the case, the rear elevation gives greater pleasure on account of the increase in simplicity, together with the now visible fourth floor and large staircase windows, though a photograph could not be taken satisfactorily.

Actually, in an effort to hasten the resumption of progress, as if peace was near, after the European war had terminated, my client, wishing to test the restrictions on the building of commercial buildings, asked for a survey and report upon a war-damaged store. Very naturally priority went, of course, to the rebuilding of certain destroyed houses, followed after a while by the local authorities' first housing estates, men and materials, of course, permitting; and the former hardly existed in any numbers when the greatest cry was made for houses, and little more than small layouts of temporary bungalows erected by three skilled workers and six labourers were possible.

However, the survey proceeded with a very mixed and perplexed feeling amid barriers beyond the control of client, architect or builder, amid a harsh accompaniment of cost plus and cost plus. Estimates were impossible and risky, for labour knew only this method by enforced habit.

The building had cascaded down from the second floor at the first direct hit and the boot store had emptied down on the slope. The store still functioned a few days later, and so now what could be done with this old building? Was it worth patching up again? for the rear could be rebuilt, even if nothing else was done apart from a thorough reconditioning of windows, signs and a fractured building. Could nothing better be done? for the result would be but a dolled-up and dirty brick edifice with its "life" but little extended.

A scheme slowly dawned by which the building would be

reframed and clad whilst still open to customers. The demolished side wing and a rear addition would be the first to be built if no objection came from the Town Planning Authority under the Act of 1944.

Of all the restrictions, the one-third of site area not to be built upon and the 60-degree angle of adjoining road centres to enclose the carcase of the building itself, pressed the most heavily.

After the side and rear had been completed it would be added to the shopping space, another section taken over and the temporary screens put up inside, and so on to completion.

This " strip-tease " form of reconditioning would, when completed, not show in any way that the building had been rebuilt in sections, for the materials chosen would eliminate such a possibility, even if two or more years were required for the work.

Glass would be used throughout. Glass bricks, possibly in colour and but four inches thick, would be used as the continuous cladding between the unbroken horizontal windows of plate glass and galvanised steel frames, that is, from their sills to the window heads of the floor beneath. There would be no plastering inside, for the internal walls would also be of glass brick.

The steel frame would be threaded through and connected up the easier, for it would be of " Chromador " steel, with its sections almost half-size and looking ridiculously light in comparison with the ordinary steel framing in general use. Light steel trusses of flat pitch would carry a protected steel-sheet roofing.

Four stories are probable, and the pavement canopies of light steel with an asbestos facia rounded at corners, flush sheeted on the underside and electrically lit up underneath as required by the local authority.

Silver and green shop signs three feet high in letters five inches on face and five inches thick would rest on the top of the canopy facia.

The building, looking like a "Crystal Palace," would be floodlit from behind the canopy facia, and orange or green window curtains would be drawn in sunlight.

The canopy would be at ground-floor window transome height, which would preclude the entry of sun into the windows below it and so avoid the use of sunblinds this time.

Two rails under the flat projection at the eaves would enable a cradle to be used for the window and wall cleaners.

One can readily imagine a shopping street designed as a whole in glass, each building a crystal unit and part of the whole façading. Lit up in winter, in colour and flood, and appearing as a fairyland in crystal architecture but without advertisements, revolving lights or flicking, though a flame or two would not detract too much.

Quite an elevating effect coupled with the silence of the rubber roads of the future, and in rain the whole scene would scintillate.

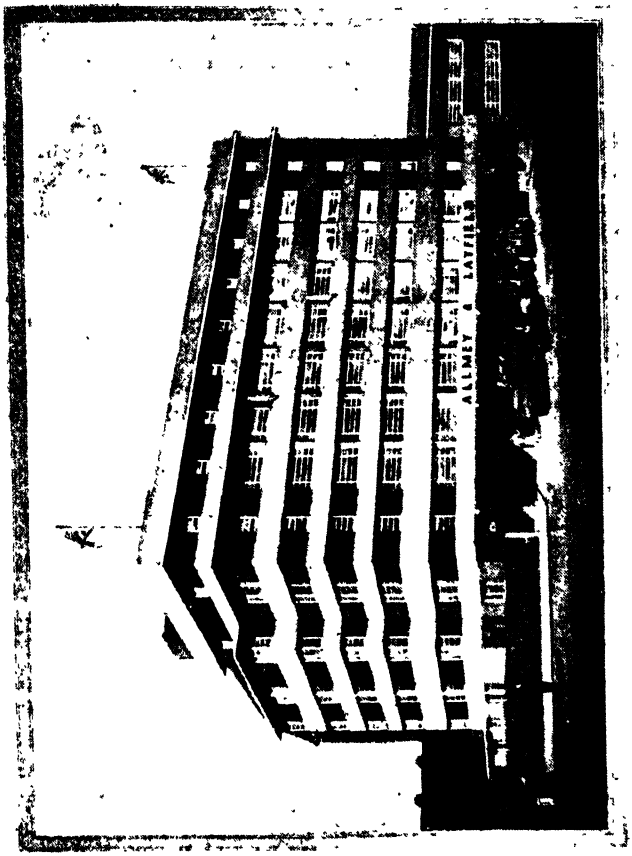
Whilst the past alternative of dirty overhanging cornices and deep-set façades in heavy-weight and ponderous building, would appear to be prehistoric by comparison.

Are the schools of architecture already harking back to this? I truly wonder if they have ever sincerely broken away from pedantry.

Having come through the "decorative motley" but once, and never as a Roman, being early referred to as an authority on neo-Grec in the days of the Cunard Building, Liverpool, very long ago, I am surprised at the rapidity and ease with which these mouse-like cycles of so-called Renaissance pop in and out again.

Is architectural education still but skin deep? Do exercises in past styles burn too deeply for the insincerity ever to be cast off?

Another building, a project for a factory of six floors, would appear to mirror the surrounding blocks of city tenement flats. A good camouflage it might once have been thought, but we now know that nothing above ground is safe. safe.



A factory amid municipal blocks of flats.

It may be clear from the photograph of the perspective that the brickwork between the windows of each storey lightens in shade as the building increases in height—the colours of the sandfaced brick varying from double burnt blue, through dark and light red, brown, golden brown which is quite pale, to yellow in the full sunlight of the top stories.

A camouflage sun effect for dull days, and a perfectly permissible though rare colour effect, except on most artists' drawings. As brickwork darkens with dirt adhesion, I would not be loath to experiment with raw or boiled linseed oil on completion, so as to let the rain run off with most of the dirt.

These restricted town sites do not lend themselves to asymmetrically designed elevations, for the plans demand full building to maximum length, width and height, with an unbuilt-upon one-third of site area in accordance with the Town Planning Act—business economy cannot afford to give away more than this.

Acoustics and the Acoustical Curve

A cinema easily meets the latter necessity, for a car park has to be provided, and this will comply for the unbuilt-upon area under the Act and for compact planning interest. The basement may be very full of mechanical contrivances, and above is an auditorium requiring full acoustical attention, though this is never as fully met as is the case in theatre or philharmonic hall, where the house echo, or reverberation, is fully alive to suit all musical instruments and vocal effects, in addition to the more improved acoustical curve on which the seating is built. This class of building is exceptionally intereresting to plan and design.

University, college and even school lecture theatres or rooms are also built up to the acoustical curve for the advantages it will give to good hearing and vision.

The even rise of the steps carrying the seats has, however, to suffice for cinemas and football stands, for the time being at any rate.

It is, however, with the less rigidly economic type of building that the more plastic freedom is obtained, and in these a subsidiary grouping of various blocks of different heights, together with possibly the inseparable squat tower, may be obtained in one and the same unit of design, with a sufficiency of spatial surround, as in the playing-fields surrounding a modern school.

Asymmetrical grouping is obtainable in many other buildings, such as branch libraries, branch technical colleges and schools, factories, district council offices and many another. But there is a disadvantage in single storey or shed building, for to obtain that very long and impressive single-storey building, with only so very little of a two-storied building at its end, that single-storey demands the same roof and foundations as if it were three or more stories high, and pound notes cannot be printed by your client.

Factory owners may require another floor, or two, on the shed building as and when business develops. The original roof must be able to carry 150 to 250 lb. per square foot, and not be lightly designed for 40 lb., as for a roof only. Its asphalte covering may act as a floor in 75 per cent of the possible cases.

I am very much afraid that most architects will prefer a material other than concrete for their walls, excepting factories to some extent; for its rapidly dirtying surface on top of its dirty grey-white colour (the appearance of looking like last week's snow to begin with) is a severe detraction.

This original dirty white shade is partly due to coal-dust burning of the slurry before cooling, grinding and aeration of the cement. White or even cream cement may be added on a perfectly keyed or rough surface—I will try "Snocem."

After a generation of exacting symmetry it is a change, if nothing more, to welcome the now-accepted asymmetry

—with almost no ornament and but little sculpture as yet, though crude engineering is not architecture.

Colour Schemes

Colour is very desirable, and I do not doubt that architects will eventually resent the crude white-cast finish of concrete. And although the poster effect of Mediterranean-blue sky and white walls on green verdure is extremely attractive at a distance, I am afraid that to live in this perpetual white surface would try my own eyes and result in the use of gold, green or black glasses to varying degree.

In the village or town some of us would immediately add colour by square slab, mosaic or if only by outside water paint to the domestic architecture. Personally I would use the square washable slabs continuously jointed both vertically and horizontally, and then drive large-headed gunmetal nails into the joints, just as the schist slabs were fixed in the domed interior of the tomb of Agamemnon at Mycenæ in 1185 B.C.

Now, to these non-rusting and non-staining nailheads I would indulge in the persistent habit of attaching all the varieties of flowering crab-apple, cherry, buddleia, forsythia, jasmine, magnolia, pyracantha and others, including the Emily Gray rose.

All the cement compounds containing marble that are applied to brick or other outside wall surface require cleaning every two years, and even then they only the more readily absorb the dirt to greater depth. These mixtures are applied by a hand float and then polished, and will craze or finely crack all over the surface.

An improvement on this class is the hydraulically pressed slab, 2½ in. thick and made of the same materials, or similar; for as the result is so much less porous than the cheaper *in-situ* made material, it will keep clean for a longer time, and may be periodically washed down, say, every two years if hooks for the cleaners' cradle-are built into the building at roof level. The slabs should be well attached

to the walls. We must find better-coloured materials, and glass, up to a point, is the one outstanding at the moment; though its application in sheets or as mosaic is not anywhere near finality.

Now, if we could obtain facing bricks in clay, as we now have but with the addition of a glass face in colour, from brown glaze to more brilliant colours, we could create a very pleasing effect by reducing the tonal shades to finish with pale yellow gold at top of the building, and all in 2½-in. high bricks of dull antique finish. Though storm and atmosphere would dull the glaze very slowly, I would, given the chance, use them for their very cleanliness and colour and with pointing to match. Moscow is using cast gypsum blocks which keep clean in that city, though expansion is the trouble in this case.

The city hall at Hilversum, Holland, designed by Willem Dudok, is a fine example with much to commend it, apart from the usual proneness to cantilever, and the tower which appears from the photographs to contain at least one superfluous element, for the clock slabs actually look dangerous. However, mundane as it may appear, I am interested in this use of yellow brick. It is decidedly curious, for its use in our country, where old examples from A.D. 1860 to date have been associated with sides and rear of badly designed chapels, and with the gaunt spiky gabled dwellings with Gothic affectations. All these I associate with Street's *Brick and Marble in Italy*—stripy yellow bands from a Byzantine origin.

However, this yellow brick surface keeps clean, like its colleague the engineering red pressed brick that has rightly fallen from grace. But what hasn't if reinforced concrete is to be our only material? The yellow is, however, too bright, and will brickmakers please copy, if samples of a paler yellow or deep cream to a pale primrose could be attempted, and for bricks 2¾ in. or less in height, and possibly made up from a 50-50 or 75-25 mixture of the white clay from Devon with the previous yellow brick clays,

the result might fill a gap much wanted for a clean, or cleanable, pale yellow material that we could use on reinforced concrete or steel-framed buildings, in place of the non-" Persil " attribute of the former as a façade lining?

The pointing, say in " Cullamix," to be an exact match.

Yes, the porosity of the often-used sand-lime brick is a detraction, it is pleasant for but a limited period. It is not glazed and is too much like white blotting-paper; though the shadow contrasts and colour foil against its surface are very especially acceptable for some elevations and all such at the rear of our buildings. For it is one of our best bricks, and I trust it may be found after the war. An example is illustrated in the rears of both stores as illustrated.

The architect struggles to obtain a clean-faced material of goodly appearance and colour, as it always has been down the centuries, for this is but part of his planning.

He has possible selections in mind even as he plans the building, nor can he forget that he is able to use cheaper materials than reinforced concrete for facings, all with as long a life and much less costly to remove when that is completed. But the material is there and has been for half a century, and it will remain in the forefront.

Permanent colour must be added, even glazed to plinths and doorway surrounds—maybe shortly by spraying on fusible coloured glass dust; for nothing looks more annoying and dilapidated than lines of children's blue crayon or other marks—primitive, lurid or lewd.

I am afraid that I cannot agree with the remarks of Mr. Anthony Bertram, in his excellent little book *Design*, regarding the optimism with which he looks at the problem of their constant and wholesale wanton destruction, whether in peace- or war-time, slums or no slums. Other countries are not faced with a difficulty of this nature, and the root of the matter lies in our ineffective law, which has reduced magistrates and police to a position more ludicrous than could be enacted in a " Gilbert and Sullivan " entitled " Law *versus* Justice." Destruction is now unlimited.

CHAPTER IX

SIMPLE DESIGN

LET us now consider a simple design in light marble-faced reinforced concrete of recent date in Sweden which, together with Denmark, Holland and Finland, provide increasingly numerous modern examples of non-eclectic architecture.

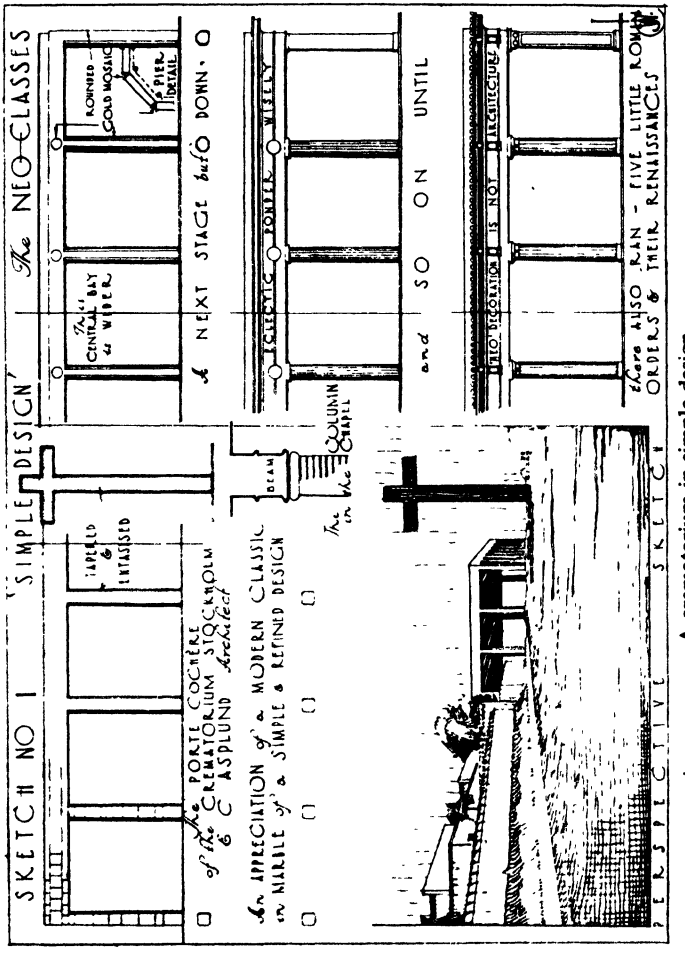
This is the Swedish crematorium near Stockholm, designed by E. G. Asplund, and as fine a piece of austere architecture as one could wish to see, perfect for the site on the rising hill as for the work it has to do.

It impresses one as a fit surrounding for the last obsequies by the living to their dead, a perfect *campo santo* isolated on a green hill.

It is reduced to almost zero plainness outside, and has a three- or five-bay projecting and a seven-bay frontage to the large entrance portico. To this leads a severely plain roadway running parallel with the white enclosing wall, but flush and inconspicuous in its plain field surround of immense spaciousness which is increased by the unbroken surface of the grassland without either shrub or tree. Actually the surround is even more austere than the buildings and walls themselves, devoid as they are of little but their building shape and good proportion.

The enclosure contains a few trees, in group and single planting, to almost suggest that the deceased would be passing from death to life—the appeal is as strong as an invitation.

On the road, on the opposite side to the white wall enclosure, stands a huge dark marble cross, both tapered and entasised, and, like the square marble-faced concrete piers of the portico, it has no base or steps, and is the better connected to the whole picture for this (the result of the unemphasised), and one can only describe it as archaic machine-surfaced architecture, a Stonehenge of modern



A crematorium in simple design.

times without ostentation or affectedness, a perfect solution to the problem of a modern crematorium outside a city.

Inside, in the charmingly marble-floored chapel containing the catafalque, is a circular brick-faced column with a slightly projecting and lighter toned and undercut circular capital. Or is it an abacus like the Beni Hâsan tomb columns of ancient Egypt, where it is square? Above this is a beam which spans longitudinally with the chapel and almost rests upon a thickening of the wall at the rear of the catafalque, or its reredos, where a group of high-relief sculptured figures are moving away in receding height towards the organ, under the guiding winged figure on the right. This beam is divided into two faciæ, each terminating in the bell tilt of the roughcaster, or an inverted Greek cavetto, possible dust ledges, like the old-fashioned picture-rail.

I am looking for the beginning of the detail or mouldings for our new style in lined or faced reinforced concrete, and here is a very functional member in building, to wit the beam, decorated with a false widening of its soffit by an almost feather edge formed by a cavetto on each side, and with a replica half-way up. I am brought to a halt in some bewilderment. For whilst there is a pleasant hanging melancholy in the appearance created, and I may be hampered by a too historical background in my critical approach, there would appear to be more than the possibility of a development, which may be fanned by a study of pre-Christian forms. This might again lead to a granted more refined but still the topsy-turvy playfulness of Michelangelo, who was an old sculptor become architect, but who knew not Greece to aid and restrain him, in the new principles and refinement, which would have given to his work that distinction he so desired to win.

The Architect

There are undoubtedly some things once done in architecture to the requirements of the master minds of the past

that are not easily gainsaid; for they are final laws in the abstract for the architect.

These minds are mostly to be found active in pre-Roman eras, and here may I say that it is a pleasure to note that in the outside portico, or porte-cochère, it is seven bays long in front and three or five bays on its flanks, but in neither case an even number that would produce a pier, or a column support in the centre of either. An uneven number of bays with tapered and entasised piers in modern non-eclectic present-day design, even some of our latter-day stylists, in the now very modern schools of architecture forgot that, in their past struggles in the Prix de Rome manner, and do so in the very modern present.

Simple, very simple, as this little masterpiece is, it is everywhere the work of an architect, and it could not be produced by other than an architect. It is more Greek in its refinement than appears at first sight.

If this is so in the smaller problems, the architect again is more required in the larger buildings. And even so, the more so in the grouping of buildings and on to the necessary grip on the whole picture of the town plan. For this complete architectural design many years of architectural training are required, never omitting the experience in an office, preferably in a private office rather than public. For here a better all-round education in the economics of building will by the very nature of conditions prevail, with the result that a more self-reliant building practice condition is reached by assistant architects on their way to their own private practices later on. The reason for this is very obvious, the private architect makes his assistant responsible for all the business connected with his job; whereas there is far too much splitting up of responsibility in the public authorities' offices, apart from other protected employment aspects.

In the crematorium by E. G. Asplund there are no stopped chamfers to the angles of the square piers of the portico. Architects do not use this horrible answer to overcome the possibility of a chipped angle, but they know

who does use it, given the opportunity of venturing into building design.

The angle should be rounded or splayed as it is here for its full height, to the radius or size of splay required for the proportion and rhythm of the parts in the design.

For the sake of a simple exercise, and only as such, the portico lends itself very well as a problem in simple design, and suitable only as an indication of the various stages from the simplest as built, and then increasing the subdivisions or multiplicity of parts in each of the various stages.

The sheet of simple sketches will illustrate this, and it may here be stated that all building façade designs may be stepped up or down, according to the architect's wish and the state of progress in the development of a new simplified style. First of all it will swing violently away from the too florid and costly succession of stylistic revivals of past historical periods of architecture, and together with a greater use of reinforced concrete and the slabs of precast or, if you will, prefabricated materials, some of which will last some time outside, though knowing the test to which building materials are put to in this climate, it is certain that there are few, if any, that will stand the test and prove satisfactory after more than a few fleeting years. Buildings, even in this age of queer beliefs, must last quite a long time.

The " Phœnix " bungalow might be required to last fifty years in Sweden or the United States of America, and its accommodation in a private block of flats would be rented at £150 p.a. in the United Kingdom. Though £26 a year rental is not an economic proposition on an expenditure of £800 to £1,000 per bungalow.

In the marble portico sketches, we move from the plain original ordnance and square tapered splayed angle piers to the octagonal and allow the beam to overhang 1 in. to give it a rainwater drip at the top. Not that the latter is absolutely caused by necessity. In fact, you can avoid its necessity if that is what you want.

The Piers

However, with the octagonal pier development, some slight increase in rhythmic balance of beam to pier is required, and the bare elementary addition of a cavetta supporting a broad filet, or a small facia, will suffice, though there are other possibilities.

Now, the angle pier is septagonal, for the building corner angle is not splayed to form the eighth side, and this results in a strengthened appearance to the angles, for we may round the angle, including the beam. Does this recall the past to you? If it does, so much the better, for you at any rate will have studied some architectural history to recognise the goodly principle of strength at the corner. Nor may an architect forget his architectural alphabet of design, where pure design can be cast, even in concrete, without any change in the structural design, although even this is quite permissible.

This additional strength refers only to the simple structure under discussion, the colonnade, and is not always applicable to all problems in design, especially as the majority of designs today are asymmetrical. It is relative however.

A mass of walling at the building external angle is good, so may it be in reverse in the ultra-plastic modern treatment with a continuous void or window on both sides of the angle. Solid walling at internal angles in the façade of a building usually means a badly lighted corner in the interior.

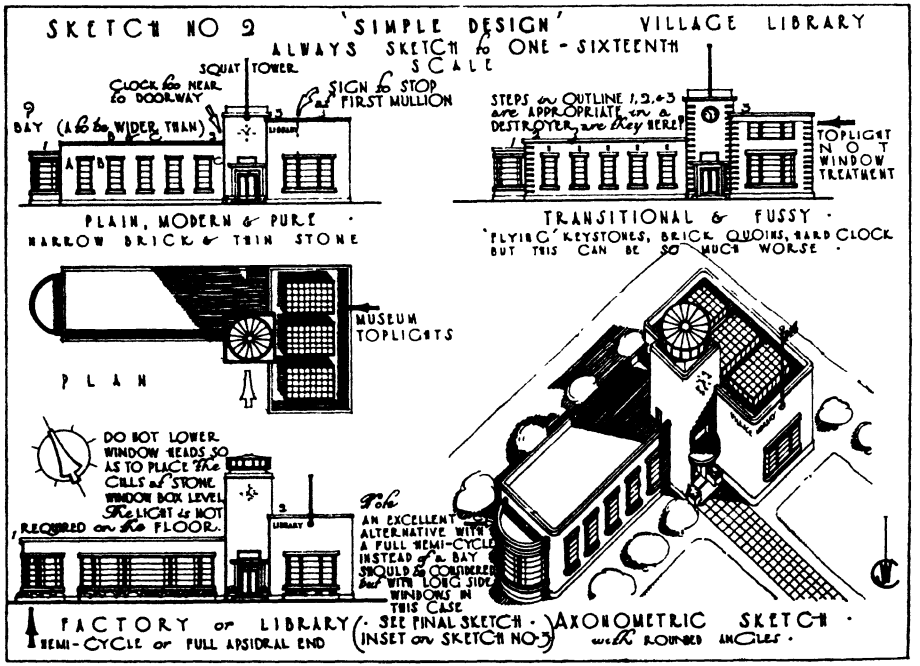
Undoubtedly we have added a freedom to the ideas of Minoan and Greek design, more certainly to Egyptian and Babylonian, and introduced much that is new by sheer plainness of form. But the very moment that we advance to subdivision of composing parts in our designs, as will become only too obviously necessary as time moves on, the cast concrete piers will be given an increasing number of facets, to octagonal and upwards, until possibly someone then acclaimed a master architect dares to cast a

straight or tapered and entasised cylindrical column with large Greek Doric flutes and their single arrises in between, forced by the sheer impossibility of resisting the foils of the highest achievement in form division, producing closely knit and receding vertical lines and shadows, in glorious contrast to any large ultra-plain surfaced building with horizontal voids or windows, be they but few or many, the former for the better contrast and using clean surfaces upon which shadows may be appreciated.

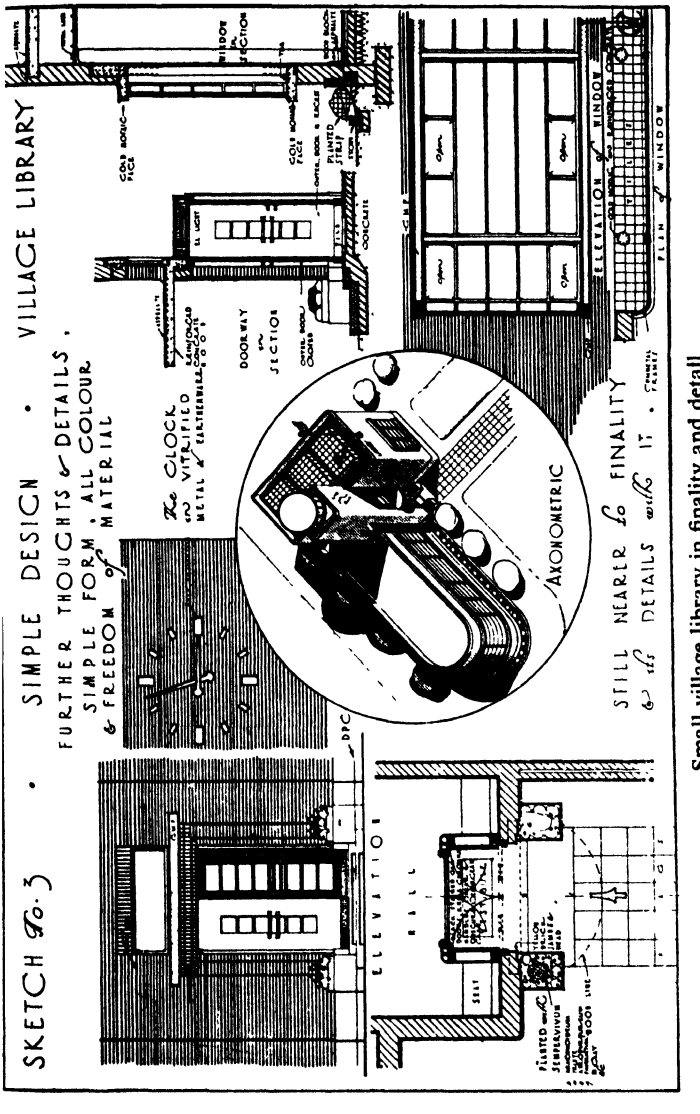
The taper and entasis to columns might be there, but a capital may not always be found in our design, as form is greatly reduced to simpler masses, though I wonder if the latter may not be included at some future date.

So that whilst we may hope in time never to see metopes and triglyphs again, nor in fact any bygone style resuscitated, you, the young architect, cannot afford to treat the knowledge of the Greek, Minoan, Egyptian and Babylonian with impunity, derision or sarcasm. Quite recently a student of the gentler sex inquired as to whether she could not begin history studies at the "Edgware Road Style" and continue on to the present day, instead of with the previously mentioned. Or in other words to start with the rot without knowing the living tree upon which the decorative Roman Renaissance had gradually deteriorated into a fungoid growth, metaphorically speaking of course but with no apologies.

Our talk on the work of the architect, and the interlacing of that work with those sections of the building industry with which his colleagues are so closely connected, can only proceed as far as is consonant with the exigencies of the co-relative restrictions. This fact I may now assume, the super-man in the street has become the equal of the junior architect in his early years at a school of architecture. This state is produced by his or her more advanced years and a recent full indulgence in the spate of architectural literature that so greatly adds lustre to our bookstalls.



Small village library in discussion.



Small village library in finality and detail.

The Ultra-modern and Modern Styles

So, for the moment, let us proceed a little farther with the facial appearance of ultra-modern and the closely associated but less ultra-boxlike contemporary types of building.

Without penetrating too deeply, although in the right place and time it may be as deep as one may wish, we have the following manners, methods or even styles :

(*a*) The ultra-modern, reputed answer for a complete break with all past styles of building, and concrete, steel, other metals and glass are its materials, even to standardised stock units with slab cladding.

(*b*) Modern, though still adhering to use of brick façading, steel frame or skeleton, in lieu of the reinforced concrete of (*a*), on account of expense, reinforced concrete floors and roof, otherwise similar to the former although generally portraying less freedom in fenestration, in which windows are more regular and more often placed above each other, as separate units.

(*c*) A large and growing group in an ultra-typification of late English Georgian, just as if the rot of the nineteenth and part of the twentieth centuries had not occurred. Its materials are brick with thin stone dressings, all else as in type (*b*). A refined and simplified portico of even cast concrete columns of attenuated height and span as in the Georgian but without its frippery detail. There is a freedom in its asymmetric plan grouping not always aimed at by the exponents in the ultra (*a*) group, and the Scandinavian countries were first quickly to hasten its development, being farther away from the decadence of Rome, a great advantage.

This type requires lovely coloured, shaped and textured brickwork, as in fact does type (*b*) though to a lesser extent, materials are also the same, and you will often find the squat brick tower with an attenuated green copper or dark-toned timber, or stone turret, upon its flat top. The tower is used to separate one-storey from two-storey

building, whether on a continuous frontage or at the internal angle meeting of the storeys of different heights. The lower or single-storey wing is, as might be expected, longer than the higher, two-storey wing, as see my simple sketch designs Nos. 2 and 3.

There are, however, a few features that still recall too much the overdressed and would-be eclectically academic English Renaissance of Roman origin.

The keystone could be omitted on principle. The Greeks did not use it; therefore by your action you are purifying design of all that Renaissance claptrap unfortunately far too prevalent still in our Royal Academy exhibition of architectural works to come. All these designs are dated before erection as nineteenth- century standard adaptations of seventeenth- and eighteenth-century Italian and English Renaissance, with Roman unfluted Doric columns complete with the four-sided and pedimented ends to enclosing colonnades, as in Bernini's oval enclosure in front of St. Peter's, Rome, the would-be brick-and-stone Georgian façades, having lost the original charm of their models by a slight Norman Shaw freedom, with elliptical oculets in their pediments complete with four keystones, two on each axis.

Can you complain of the speculative builder who builds in a small circular window having a keystone long enough to hang it up to his roughcast bell tilt overhang above, or even of his half-timber, if you do these things? But, modern architects, why a keystone in your stone lintols or even in flat brick arches? For if you must pull up the window proportion or emphasise their heads, split the 6-in. stone lintel and give the two half lintels a one- or two-brick course rise at their dowelled meeting in the centre. And there are other ways, that 30-in. keystone of yours savours of the dusty Victorian picture-hook affectation and *l'art nouveau*, not even of " modernistic " the " would-be " modern. There are even imitation bits of rectangular keystone above the window lintels in some cases.

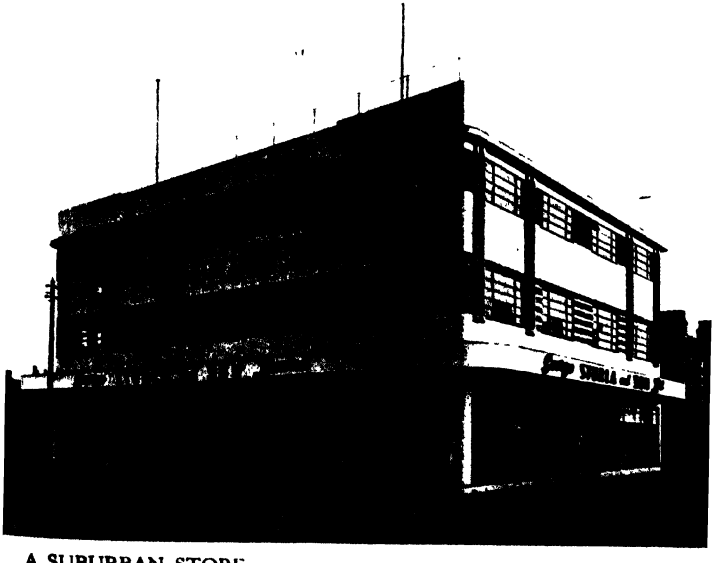
The Façade of the Past

The time has long since passed for any further addition of the dull and weakly academic stone façading, and London's new acres are deserving of something more worthy of the Metropolitan nerve centre of the Empire—that in very truth saved the world, in spite of the impossible odds against it, a lead that was somewhat belatedly followed. Surely something better than this eclectic smearing of the past can be found to clothe its buildings, or must we assume that only a short life must be given to these buildings? Is it not possible for the scholastically trained in Victorian days to change their shrouds to something more akin to the modern training of the architect?

Nor will much result by the architectural and building papers describing the work exhibited in the Royal Academy exhibitions as "dated." Should not the criticism be at least as ruthless as that meted out to the young student in his school who ceases the pedantic copying of the past in his third year?

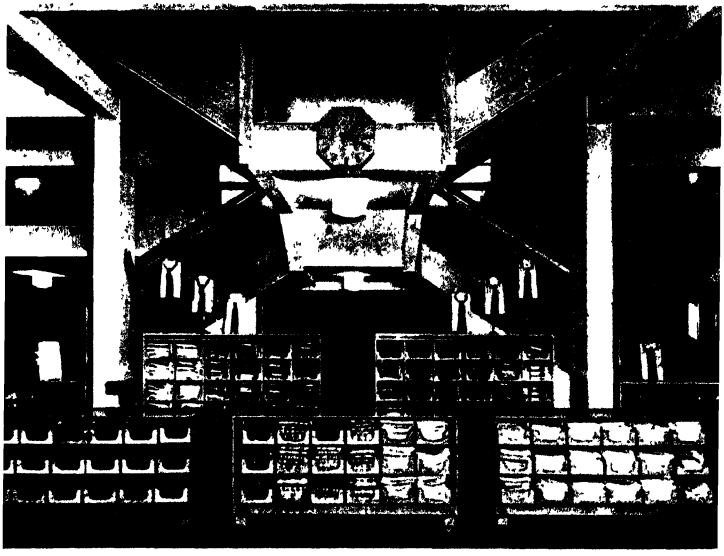
It is a slight relief to see a perspective of a suggested approach road to the south transept of St. Paul's, and, discounting the excellent drawing, the attraction is in the plain astylar architecture, and the resulting contrast with the columniated façading of the cathedral. Most of this is of sham walling with useless pilasters plastered upon it. We must admit that Sir Christopher Wren was 100 per cent. in engineering and from 50 to 70 per cent. in architectural detailing, where the hand of a humanising artist is missed so much, and one feels only too certain that the detail nowhere approaches the standard of the little temples of even Rome, only to mention Castor and Pollux in the Roman forum, which were already on the downward path from Greek standards. These early examples were all by Greek architects sent to train the Romans as part of the victor's spoils, and as embodied in the peace treaty with Rome. However, to foster both simpler and better-

A SUBURBAN STORE—SIDE AND REAR



A SUBURBAN STORE

A SUBURBAN STORE—BOOT AND SHOE DEPARTMENT



A SUBURBAN STORE—THE STAIRCASE

designed architecture as a background to the cathedral, and on account of expense, I would personally prefer to see the new streets built up in a much more plastic treatment of building, in the modern brick and thin stone dressing type of what I will call twentieth-century Georgian, flat roofs in preference to the raking roof of bits and pieces that come adrift too often.

This would give a much finer contrast to old St. Paul's, and provide the artist with much interesting variation in form, colour, irregular spaces, pleasant grouping and a far less harsh scheme of building to city and borough engineers' prescribed building lines. Finally, let all the previously locked-up internal light areas, as in past building, be opened up into the general grouping in the full picture that would be at least as well appreciated a revelation as was, say, the early Stockholm Town Hall—plain faced architecture relying on lightness, good proportion of void to interesting wall surface, and small properly effected shadows for its effect. What streets of pleasure these simply dressed buildings would produce, like our plain unsophisticated interiors of today, where the single splash of bright colour is so effective and soothing.

An archæologist of the future might even think we were a refined people, a super-Greek race who could eliminate so much and yet retain the essentials of good architecture to so achieve the distinction of having produced the first truthful and pleasant architecture in Christian times—shades of Santa Sophia—having cast away the fussy eccentricities and dust-holding mouldings of the Georgian, its pagan enrichments and full cornices, balustrades and symmetry at all cost.

May we never see a pediment again, either to a roof or as an "academy" decoration, nor those pretty coupled columns reminiscent of certain firms' competitive victories in the past, and quite unknown to provincials though apparently still existing among the architectural impedimenta of Messrs. Ancient Renaissance & Co., of London, Paris and Rome.

Still more seriously, however, what are we going to do with the "Prix de Rome," when no one beyond a second-year architectural student will shortly show any interest in this architectural façading factory? Will it not be as surplus to establishment as, say, "the Pugin" that is Gothic?

An unjust comparison? Really, I truly wonder if this is so, for the former is a museum collection of bits and pieces of the Roman's idea of the simple architecture of Greece, whilst the Gothic is truthful for its time, even if its design is not very suitable for the sandstone in which it is built. Its thrusting arches and vaults would hold, perishable though the material is, if its designers had made their foundations safe by not building on timber logs resting upon the wet clay stratum, and with walls of good broken bond in larger stones set in better mortar, and had never recased older walls inside and out without pulling the centre rough core down with the facings that were to be replaced in a later period and style.

But you would not like a Gothic traceried window in your lounge. Again think of the window-cleaner and the dusting of its many crannies, as with the furniture to go with it.

Nor would you exactly rave about the Grinling Gibbons or Chippendale carving in either your genuine or pseudo-Renaissance home or office building.

The private firms and companies have it in their power to advance or retard the clock of architectural design in our cities, from London down to the smallest town. Let them enquire searchingly as to which dead century's make-up their new building is to be designed in accordance with, and if the answer is English, French or Italian Renaissance, Elizabethan or a free Renaissance, your answer should be that you do not want an archæological specimen for a museum, but one whose eventual entry into the historical books of famed works in architecture will be to represent twentieth-century architecture.

Believe me, the past chapters of the bygone centuries are truly well filled. Nothing that you may erect can oust them, for the date of your building erection would be wrong. It is a ghost of the past, commonly known in smaller articles as a fake.

In addition, I have not mentioned Egyptian, Greek, Roman, Gothic or Byzantine, as these are also of the past, and it is something much plainer than any neo-Greek, neo-Gothic and neo-Byzantine that would pass muster as a building to be considered as not style dated, and therefore of original design and of the current century.

Byzantine recrudescences usually start off well enough inside with flat gold mosaic domes in shaded light, only to finish up below in what can be described as a galaxy of colours in marble that might be expected in the sample yard of a marble masonry firm.

In case I may be accused of having given some loophole for death to again go a-riding on modern foundations, there are Tudor and Jacobean as unlikely starters.

Still there are omissions. For where are the two parents? Or is it to but one overself-fertile parent (the Romanesque) that the credit is due for the Gothic intervention into what otherwise is an unbroken continuance of Classic architecture, with Norman as but this end's idea of it after the huge Norman empire of that time? Be it but one or two, let their skeletons of transitional development rest in peace. This stylar skeletonia came to life again in that most terrible century of architectural confusion, the nineteenth; the true architectural course terminated at the eighteenth. And many of us are trying to catch these escaped skeletons so that they may be safely reinterred, with a certain amount of unnoticed roughness—for the damage that they have done cannot even now be gauged.

We sincerely trust that the post-war clients of almost another generation of architects will add their further weight on this reinterment. For they are not all caught as yet, and their mummies still breed as their sarcophagal hoardings

are thrown down to the gaze of the increasingly knowledgeable and critical public.

Will you spend your money on a supposedly new building that the man in the street, let alone the bogie-bogie super brains trust of the future, will readily date, and all will know that you have failed to give proper thought to your project, and have not pulled your weight for the advancement of your city's architecture?

Still, two much more recently interred styles have been seen about too much of late, though their revivification is a lesser sin; for it is but a short advancefrom them to the flat brick face, thin stone dressing style that is so very passable for today. It is not extreme, but oh so very acceptable, as it is one of the subdivisions of the true architectural developments of our twentieth century.

Now for the two very close relatives (our still unnamed styles of the past) one Queen Anne, which every child will certify is quite dead, and that greatest deceiver of all, the Georgian style, so eminently suitable for its bygone period, but which will take a good deal of force to inter, not until the ever-so-new modern brick and thin-stone style comes up against it good and proper in sufficient weight. For emphatic effect upon our slower thinkers still far too mesmerised by symmetry and the attenuated dust-collecting Classic detail, the sash-window and its small panes, bits of wrought- and cast-iron, and dark mahogany panelled doors with fussy and dusty stair balustrades. If I remember correctly, my relatives of the last-but-one generation used to clean the latter with tooth-brushes, and the lead-lined floored school theatre in the basement was lit by two hundred candles. Quite as departed a period as any other, but if it is any salve to aching souls who now ride in streamlined internal-combustion-engined limousine cars in lieu of sedan-chairs, snuff and peacock clothing, you may term the modern flat-roofed, brick and stone buildings as modern Georgian, should you wish, even its culminating period.

The Georgian clubs, literature and interests need not

then pass away, but will only require to be revivified to date, to live on in the reign of His Majesty King George the Sixth. A day of glorious and unsurpassed victory, and many hard facts that do not include a pound-note machine for each household, nor the continued employment of every bureaucrat who has been employed in these our years of great trial that could readily have been done without for our future happiness, amenity and well living.

CHAPTER X

THE STUDENT ARCHITECT

Models and Detailing

I MUST confess to some fear at the crudeness of most of the models by architectural students, speaking personally. And as such small-scale models cannot do justice to any scheme, however simple, I should be chary of bringing a client anywhere near. But, then, they are a help to the student in giving him the more complete understanding as to what he is endeavouring to express upon paper to the three dimensions of plan, section and elevation, that are now very often too sketchily and crudely rendered.

Models are almost an unnecessary luxury in private practice, and time is often wasted on the drawing of full ¼- or ½-in. details of the whole of the elevations of municipal tenements, schools, etc. The trained joiner or bricklayer foreman is more confused with these long, large-size details than without them. Give him the abbreviated type of " one of each " detail, plus one only to the full height, in combination with complete eight-scale drawings that are fully figured with dimensions to centre lines, and he will do his stuff.

Unless the big idea is to publish impressive drawings in the architectural press, I am afraid that but few private architects can afford this method of working; for it will not save supervision nor the usual questions on the job. And speed is the essence of work even in good building, which is what we term architecture—the work of the architect or master craftsman.

The architect and his assistant architects should be seen more on their jobs, and confirm any instructions given by letter; that is very important.

Therefore we have more hours on the job, with fewer at the drawing-board; more co-operation with the builder

as the master craftsman, and less as a draughtsman of the office.

Have you ever drawn a full-size detail of some moulding or a spot of construction on the job, as Wren used to do? It can be done you know, but keep a copy.

Too often students do find the world at large a rather cruel place to be exposed in, after leaving the sheltered precincts of their Alma Mater.

Reinforced concrete houses, glass-brick windows, cold solid concrete floors with marble mosaic or granolithic top surface in bedroom, staircase and living-rooms, with a strip of glass omitted from each window—these may be accepted for a sanatorium. Though if, on the other hand, you may be tempted to serve these things to your client for his house, he may doubt rather more than your ability as an architect, unless you have previously shown to him exactly what you intend to do by a visit to some building having all these attributes, as you intend to use them, unadulterated.

No reference to what you have been taught at school or college by your late instructors, however high may be the pedestals upon which you have placed them, will save you from your client's wrath. For if in addition to concrete walls you have forgotten to preserve them from condensation, the cold floors, ever-open windows, extra heating and his children constantly climbing through your open stair balustrade, cost of your hidden electric lighting, heating and redecoration of sweating walls, your client may never be allowed to forget you even after he has boarded over your cold "Mediterranean" floors and stairs, glazed the open windows, cut the electric lighting and got the builder to fill in around your stair balustrade to make it a solid one—at that moment the world is a very nasty place to live in.

The Local Authority Employees

You will slowly learn—even if you should at first really believe that the world has just been hanging fire until you came along, or you may feel that you are becoming bored,

bogged and sidetracked in local authority work, painfully waiting for higher circular instructions which when they arrive are elementarily evasive and refer back to half the would-be perfect, by legal phraseology, circulars of the past, and when your drawings have been half round the world for approval—it will slowly dawn upon you that in any case you are but the unknown author, and that an editor will add this name to them, although he is not even of the same profession.

Tired of it all, you stumble on a small coterie of clients, and for the first time begin to enjoy freedom, to design and practise for yourself, detailing your own work and doing everything for yourself, even to putting the stamps on the envelopes.

Quite the best experience for the young, or not so young, architect.

You may soon rise, not necessarily to greater happiness, and by influence and a competition or two blossom forth as an employer of a staff, and then spend quite a lot of time running about looking for work to keep them employed —just like feeding your hens.

The Private Architect's Office

Whichever way your pathway lies you have selected a goodly employment, though one of continuous study that knows of no trade-union hours; and the employment is casual and not always continuous in private practice. Office training in an architect's office is the best for your eventual start on your own, and prior to this a full training at a school of architecture is essential.

You will enter the latter of your choice by various means, mainly parental, although there are possibly 7 to 10 per cent. who obtain a city, university, registration council or other private scholarship, renewable annually, and tenable for the customary two to five years; and these include all fees and some maintenance—the latter possibly thirty shillings a week. And in the case of the city scholarship or

studentship, this is obtained as a result of being a student of outstanding merit on the roll of the part-time architectural course of a technical college after a three or a five years' period. The latter is preferable, as in addition you will be obtaining very useful experience in an architect's office in the daytime. The plums in prizes and grading of a student's position in his year do not fall to the very young except in exceptionally rare circumstances, and he or she will arrive with some knowledge of drawing, construction, structural design, history of architecture and customary architectural code of practice which will enable him, or her, to avoid some of the pitfalls of the uninitiated who are pitchforked into elementary design and other subjects without the training that will have been obtained by many, and older, colleagues of their year.

Any change in the length of elementary and secondary school-leaving age in the post-war years will, of course, have visible effects, although full-time training at a branch technical school is an alternative that should be unequalled among those open to the elementary schoolboy.

The budding architect in his first or even the later years at his school must of necessity delve and probe for information in every way open to him, so that he may speedily and successfully cope with his drawings and studies; books, magazines and previously made drawings must be combed. And lucky is the student who has a knowledge of one or more helpful subjects to guide and to save time, for the pace is at about one drawing or design every week or ten days, with quite an appreciable account of interruption for other things in between in the way of lectures, ten-hour *esquisses* or sketch designs for impossible subjects such as " A lift up the cliffs of Dover," or " A summerhouse on Mt. Blanc for the boy Excelsior."

If you will apply a bygone style of Greek or Roman garb to it, do see that the entablature on the end columns overlaps the top diameter of the latter by from 1 to 3 in. Your little design will sadly crash from commendation or

distinction status with that satisfying but illegible crayon mark upon it if you stop it on the centre line of the columns, the corner columns in your elevation. These designs in a fixed past style can make you quite sorry that you did not look over that style's full box of tricks before you started to so clearly indicate your handicap of lack of knowledge in the history of architecture.

Make it your hobby to study the latter subject as much as possible; for in spite of curriculum curtailment due to lack of time and desire, it will serve you well throughout your career and the more fully equip you for all emergencies, even if only in discussions. Again, your timorous outlook may lead you to some confusion owing to the varying collective advice of your studio instructors, or they may appear to consort mainly with the leading students rather than with the rank and file. Or if, after a skyscraper solution to the problem of a town hall for a county town has been most thoroughly condemned during the preparation stage of designs, you find that the only such solution by a queer lad of your year is proudly flying the " mention," whilst the remainder of the designs making more use of the large site are not even commended at the " crit."

There isn't even a lift in this five-storied skyscraper, and you picture its councillors starting out very early to reach its upper floors.

This perversity and almost immoral state of " goings on " could be avoided if instructors would scribble at the problem themselves first, and compare results. For the student must take their hints and tips seriously as they pass round the studio, so long as they are believed to be verily the gods of architectural creation. Later on the students become the critics, and still later on in life will find that the same thing occurs in the much more serious competitions in the architect's practice; and they may sometimes wish that they had thought of another method of earning their daily bread, where there would be only one god, and a devil, to contend with.

School of Architecture and the Professional Degree

The student should have matriculated before entering the school, for this will enable him to obtain his graduateship, the degree of Bachelor of Architecture (B.Arch.), possibly with sectional honours. But that will depend upon the natural ability, maturity and assiduousness of the student. Without it you may earn the Diploma in Architecture, or Dipl. Arch., and (like the sergeant-pilot) have done the same course and passed the examination successfully, and continue in the same work. In a generation the diploma will disappear.

However, for the moment at any rate, both degree and diploma will exempt you from the final examination for the Associateship of the Royal Institute of British Architects, indicated by the abbreviation of A.R.I.B.A. It may be, however, that the synonymous receipt of both university and professional degrees may undergo some change, for it does stand to reason and experience that no university degree can fully qualify for the immediate start in the profession of architect, and I feel personally that a period of three years is not too great an interval of time between the two degrees —that of the school and that of the profession.

Those unable to afford the expense of this full training, part-time instruction by qualified architects is given in some of the technical colleges in the larger cities, and in varying stages of progress they will cover the instruction necessary to enable students to qualify for the intermediate examination of the Royal Institute of British Architects, whilst a few only have reached the standard necessary for the final examination leading to the A.R.I.B.A.

Whether you propose to undertake the serious study required for the profession through school or college, if without the matriculation examination, you must sit for the preliminary examination of the Royal Institute of British Architects. Unless you are exempt from the final A.R.I.B.A. examination, by university degree or diploma, or pass the

actual examination itself with private or technical college tuition, you will be unable to practise the profession of architect. Incidentally there are a number of colleges whose examination is recognised for the Diploma of Architecture. Nor must I forget the younger architectural institution, the Incorporated Association of Architects and Surveyors, of 75, Eaton Place, London, S.W.1, through which association's examinations you may also qualify for registration as an architect with the architects' registration council.

The Register of Architects

So by whichever method you may qualify to record the word " architect " after your name upon drawing and business paper, you must now register with the architects' registration council, and upon being registered to pay to this Institute the annual sum of ten shillings or one pound. And that so far is all the progress made towards the full recognition of the architectural profession by the existing Acts of Parliament, which do recognise *in toto* both the medical and legal professions.

However, even the existence of a register is something on the way to full status, and the " chartered architect " (or member of the R.I.B.A.) and the " architect " must conform to the rules of the newly appointed Architects' Registration Council. These professional commandments have been in existence since the foundation of the parent body of architects in 1834 as the Royal Institute of British Architects; but as recently as a decade or two ago a small minority of architects formed new institutes of varying sizes, an action typical of all other spheres of work in this dissentingly argumentative democracy. And so the profession's registration body is one that is formed by a proportional combination of representatives from all interested parties, and, as would be expected, its members, as a whole, are fellows or associates of the parent institute. However, every interest is represented, even unattached architects—although it is hardly possible to believe that any could be found today.

Admission in the future is only by Royal Institute or other examination, university degree or diploma, or college diploma where recognised for the Dipl. Arch. The council's numbers will be reduced in time. In the meantime great leniency has been shown to all who have at any time earned their livelihood as architects, either with or without qualifications, and this inevitably has led to some queer bedfellows. Let us take one example. How can it be said that a city, borough, urban or rural district council engineer can become a registered architect whose only qualification is that a member of his staff is an architect (with or without qualifications), simply because in the course of duty the engineer's name is printed on his junior architect's drawings? Because of this it may be claimed that at this time, and for the necessary period of years, the engineer has earned a part of his livelihood as an architect. He may aspire to membership of another new institute—the Institution of Registered Architects. Is it to be wondered that it may be the ambition of every engineer to qualify as an architect when apparently so very little is required?

So far this has not spread to similar cases where engineers in private practice may become registered architects by employing architects on their staffs.

The solution could have been two signatures on the drawings—the engineer's as the engineer pure and simple.

An engineer may qualify by passing the architect's examinations, and vice versa the architect the engineer's, but otherwise the twain shall not meet; they are in part complementary to each other. Perhaps, in many years' time, large firms of both architects and engineers will not exist to be in the privileged position of being able by the mere reiteration of their firm's name to attract work from the public councils and companies, as they can do today. If and when the time is ripe for all or most of these professional men to design and draw out their work, properly manage the business side and visit their works with the full working

interest that can only come by so doing, there will then be less editing.

Then, and only then, shall we know all men and their works.

Naturally the remuneration to the smaller firms resulting would be less. What of that? Think of the panel doctor whose profession was closed to the unqualified so long ago. Fifty years have passed since Belgium and other Continental countries awarded large projects to the most successful students from the academies. It might be that in time all architects will work at their boards upon work passed to them by committees of their fellow members under the excellent registration council. In later years, possibly when all architects are members of the parent institution, one council might suffice with the allied local architectural societies as distributing bodies, for, say, all buildings over two thousand pounds, always excepting domestic buildings.

Large buildings would require two to four architects working together as a firm, either temporarily or permanently. Four would be sufficient for contracts up to four hundred thousand in commercial buildings or at a rate of one hundred thousand per architect, or up to half as much again in the case of the warehouse class of building.

This is but lifting the curtain before time. But there will be changes, for the accidental chance of privilege or selection cannot hold sway for ever when there are so many architects, both young and capable, to put architecture thirty years ahead. Never truly up to date, however academically correct be its garb and perfectly drawn its perspectives in the halls of the great, there would be a livelier architecture about as a result of the freed activity.

A word on the qualifications for the professional degrees of the architect.

Exemption, with certain qualifications, by university degree, school or college degree or diploma, has been discussed. There are, however, men who still sit privately

and pass the Royal Institute of British Architects' intermediate and the final examination leading to the associateship or A.R.I.B.A. qualification. And in addition there is the special examination for the associateship, where a man has been in practice for a lengthy period and upon approval of his works, as illustrated by drawings and photographs, is only required to sit for the special final examination to qualify for the associateship, which includes design.

Again, a similar entry to the Royal Institute membership may be made by entering as a licentiate, open in the main to architects who have had some success in private practice and whose own drawings and photographs of their works have been approved. Although I understand that, subject to approval, every registered architect may now apply to be considered for the licentiateship class of membership.

However, after some successful period of practice both associate and licentiate may become eligible for promotion to the highest class of membership, to become a Fellow of the R.I.B.A., indicated by the letters F.R.I.B.A.; with this distinction—that whilst no further examination is required of the associate member, the licentiate must now sit for the design examination in order to obtain this advancement.

The full membership of the F.R.I.B.A. is a right and full corollary to the status of the chartered architect, after public or private practice indicating the use he has been able to make of his earlier training.

CHAPTER XI

THE ARCHITECT'S TRAINING IN TOWN PLANNING

ARCHITECTS, having successfully ended their specific professional training, should continue their studies by entering the town-planning school in connection with the university or college school of architecture.

These schools were started about twenty-five years ago by architects—one such occupying the chair as professor in charge, with a complete staff covering all the diverse subjects, including engineering. A proportion of the students attending the course will be engineers, for in this subject the latter profession has been responsible for the town plans, with very few exceptions. And what has been done in the way of ring and radial roadways is now very gravely questioned as being developed upon mistaken ideas—that what had to be done was to widen all roads for traffic and all would be well.

This is not the case, and the increase of speed obtained merely increased the number of accidents, whilst the roads became speed tracks or railways, which in all common sense they must inevitably become; for, after all, they are built as such as the only means of dealing with increasing transport and supplies to the people (Including those who meet their deaths upon them), whether pedestrian or vehicular borne.

Once you recognise the position—and it is one to which admittedly neither architect nor engineer has paid the attention necessary to provide the full solution to the problem unaided—it becomes but another sideline to the combined professions in town planning.

What could be better than that the final clinch with the problem should emanate from an excellent uppercut dealt by one who should know the roads and their traffic—the

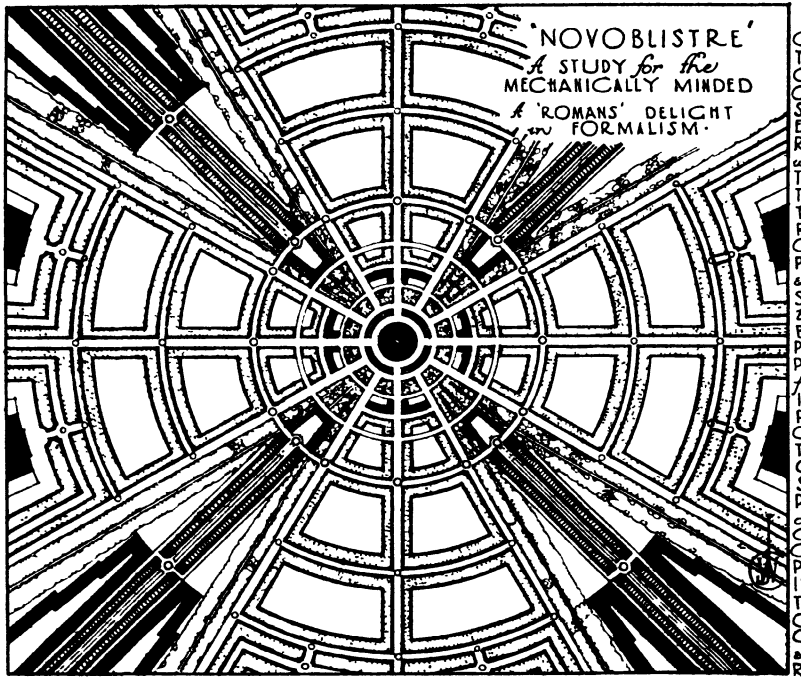
Assistant Commissioner of Police, Scotland Yard, H. Alker Tripp, in his book *Road Traffic and its Control*? And this concise summing-up should put the study of the roads, and the segregation of the different classes of traffic and pedestrians right on the spot, to end the question more quickly than we architects can inter the question of the dead styles.

His delightful gibe at our drawing-boards is to me a double-pronged dart at the all-wide road layout schemes plus the dead stylar and astylar architecture that it is suggested should litter the continuous frontages thus provided.

What a myopic mix-up of incongruities! Think of them—Roman buildings, pavements filled with stations and waiting queues, roads of four to six lanes of fast traffic, with the road as a level-crossing for its whole length, plus some excellent subways for the timorous.

Yet, in the suburban railway the signal-box operator closes the wide gates to the level-crossing when *one* train is a mile away.

Now, in spite of the mistakes of the past and the *volte-face* necessary in the town-planning schemes of the future, so as to safeguard the pedestrian and vehicular borne passenger wherever they may be on the roads, not even the Commissioner may get away with the remark that architects should not be called upon until the sites have been laid out by the town planners. Apparently after his experience with the grand vistas, all-wide road layout for some city, the whole of the members of the mistress art of architecture are to be tethered like bulls to their building sites, whilst others far less trained for the work forget the irregular architectural picture that has been in vogue for many years among the new generation of architects. It may be that these men are or have been serving their country in a more primary need, like the architect who sailed six men to safety two hundred and fifty miles out from Sumatra, in an open boat, or who went down in the Mediterranean through



"Novoblistre" formal town plan at centre.

a direct hit on his speedcraft, and they who led flights over enemy territory each week, just to see with others that the real hypostasis of town planning, as in all else required for the amenities of our people, is built up without the threat of aggression in the future.

That rightly settled, they will return and, if not already qualified members of the town-planning institute, they will soon be, to become associate members, or A.M.T.P.I., and eventually full members, or M.T.P.I. Exemption from the former is obtained on passing the town-planning examination at the schools.

The Town Plan

They, and a strong minority of architects too old for more active service, do already eschew the idea of all-wide roads as a solution to a town plan, so as to obtain the reduction of road casualties desired by all.

On the other hand, we have also gone rather beyond the formality of the Haussmann circular radial plan, as indicated by the sectional plan of Paris at the Place de l'Etoile. This is given as the radial combined with new circular plan and the best for a city, and is perhaps more complete at the older Karlsruhe.

Even if the wedged-shaped blocks between the radial roads are planned with building and open spaces, the fundamental regularity of the plan cannot be successfully dealt with by a plastic layout of building, when the original formal plan is so harshly geometrical and crude—for the grand manner is dead and informality reigns in its stead.

In fact, if adopted in the formal garden, artists and architect gardeners would turn the other way. Whilst the public, recreating after the war, might greatly suffer from the effects of astigmatism and even colour-blindness if the plan was carried to its normal conclusion by the regimentalism of lobelia and geraniums, or if with buildings, as in the case of the serious city plan under discussion, it might produce an engineer's paradise but not one for a modern architect.

Think of its geometrical symmetry still further "enhanced" by the prescribed line-up of so-called English Renaissance buildings so beloved in London, as we can judge by the perspective that bears St. Paul's Cathedral as its focal point, and the view is towards the rising sun.

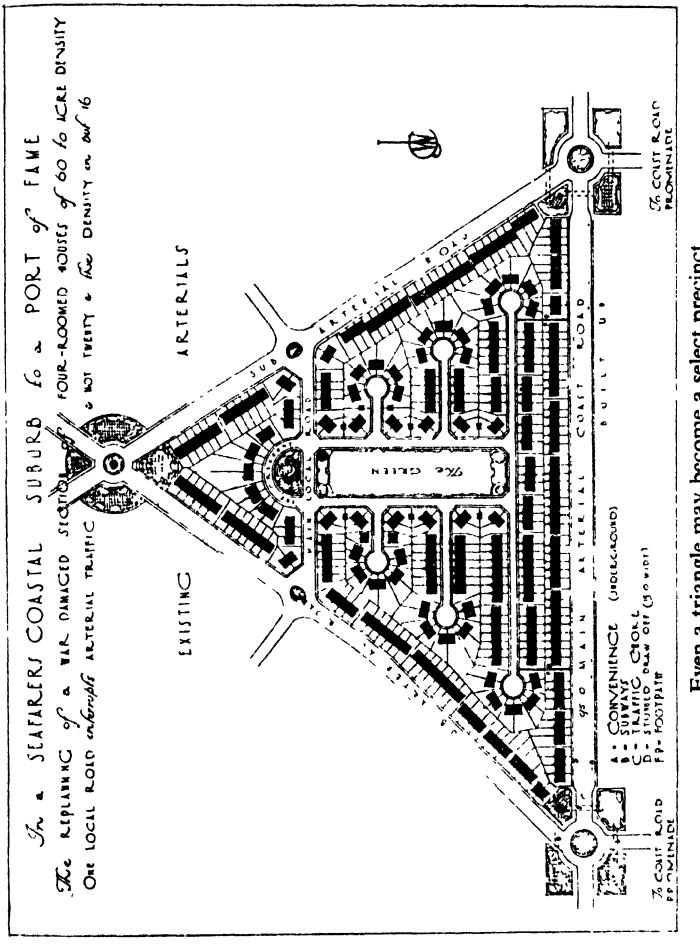
Again, these straight radial roads would be arterial, with a few sub-arterial roads in between. Now in an irregular radial and elliptically concentric plan combination, the radial traffic arterials would correspond in rhythmic consonance with the irregular backs of buildings, which the Commissioner says, and I fully agree, are the correct façades to face the through-traffic roads or arterials. That is, of course, the first alternative that comes to mind. A second might be that very irregular plan that may be said to be the lesson taught by the semi-haphazard plan of London itself, put into irregular sections almost entirely surrounded by patches of country or large parks—self-contained communities for local or general purposes work in the city.

Just as architecture is not merely the beautification of building—but is building to a high standard of art by artists who are trained architects—so it is with town planning; for if the art side of the picture is not kept well to the fore from the beginning, much will be left for which to mourn.

The people themselves, recognising the utter ghastliness of all the past unorganised effort at building, now ordain new decrees from their Parliament, and under public and privately employed architects in increasing employment hope to arrest any further defilement at its source.

It will be a hard row to furrow, how hard only time will show to all the people now full of the new hope, with many a clarion call still to be sounded. This glorious effort for the future only comes at the eleventh hour, as is usual with our lackadaisical democracy. It was even worse still when our very existence was at stake.

Now, although the stakes are less than life itself in the replanning of our cities and the designing of our buildings, we cannot use a dictator and twelve strong men similarly to



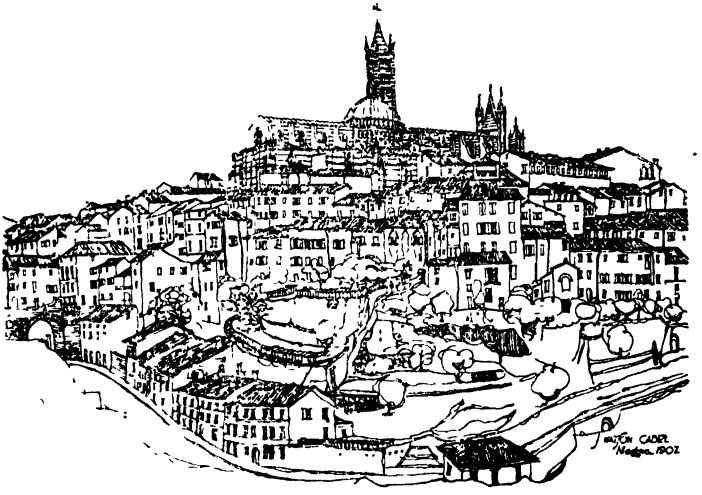
Even a triangle may become a select precinct.

attain our goal by instantaneous laws and fine design to obtain a clear-cut all-in totalitarian effort to save and rehabilitate this land of ours in these great amenities. We prefer to ponder and argue about it.

When once the town plan is approved, it should not be possible for any official or member of the council to increase the density of houses in any portion of the plan—for any near proximity to a factory area should have, and would have, been fully taken into account by the qualified staff of the council and their associated council committees in the various stages of the development of the town plan. Once again it must be reiterated that until architects, now registered according to the law, and architects alone do the work for which they were registered—the designing of all buildings, the supervision of their erection and the education of the public in the way it should proceed—little advance can be made. It must be from the castle to the cottage, and even in the additions to the latter and the small garage to it, that his, or her, services must by legal enactment be enforced upon all. A specialistic control of every road and erection upon the land throughout the country is now the watchword. We need scientific or skilled approach to all these things, and this includes all associated trinklets, advertisements, nor would I look askance upon prizes for private house gardens, and collectively as streets, even to the better classes of flowering trees in the pavements with a campaign from pulpit, Parliament, school and parents to prevent their damage. Surely the children of this country should be as good as those abroad. We find very little damage even in Egypt, where the flowering trees of each street once seen are never forgotten; the real "street Arabs" of ancient vintage have had their day.

In some towns we have got as far as the red-berried, white-flowering Mountain Ash or Rowan-tree, and the orange-berried, white-flowering White Beam of silvery pale green leaf, although blackbird and thrush soon clear the orange berries in some districts. However, the seeds that they distribute in

adjacent gardens would, if handed over as seedlings to the council nursery for the replenishment of stock, more than pay for their crime of robbing us too soon of the silver and orange fairyland trees.



Siena, one of its three hilly precincts.

Try full standards of flowering cherry, Cerasus Hisakura, with its grand early bronze leaves, deep pink flowers and orange-coloured leaves in autumn when the chlorophyll creeps back under the bark. I believe, on deeper thought, that this escaping green colouring matter and the resultant orange colour of the leaves together make the original light bronze green of the spring and early summer colouring. The large orange crab-apples which hang in groups from the John Downey crab after the white flowers make this tree a showy and suitable one, and there are others more delicate. It is therefore pleasant to hear of them growing undisturbed in Temple Fortune, the select suburb in Hampstead Heath, and at Hendon.

Our towns will develop by some extension and a great

deal of redevelopment into orderly irregular layouts without the mechanical regularity of our past theoretical ideals; although this country would not have lost if it had contained one fine example of each of these older types as partly developed abroad, had, say, Liverpool, a seaport with a similar population to Barcelona, started with the latter to rebuild and develop its city about—let me see, I was there in 1901 and it was then many decades on its way towards the type selected.

Barcelona Planning

The plan was then one of fairly regular octagonal blocks of buildings which produced large squares in the streets at all crossings.

The streets are therefore running regularly in two directions only, except that from the inception of the plan diagonal roads were planned in the two directions, and not left until too late as in the case of New York, which is of simple rectangular blocks of the military camp plan of Greek and Roman times, without even the diagonal roads of still more ancient Babylon, though these are now in the process of being grafted on to the original plan.

Barcelona has roads over twelve miles long of varying gradients running into the country towards the hills in the distance. A number of these roads are triple avenues separated by two boulevards of completely arched-over chestnut trees containing its electric lights, apparently unsupported, high up in the leafy vault. On such a road is the circular Plaza de Toros or bull-ring, not a very paying concern even in 1901 in this then thought to be well-planned and modern city.

The then new octagonal layout was varied by every sixth block being unbuilt upon and reserved as an open space. These were planted in all possible ways as interesting gardens—oranges, apples, date palms, cacti and all the flowering trees of a semi-tropical climate.

APPROXIMATION of BARCELONA TOWN PLAN 1880 & 1944

There is a date-palm boulevard surround to the docks or large harbour areas, enclosed from the blue Mediterranean by hard stone quays as enclosing arms whose multi-coloured irregular polygonal stones are visible to the dock bottom in clear water. This dock area is cut off by a continuously high and heavy bronze railing.

The palms and other trees are stripped of their fruits, and these are given to the poor. The land and even some of the trees produce three crops of vegetables, corn or fruit in one year.

In addition, there are well-laid-out parks containing zoo, cafés, lakes and the usual items that one finds here, including a model mountain to climb. At one time there was an old city of Barcelona surrounded by walls; these latter were pulled down to form a ronda, a more or less inner circular road coming to the front tangentially; and it forms a useful tram route. This quaint old town with its narrow streets was very interesting to live in for a month or more. The flat was modern with terrazzo floors and good bedrooms, and on returning late at night the street watchman came along quickly to open the hall gates upon a clap of hands. Then the old fellow would move off with his smock, pike, lamp and keys to chant out each half-hour during the night—at 11.30 p.m., " son las once y media, sereno," or clear sky.

This old town has gone, as the walls did earlier for the Ronda. Its area now is but more large octagonal sites, and the streets were cut through to leave a wedge-shaped portion of a room in most places, a truly ghastly procedure, and I was sorry to see a photograph later of the Calle de San Pablo in ruins ; it was transition at its worst.

When I look back I feel that it would have made an interesting precinct or two inside the traffic of the Ronda, in a less drastic method that would leave the quaint as much as possible to survive; for it was nowhere approaching the deadly aspect of any of the slums of seaports on our north-west coast, inasmuch as there were no slums as we know them.

To find the nearest approach to these one had to go to the isthmus protruding into the sea, to Barceloneta, the seafarers' quarters, obliterated by the bombing in the one-sided civil war preliminary to the greater attempt that failed, through Britain and its Dominions holding fast when to everyone else all hope had apparently gone. The great layout spread out to encircle the villages, and of these some unfortunately disappear in the same way eventually as old walled Barcelona.

This hard regularity of octagonal block town plan has, however, received its death-warrant at the hands of the architects of Barcelona, and plans and models have been prepared to produce the modern picture of a city with huge blocks in oblong form as if for offices or flats around four sides of large enclosed rectangular gardens, as in my sketch plans here illustrated.

The fourth and entrance side has two short returns of the main building, with a separate block forming a screen to cover the enclosure or precinct, and this block is recessed to allow of the entrance and exit roads between this baffle block and the short building returns at each end.

These huge blocks are from four to six times the area of the original octagonal blocks, once considered the best possible for all time. However, as is now a worldwide movement, the desire for quietness, safety and the expedition of transport has necessitated this change, quite apart from the previous harsh regularity of the octagonal buildings, an engineering layout with but little art.

Railways, as from the very beginning, are in open sunken ways along the wide roads, and fast traffic may be similarly segregated, whilst road bridges will span these sunken rail and roadways.

Some of these roads, begun over fifty years ago, are twelve miles long, are straight and of a width of 180 ft., as is the Calle de Cortez, whilst the Paseo de Gracia is 300 ft. wide, and the ordinary roads are from 60 to 80 ft. wide.

The sunken railways are lined in glazed brick with marble balustrades above the upper road level.

An occasional historic building like a church alone remains to speak of the past, and the civil war with its religious corollary led to irrevocable damage to some of these, as happened, I believe, to the subject of my first student sketch, Santa Maria del Mar.

It is to be hoped that streets, even if still, after their prototype, straight, will have irregular, very irregular, building lines with garden softening, almost as you would model the encrustated and houseleek section of a rock garden, even if the edges line a straight or curved path. The varying shades of green are not necessarily confined to the Lake District. The colour and varying block of non-eclectic architecture is interspaced in the picture, though if the road itself is not of layout and material suitable to good architecture (a public amenity without which improvement towards the ideal cannot be made), we shall still be in the wilderness of coarse mechanical imperfection, with our goal of both understanding and fulfilment not yet even in sight. In spite of all our verbosity our results are tempered only by the science of engineering; the art of architecture is still but visionary and little understood.

So much for the type of city plan based upon the square, oblong, octagonal or rhomboid building block sites; the old military camp or town plan with improvements such as the octagonal block sites with diagonal roads—they all fall short of perfection.

It must, however, be remembered that most old British city plans are irregularly radial and developed on fairly direct lines of access to neighbouring towns or to other primary main roads of the country, to which, if not already in existence, elliptical ring roads will be added. Liverpool is of this type, and when the widened radial roads cross the outer elliptical ring road and crash through to the proposed newly aligned inner ring, this city will take its place among the possible presentables of the future.

However, the traffic-cum-pedestrian confusion, leading to war-time lethal figures of casualties, has still to be faced, as its urgency might be pressed by the purchase or free distribution of Mr. H. Alker Tripp's book to at least all local councillors and particularly those on the town planning committees—for only by very careful supervision of all town-planning development can improvement be made, and if the lesson of road traffic control is not thoroughly understood and *appreciated* much of our effort will require to be redone.

Keep careful watch over any official who says that " it cannot be done," for it is now two decades ago since even he paraded a little knowledge on this subject by insisting, and rightly, that private garages should not be entered from the main traffic road, and that the number of crossroads or other roads must be reduced by the use of cul-de-sac development entered from the local roads abutting.

The full acceptance of this recognised science of road traffic control must be made, upsetting as it will be to the haphazard planning of the past. And this will cause disturbance and the expenditure of large sums of money as rectification is made step by step in our existing towns, where the reconsideration of the town plans should now be made with this view in mind, unless we are to drift to even worse condition in the future.

CHAPTER XII

BUILDING WORKS OF THE ARCHITECT

WITH regard to the historical types of town plans, these may be omitted from this elementary preview of the interests that go to make up the life's curriculum of the architect in practice. As it is, the fringe only has been disturbed, and in the residual hard core of the appended list may be found some of the items that he is called upon to design, to make the necessary working drawings and to supervise the building or making thereof, to control the cost of all these works, and to close each contract with the completed building and the cost of its erection, and upon this his fee will be based.

The latter will alternatively be upon the work that he has done should the client not proceed with the completion of the work, for one reason or another.

Now, may I issue a grave word of warning? I would beg of all prospective clients to remember that 1939 prices have gone for a long time to come, if ever to return. And so, as the position now stands with the war-damaged properties, it will take from 50 to 100% more to rebuild.

All honour to those who can afford and wish to proceed with this prospect facing us, whether the work be entirely new building, or the cost of repairs which is on quite another basis, or additions to or a reconstruction of their existing premises.

Many an architect is already receiving pressure from some of his clients. So may they bear this in mind, for work similar to the reconstruction of two old shops into one modern shop, as illustrated.

If, however, they still persist in spite of high estimates ruling, this is no fault of the architect. Materials even if obtainable are expensive, labour costs are high, and there

is a scramble for the various priorities that still exist. The client will be doing all that he can to reduce the unemployment that will follow the totalitarian employment of all of us during the war with the bottomless purse of all our money for fifty years to come, for half its cost has been put aside to be paid off when this is possible.

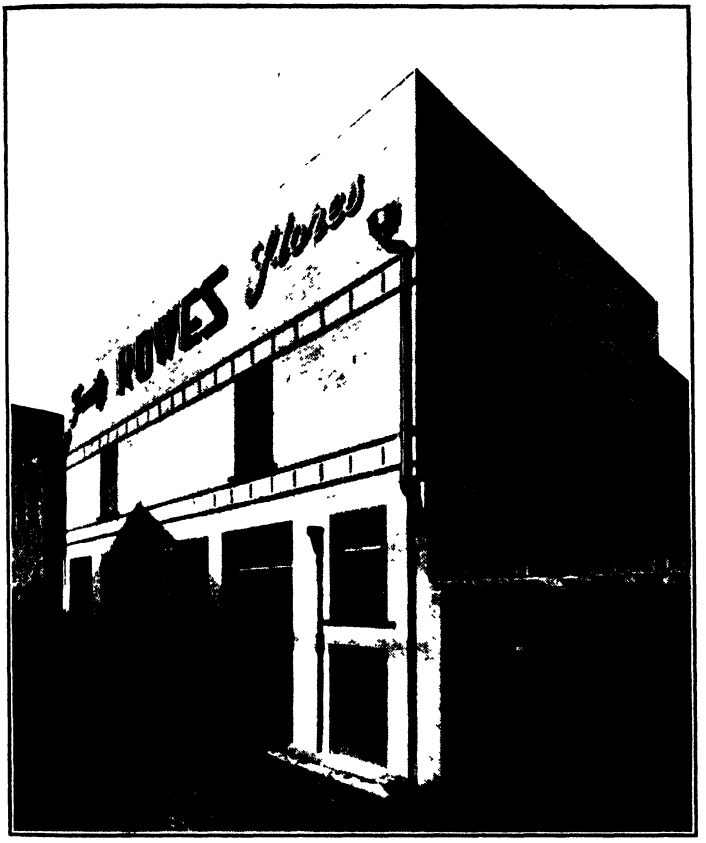
Now here is the list of what may be considered the work of the architect in building design, its equipment and furniture, vehicles of all kinds and some of the minor objects of everyday use:

Buildings of All Classes, etc.

All municipal buildings; town halls; guildhalls; public, grammar and secondary schools; technical colleges and all university buildings for the arts, sciences, medical and engineering faculties; schools of architecture and art schools; elementary and nursery schools; crêches; central and branch libraries; spas; baths, both indoor and open-air; wash-houses; miners' welfare and other pithead buildings; cinemas and theatres; public and church halls; ballrooms; picture galleries and museums; customs houses; warehouses; council houses and district offices; banks; commerical buildings, including shipping offices; all government buildings (naval, army and air force), either temporary or permanent; aerodrome control buildings; football stands; dog-tracks; hotels and public-houses; inns; hostels; railway stations; bridges; piers; cotton and corn exchanges; general and fish markets; emporiums and stores; all shops and their fronts; clubs; cathedrals; churches; chapels; memorials of all kinds, including small marble and brass plaques; hospitals; mortuaries; all state-rooms, alleyways, companionways; book-stalls, furniture and fittings, cabin accommodation, etc., on all liners and other ships; tunnels and their entrances; bridges; public garages and motorworks; shopping arcades; public exhibitions; railway coaches, interiors and fitting up of same; public amusement build-

Two nondescript shops redesigned as one.

ings ; cafés ; tea-rooms ; public shelters ; homes for sailors; trade union and other offices; boxing stadiums; railway or bus stations ; tram or bus depots ; electrical supply offices; power station and other tall chimneys; zoological buildings; pavilions, park, sports or other; factories



The shops completed at rear in a narrow service street.
(Note hollow-wall ventilation to fruit store.)

of all kinds; clock towers; broadcasting stations; police stations and prisons; bandstands; tanneries; tin smelteries; public conveniences; billiard-halls; ice-rinks; farmhouses; farm buildings; shippons or cow biers; pigstys; all temporary buildings; public and private

gardens; pergolas; summer-houses; greenhouses ; rills, rockeries and moraines ; laundries ; river fronts ; lighthouses; gateways; fortifications; air-raid shelters; houseboats and boathouses; all railings and enclosures; the reconditioning of all ships ; the reconstruction and modern facing of shops and business premises in modern clean and coloured materials.

City, Town and Village Planning

Estate planning, including supervision of all plans for erections thereon, and all layouts under this title.

Residential Property

Large and small houses ; bungalows ; all cottages ; flats from two storeys upwards ; air-raid proof houses ; all inspections and reports for valuation, purchase, dry-rot, schedules of condition, dilapidations, etc.

Equipment, Furniture, etc.

Office furniture; all domestic furniture; pianos; all furniture on board ship, train, plane and car ; all stock fireplaces, windows and doors, bureaux; sectional book-cases, furniture, kitchen fitments ; tapestry and curtain fabric as used in residential, office or by largest shipping companies for their liners ; tea and dinner services ; all glassware ; carpets for modern buildings ; piano casings ; tombstones ; street decorations ; telephone kiosks ; car chassis ; sundials ; bird-baths ; pigeon cotes ; fountains and pools ; street lamps and standards ; shop signs ; stage scenery and costumes ; wireless cabinets ; book covers (not this one), bookplates ; printing and lettering.

Consultants—to all Building Trade Factors

Now the " secret " lists are out, unclassified and without a breath. Even so, much is still missing. It remains to be said that our successors may be thankful if the general public will understand just a little more of what architects

are doing on this earth, and why it is essential that they should do it and much more.

They do not buy and sell coal or meat or fruit—that only produces a banking account. But they think and think and think as to the best way to improve the lot of humanity and its habitation in natural surroundings. And if they are hunted out of their hideouts, one by one, no harm can befall the hunters.

Some of these men actually wear an epitaph before being run to earth professionally; whilst a number eschew a brass-plate, and they are not now known by their ladders, cranes and old chimney-pots. They sell not leather, but plan and design your building to fulfil your wants in the best manner. It happens to be called architecture, clean architecture at its best and suitable to represent this century A.D., whilst the price that you accept and build to is competitive—they see to that. In the days of peace there is no cost plus except for very large buildings.

There is no other way to obtain these conditions, your wishes moulded into good architecture with competitive costs, the latter from any contractors or builders invited to compete.

Now, I have said "think and think," and this is true, to study history of architecture, and not despising even archæology, when you have curbed the many mercenary alternatives open to all mankind, is a great and useful hobby.

I have mentioned the old lock and the new. Similarly all along the line the past teaches the present—you will build to other shapes and construction, thoughts grow apace from the well-tilled past, though Vitruvius may rest in peace unsought and unnecessary to an artist, a true architect.

The drip of rainwater from a conveniently leaky gutter of a neighbour's outhouse gradually filling a trough the contents of which were to be used for the improvement of his daughter's complexion (although she was then in the West Indies in her country's service, and the soft water was overflowing), not only speaks of Minoan Crete (where it was

trained to run down the marble staircase in a side channel so that the water could be used by the king's daughter), but suggests the collection of filtered rainwater from our roofs, particularly in hard-water districts, and its use in the bathroom where its cistern store could even be connected to the hot-water cylinder; with a stop-cock to save supplies as necessary.

I would revert to that in a house in London or Southport, in addition to the water softener. This may be fairly common. I know that it is in some farmhouses.

An architect is an imaginative improvisator; the more so with a sympathetic knowledge of this history of his art.

Now, in introducing the subject of what is, or should be, the primary hobby of the architect—that is, the history of his art and craft, architecture—I do not agree that architecture must of necessity always reach new heights of achievement after a war—for it so greatly depended upon the opponents and again as to which of them was victorious; might was not always coincident with the better architecture.

For instance, Greece would have been better with the concrete era rather than Rome, and there were always many centuries of nightmare after a Hun victory. Too many for even history to record anything of note in architecture, and long after they had pushed us out and over here.

As early as 1901, and in common with the lot of most architects, I spent my first long visit to the Continent, in the vacation between first and second years at the School of Architecture, and it was during this period of sketching and some measuring that it first dawned upon me that there was a very dependent connection between architecture, war and economics, and that whilst architecture could just linger on in war and bad economics, it would be on a much better basis in countries that were not afflicted with either of these pests.

I remember greatly envying many of my colleagues who erected some hundreds of new factories, etc., when tariffs were recently introduced in this country.

Orders were even given from mid-Atlantic and by cable.

CHAPTER XIII

THE ARCHITECTURE OF THE PAST —BABYLONIAN

COINCIDENT with, or slightly prior to, the first conceived date for the Garden of Eden (incidentally the root cause of all our troubles), two great civilised races seem to run neck and neck in what are termed B.C. days—the Babylonians of the joined rivers Euphrates and Tigris and the Egyptians of the Nile Valley; rivers that overflowed to cheaply irrigate the hot lands made habitable thereby. And farming flourished, bricks were made from this clay mud and many canals were cut, as in the Low Countries, to give easy transport generally, with temporary cuttings for carriage of building stone, etc., for the many buildings necessary for populations of over fifteen millions each.

Flooding was disastrous at times, and the Nile was closely watched by the priests, then the sole general-purpose guides of the country, who went about with stakes to mark the water levels forecasted, and these were marked by a cross bar on the vertical stake and thus forming a cross, then known as a sign of safety.

There was a loop of cord on the top of each stake for carrying, and this would fall down on the crossed stake, and as the circular cord suggested the endless circle that typified eternity, the succeeding Copts of the then Christian Egypt introduced the "Celtic" form of cross having the circle evenly centralised on the crossed stakes.

In both Babylonia and Egypt flat roofs were common, except in the smallest houses, which were generally thatched, though the dome and vault figured to an extent in the former country.

Four inches of dry clay that had been rolled on to the roof flags (that were supported by main and subsidiary stone beams) completed the rain-proof roof in Egypt, and if it

leaked the cracks or porosity were cured with a little more clay. Sheet lead was not then in use; that is, for this purpose at least.

Bitumin was used, however, in Babylonia on roofs, and as a damp-proof course to keep their lower stones or brickwork dry as the floods surged past.

Babylon, the Gate of God, was a super and learned metropolis. Its more distant suburbs or migrations became the cruel and constantly warring Assyrians. It was the Athens to the rest of Greece, and both were overthrown by their own countries in jealous conflict later on, though always revered, and in the case of Babylon rebuilt in sorrow; for it was their own centre of learning and hitherto immune.

Babylon gave to us weights and measures, cube and square roots, botany, zoology, law with conveyances and private ownership of land and buildings, and so much else. But above all, its huge brick architecture and a love for gardening.

This great city was built upon heavy brick piers, as in all the similar though lesser cities of this civilisation, so that the flood waters passed underneath just as in the most perfectly planned future city of our time the fast traffic might do, though by excavation (as proposed for Greater London) rather than the raising of the whole city on a platform and carrying through the first floor as a local slow-traffic road, with the fast beneath on the ground level, as all today's roads now are. The pavement would be of glass; each building would have lift and staircase down to its own heavy and light vehicle garages for the fast traffic road.

Sewerage

However, Babylon had its sewers down below, with no excavation necessary at any time. There they lay in reclining pointed-arch brick rings for strength against settlement, 75 ft. below the city road level, and brick shafts guided the sewage down to them.

To support the city the brick piers were vaulted over with

intersecting pointed-arch vaults of brick, and a heavy road or city base built thereon, upon which the buildings were erected.

What the archæologist does in rebuilding the building history of past architectural works, the architect of today is doing for the living humans for whom he designs in accordance with the new conditions and materials in use.

There is, however, in peace-time a field for a number of young architects in the work of drawing out the newly excavated towns and buildings, furniture, incised carvings, tools and construction—especially in what is now known as Iraq (Assyria) or in Egypt. Both archæologist and architect as a team do good work out there in peace-time, and in war are granted useful commissions on account of their local knowledge and of the peoples thereabouts.

However, the drawings made are used to illustrate books by these recorders. To the archæologist the honour of finding and to the architect the recognition of object and construction of the building design and planning of the past.

The recordings of Assyrologist and Egyptologist have repaid their labours beyond any cavil of narrow view.

CHAPTER XIV

EGYPTIAN ARCHITECTURE

The Country

CONCURRENT with Babylonia and Assyria, Egypt too was overrun by those tyrants on two occasions.

It would be hard to say which nation reached the higher plane in civilisation and in its building. On the whole, it is as yet even too early to judge, for more must be known of Babylon.

The Egyptians came to the mouth of the Nile fully trained from somewhere as yet untraced, and proceeded to design and erect their finest buildings very shortly afterwards, as dynasty or family reign followed dynasty, as they made their way south down the Nile, using brighter colours as they approached the equator, towards the Ethiopians who copied in a crude manner all that the Egyptians built or made, from pyramids to the manufacture of glass and tiles.

The Pyramids

In 3400 B.C. the Egyptians amalgamated under one Pharaoh (Menes), whose burial building (a mastaba), was found by my friend Lieut.-Col. W. B. Emery, M.B.E., just prior to the war, when excavating on behalf of the Egyptian Government, and, like the planners of L.C.C. London, is from Liverpool.

Hiding the bodies of the dead was the duty of the near relatives, and the earliest royal tomb was the mastaba, and this developed in succession to the stepped pyramid, as at Sakkara, and on to the once polished and complete pyramid at Gizeh. Then the final rock-cut temple tombs like those at Beni-Hasan followed.

In but a few of these tombs did the architect beat the tomb robber of ancient times.

The mastaba was oblong on plan and of draughtboard

pattern—with, say, the " black " squares built up in masonry as piers touching only at the corners. And down below, in one of the unbuilt square pits, the dead and its jewellery reposed, with fake burials of stone covers also in other diverse positions.

The roof was built solidly over and the exposed " white " squares on its sides were filled in with stone panels, often double recessed like what is known as palace façading common to both this pier-filling construction in Egypt and in Babylonia, where important buildings were raised up upon brick piers that required filling in on the exposed faces.

The trouble was that the Egyptians had not learnt from experience that the resurrection of the dead did not mean that the body would be again inhabited by the soul or spirit, and so every precaution was taken with the body by mummification, of salt immersion and bitumin filling. Even the poor did their best, and all kept their graves above water-level.

Many stele stones having the name of the dead were left around them in their tombs. There was to be no doubt that the soul would identify its body, and not go masquerading in another's. We erect but one stele to our dead, and for economy in stone and land it may apply to more than one—flats in life and in death.

Actually burials today, apart from cremation, are just on a par with prehistoric times. Whilst the Egyptian town planners did not favour the import and use of mass-produced Sicilian gravestones in glaring white marble to cover acres of their land abutting main or any other road—we unfortunately do today.

Luckily the imposition of import duties has given us the Cornish granite and the reconstructed granite, Hopton wood stone and some other stones that dirty too readily.

But even the polished pyramids failed to function for the purpose for which they were designed—for their dead were robbed later on and the limestone casings were taken to build Cairo.

The Temples

Surrounding the pyramids (and endowed by the dynasty) were planned colleges and temples on the flagged enclosure, together with obelisks and gardens. Schools and art schools were common, and the wooden colour and brush boxes, together with brushes, the handles only (and these were rebated for the quill brush tips), are quite commonly found, and belonged to the students. The remains of the colours have not yet departed, and vary from two to twelve in number.

All Egyptian buildings, Babylonian as well, were of a long horizontal type (like our factories today), with a much lighter form of construction than is found in the temple or pyramid. The remains are buried and more fragmentary, although there is at least one house still in use today—it having been reconditioned for living quarters by the archæologists. There are many 6 ft. high.

Like the temples and houses, the façades terminated at the top with that fine coved moulding called the gorge. This had a large bead or torus at its bed joint, and a deep fillet or fascia on its top to prevent a delicate feather edge, and its origin would appear to be from the open Lotus flower that is best typified in the finest curved line ever to be produced on earth—the open capital line of the central columns of the nave of the hypostyle hall in the Temple of Karnak, built in the time of the Greek Domination. Both Greek and Egyptian architects were on it together about the same time, but I can take nothing back that I have said. It is exceptional, though the Greeks were actually never surpassed in mouldings and shadows, at best when at their simplest.

The palaces seem to have disappeared, though one is reputed to have been found recently. It may be that each dynasty pulled down its predecessor's to erect a new one, which is the modern architect's dream of an ideal procedure.

Kitchens and Bathrooms

Instead of a car-park as a first requirement, the Egyptian architect had to erect a village. This consisted of a terrace or two of back-to-back houses. Little double-fronted houses with a centre door and a small room each side, with three at the rear; a small kitchen with its wooden dresser, pots and pans, brick oven and hearth.

Single-storey thatched bungalows, little gardens in front with a wall enclosure and gateway. So they exist today as the thatched roof collapsed into the rooms and the preserving sand closed over. (A pity this could not have happened to ancient Greece.) Though as soon as the survey is made the sand creeps back and they have gone again; white ants being the only enemy and in some places no timber is left.

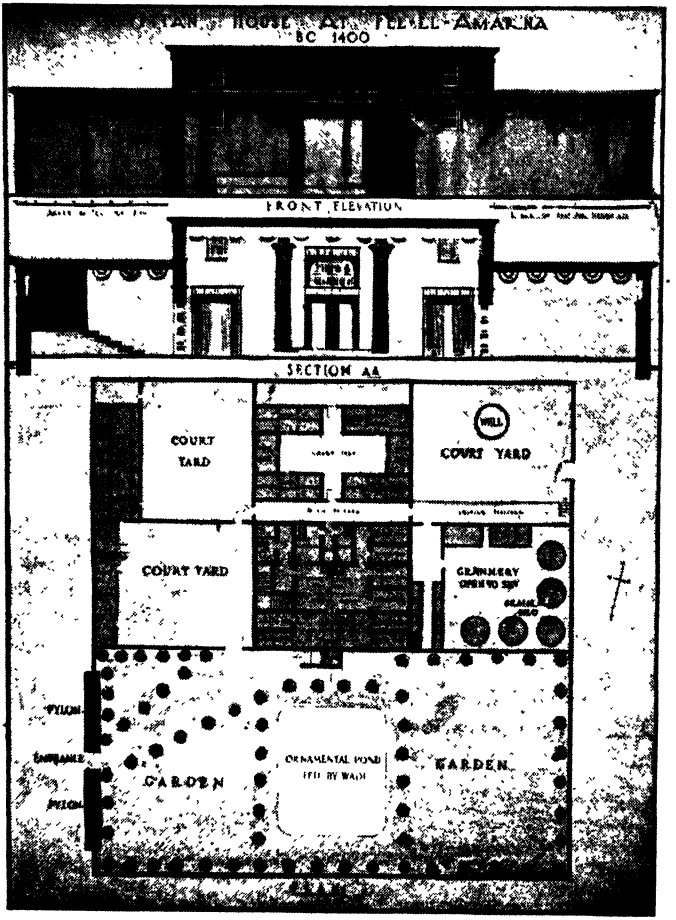
Picture the middle- and upper-class houses. Their plan and design are comparable with ours. They had bathrooms of the combined type. And that means indoor sanitation, even if it was only a blue or green glazed pail with its hardwood holed seat resting upon two brick wing walls that in some cases were lined in glazed tile or floral pattern mosaic tesseræ in blue colour with a black edging. I am able to show any disbeliever these tesseræ with gypsum plaster still adhering. They are very thin indeed, and prove that gentle home-loving people existed in these classes and days.

The bath itself was often lined with alabaster, and it had circular sinkings on its top for the glazed pot, alabaster and glass bottles of unguents. There was a bronze waste pipe from the bath leading to a soak away or sump-hole outside.

The floor, like that of the kitchen, was of green or blue squared floral pattern tiles, having splayed edges so that they could be set tightly together. The glaze is now coming away to expose the pinkish burnt clay inside.

The Houses

Some of the Egyptian houses had two or three floors;



A good-class Egyptian house.

but we will deal with the single-storey bungalow type in more general use.

You entered through the garden and a vestibule (its entrance turned against the prevalent wind with its blown sand) into the central living-room or lounge, out of which practically all the rooms, but the kitchen and bathroom, opened direct. This room had a flat roof of clay-topped flags supported upon stone beams and usually two stone columns with capitals. These rested upon a stone dais for the family table, which had a raised stone coping or seat all round it except for an entrance gap left out between the columns. Reed cushions would make this a comfortable seat at meal-time or for the children's school homework.

The Egyptians were usually very conscious of symmetry in this room, and would balance a missing door by introducing a deep recess. And it would be similarly lined with their flat, incised ornament in colour, as an architrave.

These doorways led to the rooms of a lesser height than the living-room, which they practically surrounded, and they were roofed over by a lean-to roof of thatch that would keep the living-room cool. The large central living-room stood well above these rooms, and was naturally lit by a number of pierced stone slabs acting as windows. The vertical slits were in one or two rows, one above the other.

In between these windows were painted festoons or swags that we shall not find again until Roman building and its followers of the Renaissance and False Modern.

The surrounding *en-suite* rooms were the private family rooms (six to ten in number), and included the bedrooms, library, stone staircase (the entrance to the latter often leading to the bathroom), and an ante leading to the kitchen, scullery and larders.

The stone staircase rested upon a long stone string, stringer or raking lintel; and the other end of the steps was built into the brick walls. At its top you stepped down on to the large central flat roof over the living-room.

The house walls (similar to those of other buildings, even temp'es) were covered over with a thin $\frac{1}{16}$-in. to $\frac{1}{10}$-in. coating of plaster, or plaster of Paris or burnt gypsum; and this was coloured as if it were stone. Some of it survives the latter, for it was very hard and also used on a lath base of reeds nailed to a wood styling, $\frac{3}{4}$ in. thick in three coats just as we did prior to the First World War, after which we dropped to two-coat work.

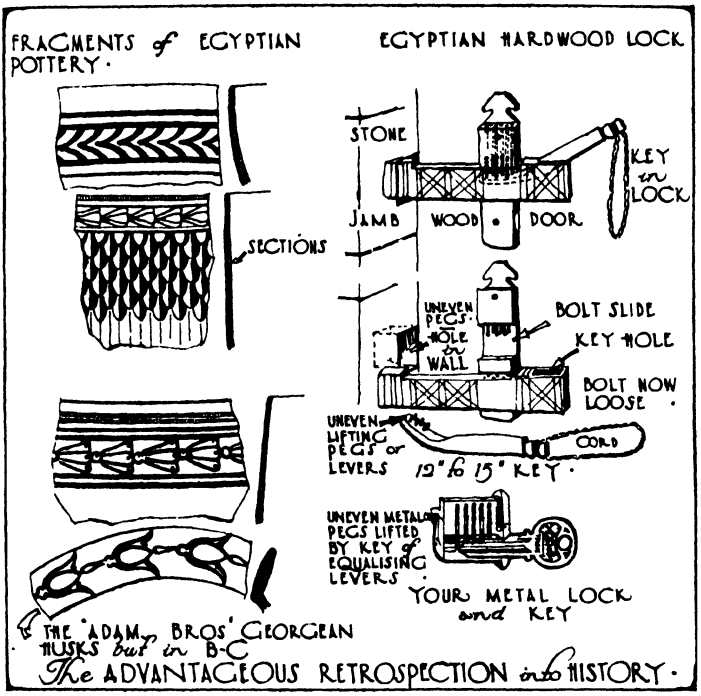
The low height of the doors (at 6 ft. high) would give a good scale to the interior, and be in keeping with our ideas of making ordinary objects like doors and steps as low as is possible to deceive the eye, and thus to make it register the room or building as being larger than it actually is—just as if you were to make your foot rule only 9 in.

To revert, the kitchen, scullery and food stores are situated in the north-east corner, as might be expected in an architect's plan, and these were well fitted up with sinks, cupboards, brick ovens, ranges and hearths, and were tiled. I particularly admire the ingenuity of the cold-water vase (and in fact other containers also), for it had a pointed bottom that would not stand up, and the vase bottom would only fit into its own hole, be it in stand or in the floor. And so the misplacer and breaker-up of organised and happy homes had no chance with this precious liquid. Some of the healing and culinary potions also required the use of some thought (after use) as to where the vases belonged.

However, on the other hand, greatly would I like to show Senmut and his client, Queen Hātshepset, a modern kitchen, all hidden behind flush-panelled wall fitments and electrically worked—cooker, refrigerator and all that. Certain it is that Senmut's revelationary report, in hieroglyphics or hieratic, to the architectural students at the University of On, and on papyrus, would be a very priceless addition to the R.I.B.A. Library of today; although there is more than a possibility that his client might sadly affect his renowned appreciation of the original, for even in the best circles, architectural of course, custom dies hard. If not, what are

some of us doing with triglyphs or egg and dart in our bedmoulds? What are the latter anyway? AUGUSTAN VITRUVIUS, VITRUVIUS MY USHABTIU.

You will all know those small husks of the Adam Brothers, used in monotonous repetition in thousands on



The Egyptian and the modern lock.

their plaster ceilings and walls. I have these identical shapes in three varieties painted on in black, with a brush, before firing the clay basin ware, and I append a copy.

Similarly our eighteenth century was endeared to the elliptical arch. Well, none were better cut than the trammel set out, and fully voussoired, stone arch of the Bulls' Sanctuary at Sakhara.

The Construction

Externally, the house of the better classes was a mixture of the ancient with the modern, the thatched roof surrounding the higher flat roof. Though occasionally there was no thatch, and then the lower roof would also be flat.

In the latter case, you find the standard Egyptian gorge and torus cornice finish to both, whilst the walls were built of sun-dried, hand-pressed clay brick. In the older houses clay walls reinforced with reeds would be battered on the outside, owing to the greater stability, with a thicker wall at the base. And so in all stone-faced building, such as temples, the sloping outside face still persisted in spite of the change of material. Well, and what of this? Greater strength is required at the base.

The stone windows would give some interest, and these sometimes had stone heads and sills, and occasionally sides or jambs as well. The pierced window-slabs were let into grooves made in these surrounding stones that formed quite a respectable frame.

The modern timber joints, such as the dovetail, dovetail tenon, pegged or pinned tenon in a mortise, were in use.

Flat roofs were often of timber, and the construction consisted of 2-in. or 2½-in. planking resting upon heavy 10-in. by 7-in. timber beams.

Internal wood panelling was constructed of very small panels, as on account of the heat the panel shrinkage was excessive. The appearance was very like the Elizabethan panelling in England. Though here the shrinkage, again demanding small panels, was due to the defect of the timber used, oak.

Other timber used was imported cedar (actually the most common); whilst acacia and tamarisk are found.

The doors were hinged by vertical hardwood or stone dowels let into the door lintel and the threshold. Many of the largest would slide into slots in the wall at one side.

In the schools of art and in the artists' studios can be

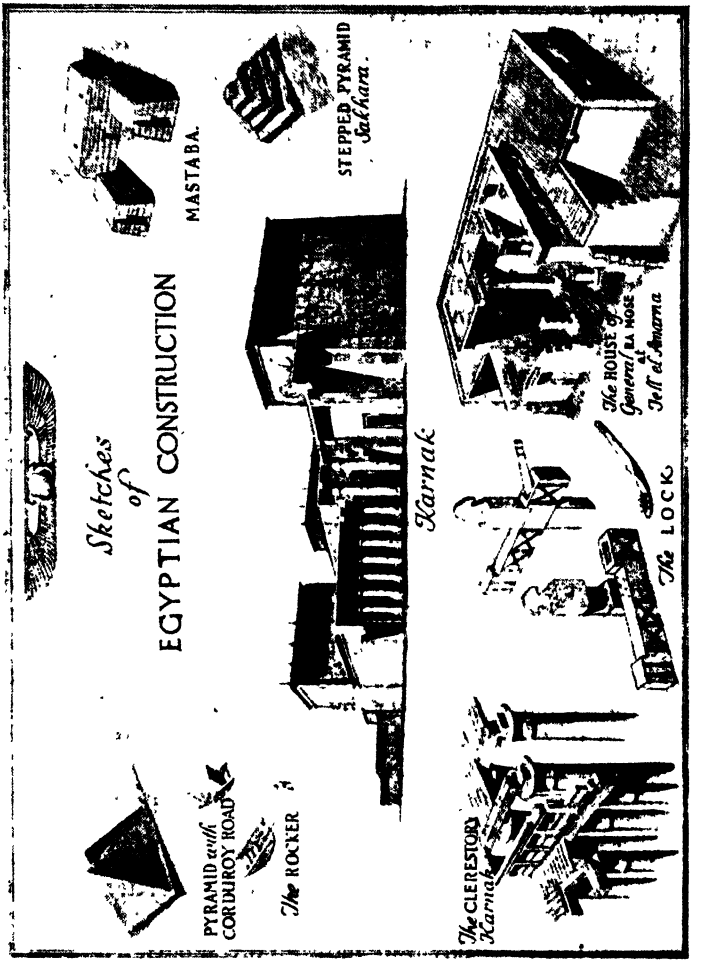
seen many of the things that the architect would have called in to see and supervise.

First he would see the small original sketch for any incised light relief wall sculpture. And when approved the sketch would be squared just like the northings and eastings area divisional squares of our war maps today.

This done, the large full-size panel outline would be similarly treated to the same number of squares. But they would now be the full size; the enlargement could then the more easily be done, square by square, by dashes to be completed by the full-size drawing for approval before tool incision and chip moulding to its finish, when colour was generally added to the panel.

The large squarings were flicked on to the stone walls by ochre chalked strings held at each end and pulled out at the centre by an assistant. On letting go the result was a good yellow line, just as it is today. The string, yellow ochre and unfinished squarings, drawings and carvings are still to be found. Again, in the models and casts made for approval before the actual carving of the stone, granite, alabaster or wooden figures of men and beasts, you will find that the carver's method varied from the method of our time, which is that of cutting down to depth dots for the general shade to be brought to a finish. Their method, however, was to cut the rough block down by cutting it two ways to the finished profile of the model. And in these buildings the leather sandals of the students and others are lying about; though not in today's colours, when they must, of course, match the dress of the wearer.

We have, in modern writing and printing, travelled a long way from their hieroglyphs and the later hieratic writings. But in the matter of craftsmanship and the allied arts that but yesterday were indisputably a part, a necessary part, of architecture, not so much advancement is noticed, and perhaps this is only natural. But to expect both to end abruptly with the advent of the framed building and the machine age does not make sense.


Sketches
of
EGYPTIAN CONSTRUCTION
MASTABA.
STEPPED PYRAMID
Sakhara.
PYRAMID with
CORDUROY ROAD
The ROCKER
Karnak
The CLERESTORY
Karnak
The HOUSE of
General EL HOSE
at
Tell el Amarna
The LOCK

Karnak Temple is the largest group of temple buildings, 1,200 ft. long, against St. Peter's, Rome, at 720 ft., and St. Paul's, London, with 520 ft.

Khons is small but satisfying and complete, whilst the Philæ Island temple, with its coloured Roman Emperors in Egyptian costume along its Nile wall, is an example of more irregular planning and a varying axis not found elsewhere. It is now under the waters of the raised Assouan Nile Dam, one of Britain's great projects that has enriched this ancient land; and there are others, not forgetting our wartime occupation—where our loss was their great gain, tens of paper millions spent that we must balance by trade.

A cross section through the Egyptian temple, the Gothic church, or even the Renaissance St. Paul's Cathedral will show the main lighting of each to be by clerestory windows; the Egyptian temple through its pierced stone grid-like windows two slabs in height and built into grooves in wall and mullion.

The central nave was built above the aisles, so that it became a clerestory, and windows in it were possible. And the brightest colouring was given to both wall figures and capitals when nearest to the light, with the duller colours in the darker windowless aisles.

All the roofs are flat and (as before noted) of clay on flag and stone beam. And if it were not for the close intercolumniation or close proximity of large or small columns, due to the comparatively short lengths in which stone lintels can be obtained, the similarity to modern work would be even more pronounced than it is, barring in detail of course, and yet immeasurably so if compared with the Roman, Gothic or Renaissance, almost to appearing as huge reinforced concrete machine shops having too many points of support in them.

The Memorials

The Egyptians used a memorial shaft, or obelisk, a slender tapering towards the top of one stone which rested

upon a pedestal base, with a Sphinx at each angle on top of the pedestal. You may observe this in Cleopatra's Needle on the Thames Embankment.

It is still the finest free type of memorial, though the Cenotaph is a very close second. And this form also is of Egyptian origin, for its prototype is undoubtedly the tapered pylon.

The lower table, bed or altar form of cenotaph is found in Egyptian, Greek and Roman biers, altars, etc., the resting-place of the dead during the citation of the funeral rites from the Book of the Dead, or on the funereal barges as they were sailed or oar-propelled on the canals and the Nile itself.

It is, however, with the obelisk that interest lies. They were generally used in pairs, and incidentally, if both stones did not arrive from the quarry of the same length, were they cut down to equal length? Well, not as a rule—the shorter shaft was sited a few feet or as required in front of the other, to give the human eye and mind just another test; for then they would appear to be the same length.

I remember using this method of false balance or illusion in dealing with two chimney-stacks appearing over the ridge of a bungalow, they were not in line owing to the dining-room having a flush fireplace or chimney-breast.

From the road the latter chimney-stack appeared lower; and it was not until I had added four more courses to it that the eye would pass the two stacks as level. To have left it otherwise would have given everyone a jolt; for the eye could not register that they were not exactly in line, cut off as they both were by being on the other side of the ridge. Actually they were 18 in. out of line with each other.

The quarry faces of ancient Egypt were covered with incised sketches of methods of building, but not when in any way connected with the sacred buildings, since added to by the names of many of Napoleon's French troops.

The obelisk design is superior in every way as a memorial to the Roman column complete with capital, and therefore

ready to carry a load as an integral part or section of a building. Yet all it receives is a human figure, whether it be Nelson or Wellington, in this architecturally eclectic country of ours, or Trajan on the original in Rome, a city renowned for its ruins of generally far from perfect architecture.

However, these people built for eternity, and were nearer achieving their purpose than were those of any other era since their day. This is frowned upon now so as to meet the rapidly changing development of planning and design necessary to fulfil the quickly changed conditions and to rid Britain of its pall of low-class building, though this did serve its temporary purpose.

So now we read Leopardi, with a new meaning, that:

" Bronze is but wax
And granite sand,
To baffle Time's attacks
And stealthy hand."

Why attempt it? Build for a time, as your client may wish, for from thirty to sixty years. The latter time is required to pay off a State loan for a building; and they might wish to see the building last for at least that period of time—and mortgagees very easily look askance.

Each building is to have its " life," a stated period of existence. In that period its original cost must be set aside for its rebuilding to more modern conditions appertaining at some later date.

That is the contrasting condition of building then and now. No memorial of his work will remain after a century or so, and the modern architect might be remembered only by a photograph or two in his one-time professional headquarters—unless his work happened to include a cathedral, a church or certain classes of State and municipal building. Though I verily believe the effect of " life " will hardly be noticed, even less, may I say, than " prefabrication " ; not that the latter will not serve its purpose.

CHAPTER XV

MINOAN ARCHITECTURE MAINLY CRETAN

The Country

LEAVING Africa for Crete, where an excellent building epoch developed and ran concurrently with that in Egypt until crushed in a ghastly descent of war and destruction in 1400 B.C. or thereabouts, when its fleet had met disaster or was overwhelmingly attacked by Achæans, or their mainland fellow people, the Mycenæans.

The early Cretan work at Knossus and Phæstos in Crete, and its near but later counterpart on the mainland at Mycenæ and Tiryns. The latter sub-section, often named as Mycenæan, we will refer to as Minoan after King Minos and his palace and town of Knossus. A very democratic little state where cities were not walled in and its island was defended by a strong navy and salt water—until it was overtested and the civilisation passed away; not to be resuscitated for 700 years, and then on the mainland by the Dorians.

The Houses

On the island from 4000 to 1400 B.C. there was developed a goodly architecture. Its houses were of half-timber with joist ends projecting over the stone ground-floor wall, and these were rounded. The houses faced a narrow road of flags, and had a cobblestone centre for donkey, mule and horse, to say nothing of the bullock traffic.

These houses were often of three storeys, and the attic floor in the roof was lit by dormers. The very name attic denotes the origin of the roof rooms from Attica, the Greek peninsula.

Sanitation had reached a high level, and well-appointed latrines far in advance of the down-the-garden-path non-earth closet of our small farms today; whilst the drains and

sewers were of glazed and socketed drain-pipes 2 ft. 6 in. long, cement jointed for the former, and brick-built sewers where required.

The Construction

The houses had stone mullioned and transomed windows each fitted with brightly painted shutters of red and other colours; none unusable or permanently fixed to the walls (even without hinges), as we find in our eclectic modern resuscitations of the eighteenth century in England today.

The roofs were covered with terra-cotta tiles, stone flags or were occasionally of marble slabs.

The stone-built ground-floor was devoid of windows, and the door was of heavy timber. On occasion even the cattle could be brought inside for protection.

Large circular pateræ cut into the stone formed some interest to the ground-floors, just as we find these in coloured glazed ware on the walls of Babylon.

The house of each craftsman has been found where the mound of destruction of 1400 B.C. has been excavated. Lying there side by side were the round shields of the Achæans and the figure-of-eight shields of the Minoan defenders of a fine epoch—where the king's people went to his palace precincts to see boxing contests in the early arena with stepped accommodation, or to see the early and original bull-fight, or again to trade by barter with the many occupants of the palace.

In these houses both tools and work in hand are to be found in the following trades or crafts—carpenter, smith, caster, loom-weight maker, potter, seal maker, goldsmith and others.

The doors were single or double, as required, and bolted by a long hardwood bar pulled across the door out of its long recess in the wall and across the door into a slight slot in the opposite wall.

Corresponding work on the mainland in Mycenæ and Tiryns was not of the same standard. They probably

missed the settled life behind a sea and fleet that Crete enjoyed.

Planning and Design

As we will trace history with emphasis on the development of the house in plan and design in all periods, we cannot omit the royal villa with its chapel or temple to their gods; or was it used for another purpose—as an exchange or market-place?

It is the earliest known Basilican plan of nave and aisles and is four bays long, the prototype of the Roman and Gothic church plan of much later eras.

There is a raised bay or chancel at one end having a central group of three steps with a balustrade on each side forming the first chancel screen.

The balusters are of a delicate and refined line, superior to anything in Roman or Renaissance days—an early Greek effort of great quality, but the Cretans would rightly eschew any connection with their victors.

There is a small apse recess on the raised portion in which votive offerings were placed.

The building, be it what it may, is 37 ft. by 15 ft. wide, and today (that is, when last seen) had six column bases a few inches above ground and the lower part of its walls remaining, whilst the house itself possessed a double staircase with finely frescoed walls.

White stone was used for important walls and bases to the houses, colonnades and balusters, whilst the walls were generally of adobe or sun-dried brick plastered both sides, timber framed and therefore of brick or clay nogged construction.

The palace of King Minos, once under a mound of sand and rubbish, was unearthed in 1900 by Edward Evans, who was afterwards knighted. He questioned local natives, and these spoke of stone walls with bulls carved upon them. The result was sufficient to prove a greater amount

of mythology to be the actual truth than spadework has hitherto ever been able to accomplish on any one site.

The twin colonnade of white stone piers has been re-erected, but little remains above or of the ground-floor itself, and for the example of the great Cretan staircase one must travel to nearby Phæstos, where the palace stair is 45 ft. wide.

The Minoan column, like our table-legs, is unique in having its shaft narrower at its base than under its capital. The latter is a round pad with a square abacus on its top, for it carries the heavy beam.

The column is often surface carved with zigzag or chevron ornament, which precedes the simple Greek fret. This turns up again in the Norman or Romanesque, although, curiously enough, the simple Greek fret breaks in again in Normandy, at Caen, in the semicircular nave arches of the large churches, many war damaged no doubt.

The symbol of the double axe-head, or labrys, is common, and it is the symbol of law and the enforcement of it. Whilst the Romans used it later bound in a bundle of sticks to represent unity and law, and as such they were carried before the magistrates of Rome by the prætors.

I recall using this symbol cast in iron to a flat oval shape as a baluster to a town club staircase, and it was finished in green with an English gold wipe. The steps were panelled in green asphalte and appeared as if a green carpet was laid. Against a background of plain panelled walls this stair, which was of reinforced concrete 6 in. thick and without beams and with but a slight string projection, gave me more pleasure on seeing it again after a lapse of twenty years (still as bright and well kept as when built) than if I had been the architect of a ponderous resuscitation of English Renaissance in the Metropolis, or even if I had utilised the solid balustrade or the hoop-iron rail types of today.

So much for what was then called Neo-Grec, it was a stimulus even in pre-1914 days to have put aside the coarser Renaissance with its continuance of Roman orders, pedi-

ments and the compass-drawn moulding. It is astounding that whether the Renaissance be Italian, French or English, the knowledge that their trappings originally came from ancient Greece was not known to the architects of the national periods, not until the beginning of the nineteenth century when Cockerell fought his way through Greece to measure, sketch and study the origins of this columniated architecture that had become so debased in coming down the ages to modern times, though there are a few gems of astylar examples in each period that do appear to have been designed by an architect who was at the same time a real artist in his craft unaffected by the " veneer " design.

In leaving Crete and the Minoan period, and as we take a last look over some of its ruins from the flat roofs of Phæstos, it may occur to us that crude men from the north have again damaged this same coastline, once again with its white towns badly damaged.

As a token of the success of the 1650 B.C. architect, we are conscious that after a heavy shower of rain, the drainage system still works as it did in the days of his client's occupation. For the flat roof discharges its rain-water down the staircase in the well-cut gutterway in each marble step, cascading from one to the other and swirling around the wall edge of the landings where the gutter is banked up like a motor track with a slightly overhanging lip to hold the clear water on its way down to tank and drain.

Comparatively, in our large buildings today, and for at least thirty odd years, we also have kept our rain-water and other pipes inside the building, in a large pipe duct, easily reached at all levels, and double floors containing drainage between them connect up with and are entered from them, for painting and easy repairs. So there is no disfigurement of the important elevations to the roads or internal courts.

Now even our modern houses are designed with an internal pipe duct, and we follow the ancient prototype and keep our rain-water inside.

Our fragile gutters and downspouts are a menace to our

house walls, whilst our bits of slates and tiles on raking roof, together with the laths and tiering, are too temporary for even a reasonable life to a building.

In our brief résumé of plan and design in the ancient times of Babylonian, Egyptian and Cretan housing, we must not forget that the labourer was probably content then with his single bell or domed hut of sun-dried clay, probably thatched on top. It was up to him to add to it, for the State did not then look into the question of overcrowding, nor provide a house with a bath for him, at an uneconomic rent that must be added to by others to make it possible.

CHAPTER XVI

GREEK ARCHITECTURE

The Houses

IF I had the alternative of inspecting either the contents of the museums or the skeletons of her ancient buildings, my choice would lie with the museums. Though so many have been deliberately bombed (by the only nation capable of it) that that and the certainty of looting (most probably of a wholesale character) might now leave but the latter alternative—together with a visit to our own museums.

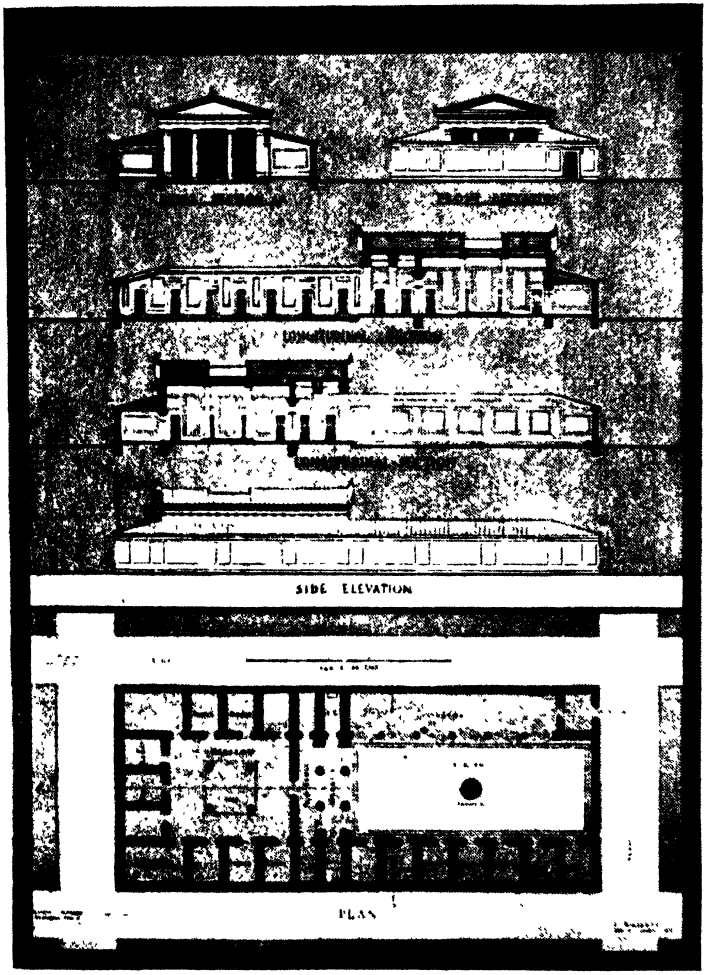
It is truly wonderful that the Greece of old remains with us even to the extent that it does, for there was no protecting and rising sand as in Babylon and Egypt.

The Greek house design is a natural development of the Minoan megaron now pedimented at either end and with a lean-to roof or two on the small private rooms surrounding it, at so flat an angle that it fully passes muster for ultra-modern work today, though not for slates and tiles.

There was an entrance yard or atrium, having generally a summer living-room facing south and widely open to the sun except for the range of piers or columns that carry the upper room wall over. The latter would have an outside stair leading to the bedrooms or stores, whilst other guests' and servants' rooms would face this yard or entrance court.

There might also be a chariot or coach-house and stables, with a covered entrance, either inside or outside the yard. And we must not forget the drinking-water well, in addition to any rainwater tank used.

The houses of the reign of Pericles, a period which covered the seven years of great building, are a hundred years earlier than the very human age of the Hellenistic period of Alexander the Great, which occurred long after Sparta had had her war of attrition and jealousy with Athens.



A Greek house without the open-air living-room.

These Periclean houses were of sun-dried brick, and were not so rich as the Egyptian of a thousand years earlier, although the fittings and furniture were of fine design and workmanship. Irregular polygonal or even broken stone was used to face the external walls, and these Spartan houses had no internal plumbing, for all water had to be carried by the slave women from the public wells. These were pleasant centres of gossip, and the covered water supply of one to three pumps formed a pleasant bit of architecture in the lanes.

However, these narrow crooked lanes gave way to the better roads and houses of the last grand years of Greece under the Macedonian Greek Alexander, prior to succumbing to Rome in 147 B.C.

These days were unexcelled in freedom and invention, and architectural planning and design were now developing on very free lines in place of the stiff perfection-seeking days of the Parthenon, when architects Ictinus and Callicrates designed and supervised this and many other fine buildings about 438 B.C.

These Royal Axemen did produce perfection in marble and stone, and would be truly shocked at the commercial architect's Renaissance produced by our Western civilisation until this very day. The Roman had produced a third-rate and easily adaptable set of parts for the service of *the complete architect*, Prix du Rome standard, a heresy in theatrics.

Amenities increased in the later Greek house, which reached quite a high standard in consonance with the times. There was a bathroom with a wash-basin partly built into the wall and a bath having a bronze outlet pipe leading through the wall to a sump-hole outside.

Even external walls were curved to fit the outline of the land purchased, though this did not then lead to curved walls as an enclosure to space unless forced upon the architect by the shape of the site, for they were not then tired of rectangularly enclosed spaces. However, the think-

ing minority of today in most things forms the nucleus of the majority of tomorrow, though this free innovation is hardly one that would appeal to the Renaissance mind. If the latter could assimilate this freedom into their symmetrical designs of dressed-up pseudo-antiquity, or very refined Roman engineer's classic, architecture imprisoned by Palladio and Vitruvius together, the result would be incongruous.

In the later cities a little more thought was given to town planning and the roads bore some relation to important buildings, and it might be so arranged that one could be seen at the end of a street. Now this long view of a building has been termed a vista. In both Roman and Renaissance times, except in England, great use was made of this grand approach. Wren's plan for the rebuilding of London had it not been made to appear too difficult by private owners, anxious to rebuild immediately on the charred debris of their sites, might have given us a flair for an over-rated appreciation for vistas.

Perhaps it is better as it is, for if it had really got going (that is, farther than the architect's drawing-board) London would have appeared in dull measured academic Renaissance garb until the final trumpet call. So let us be content with the Mall, our one ewe-lamb so to speak.

Hospitals were erected in latter-day Greece, and no doubt the road traffic of chariot, horse and bullock-cart would produce a quota even then of their daily intake. But not in Priene nor Pergamon did the internal-combustion engine travel at 15 to 60 miles an hour. Not until over 2,300 years later were our main arterial roads to take fast through traffic only, with intermediate roads or sub-arterial roads to pick up traffic from the local roads—such as were all the roads in these Greek towns. So it will be that the local roads will hold such vistas as are opportune in the various districts now best described as precincts, to be known by a special appellation such as cathedral, university, abbey, college, school, market, shopping or as may be.

The Doric Order

Many say that the Greek Doric Order of architecture is based upon earlier timber construction and that its construction failed to change with the new materials—stone or marble.

Both timber and stone construction is of the post and lintel type, and therefore the copying of timber work cannot but be trivial and in detail. There is the ornament of flat spar feet underneath the cornice soffit, with what might be called pegs hanging from them. They are actually termed guttæ or drops—like one of the best figs grown, the gutta, on account of the juice drop hanging from the figs when ripe on the tree.

The Greeks preferred ponderous monumental building, and although we need not fall into raptures over the coloured Doric frieze, one may very easily do so in the case of the light running sculptured band of figures fixed on to a black background as in the Ionic Order, in the north portico of the Erectheum, which stands but a stone's throw from the Parthenon on the Acropolis at Athens.

Well they knew that, so far as the mere dictates of construction demanded, their monumental work was far too strong and they were wasting 50 per cent. of the material used in column and lintel in their earliest order, the Doric—for the bed-joints of the stones or drums of the columns only touched one another for 3 in. around the centre hardwood " rotating " peg and at the fluted edge.

The slave labour rotated the drums to a fine joint, and the resulting dust inside fell into the sinkings in between the touching rims.

No mortar was used, and all joints were so fine in the marble that they filled up and became invisible, through free movement of lime from the marble, some rainwater and pressure.

This hollow construction was most marked in the entablature that rested on the columns; and these stones were

clamped together by bronze cramps, though you could walk in between the marble blocks.

This group of finest Periclean architecture was erected in a short space of seven years, together with so much elsewhere, in a period of great exaltation to be memorialised for ever.

The great standard of excellence attained may be understood if we compare the finest Gothic sculpture of Rheims Cathedral with Minoan and Greek as that not yet surpassed. The Greek building appeared as if cut out of one stone, whilst the Gothic required its small stones of coarser material together with wide emphasised jointing to form the coarser texture demanded by its lower class of workmanship and design, for few of its buildings are not defective to a degree in many places.

The Greeks did not use a column having its taper and entasis beginning only one-third up from its base, with the bottom third either increasing, say, $\frac{1}{4}$ in. in a straight line from the base; nor was this third just a true cylinder. Yet this debased form was paramount in Britain even up to 1939. I have often wondered how many have taken the trouble to study the purity of Greek architecture, for surely it would dawn upon any architect of refinement that the line of their columns, and incidentally those of everyone else, would or should be one where taper and entasis both begin at the base; which results in a naturally true line of grace that the eye cannot detect any sausage effect in column shape, however slight. For this is disastrous, and nothing more betrays a superficiality of column study from those cards of the orders that were the be all and end all of the cheap eclectic of—but perhaps I am still premature in adding—the past.

The Parthenon

The Parthenon was, after all, so simple in form that it was but a glorified dog-kennel. It is surprising that such a hard shape could be so planned in its design by the Greek

architects that the result was nearer to perfection than any building of other periods.

The softening of all horizontal lines by upward curvature in consonance, if exaggerated, with the curve of the earth's surface, to avoid sagging.

The long steps of the stylobate were cambered $4\frac{3}{8}$ in., the ends $2\frac{3}{4}$ in., and its beam, frieze, cornice and roof followed in correct sympathy—a curving parallelism, or of concentric but very flat arcs.

The columns were not even vertical, but inclined $4\frac{1}{2}$ in. towards the building to counter any effect of top heaviness in appearance that would be slightly accentuated by the camber of the steps and the entablature. Nor were the columns in line, for they were on a centre line convex on the flanks and concave under the pediments, which were also concave.

The inner colonnade under the latter was raised up on two steps, so it was necessary similarly to raise its beam and capitals above those of the outer colonnade. Just think this over and let its effect be visible in modern architecture, for it is the sympathy of the modern sketch that fails to fructify in the building.

Under the peristylar passage, or pteroma (the covered way all round), was the finest frieze of continuous low-relief sculpture to date, on the temple walls under the coffered or panelled marble ceiling the same marble as used for the whole building, pentelikon.

Lighting to the frieze was only that reflected from the steps of the stylobate and the flagging of the pteroma, and to aid vision at this height the frieze is tilted slightly forward so that the Pan-Athenaic running groups of horsemen, chariots and figures would receive the almost vertically reflected light from below.

The double doors were 33 ft. high and had wheels of bronze that ran on quadrant rails let into the 1-ft. thick pentelikon floor, much of which remains today.

Much of the plain surface of the Doric Order was decorated in colour, and stencilled patterns included frets, honeysuckle, wave and scroll in buffs, black, green, etc., and a considerable amount of colour may still be seen on the Theseum Temple lying at the foot of the Acropolis, the treasure citadel on a hill, upon which the Parthenon, Erectheum and the Propylæa stand. However, in the later orders we find colour work dying away, as form of moulding and carved enrichment take its place.

The Greek Ionic Order

The Greek Ionic Order, with its voluted capital from the iris frescoes of Crete or anywhere else, reached perfection in the north portico of the Erectheum, with triple stranded volutes divided by a deep sinking and its low honeysuckle carved necking that some criticise as being non-essential. Probably it is.

This deepening, however, soon led to the deep bell-shaped Corinthian capital of small volutes and acanthus leaves, so much adored by the later Romans, but with results not at all comparable with the Greek examples.

As a beginning, no two Greek Doric capitals are the same; some are very much more human and more interesting than that of the Parthenon. At Delos there is a deep hollow and the water-leaf is introduced.

Preserved may we be, however, from any further square-shaped volutes by modern clever personal style classicists, for it is simplification that is wanted plus a little gold-and-blue mosaic rather than dressily tortured stonework—and it is absurdly expensive and inane.

Experiment with stone surface fillers, silicate or other, to keep your designed shadows on a cleaner stone face; even Portland stone might be treated immediately after washing off the slurry dirt absorber that makes the cleaning-down process so much easier at completion, though penetration must be deep.

The plain black marble frieze of the Ionic originally had a

mellowed band of white marble figurines flowing along its surface. These were rag-dowelled on to its surface, and it was quite a pleasurable contrast to the stiff frieze of the Doric. It brings to mind our modern shops with a frieze over their windows of silver metal lettering, inset and upon a contrasting glass or enamelled surface of blue, orange or a tone of lesser contrast.

It must, however, not be forgotten that the metopes and triglyphs of the Greek Doric were also contrastingly coloured in two shades, red and blue, and with the White Temple, then lightly coloured, it might have appeared surprisingly patriotic and vivid in its heyday. And why not?

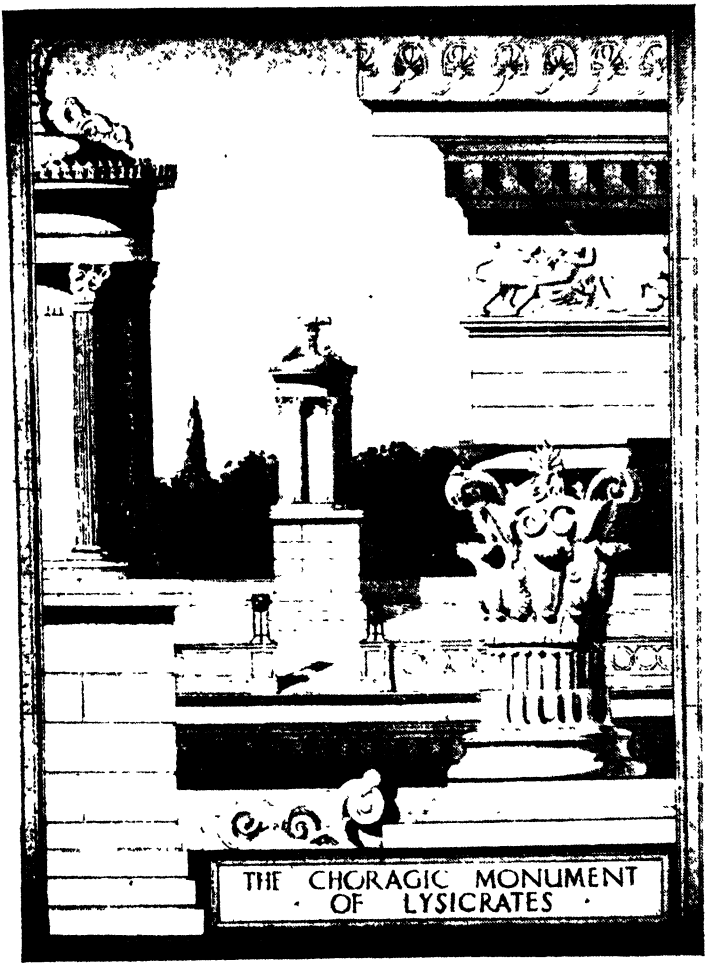
The Greek Corinthian Order

The Greek Corinthian of the fourth century B.C. again bears out the masterly treatment of form that one has come to expect from these unsurpassed architects. The conventional treatment of horseman, foliage, enrichment and moulding if compared with the Roman copyist's idea of them later never leaves any doubt as to which is Greek.

Your powers of freehand would be extended in drawing the Choragic Monument of Lysicrates, lying just below the Acropolis at Athens, whether it was a general drawing or sketch, a measured drawing or an enlarged detail of but part.

Below the six-column circular body of the Lysicrates Monument is a square plinth, and its marble masonry had jointing emphasised by a broad, slightly recessed edging at the top of each course; whilst the occasional vertical joints were hidden by a smaller channel sinking of lesser depth.

Thus is commenced the rustication of the joints in masonry with emphasis laid on the horizontal joint channels, as we find in the better-class work in all the later periods but Gothic. It even spread to brickwork, where one brick in five would be set back to form the channel.



The Greek Corinthian at Athens.

But this not only aids rain percolation into the walls, and is common in short lengths at the building angles as quoins, but war-time children have climbed to the roof of even public buildings to sit in a row on the cornice over the first floor. No doubt they could go higher if provision was made in the studios of overdressed design.

Apparently the earliest Corinthian column and capital is that which stood in the centre of the Ionic interior of the Doric Temple of Epicurius at Bassæ, previously mentioned.

This is a charming example, and one that would have been unknown to us had not that great "Greek student" architect of ours—F. P. Cockerell—not stolen ashore and measured it carefully, and sketched the temple, in very rough times for travelling students. He kept out at sea in a small boat and carried a revolver; even then the wild ruffians of occupied Greece holed his boat and smashed up the one and only Ictinus Corinthian capital with their rifle butts.

The largest Corinthian temple is just below the Athenian Acropolis, and the capital has become more stereotyped in form and therefore rather less interesting. The scale was immense, and ordinary chairs for tourists read against the column height give a good measurement or scale to the seventeen fluted columns remaining, and the temple was not completed until after the defeat of Greece by Rome.

So much, and yet so little, for the original three orders that were, through Rome decadent, to hold the world in such awe for almost two thousand years. No building was architecture unless it betrayed architecture by a sham academic dress or overall of Roman Classic of its fifteenth-century Italian resuscitation, just as if we were still under the Cæsars or with the Medici.

The greatest building period of the Greeks is that under the later Macedonian King Alexander, the Hellenic time in all the Eastern Mediterranean when the great lighthouse or pharos was built on the isthmus at Alexandria, and its

immense highly placed octagonal lantern with its light visible thirty miles away, the base to it was a building in proportion which accommodated the 100,000 books, etc., then transferred to it from the old Egyptian Library of the University of On, later Heliopolis, which became unimportant after the transfer.

The Greeks by this time utilised the window as an integral part of their design, and both these and their doorways would have slightly raking jambs, as in the early Erectheum Temple; where, however, the windows are of rather later date.

The Tower of the Winds

Before leaving Greece there is a little Greek building that stands near to the Roman market-place and exchange at Athens. It was built in 100 B.C. in Roman domination days. It is the Tower of the Winds, a small octagonal flat-pointed roofed building that housed the Clepsydra, or water-clock, so that business people could see the time by entering through an entrance door and leaving by the exit door. The octagonal interior is 22 ft. 4 in. across and 41 ft. high, and there is a two-column, or distyle, porch to each doorway. The order is Corinthian, though there are no volutes, and the bell-shaped capitals have one row of acanthus leaves at the necking, whilst above are plain water leaves, or palm or lotus, that form a second row with nothing more above this. (See small sketch plan illustrated.)

A little turret at the rear housed the clock and its water tank; whilst as a check and standby there were sundials on the vertical sides outside, just below the panels of the winds; eight in all.

The sun would always shine on one dial, but if one was not so clear you could try the next.

The wind panels were carved to suit the wind. A female figure on each was dressed to suit—hood drawn over the head for the north wind, and likewise minus hood, cloak and all else in the panel enjoying the southerly aspect.

It is a late effort, for in the purer style of earlier days both the octagon and the circle so much enjoyed by modern architects, at least in the half-circle form, were eschewed as being below hard Spartan standards.

Open your modern book costing from sixpence upwards and you will appreciate the telling contrast with the past symmetry of everything illustrated centrally on each page; for here the illustrations are placed as if cut through by the edge of the page at corner or side. Well, so is the finely modelled Greek head on the silver coin which occupies only the area to the right of and between one o'clock and six o'clock on the unbordered circular coin. The one-third area covered by the head in contrast with the two-thirds plain space on its left is so modern in its outlook and treatment of space, untrammelled by aggressive symmetry, that if the coin is placed on the modern illustrated page together with one of our own, which would you think is the more modern in its free design? Sorry to say, it is not our currency with its borders, bands and garters of mediæval times, much improved though it be.

May we hope that some future issue will find its design based on this theory of pleasant contrasts in spatial treatment of the area at the disposal of the artist, in place of the Roman mediocrity of the all-overish encroachment on space to the point of its non-existence?

The architect recognises this attribute in his design by reserving his richness and subdivision for his entrances, leaving plain all but a window or two in his cliff-like façade until high flashpoint is reached on the skyline in full sunlight.

The thin stone and brick modern Georgian collects his windows into a group or groups, leaving isolated windows unemphasised outside in plain brickwork. He could, in fact, still further obliterate their effect on his design by a darker differentiation in colour of paint used. Similarly doorway and turret are emphasised, and everything is done to increase the spatial contrasts with the surrounding brick

surfaces, and increasing these by every physical and illusory power available to him, and resulting from his long and assiduous studies.

The ultra-modern architect is not in another category. With him also it is a question of interest, spatial balance by contrast, and an increasing appeal to bright colours and immensity of white walling. Though it is asking far too much to expect the bronze medal for a façade of nothing but evenly spaced sash-windows cast in a reinforced concrete façade, simply because of its contrast and scale with its adjoining block at right angles to it but twice its height and three times its length, and having an unbroken surface of unrelieved concrete.

Of course with the windows in the foil block painted blue (for as long as this so readily fading colour remains effective), and with a window-box filled with orange nasturtiums in each sash-window, plus a 4-ft. wide massed bed of these at the foot of the immense block of concrete alongside, perhaps even this architect (if he was not an engineer in disguise) might imagine his colleagues reduced to overpowered awesomeness, his overdraft expunged, the R.A. doors beginning to open and his picture-paint-stained fingers on the medal.

Yet, give the devil his due, can you honestly say, as a true artist in architecture, that you wish Britain to be rebuilt in the oh so properly pedantic and academised Italian-cum-English Renaissance? And, by the way, as the latter word means rebirth, how long does this operation require? For it is becoming more than painful in the twentieth century A.D., rigor mortis and mummification having set in unbeknown quite 150 years ago.

To you who decry triglyphs and metopes, with me, see what a shaft of light even a little silver Greek coin may produce, and for evermore remove your hat to the Greek Doric Order, not for its own high elevation but for what lies behind it and not too visible to the uninitiated, for the weight of its columns, together with those triglyphs, form an almost

impenetrable smokescreen that prevents appropriate and necessary appreciation of what is behind and forms the cradle of European architectural design in form and colour.

Mosaic and Vase Painting

Greek figure sculpture, or vase painted, wall frescoed or in mosaic always stands strikingly attractive in its purely conventionally conceived outlook, and in this there is always a tendency to improve upon nature, as if to impress you with the idea that those portrayed (say the Athenians or the Delphians) are outstandingly strong, lithe and well shapen, and not of flabby human curves and proportions. Neither their architectural mouldings nor their body muscles are compass drawn. It is all a matter of thoughtful design of line, proportion and shadow, a gaily free artist's interpretation of finely drawn and excited work. Like all things in architecture (or in its setting the garden), it is a selection open to all; either the work of the trained and free artistry in architecture or the drab as exemplified by black façaded and depressing property; and that badly designed or not the work of a qualified architect—one free from the work of the past, whose staff is not divided into compartments of Byzantine, Renaissance, Gothic and other dead-hand imitations.

Our artists today, on canvas and in marble, have not forgotten that it is a telling factor in avoiding the commonplace to draw or carve the head to a smaller size than is found in the man or woman of real life, just as the Greeks did of old.

Not so the Romans, and some moderns, for these times are about on a par with each other, although the Greeks were alongside training their coarser outlook, degeneracy of sculpture, architecture and all else rapidly came about, for the appreciation at best was but superficial.

The Greeks show more than the rudiments of perspective, for in carving, mosaics and paintings elevations are

indicated with returns of another face running down to one vanishing-point.

As they became conscious of perspective and space, their silhouette band of red or black figures in vase painting fell into disuse, and so did vase painting itself.

Wars do not aid architecture, for architects require cheap materials, few debts and everyone building and working for themselves.

One cannot blame perspective; it was just the general all-round inability to hold the high governing principles of planning and design up to the level of its previous standard, so as to prevent this slough into depravity in a coarsening age. It is, however, surprising that when the Romans developed full perspective with two vanishing-points, contemporary writers, such as Pliny, scorned the imitation of realism or naturalism in these pictures—and he was a Roman.

This naturalism, however, did coincide with the continuous retrogression through the ages, apart from a few high-points to be enumerated, and unbridled licence eventually let in the renowned nineteenth century of the aspidistra, "Gracie's Orchid" known to all; it bears a low white embryo of a flower that comes, appropriately, to n'owt. Just as architecture slipped into the abyss of oblivion with but a few strands hanging fairly high above the catastrophe, the thin red line of Greek enthusiasts—Stuart and Revett, Cockerell, Elmes, Burton, "Greek" Thompson and some others—held on but overweighted themselves with ponderous copy and darkness therein.

Had there been a dozen schools of architecture then, to augment the work and studios of these men, forcing the hand of a public without knowledge but with many cranks, a majority "so Gothic revival," the terrific building effort might have been put to very good account, and not even have known the false masonry-jointed stucco of the Regency and later. We might even have reached the reinforced-concrete period, so called, without an intervening period

that in its violent severity is almost unclassifiable. For the best periods have been functional, but only few astylar and relying upon fenestration or window treatment for effect.

The bottom of the abyss was reached when the cast-iron ogee gutter of small red or yellow brick houses was supported upon two courses in red-pressed, moulded and enriched brickwork, each of these an egg and dart course, but the upper course was placed upside down over the lower, so that the eggs were one over the other, twice as high, two yolks beating as one, and, as might be expected, by then even the worst Roman detail had been excelled, for there was no one to say, " Stop ! Mr. So-and-So of Repute says what you are doing is utterly foul. Go away and take your aspidistra with you ! "

CHAPTER XVII

ROMAN ARCHITECTURE

Peace Treaty Architecture

WE must open the door to the first of the wreckers, the Romans, who in their *Roman* (*Classic*) *Architecture* did try ever so hard to emulate Greece, that for a hundred years, whilst still being coached by Greek architects working in Italy or through the training of their students in Greek schools of architecture (all as part of the peace treaty), did work that was interesting even if it had lost the pristine free beauty in a boundless increase of fussiness as their work went on—and down.

The best examples of the peace-treaty works are those by Greek architects in the temples of Castor and Pollux, Vespasian and Mars Ultor.

Few today appreciate the fall in the architectural status of design and detail that is to be found even in these, a measurement that will expand as the era of the geometrical engineer professing in architecture smothers out the freedom and high art point in building that was so natural in the Greek times.

Sculpture had almost gone and small carving effervesces over the Roman's favourite order, the Corinthian. The flutes disappear later for coloured marble, conventional parabolic-line mouldings disappear for geometrical, whilst the live spirit of design dies in the debauchery of its high standard to a cheap eclecticism of Greek features now thoroughly badly drawn, coarsely worked and scandalously used, just as you will find them today, though more refined of late, in the Roman aftermath still in vogue to this very minute.

False Construction

Beams and columns of small stones built into a stone, brick or even a 20-ft. thick concrete wall, as does in fact carry four storeys of this rubbish in the Colosseum, Rome, as if they were trying to convince the uninitiated that these are all honest-to-goodness beams spanning in one piece of travertine from column to column, and that to a lesser degree they are also carried by these columns, which are, in fact, actually but part of the wall.

The concrete arches carry the beam with the wall, but holding columns, beams, etc., to a stabilised face to prevent their collapse; the collapse of a column or point of support is quite humorous and similarly absurd.

A stonefaced, scenic or applied facing for evermore to be considered architecture. And, believe it or not, in some considered high circles it still is.

The disease started with Castor and Pollux, in which temple of those Augustinian days the entablature beams, known as the architrave, were in fact flat arches of three stones, one overlapping the column as a cantilever to approximately the point of contraflexure, and the middle stone splayed on its sides to fit in as an arch keystone does, and is resting on the skewback faces of the two cantilevers. And to add constructional ability to aid untruthfulness still further, I believe that these splayed voussoir joints are joggled—that is, they have a small shelf in a suitable spot in the skewback so as to prevent the centre or keystone of the flat arch from slipping and spoiling the continuous fillet and carved mouldings of this main architrave or beam—if a flat arch may be termed a beam.

Later, Perrault, the architect, in his late addition to the Louvre, Paris, again uses this device over his pretty pretty coupled columns which were to become the competition fashion of pre (first) Hun war days, but even this triviality still lingers, but not in more functional steel design.

It must be remembered, however, that to face a brick wall

in stone, marble or any other material in the form of slabs, or even in a narrower brick of a better texture and colour, does not lay this form of construction open to any serious criticism—that is, in comparison with the copying of Roman detail.

Otherwise, it must be considered extremely naughty of nature to fit the human body with a skin to keep the weather out. We should look jolly and up to date with our muscles on view and in action—quite in keeping with the Machine Age to be sure.

I am afraid that if one cannot afford the full reinforced concrete of the mushroom column and flat-ceiling type, sheer economic necessity will compel the Royal Axeman to encase his steel-framed building with a skin, and to use a false flat ceiling with its beams hidden in this double layer of floor and lower ceiling in accordance with the plain surface now required, and to deaden sound from the floor above, the latter an advantage not obtained in the single thickness of the mushroom floor with no beams.

Now, where the Roman architect did go woefully askew was in his use of the pediment from the gable ends of the Greek building, house or temple, as a decorative feature over window and door. Originally the pediment slope of the roofs concerned was 13½ degrees, but in the coarser design it had to be steeper in consequence, and 30 to 40 degrees was the rule.

Over the portico of the Pantheon, Rome, the use of the pediment was correct, even if the slope of it was increased when the Rotunda was built behind this portico of an older temple, though the larger plain surface of its tympanum simply cries for the sculpture of the Greeks. To introduce that would mean recasting its design in keeping throughout from a third-class to a first-class conception and finish.

The question of Greek or Roman style does not enter into it at all. It is the artistic mind of the architect, above all, that is being compared by the result obtained.

Again, Roman columns were usually in one piece of stone

or marble, even granite, and unfluted, and were therefore monolithic in construction.

This single piece of stone up-ended as a column is not good construction. For as we know too well, to our own cost when we likewise transgress, all stone to last in a building must be set upon its natural bed, just as it lay in the quarry. Hundreds of tons of stone were cut out through premature decay caused by overlooking this in one large modern building some years ago.

The decay was accentuated in these monoliths, for the columns were tapered, thus increasing the entry of rain into the strata formation. Constant wet and dry conditions did the rest. But frost would greatly hasten destruction by greater expansion, and so to snap off the edges of the strata.

Concrete Construction

It was not until the great Roman Concrete Age that the Romans in part dropped the use, or misuse, of debased interpretations of Greek bits and pieces anywhere and everywhere on their building façades.

It was in the more utilitarian projects in building, such as bridges for roads over rivers and aqueduct bridges, that a plain stone-faced concrete without trappings sufficed and produced a good inoffensive architecture relying on a fine contrasting proportion of arched voids and piers, as in the Pont du Gard at Nîmes in the south of France, and the many aqueduct bridges carrying almost level water ducts, or aqueducts, over the Pontine Marshes to Rome, that this period reached its zenith in architectural perfection, and the thin stucco finish over the brick-faced and stone-faced concrete was not lined with imitation joints. One notices with interest these coloured surfacings, or casings, now showing where the Roman cement skin has worn or fallen away.

The marble-lined external walls of the baths of Caracalla and Diocletian in Rome, in part stucco, must be added to

the plain-surfaced buildings of this age; even now when stripped of surfacing these concrete buildings with the huge hemicycles give a forecast of the rest that is to be when we cease to copy the would-be academic Rome, whether the original classic from an earlier and purer source or the resuscitation called Renaissance.

This marble- or stone-dust Roman cement stucco remains clean in Italy, is common to both Roman and Renaissance eras, and it adhered well to the 1½-in. bricks forming the usual casing to the thick concrete walls; possibly many coats of thin wash stucco was used and finally polished to aid in dirt resistance.

These bricks were triangular, 18 in. long and 9 in. to their apices in the wall of concrete. They were broken bonded, with a through rectangular brick bonding, or fracture-reducing course, every 4 ft. up the wall.

When little stone pyramids were used in lieu of brick, these formed a diaper or reticulated pattern known as *opus reticulatum*, reduced by our idiom to network. The concrete must have been very dry to hold these almost stone canine teeth as a wall surface until it had set.

Brick quoins were always used at the angles with this *opus reticulatum*, for the little stone pyramids could not go round a right-angled corner, though they could have been worked around one of our rounded corners that are used to soften the simpler buildings of today.

Neither the Romans nor ourselves have mastered this material, concrete, and with it its co-related cements and plasters—for it shrinks about 1 in. in 70 ft. and it shows shrinkage cracks in everything from a reinforced-concrete building to a reinforced-concrete road, and in your plaster ceilings, especially the old-fashioned thin ceiling to the top floor under the sloping roof.

The study of Roman construction should have taught us many a remedy long before we again had to learn from experience.

The Roman concrete walls developed large fractures and

many smaller cracks. So did our earlier efforts. But there should be none now; all should be reduced to hair cracks and camouflaged in our best manner, although the shrinkage is still there.

To overcome the larger fractures the Romans divided their walls horizontally throughout their height into 4 ft. strips, by building through them with large slabs of brick, 1½ in. thick.

This gave little facility for fractures, for each crack had little height in which to develop and, owing to the separate layers of divided concrete, such cracks were not continuous from floor to ceiling nor from foundation to roof.

Further, when these minor cracks came to the surface of many small bricks built into the concrete to serve the double purpose of shuttering, falsework, formwork or casting trough, and also as a crack diffuser to split up the larger cracks into hair-like cracks running around the bricks, there was then little left of the crack or shrinkage fracture to destroy the frescoes on the stucco that were always added to the brick surface. Nor when mosaic was used did it break away in patches, nor did it unduly show cracking beyond hair cracks and the crazing common to cement facing when the wall is not wetted first before the stucco is applied; or if the latter is too rich or its aggregate contains too much fine dust, is badly mixed and many another cause, some as yet unascertained, though readily assumed by the looker-on.

Roman concrete bears no real comparison with that material today. Though, however much we have improved upon their first attempt at a homogeneous material, neither Roman nor modern has overcome its shrinkage, nor its porosity when exposed to the rain.

In ordinary circumstances the steel bars forming the reinforcement expand through rust resulting from rain percolation, and gradually in ten to twenty years the rods and their binding may push off the thin concrete covering to expose themselves in beams, columns, cantilevers or

cornices. One such building erected in 1911 had already exposed its reinforcement at some of these positions when I first examined it in 1923.

One beam must have lost 25 per cent. of its strength—and to repair concrete is not too easy, for old cement concrete does not become homogeneous with the new, and there is a loss of strength in patching in a manner similar to dentistry.

Probably by hacking the fracture and replacing the missing concrete with cement and sand grout, fired or under pressure from a cement gun, will partially remedy the defect. The existing surface should be wetted and cut to form a key in dovetail fashion.

But for permanency and when effectively made rainproof, or with the building frame covered as of old—although this may shock the modern men who have found concrete but recently, and would cast iron railings into it—there is, however, no better material, particularly for earthquake, bomb-proof buildings and fortifications. It may be trowelled to a fine weathering and traceried surface, but it will generally throw off a camouflage of colourwash rather too soon for a long war, and is better inside a building if surfaced with some building board as an insulator—otherwise condensation is a continuous problem, and the decoration of its surfaces without patches of varying shades becomes well-nigh impossible, whilst concrete steps or hoods exposed to the weather should not be brought to the inside of a building, or the wall will be wet for evermore.

For the prevention of rain percolation I have found that a good rough key can be obtained on all exposed concrete surfaces by coating the timber sheeting with " Redalon," and then covering or skimming the concrete surface with a good coat of cream waterproofed cement and sand. But before skimming, the rich cement surface whose setting has been retarded by the " Redalon " must be strongly brushed away, and the roughened hard surface remaining wetted, as it is required for skimming.

There are other methods—such as waterproofing all the concrete work, in the mixer, for the work that will be exposed, and no doubt the surface will remain the cleaner for it if the mixing is perfect.

Will those who, like myself, still find it impossible to do without brick (which is an ancient and yet still a modern material), remember that if you use a hard, smooth-surfaced brick for interiors, your specification must allow for raking out the fresh mortar with a stick before it has set, or the plaster will most certainly be found to have addled over large areas, or specify that thirds rustic brick be intermixed to one-third of the area to be covered by plaster inside, or even with cement inside or out.

So, like the Romans, we are still trying to understand and perfect our materials. Even stainless steel is not what we had hoped at the beginning; not even glass itself will remain in the same condition as when made, though the change here is trivial. Steel in framed buildings and even as rods in reinforced concrete will not last for ever, for it still remains to be proved good for 60 to 100 years after erection.

Under constant vibration and changing strain, or accentuated by irregular loading, the small percentage of impurities rolled in the steel may start "split," or short hairlike cleavages dotted about in the material; and eventually fractures may develop through a weakness caused by a patch of these connecting up through constant movement or vibration. Even so, we have lowered the factor of safety.

The mosaic used by the Romans was of marble, and its tesseræ for the floors, such as in the Baths of Caracalla, were long and therefore deep set in the cement topping, whilst on vaulted ceilings they were flat, for there was no strain similar to that on a floor.

Today, however, so much improved is our cement that both need be of only ¼ in. thickness, even out of doors; in which position opaque glass tesseræ set in cement as a large panel containing the words "Garden of Remembrance" in brass (now turned to a soft black with the antique large

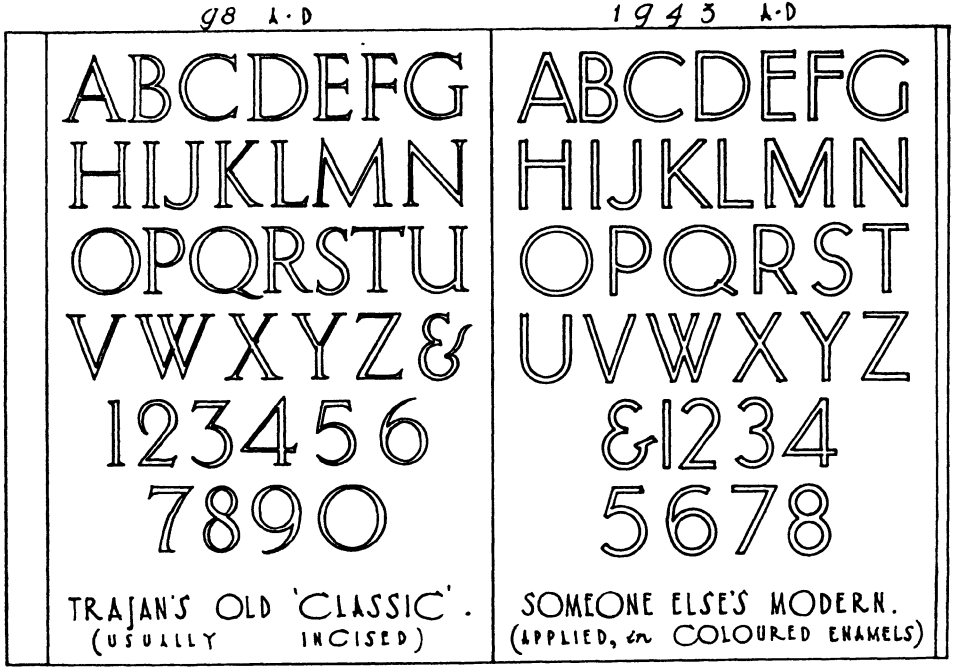
cream yellow tesseræ in fine contrast) is as good as it was twenty years ago. A good camber was given to drain the rain away to the beds on a lower level 2 in. below.

The big spans of the Roman vaults of concrete, which contained a hidden skeleton of brick ribs, were reduced to as short a span as possible for the start of the thin concrete vault, especially when it was of the intersecting barrel-vault type, for as much as possible was built up in the wall as a cantilever in one solid consolidating block. And this block of the intersecting groins is continued as a thick wall or buttress, or balance, over the cross walls separating the bays of the aisles.

Pozzulana pumice aggregate, as used for the thin concrete vault itself, would allow the latter to be balanced by the heavier concrete well-built-in block forming the balancing weight, just as in the balancing cantilevers and holding-down beam to negative the double load on the reinforced-concrete frame caused by the eccentric load of the 6-ft. projecting Portland stone-faced reinforced-concrete cornice of the Cunard Building, Liverpool, almost Roman in construction, but with a Neo-Grec interior.

The lightness and great toughness of Roman vault concrete was due to using the lightweight, porous and strong broken aggregate called Pozzulana, from the small town of Pozzuoli on the Bay of Naples, under Vesuvius. This, mixed with its fine gritty dust and Roman cement, made a light and tough concrete, and I have found the aqueduct bridges of France and Spain, where pebbles were substituted, but a poor concrete by comparison.

Græco-Roman building types filled the last century before Christ and the first century A.D. After that heavy concrete construction began to supplant it, and this held sway to *circa* 350 B.C.



Trajan's, and one of ours.

Planning

Asymmetrical planning to a degree, with but an almost natural balance of building and open space, with road and footpath as if formed by some natural power, none wholly straight nor all curved.

The buildings are sited almost as if the appearance desired was to be that of a huge farm of semi-haphazard buildings and yard spacings, the whole a municipal precinct that would be surrounded by arterial and sub-arterial roads for the long-distance non-stop traffic that must turn a round-about to enter the precinct, and slacken speed.

Some of the buildings in this scheme are of great length and form the side to an open space of an irregular oblong appearance, and bent or slightly curved to soften the otherwise harsh straight line, as if rejecting the slight approach of a would-be component building opposite as it trespasses too near on a line not quite parallel to it. The space left in between is not oblong and the whole plan appears haphazard.

In the first proposed new Civic Centre at Coventry, we had a good example of this modern plastic town planning, devised architecturally, but as if it were a bit of natural environment of rural irregularity. Even in the centre of a city, and subtlety of subtleties in this jigsaw of artist-architects' patter of a delightful balance of oddity, we do find, after all, that so-called crime of all crimes of the architect, a vista. A straight road across the width of the precinct from a tree-lined beginning and later under a wide trabeated opening, incidentally in the bent block, and then on to a low semi-elliptically ended building axially planned to terminate this cleverly devised remnant of Trajan and others.

At no point in this modern planned effort in combined layout of road and building does the work appear to be of any other profession than that of the architect. And its beginnings would emanate from the illustration of thought upon paper on a drawing-board, an inoffensive instrument that has been literally hurled at the profession as

being responsible for the vistas of geometrical symmetry of the past and the academically all-wide road of the future, caring but little for traffic control. And the sentence was to keep them to their sites; they must not stray on the town plan.

So far, in the L.C.C. plan of London, and now with Coventry and elsewhere, the leaders, the artists, the binding force in putting the best together with due respect to all the factors of the problem, and worked out in detail by the men and women working under them, are architects who have studied town planning, which is not a difficult problem for the qualified man in architecture.

May these architects have better luck than Wren. Except for his little Greenwich Hospital effort and its vista, his schemes died on the drawing-board.

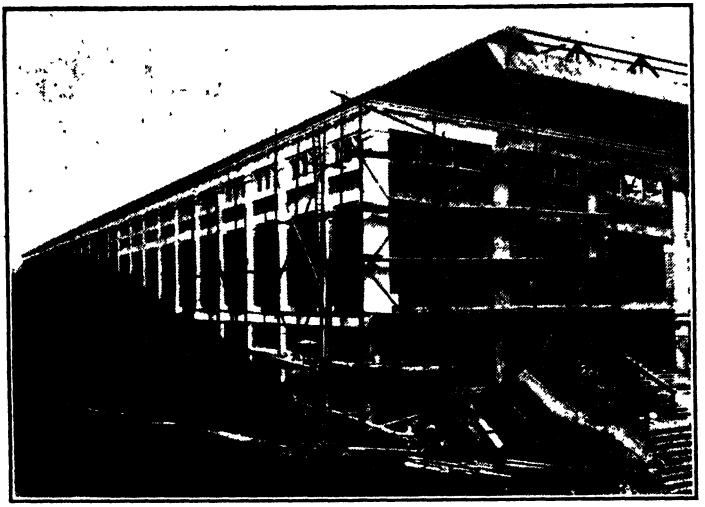
There is no doubt as to whom the authors have been in the past years, for the information is given in the pamphlet, *Post-war Planning and Reconstruction*, issued by the Institution of Municipal and County Engineers.

The Steel Age

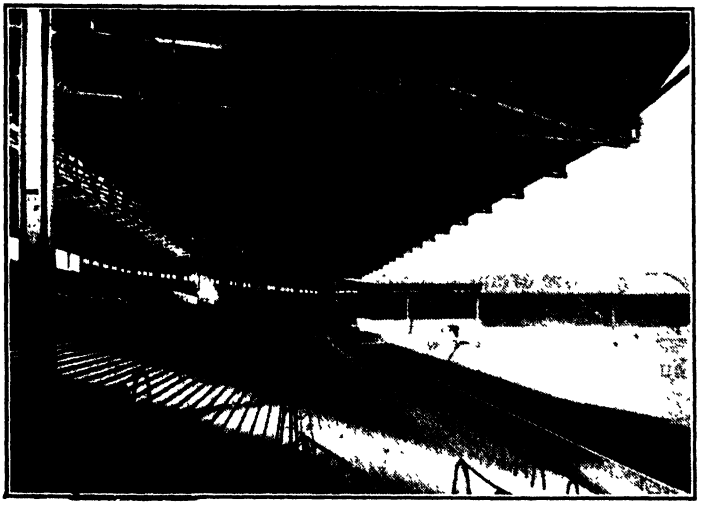
I wonder what the Romans would say to the Steel Age —when a roof of that material over one end of a football ground (that of the Liverpool Football Club) spans 135 ft. including a 51-ft. cantilever, and covers 28,000 people on 106 steps, through which but four stanchions penetrate, 80 to 90 ft. apart, and go through a cinder-hill of the past, down into the rock 30 ft. below. (See drawing, pp. 178–9, and photographs.)

Half of the accommodation is upon a suspended reinforced-concrete extension of the hill. The Romans called it suspensura. Theirs had no steel in it, and the spans were small between the brick piers underneath ; for their day was not ripe for reinforced concrete—theirs but introduced mass concrete.

The football stand, with the exception of its roof, is built in the light-steel framework with an auxiliary surround of



Exterior of football stand.



Interior of football stand.

reinforced concrete to give the required strength to post and beam.

The great advantage in the use of this " Ritchie " patent is in the fact that its shuttering hangs from the light-steel frame, and thus is the concrete carried, without propping from floor or steps whilst it is setting. This enabled the use of the stand by spectators during the season in which the stand was erected—1928–1929. Thus it is that the beams set whilst carrying their own weight, and tests prove that they are stronger on this account and the more readily take up the live load, for they are " pre-stressed " and receptive to load without initial sag taking place.

At that time the elevations were transitional in that the plain moulded capitals to the posts appear to suggest that the construction is of separate piers and lintols, whereas although the steelwork inside is of separate members, the actual finished construction is homogeneous or in one piece.

So the mere suggestion of even-moulded capitals is incongruous, and the window-bars of borders and diagonals should be either omitted altogether or replaced by horizontal bars only; breakages are cheaper with the latter.

Neither does the lessening height of the side elevations accept the trabeated suggestion of these meagre capitals, though the new staircase or inclined way is properly treated.

Football-stand seating accommodation today is similar to the Roman when not on the ground.

Below the arena in some amphitheatres there were two floors of cavea or basements, and man, woman and beast entered the arena from trap-doors in its surface. The human beings were huddled together at the mass slaughterings of the early Christians, only excelled quite recently in Poland, Russia and elsewhere.

Religious and national bigotry began very early and die hard.

CHAPTER XVIII

GRÆCO-ROMAN HOUSES

THE Romans' houses are a further development of the Greek type, for all round their coastline were numerous and greatly flourishing Greek settlements or colonies, including Sicily, Tarentum, Pæstum and to a great extent in Pompeii, among others, and in these we find temples, theatres, market-places, etc.; from Pompeii, and its better-class community in adjoining Herculaneum, we have the best examples of these early Græco-Roman houses, shops and taverns, some of the Roman having lost most of their stucco-wall surfaces to disclose the same triangular brick or the stone pyramid facings to their concrete walls.

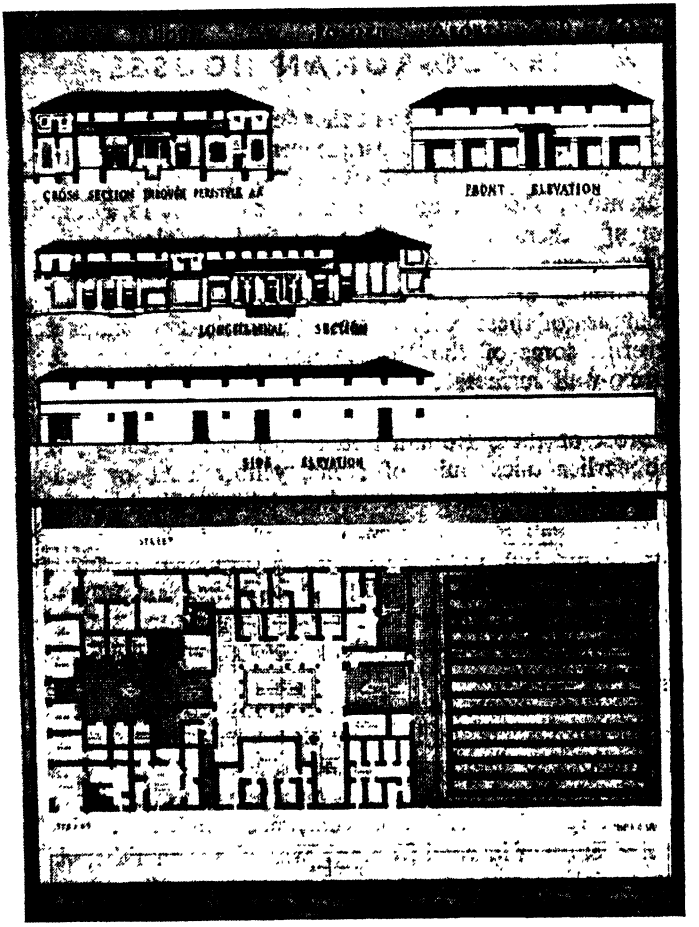
Most of these Roman houses are of two storeys, with the earlier ones built of stone, yellow Tufa or yellow Travertine limestone, either solidly built or filled in with a core of small stones. The Vesuvius disaster occurred in A.D. 79, and thus the introduction of the concrete wall here is exceptonally early, probably owing to the near proximity of the excellent aggregates for its manufacture, and it is certainly used in house after house of the last-built Roman examples.

The latest excavations disclose almost complete houses except for incineration in many places, though in the small excavations to date in Herculaneum enamelled and glazed screens are found almost intact, although of timber.

The largest houses have an entrance porch or vestibule in the centre of its road frontage, with shops on either side, some of these being managed by the servants of the house.

Inside is the first courtyard with its shallow impluvium, from which water could be taken for washing and poured down the drain afterwards.

Surrounding this courtyard were the guests' and servant-slave quarters, and there were stores and reception-rooms



The Roman house of Pansa at Pompeii.

on the innermost end leading to the family quarters, which were again around an impluvium, deeper for complete immersion this time, followed by a rough towelling probably, instead of the scrape over with a Greek strigil. Unguent oils and perfume to taste completed the toilet, no less necessary then as now.

The water supply to sinks and washbasins in the house was usually run by piping and taps from large cisterns situated in the roof, and these were filled each day by pumping from the well.

The water was pumped by two slaves using a double-handled pump of bronze; actually a fine piece of casting complete with tappet or flap valves. (See specimen in the British Museum.) The water gravitated through bronze pipes to the tap positions installed. Rainwater filled the family impluvium.

Thus did the amenities accumulate in the upper-class house plans at this time.

The family courtyard, or open-air living-room, had a colonnaded surround or peristyle, which carried the red-tiled roof all round the open impluvium, in which would float various objects as ornamental adjuncts of the family life—waterfowl and fish, or even flowers; similar to the Egyptian, and even to the not-so-far-removed table bowls of but twenty years ago.

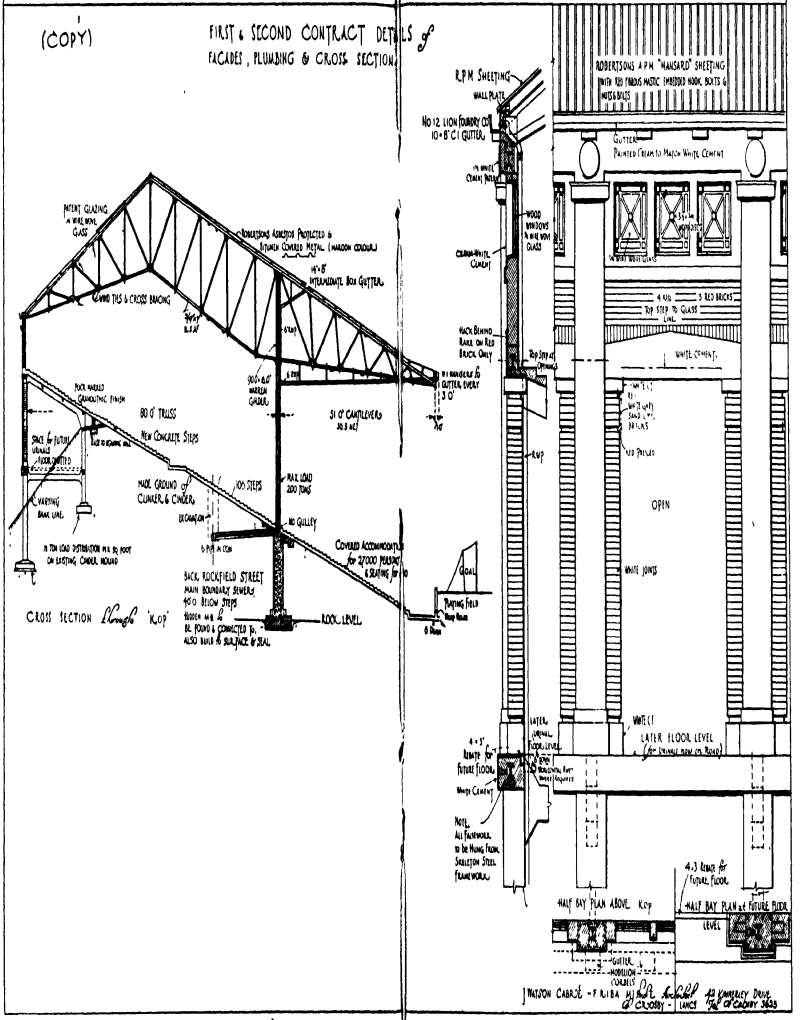
The columns were fluted and generally were of the Ionic Order. All openings had stone or marble architraves, whilst the walls were frescoed in colour, often allegorically like the cupid chariot race with the chariots drawn by stags, one of which is collapsing, cupid, chariot and all.

At the rear of the family courtyard-cum-living-room is the family safe or strong-room, the summer and winter dining-rooms, kitchen, pantries, scullery, and finally we pass outside through the summer dining-room or triclinium to the long verandah and so to the garden, or xystus, at the rear and which supplied flowers, fruit and vegetables to the house.

LIVERPOOL FOOTBALL CLUB - EXTENSIONS & GRAND STAND & 'SPION KOP' 1938.

(COPY)

FIRST & SECOND CONTRACT DETAILS of FACADES, PLUMBING & CROSS SECTION.



Some were formally laid out with yellow stone posts and timbers above, forming pergolas from which hung double flowering roses and vines in variety, whilst oblong ponds with flagged surrounds and carved, cast terra-cotta and even bronze gnomes and fawns were spotted about the garden as badly as the red-hatted Dutch gnomes of today.

The earlier houses were simpler and more like the Greek, one courtyard, plain in design with walls plain painted. The influence was Greek all the time, although the Etruscans of Etruria, who eventually became Roman, were responsible for most of the planning; some was Oscan, and these people were closely associated with the Greeks of Neapolis and Cumæ nearby. Actually the Etruscans took over Pompeii at least 200 years after its foundation, and the Romans came in 83 B.C., after the Samnites, who were associates of the Greeks and kinsmen of the original Oscans. Greek influence was felt in all these races.

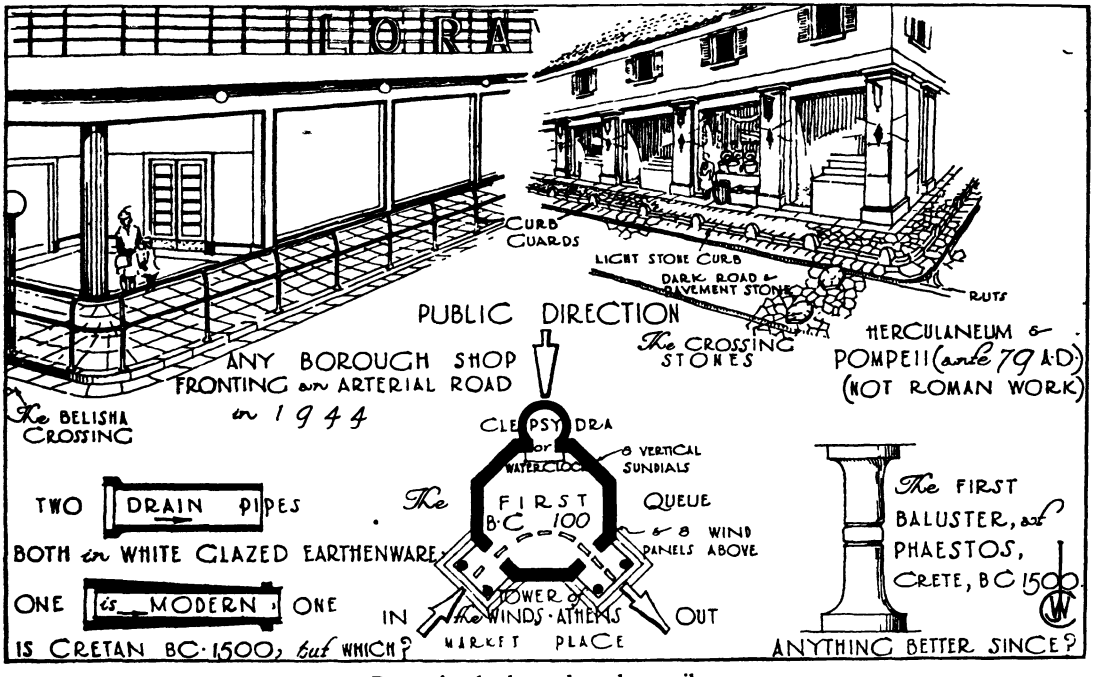
The Romans were impassioned by this bright seaside town, with its gaily painted houses and varied shop signs, from each of which hung lamps in the evening time to make it a very bright, gay and cheerful spot, though too early for window glazing, and so we find the few windows and those to the shops heavily shuttered—for the unglazed windows still faced the privacy and protection of the family court-yard.

As is prevalent today, the rooms over the shops were let to the poorer people; maybe thrifty and biding their time for comforts, earned after the grist of the mill was producing, or had produced, for them a higher standard of living.

The Romans introduced window glass later on, and so our amenities add up to the total we enjoy today, slowly but surely.

Streets were narrow and varied from 8 ft. to 23 ft. 6 in. wide, with 5 ft. footwalks in the latter case, leaving a carriage-way of 13 ft. 6 in.

These roads were crossed by stepping-stones, and the cart and chariot wheels passed between these. Its surface



Pompeian kerbs and modern rails.

was formed of thick irregular polygonal dark slabs of lava, now deeply rutted by this wheeled traffic; whilst at the road crossings, and in lieu of orange Belisha globes as the warning, we find a shrine on the walls with some of the gods painted above it, and obviously waiting to receive the rash pedestrians who did not look before crossing on the stepping-stones. The choice was open to them, as now, and quite an early chapter in town planning and road traffic control was being written.

There are, however, still many charming plans and building relics left to us, in spite of the destruction done by, or allowed by, the local authorities and their officials in widening their streets, and rounding corners, to ever-increasing demand and with but increased casualties resulting.

In old Pompeian days this finely situated coastal town, so long hidden under 10 ft. of congealed volcanic ash that engulfed over 2,000 of its twenty odd thousand people—those who did not evacuate before the worst befel, when asphyxiation by sulphurous gases or heat killed those remaining as the red-hot ash closed around them; some still in hiding or casually living on in hope of escaping when it was actually too late ; others even returned to save a few belongings.

These people were actually cast in their final postures for posterity to view, even in stepping out of a bath, or around a handcart containing their objects of value, sentries at their posts, the sixty-odd gladiators in the cubicles with their armour near and close by the weird triangular-shaped forum, even a dog and its kennel. Friends formed rescue parties, and many, including the elder Admiral Pliny, lost their lives on the shores and in the town, for cushions and screens held over their heads against falling red-hot ash was no protection when poison gas was the factor.

Herculaneum and Stabiæ, on the other hand, met the molten stream of lava from Vesuvius, which hardened in

the rain then falling. Too expensive and difficult an excavation, especially with modern towns built on top of the lava.

The tessellated or mosaic ground-floors to the houses, taverns and larger buildings were very satisfying and modern (often in black and white marble set in red cement), except that they are far too cold for floors in our domestic building today. Though many think differently, even after their clients have taken possession. The upper floors were of wooden joists and boards.

It is curious that the local stones when hardened in salt water turned a deeper cream in the case of that quarried from the river bed in the Sarno Plain, even yellow when compared with the Roman limestone travertine used as their common ashlar facing. Whilst there was the yellow tufa hardened in salt water and white if hardened in fresh water, though these are but coarse materials of volcanic stone. There is also a lava formation of hard solid basalt; whilst for the concrete the volcanic ash, of a fine fragmentary formation, was very suitable.

Pumice-stone, known all through the ages, was used by painters and others, and I am in possession of a piece from a Ramesean excavation of two thousand years earlier, for they excavated this material for export to all the known world. Age had made it very yellow, and it had been work-worn to a good handful of a practical size.

In the best and early days of Greek influence, from 200 to 90 B.C., the walls were plain, just as we prefer them today. Though they were plain painted then, earlier still in the Spartan-Doric days they were not even painted.

It is a pity that so much has been removed from the first excavations to the danger of the Naples Museum, for amongst them are the shop signs of men working in the various trades—dyeing, laundering, etc., though most priceless of all is the Greek mosaic panel of Alexander and Darius, in the Græco-Persian battle scene. They would have been safer and better left in position in Pompeii, bombs or no bombs.

There were two fine baths and two theatres. The smaller one of the latter was original in that it was wholly roofed in, whilst the stage could be flooded with water for maritime scenes, for the port was an important one, and its sailors had their own precinct in the town. The stage screen or curtain was raised from its slot in the front of the stage by hydraulic power.

All this, and more, was done before A.D. 79, and preserved for us by volcanic ash, just as the sand accretion has saved the Egyptian work to this day.

Much of the interesting household goods are in the museums. The design of furniture, silver platters and pedestals, lamps and utensils are often just a development from the Greek, though the Egyptian Sphinx is incorporated as is found in the silver tripod urn pedestal from one of the old Greek Doric temples; the best of which on this interesting coast is that of the Poseidon, or the Fishers' Temple, at Pæstum, or Peso, in the next bay south of Capri, where its golden fluted columns are heavily picturesque against the blue sky and sea, notable in its completeness of superimposed column on column, and the gallery or triforium prototype.

Classic Development

This Roman Classic development upon the Greek has much of interest for us, and although so much is debased, coarse and transitional, as in our Tudor, the basic problem is there in the strong planning of immense structures that have a great similarity to our big-scale edifices today.

Perhaps it is all to the good that they did not reach the present-day thin-brick and thin-stone modern, nor the scenic display of huge concrete surfaces contrasting with grouped, or even an all-overish treatment of plain unit windows, or a honeycomb mesh of window treatment covering an entire façade like a grille, for without reinforcement in their concrete and steel for other framings, a

differentiation has been left to our respective architectures. This difference need not have been so marked had the Romans been really first-class architects, and yet the difference could be more marked, with great advantage, if the Victorian revivalists in our midst could break away from the long-troubling curse of adaptations from Rome and its fifteenth-century renaissance.

CHAPTER XIX

THE BYZANTINE, EARLY CHRISTIAN AND GOTHIC ARCHITECTURE

Now, the Emperor Constantine, after erecting his over-ornate triumphal arch alongside the Colosseum, felt the approach of insecure times, just as we did before 1939; for the same northern tribes were massing and threatening the western half of the empire, of which Rome was the capital.

Nor were they seriously inclined to prepare to resist the event, except to leave it entirely to the small professional army, whilst they themselves resorted to all the pleasurable indolences of all times, and the vices.

" Whom the gods wish to destroy they first make . . ." You may complete as you may wish, the originality will be yours—even to the old lady in the bus, who said loudly and querulously that wrong cannot ever succeed against the right. The free thinking of a democracy will provide refreshing dreams, but more is required than dreams. So to avoid the bad ones and hoping for the better, Constantine moved his Court to Byzantium, then the eastern capital of his empire, just as if our King and Parliament had moved to Ottawa, or elsewhere, under even greater threat recently from these same northern tribes, still rampant and untamed. And so Rome fell to them in A.D. 476, and they ravaged and laid bare northern Italy.

The Byzantine Period

The Byzantine period, however, lasted over one thousand years, and the first great Christian cathedral—for I may term it as such, Santa or Hagia Sophia, the Church of Divine Wisdom—became a Mohammedan mosque, and is one still.

Its Byzantine design was the more or less standard design for all the many subsequent mosques erected by them,

and there is one almost opposite. Even domes were used to roof over the cottages of both Christian and the later Ottoman empires.

The Development of the Dome

The Byzantine dome was semicircular inside; completely so if it was built on a circular drum. But if built upon a square, part of the dome would be cut away, and only in the corners would remain the complete semi-dome. The domed portion in each corner is called the pendentive; one in each corner, that is, four pendentives.

Sometimes the pendentives are independent and struck from another centre point, and in this case the dome rests upon a cornice finish on top of the pendentives. This is the compound dome, whilst the previous one is the simple type.

The Romans had put the dome over a circular building like the Pantheon in Rome, and had one effort completed over a decagon in the nymphæum of the Baths of Gallenius, which had ten primitively abrupt pendentives. The next development was the dome on the square. Santa Sophia is the greatest example of this, and is of the compound type where dome and pendentives are struck from different centres, and there is a completely semicircular dome inside above a small cornice on the pendentives.

Whilst both the Pantheon and Santa Sophia domes are of brick in almost horizontal courses, though slightly radial, the respective spans are 146 ft. and 107 ft.

These corbelled-out brick domes greatly reduce the thrust as compared with what it might have been if the joints had been fully radial to the dome centre. The flat joints pass on mostly a deadweight and not a lively oblique thrust that endeavours to push out at the haunch, which if successful allows the dome to fall in.

Neither the architect of the Pantheon nor the two Greek architects who designed Santa Sophia would take any risks. The latter were Anthemius of Tralles, assisted by Isodorus of Miletus, and in the reign of Justinian, in A.D. 532,

the site was cleared of the debris of a burnt-out church and the new one was completed in 537, in the then modern style of Byzantium and not old Roman.

The haunches of both domes were thickened to withstand any lateral thrust, by double-thickness walls with radial buttresses hidden inside, and above heavy concrete steps in the case of the Pantheon, and for Santa Sophia there were forty charmingly modern-shaped little buttresses, one to each dome rib inside, with a semicircular window between the buttresses. The wall face to these windows was made almost vertical, and all this is Greek refinement or modern streamlining, whichever you choose.

Both domes, thus robbed of some of their height outside, appeared better in their flatter and less pronounced form, like our new roofs today. In addition, the Roman dome increased in thickness from 18 in. at crown to 48 in. at haunch, whilst the Byzantine example was increased from 24 in. to 27 in. only.

The latter was built of 2-in. bricks and 2-in. mortar joints, and the dome was built of one thickness of brick 24 in. square at crown and 27 in. square at haunch.

The thrust of these domes and vaults is only too apparent, for an excellent example occurred illustrating the possibilities not so very long ago; and the total effort must have cost a few millions—in little arched-brick shelters.

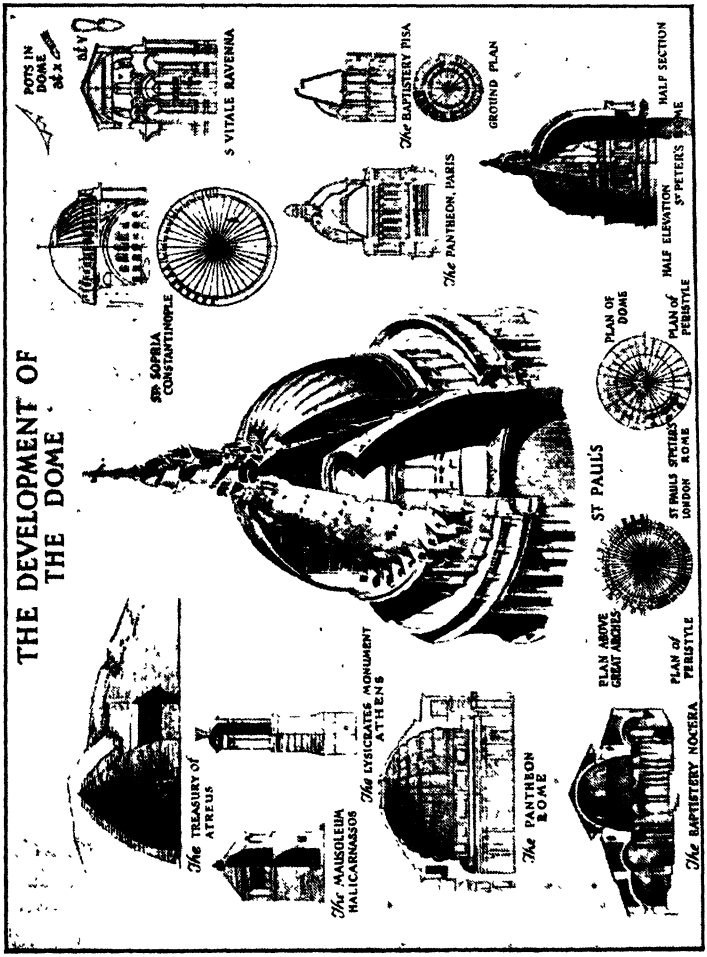
. . . . . .

Our St. Paul's Cathedral and the Gothic cathedrals from A.D. 1200 to 1450 in England are other examples.

All of these buildings were restless in thrust and counterbalance. Defects developed usually in their foundations, beech logs under the Gothic with tunnelling and subsoil streams to trouble St. Paul's.

Planning and designing is a very precise business or profession, in both its art and its construction.

The Greek-cross plan of equal lengths to the four wings of accommodation around its dome allowed the latter to be fully visible from any part of the floor inside, just as a


THE DEVELOPMENT OF THE DOME
POTS IN DOME
S VITALE RAVENNA
S^TA SOPHIA CONSTANTINOPLE
The BAPTISTERY PISA
The PANTHEON, PARIS
GROUND PLAN
The TREASURY of ATREUS
The MAUSOLEUM HALICARNASSOS
The LYSICRATES MONUMENT ATHENS
The PANTHEON ROME
ST PAUL'S
PLAN OF DOME
PLAN ABOVE GREAT ARCHES
ST PAULS S^TMARYS LONDON
PLAN of PERISTYLE
HALF ELEVATION
HALF SECTION
S^T PETER'S ROME
The BAPTISTERY NOCERA
PLAN of PERISTYLE

great dome should properly crown a building, and all architects held this to be of paramount importance. So much so that after the Gothic era, or intrusion, had popularised the long nave of the Latin-cross plan, we find the latter forced upon the Renaissance architects in the following period whenever the architect was weak enough to be overridden by his committee of clients.

The development of the dome in shape and construction is also very interesting, for from the almost concentric inner and outer lines of the Pantheon and Santa Sophia to the triple domes in one, as found in St. Sulpice, Paris, and St. Paul's, London, is a long succession of architectural development in design that embraces many other buildings in between. For the single thickness became one of two skins, less concentric as dome followed dome; for the inside semicircular dome, however, raised up upon a drum (a tapering one in St. Paul's), could never serve for the upstanding dome line, as is required in the exterior of the design.

I am including a student's drawing which covers the development sufficiently in an interesting manner; and was made in 1930.

The glory of the Byzantine is, in my opinion, the huge suggestion of high continuous space in the varying tones of gold mosaic to dome and vault. The small facets of tesseræ do vary to produce a richness of surface not obtained in any other material, and they abolished natural mosaic of marble tesseræ for enamelled glassware.

Santa Sophia

To return to Santa Sophia. Not yet had the church orientation reversed itself, for the entrance is still in the east end, not as later in the west, and we once passed through a cloister or atrium at the east end to enter into the long narthex, almost 100 yards long; an accommodation for probationers and women. The latter also crowded the galleries or triforiums of the mediæval cathedrals.

Walls were covered with all-overish arabesque black wax or marble inlay in marble, and a new thought in the use of columns or points of support, for a larger number, say six, was superimposed upon four, for they were not above one another although there did intervene a considerable distance to accommodate the lower arches over the columns and some height of wall.

Santa Sophia is now grossly over-windowed, and so is far too well lighted for its purpose. Gone is the mystical charm of subdued light broken by spots of light through the original small circular or square holes pierced in the alabaster window fillings, and stabbing into life the distant mosaic colourings upon which their angled beams fell. Some still remain in position in the gallery windows, where the slabs are 3 in. thick and the small glazed holes are 7 in. square, with 3 in. of marble or alabaster in between as a glazing bar.

Like the Egyptians and the ultra-moderns, the Byzantine had few mouldings—only two (the splay and the cavetta with a bead under it), excepting in early modern efforts; the principle being that the more colour used the less form is required, and a revulsion in favour of the plain slab surface of modern materials.

Whilst the Greeks stencilled their walls in buffs, blues, greens, black and red, the Byzantines used the more modern, and washable, mosaic and marble.

The Byzantines, again, used monolithic stone and marble columns, and in doing so they were aware that these one-piece columns would shed splinters at the top and bottom joints under load. To prevent this both ends were ringed in bronze to stop what might be called pencil pointing at both ends.

This is exactly what happens in a reinforced-concrete column under test in actual overload at the commencement of collapse. To prevent it, we in our turn double the number of horizontal bindings in steel wire, $\frac{1}{4}$ in. and more in diameter, by halving their spacings to 4 in. for 1 ft. 6 in.

from each end, with the floor and the haunches as the column terminations.

This enables the floor loadings to figure above 2 cwt. per square foot for cotton bales and other heavy storage, and the pencil pointing does not take place.

The exterior of Santa Sophia is of brick and Perperino stone used in bands alternating with brick in between. There was a band 4 ft. from the ground and 2 ft. deep, whilst the heavy semicircular topped blocks of angle buttresses to the dome were finely striped with stone. Their hydraulic lime mortar with ground pottery and brick was equal to the Roman.

Unfortunately the whole of this building was later covered in either stucco or, it may be, many coats of lime or cement wash, as is often used to imitate stone in all countries; though the wash or fine plaster coatings is most common in the Italian Renaissance, native vintage. The four minarets are, of course, of Turkish erection.

Away in Athens, in other parts of Greece and in Italy interesting local Byzantine buildings were being erected, whilst to accommodate the huge conversions to Christianity, even the old temples were converted, the Parthenon becoming another Santa Sophia and the Pantheon the Church of all Saints. They had no " life " sentence, and the latter is still in use today as the Italian King's columbarium of modern times.

Before the later Byzantine in Italy, on its eastern shores, much had to be done or attempted; for the great effort of the Byzantine emperor Justinian in his later years (ending in A.D. 465) to clear the western half of the empire of the Barbarians (just as we are doing today at this very minute), who had infested the land for sixty years, did not last for long. Nor was it even completed, for they still held northern Italy and then recovered the rest, and it was not until the advent of Charlemagne of Aix-la-Chapelle that times became more settled. Justinian, however, advanced through Egypt, Libya, Tunisia, Sicily to Reggio,

and entered Naples by its aqueduct channel at night.

The northern towns had been levelled, until archæologists have the names of cities to which a site cannot be found, even for populations of half a million.

In our time the Desert Rats repeated this and finished in Berlin.

Venice

Some few refugees from wholesale slaughter crept across the lidi, or sandy strips (one is a lido), that formed between the lagoons and the sandy islands that their successors were to build upon and name Venice five hundred years later.

This fishing village traded eventually with the Lombard, Hun and Goth descendants, and with Byzantium, or Constantinople, from which the Byzantine style of building originated. St. Mark's was the result during the years 1063–1071, almost chronologically comparable with the little Saxon church at Bradford-on-Avon.

The whole of Venice is built upon wooden piles, and these are rotting in the swampy subsoil. So much so that the great campanile (or bell tower) had fallen and was being re-erected when I saw it in 1907.

Venice, in later settled Byzantine times, produced St. Mark's; whilst Ravenna, and much earlier also, erected fine Byzantine examples. Among the most perfect is San Vitali, an octagonal church with apses—a very freely designed plan among so many of the stereotyped basilican-planned churches. Its construction and the plain marble and mosaic interior make it the best example of the period.

The old temples were converted into churches and many new ones were built; each with its early chancel or bema, often just a small apse with its hard wooden seat.

As Christianity flourished, its clergy increased in number and the wooden seat was extended. So was the chancel with its additional fitments; naves were long with one or two aisles in the true basilican type, and the chancel moved down the nave.

Mosaic floors and part of the walls, nave arches or beams on the columns, and timber roofs ceiled flat with wooden beams and plaster; often heavy small wooden panelling of great richness in heraldic arms and gilded enrichments would form these early flat ceilings, before vaulting was attempted.

The excellent campanili towers of Venice are grand foil to the low-domed buildings—massive brick towers with slits to light the staircase, and topped with a finish in white stone of a columniated order and roofed over with a highly pitched pyramid roof. Although the Campanile di San Marco is good, the later Renaissance San Giorgio (on its island across the confluence of the Grand Canal and the Giudeca) is better.

This is a gem, and against the blue sky with red and yellow fishing-boat sails on the sea-going waters of the Giudeca one can appreciate the temptation to inflate this design to accommodate the fifty storeys of a New York skyscraper, its only ornateness, at the top and at the entrance at its foot, with a cliff-like wall in between, being white stone with a great spatial divide in good brick.

In modern buildings (those still eclectic as a rule, though it would apply even to the freer modern as well) the cliff wall contains floor after floor of plainest severity; for the eye must run up the cliff face from the doors to the architectural foliation of form on the skyline.

Running concurrently with the later Byzantine work, as we have already seen, was this later Early Christian work that eventually developed through the Lombardic (Lombardy was named after the long beards of the Barbarians) into the Gothic with a ribbed stone vault but no pointed arch for the moment.

San Lorenzo fuori le muri

The Early Christian church front is typified in that excellent tenth-century Ionic (in-antis) porticoed San Lorenzo fuori le muri, Rome, of the Littorio marshalling yards fame, and it has the cove-topped wall above under the roof.

The ribbed intersecting semicircular vaulting, each bay of which is divided up by diagonal ribs into four parts and is known as quadripartite, and in both Italian and French Gothic, whether round or pointed arch is used, you do not find any development beyond this. They were very functional, though the additional ribs and complexity thereby introduced in English Gothic produced a humanisation of the function of mere roofing over in the simplest manner possible, that is a sheer relief to the first Gothic vaults in England and all of the Continental Gothic cathedrals in their simple quadripartite vaultings.

The very pretty and tricky stone fan vaulting of our fifteenth-century Gothic is another matter altogether. Here the material used is unsuitable, the design is untruthful and therefore a sham. Cast-iron should have been used, not stone, and with that the whole production, design and construction falls by default in the standard principles governing design in the late flat four-centred arch type.

The very thought of moulding it in reinforced concrete would be revolting to the veriest tyro interested in architecture or skilled building, for its constructional members became but cast ornament, just as they were, but carved out ornament in the fan vault of stone.

The Italians heavily surfeited as they were with Roman Classic in all districts, but the north where it had been demolished by the Huns and their Allies, never developed true Gothic building as found in France and England, although the detail was more nearly Gothic than the building carcase itself.

Giotto's tower or campanile, alongside the Duomo or Cathedral of Florence, is perhaps the best example. It is in a cream-white marble, and so is the cathedral with variations in colour but less Gothic in spirit.

The octagonal white-ribbed and red-tile dome on the interstitium of the cathedral is, of course, the first effort in the Italian Renaissance following their brief sojourn into the fields of the foreign Gothic of the Northerns.

English Gothic detail is often ahead, far ahead, of the French—for the debased form of Roman Corinthian capital used in nearly all their nave arcade piers or columns is very detractive, whilst the attenuation and general flatness of their interior wall design does not appear to do justice to the strongly designed exteriors, and the lack of any change in the vaulting, for ever simple quadripartite, adds nothing to liven the design towards character, strength and interest.

This is common in the later French Renaissance, where their façades are flat and treated to a minuteness of over-academised detail that one can find rather repellent, with its stock shapes and affected or sophisticated impedimenta, though 90 per cent. of the English Renaissance is probably too coarse, *à la* Temple of Saturn in the Forum Romanum, to be but an annoyance to anyone with an appreciation of refined achievement in architecture.

One must admire the interiors and the weather-worn exteriors of the Gothic Age, and in the course of a life-time have drawn or studied the style so that the history of the buildings can be read from moulding, column, pier, arch or vaulting, carving or buttress. This style, the last importation from the Continent, is almost an engima of Orientalism that swept upon us in the period of great religious profundity, that has so far not become perhaps deep enough to cast it off, though Byzantine and shuttered concrete are hardly, singly, palliatives of a sufficient counter-attraction.

Something greater than filling in timber or metal false-work, formwork, shuttering or centering with concrete, whether spewed from a channel, dropped from a hopper or spaded from a barrow, is this architecture, and in spite of all that we can say against the study of past architecture, due to the crazy copying of old details and manners of the past, it simply is not true that we gain nothing by its study, and we know it too well, for the past is great, it is our experience.

In what I am calling the narrow brick and thin-stone style, at its best with no recognition of any visible past

pedantry in its make-up, this manner of building is already past its transitional stage—it has arrived, and there are many excellent examples, seek for them.

It is well-proportioned, has well-spaced and attuned voids, an interesting surface to the large solids, well-shadowed elevations without trivialities such as keystones, bow-and-arrow slits, or an ace of diamonds, and some cantilevering is definitely permissible.

In haste we retreat from under Henry VII's fanvault, and on our way to safety notice that outside the buttress tops are domed pinnacles instead of sharp pyramid pinnacles. Well, therein beginneth a new or resuscitated style in architecture. However faintly your recognition may be, it is the classic dome shape reasserting itself after a fairly long sleep.

You find this occurring in French Gothic, as at Tours Cathedral, where the Gothic towers finish at the top in a domed and pilastered turret.

This style is the Renaissance, or the rebirth of the Classic, and it naturally occurred in Italy where the old Roman Classic remains soon attracted strong notice.

CHAPTER XX

ARCHITECTURE OF THE ITALIAN RENAISSANCE

THIS renaissance began in literary interests, and contemporary architecture followed.

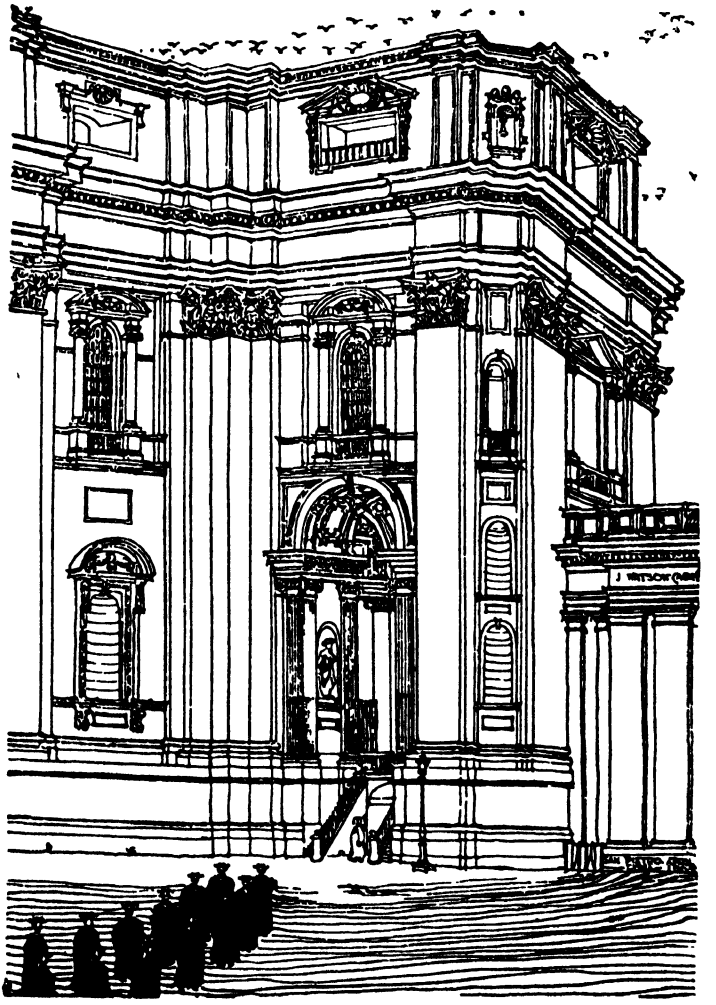
The almost Gothic cathedral in Florence was still without its covering, or roof, over the central space or interstitium, and as this had a span of over 138 ft., it is hardly to be wondered at, until it was completed in 1434.

The design of the dome is octagonal like the drum upon which it was built, and it has eight delightful light-coloured ribs at the corners outside to the outer skin of the dome, which, unlike Classic domes, is of two thicknesses, is pan-tiled in red between these ribs and appears pleasantly fresh and colourful in red tile and cream rib.

On the top of the dome, which is pointed, is a cream stone cupola nearly 60 ft. high, of pleasant shape if elementary in detail.

Filippo Brunelleschi was the architect, and apparently he won the competition after a serious study of Roman Classic dome construction, particularly in that of the Pantheon, Rome, where, you will remember, almost horizontally laid bricks as cantilevers with little thrust were used, similar to the later Santa Sophia, Constantinople.

San Michele left to us three gateways in the picturesque brick walls and moat of Verona, the finest being Porta Pallo that terminates the street of that name, even the bastions and city walls are his, and there were but a few rifle-bullet marks in this city entrance when we measured it up, using a two-lire-a-day ladder, a scaffold pole with pegs in it on both sides, though mainly missing. It always revolved when you were halfway up, so that one faced the open country and not the white stone gateway as desired; and some monkey acrobatics had to prevail.



A sketch of St. Peter's, Rome.

This work has strong Greek tendencies, for its coupled column colonnade terminates in square piers or antæ, and there are no pedestals under the fluted columns, though the detail is a refined Roman, a border-line case and a good one. Greek work and its refined high standard detail were not known at this date.

Palazzo Riccardi

It would be impossible to pass by without mentioning the Florentine astylar domestic work as represented by its best in the early example of the Palazzo Riccardi, erected in 1435 by Michelozzo. Here is a first real study of masonry in all its rough rusticated rock-faced blocks to the lesser heavily hewn and finally the all-smooth ashlar itself. The contrasts between these varying textures of stone surfacing is quite one of the big factors in building, for even a concrete surface need not always be cast smooth, though it must not appear as hewn stone. Palazzi, Polini and Sacheti are also supreme, the first-named simplicity itself and a real gem.

St. Peter's has already been lightly touched upon, as most examples must be of these more modern times. The dome is a premier example and of two thicknesses. This time not concentric in curve, and, although Michelangelo is given credit for its design, his pupils would appear to have tried to hold a guiding hand. For later on, when he was even older, in the Biblioteca at Florence he does seem to have escaped guidance altogether—for the columns are made subservient to the walls, into which they are recessed; whilst the staircase has wildly shaped treads that beggar description. As to why it has been able to exist so long without alteration on the basis of sanity and as a danger to the users of the library, it is difficult to say; possibly the master's handicraft is sacred even so.

The Renaissance ended after the rococo or Baroque coarseness had completed the riot, with a slimy aftermath in which salvation was still sought in those Roman bits and pieces of debased ideas of Greek details, for breadth,

sincerity and colour had gone. For these were all painted on the houses, orders of columns, green shutters, consol brackets, pediments and cornices over windows and doors, even with sun-cast shadows thrown in.

Whether we find these things on our façades in paint or in stone, surely it is equally as futile; more so in stone, for the cost is so very much greater.

With the closure self-imposed, the limit must be the live works that stand above the almost all-embracing decorative maw of dull and even uninteresting academic types, designed in units of stereotyped bays greatly over-emphasised by assertive columns and pilasters of, even then, an age long past and gone, a very theatrical attainment.

In France the Gothic developed to a perfection not found in Italy, just as it did in England; so it was more difficult to make the change, and this applies again to both the more western countries.

In all cathedrals after the Notre Dame, Paris (be it the almost-perfect Reims or Amiens), the richness is better designed than in our own, and to better proportion. But in almost every instance the contrast between plain wall surface and this richness is lost, for there is but little of the former. And for the proper use of this spatial contrast with the magnificent advantages that accrue, we have no better example than that of the last English neo-Gothic cathedral, that of Liverpool, by Sir Giles Gilbert Scott, R.A., F.R.I.B.A. Whether the examination be made of the exterior or the interior, the contrast to poor Truro need not be stressed.

It must be remembered that Gothic, almost as much as Classic or Renaissance, is symmetrical in design.

CHAPTER XXI

ARCHITECTURE OF THE FRENCH RENAISSANCE

THE French Renaissance followed the Italian. This time war made the quick contact, and about 1560 a commencement was made with a period of small refined detail prior to a coarse period of short duration, and then the Classical columniated period, like the similar Palladian in Italy and Queen Anne in this country, produced the large orders with the maximum height obtainable in the columns. And finally the Renaissance closes with the glorious Empire period whilst we were perfecting the Georgian. Both countries finished down the slope of stucco-faced cheap Renaissance periods of stock design; none of which is particularly worthy of mention by name, even if the Regency period is academically interesting in its decorative stucco facing.

Whilst as for adding subdivisions of these and giving to them the names of London streets, that is the author critics' method of putting up the petty styles of the architectural aftermath that makes them the more easily recognisable thereby, so that their defects may readily be seen after a criticism has been made in pungently humorous terms.

The French revelled in the high-pitched roof, broken skylines, irregular grouping and an air of picturesqueness, and these more Gothic features hardly ever disappeared, even at the end, for here the mansard roof of François Mansard, architect, flourished to keep up the high-roof visibility, to apparently lower the building heights.

It would seem almost certain that Sir Christopher Wren, when designing the triple dome of St. Paul's, had studied one dome or another. For a visit is not always necessary, especially as the school of thought is ripe to develop any

tip, clue or suggestion passed on by word of mouth. The great French triple domes of Des Invalides with its timber and lead cupola, and the Pantheon with its stone cupola as we find in St. Paul's, were visited by him.

The Pantheon

Again, in the Pantheon is found the sham first-floor screen wall that hides the first-floor windows. And so it is in St. Paul's, where it hides the main vault flying buttresses as well, and also heavily weighs down their thrusts.

All the light-weight external domes are slightly pointed to allow of the foreshortening of its height when viewed from the street.

The dome supports in the Pantheon are not as solid as in the well-tested St. Paul's, and a serious vibration might cause trouble among its divided and small supports.

Both the Parisienne examples are Greek-cross planned, whilst Des Invalides (1670–1706) was started by Bruant and domed by J. H. Mansard, and together with the Church of St. Sulpice (1740) have good elevations.

The early work in France was transitional, with panelled stone pilasters, black slate diamond inlays in the chimney-stacks of Chambord Castle, which has a heavy batter to its walls, whilst its house plan is a Greek cross with a central staircase. And there are eight angle turrets, four to the house and one at each corner of the single-storey building surround, which forms the large forecourt at rear and sides of the house.

Palais du Versailles

In the later work at the Palais du Versailles and in parts of the Louvre, the high roofs, dormers and chimney-stacks disappear and the dull but cleansing big order of Palladio enters, sometimes only on the first floor where the columns are used in couples. Quite pretty-pretty English competition family style, rebuild City of London type, it is almost true otherwise to Roman Classic, but with that refined small

scale that eventually runs this French style almost to a wall pattern of an all-overish spread.

This Louvre wing by Perrault has the old Castor and Pollux trick of the flat-arched lintels through main architrave and frieze spanning between the coupled columns, whilst for a really larger order that in the Institut de France includes four storeys.

Versailles is 1,320 ft. long, and ran from 1660 to 1700, whilst we built little Hampton Court and Greenwich Hospital.

There are many little bits of good architectural design, and the use of very refined rusticated channelled stone surfaces, and the gradual town-plan development of Paris to Houssman's plan probably did more to open the eyes of all of us to a state of self-consciousness at the paucity of design and plan in our own cities, although now we are driving to other rules as to how a city should be laid out, in great simplicity and less of assertive geometry in its make-up.

In the final development in the French Renaissance, concurrent with our historical Georgian, the French Empire style almost reverts to a continuance of the Græco-Pompeian, and a very sensible and modern interior is found in the library at Versailles.

CHAPTER XXII

ARCHITECTURE OF THE ENGLISH RENAISSANCE

Bodleian Library

THE English Renaissance also had a long transitional period before it reached the cold orderliness of the academic Palladian orders and the oh so regularised bays and symmetrical balance. In the tower of the old schools, now the Bodleian Library at Oxford, even the Colosseum was put in its place, for here are the five Roman orders superimposed one above the other complete with pedestals, and these are covered with German strapwork from those cheap booklet importations of the time. Their army had sacked Rome in 1527 to avoid any competition with their truly wonderful mediocrity in all the styles of architecture as these passed them by, except for a direct though larger copy of Amiens in the eastern half of Cologne Cathedral, and simply no refinement in their Renaissance at all, just a crude vulgarity not approached in any other country in the circuit of he styles, excluding only the nineteenth century, when Schinkel was the pick of the Revivalists.

In a welter of ghastly crude compositions in English Renaissance of early Tudor days (1485 to 1558), a few Italians were easily induced to come here and give to us the rudiments of this revival of old Roman forms and detail in building. And revival is still troubling us with its fetters of eggs and dentils on toast, and fritters of B.C. Ionic and Corinthian.

Elizabethan Style

Following this enters the Elizabethan timber style of building, and one that did truly well until oak ran out, owing to a naval priority at the time. Though again this black and white is still so effective as a dope to the tired mind

of man that, although he has forgotten where he has put his metal suitings, he still nails black or green painted floorboards on to his house walls, and paints white in between them, whilst his wife is revving up his resuscitated iron overcoat, now a streamlined lethal monster in a reinforced-concrete, flat-roofed garage nearby, complete still with an embattled parapet wall on top for active defence, and a " Morrison " shelter in the way in the dining-room for passive defence, that the local council (barely believing by circular) will not remove on the substantial knowledge of the occupants that the war is all over bar a little Mikado business so far away. They were fined later for taking the reshaped suiting with them to the " flicks," and for dismantling the passive defence without permission.

Architecture in suburbia will certainly not go down to posterity with a credit mark to its producers, though isolated cases are to be found that are quite good.

The real Elizabethan did reach a perfection all its own, with Gothic detail intermixed with debased Renaissance—the former leaving and the latter entering for its cold display of ancient and would-be scholastic dogma.

This black-and-white timber-and-plaster epoch departed about 1640, and the Palladian goal was reached shortly afterwards. And in this period in the examples where brick was used as a facing, with stone dressings of Classical detail to windows and doors, the added foil of colour and texture gives a greater interest to these buildings than is found where stone is the only material.

The Renaissance

Actually I am certain that neither detail nor refinement is of a sufficiently high standard to be of any real interest—not even in Somerset House, where rock-faced rustication endeavours to provide some texture contrast. Whereas a good area of brick surface would take one's mind off the cold copyism of the poor Roman adaptations of the Greek marble, stone and terra-cotta work.

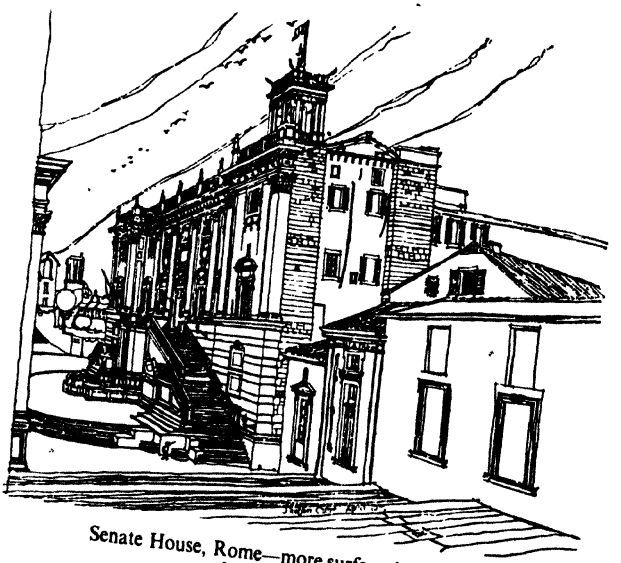
Gradually the tricks of the early Renaissance architects died away, including that of making chimney-stacks of groups of Roman Doric columns, one gouged out for each flue, with a united entablature over all. Not even Nero excelled in the defamation of the Greek pediment, segmental, twisted ogee, or broken to any shape on doorway, tomb, mantel, lead cistern, bookcase, choir-stall, tablet and on to the Classic of Queen Anne, the early beginning of Georgian. Who has not seen it on mahogany grandfather clock and Victorian hatstand? The work of amateur architects, and the mason and joiner colleagues copying.

All of them from the one-time functional and beautifully pure and refined feature of Greek architecture found at each end of their gabled buildings, and they called this a Renaissance. Of what? Certainly not the Greek standard of design.

What standard of architecture prevailed as a whole during Renaissance times, whether in Italy, France or England, when these things were a commonplace in these countries? Would you expect it to be of a high order? Until recently, when an increasing majority of architects and laymen have begun to more than question the advisability of continuing with this decorative sham plastering of our buildings with junk pilasters and pediments, few architectural histories, and certainly none sufficiently direct, have dared to say that this past Renaissance, based on Roman shams, is not architectural design but an applied decoration that leaves the true architect or artist in building design quite cold—and even frozen stiff enough for a mummy case on beholding that ponderous aggression of misshapen Renaissance forms that has replaced Nash's delightfully graceful curves and colonnaded pavements of simple proportion that once was Regent Street and its Quadrant. It could not now be enclosed inside arterial roads as an ancient precinct, as an excellent piece of building, even if of stucco, of London's past architecture.

Wren's Designs

The dome of St. Paul's is undoubtedly a very good one, possibly better than St. Peter's, though three domes to provide but one is rather far removed from the truthful modern, who would, however, not think twice of providing a tall spectacular white tower complete with shaped fin for his seaside baths.



Senate House, Rome—more surface decoration by Michelangelo.

As a telling scene, picturesque in a morning fog, St. Paul's is, well, just England. Let bomb who will, all would have mourned its loss, for to the living it is a chain and anchor to life; the dead thought so too.

However, it is architectural effort that is being criticised, both past and present-day, so as to clear the air as to what is sham at all times, that the future work may be the purer and more truthful for it. For in spite of all the old-fashioned

and effete continuance of dead and dated forms, there is springing up a modern architecture of a simple, pleasant and often of asymmetrically modelled design that betrays no direct copy of the past in its detailed make-up, and it will be worthy of its day.

The very plainness and good proportion ensures for itself purity and cheapness of erection not found for two thousand years.

What more is required of a modern building than simplicity, purity and directness of effort in plan, construction and design; refinement in shape and proportion, colour texture and low cost? Spend your money on the clean, coloured materials, modern materials in slab form with a very low pitch to your roofs. Write exit to slates and tiles.

Shortly after Inigo Jones died in 1652 the sash-window was introduced, and this proved to be a great feature in the succeeding periods of Queen Anne and its later companion, the Georgian.

Wren was then twenty years old and had met him often, the one-time joiner's apprentice and the professor of astronomy at Oxford. The former studied architecture in Italy and the latter in Paris, to enable both to become architects after studying the modern style of their times.

Wren's designs were geometrically perfect and more advanced in the knowledge necessary to produce scale in his cathedral than were those responsible for St. Peter's, Rome.

We do it nowadays by making common parts of a building, that everyone must know the actual size of, appear as small as possible, so that the piers, walls and the full height will look, by comparison, immeasurably increased thereby.

Cutting back the lower half of the riser of each step in a staircase is not as common as it might be, even in the ultra-modern concrete building. You can, however, reverse the method by making the steps as large as possible like those under the Parthenon columns (almost 2 ft. high in this case), but there was a narrow width and insignificant stair just in front of the immense doorways, the latter again a yard-stick

for the eye, to impress upon us that if a doorway is so high the building itself must be larger than it appears.

Preferably, however, doorways in all buildings should be small, and most certainly for the internal flush doors 6 ft. 6 in. by 2 ft. 7½ in. is ample. By keeping to these dimensions the room is made to appear larger, especially if the door is painted a light shade, as invariably it should be in these thoughtful and less pedantic days when we are more natural and simple—at least sufficient so to demur at second- or third-class theatrics in stone or brick.

The Georgian or eighteenth-century work really came down to the " man in the street," and quite a leap forward occurred in the house plan—excellent in finish, with elliptical, circular, square, oblong or even octagonal rooms neatly planned together with a refined staircase of similar shape and domed at the top.

Its large hall is, however, all too soon to be superseded by the cheaper passage hall of the Victorian days. Yes, a so-called lounge hall is better than a passage.

Examples of this brick and thin-stone style are to be found in all towns covering the date of the eighteenth century, but in the later work stucco is used as a wall surface, pediments instead of gables, plain blocking courses or elaborate balustrades built upon the cornice hide the flat-pitched slated roofs. Flat roofs would have served the design just as well, and the sloping roof would not have been missed even then, let alone now, except on the architect's drawings. For only on the centre gable or pediment may the slates be seen, and what a roof of constantly defective construction, to be sure.

The flat roof is a natural corollary and is very right in the up-to-date modern Georgian of brick and thin stone today, with no decorative trappings or adhesions of the past.

The mansard roof was used later on to give more space in the attics, where there were dormer windows, again more sources of trouble with the weather, as are bay windows.

The detail of this period is a refined, crisp, original and

attenuated use of the Classic Orders and their details, decorated almost to Greek principles and refinement, finely designed iron railings, balustrades and gate piers.

Adams' Period

One family section of this period is known as the "Adams'" style or period (1728 to 1792), of Robert and James Adam. Their detail is delicate and small, fine interiors in plaster and wood, and all the furniture in the same style; not that this is in any way different from other periods less exacting.

The brothers again imported Italian workmen. Delicate fans and Greek vases required expert modelling and casting. But have you never simply hated the very sight of those small plaster husks hung up in fanlike strings all over the ceilings and walls, in swags, festoons or again hanging in strips from the ears, these overhangings to wood or plaster architraves? Trivialities, maybe cobwebs of scholastic importance to some. Or does it but crown the absurdity of the general affectation of this period? An exaggeration (though admittedly a pleasant one) of the architectural features of Greece come down to us through the Romans' degenerate usage. All very refined, no doubt, but still an effective decoration only. If it was that even in its time, it is certainly very out of place today; for we are a simpler people, and these husks, fans and silly little pocket-size column decorations are as incongruous a wall background for modern easy chairs in leather, tapestry or metal and glass as ever a decorative Gothic interior could be. All are out-of-date dust-holding intricacies of past ideas of architectural decorations, when fussed-up detail was mistaken for architecture, where every fitting and the room itself had its cornice to protect it from the storm and tempest.

Now, as this style of the eighteenth century was typically British, let us endeavour to see what would be left of it when it is, shall we say, brought up to date for both

materials and the construction of this day, and similarly its decoration in stone, timber and plaster is likewise purified to the plain, almost Dorian, requirements of this year of grace and simplicity.

Window Details

Whilst there would be a more marked development of change than there is between Queen Anne's small sash-pane windows with their thick sash-bars, and the same small panes of the Georgian slightly later with very thin bars, it is all but a question of legitimate development.

Knowing that the period did, in fact, use larger panes of glass with horizontal bars in the cottages of the south-western counties at least, and I find these more acceptable to a modern room. This halfway solution to larger modern sheets of glass and the resulting end-to-end view out of the windows is an advantage to the plain void both outside and in. I do not therefore so object to the window divided by the horizontal bar.

Now, as to the window itself, the well-made galvanised steel casement is ideal, top and bottom handles on stormy wet weather aspects and with strong screw-fixing stays, with double windows against noise, and, above all, easily cleanable by special centre or other pivots in the upper windows.

The reachable lower window does not require the latter contrivance, for this increases costs. The length of window may be what you may wish, for both steel and reinforced concrete are modern materials and were not to hand in the sash-window days, or those Georgian architects would have shown us quite clearly what to do with them. And there is nothing at all against an angle window on two elevations, for there is no difficulty in constructing this with cantilevers in wood, steel or reinforced concrete. This type of window is an advantage and always preferable to those stupid little Tudor-Victorian bay-windows, and in any case are quite an old amenity of four score years.

The cords, pulleys, catches and large wood surfaces of the sash-window, and the heavy wooden transom and sashes of the transomed casement window, may still be used by those who take generations to move from the darkness of the Georgian aftermath that is called Victorian. But it is a pity that these houses will outlive their clients.

Simple Design

Porches, doors and mantelpieces are more pleasant in simple design without the addition of columns and pilasters—for the overfuss of form, and utterly sham museum stuff at that, is quite beyond the spirit, intention, design, requirement and pocket of today.

Cantilever the cover to your entrance or do without it. Away with the darkness, gloom and toothbrush cleaning-out of crevices. Breathe regularly instead of polish regularly, neither brass steps, knockers nor candlesticks for the housewife; nor brass buttons for the army—for there is no efficiency of mind over matter with these encumbrances.

Plain ceilings to lower room heights and discard the frieze, picture rail and cornices. Cove or round every room corner including that formed at top of wall with ceiling; and it is useful to stop this ceiling cove with a fillet around the ceiling, so that the latter may be differently tinted from the walls. Paint all woodwork inside the house in light shades, including the floor, to a stippled or rag-roll finish. Rugs and carpets are preferable on light-coloured boarding. Avoid cheap pictures, and avoid all of them, generally speaking. White and cream paint should be forgotten.

Plain fireplaces of many materials, faience, glass, metal, wood or even marble; quadrant bookcases at each end and away from the fire are pleasant contemporary features, not necessarily symmetrical in design.

Externally the improvement in the bricks for the facings is most noticeable, and with thinner bricks of varying hue good contrasts may be made, such as the light golden brown

with dark brown, blue and the yellow with blue shades and others previously mentioned.

Even steps of rustic brick set in cement to match (as all mortars used for pointing should do) are very safe for grip, pleasant and only need brushing occasionally, for the rain will clean them unless used under cover.

One-inch rustic tile bricks of contrasting hues may be used in suitable positions in brick façades.

Having used white or cream glazed brick as foil bands in between helio-blue rustics for the façades to stores, this could well be extended to cream glazed brick bands between the windows of each storey, with helio-blues between window jambs on all floors, for the glazed brick keeps cleaner than faience, which requires cleaning with a softening of household ammonia, then a rub over with Panshine to finish with a tepid wash-down with water.

I would give the blue rustic brick a good coat of paint oil for cleanliness and colour preservation.

Long windows, without making the interiors too cold, flat roofs generally, though I have no objection to bright green or other glazed pantiles as a roof over the centre portion of a building, though even they will require cleaning in town atmospheres. I like the very low Greek pitch of 14 to 20 degrees with a covering of coloured sheeting projecting 2 ft. all round to both eaves and gable, and with flat cement soffits. The private architect must lead here.

Tubular railings in lieu of natural or artificial stone balustrades on the flat roof, and large semicircular terminations to long rooms. Even in the same building one, or even two on occasion, narrow and high similar semicircular apses may be incorporated in the design.

The corners of most buildings may be rounded, but it is well to observe that an over-bulbous effect should be avoided, and a careful study of the building in all its aspects must be made. And this is best done by a model or at least two axonometric drawings of the building, if you are in any doubt. A good imagination can avoid both.

Construction In Glass

Glass bricks, which are actually hollow square blocks, are a useful sign of the times and must definitely be accepted, and even that *sine qua non* the circular lens type is not to be despised. It is less out of place than a triglyph, for it has a tendency to shed light, though its prototype is nearly as old.

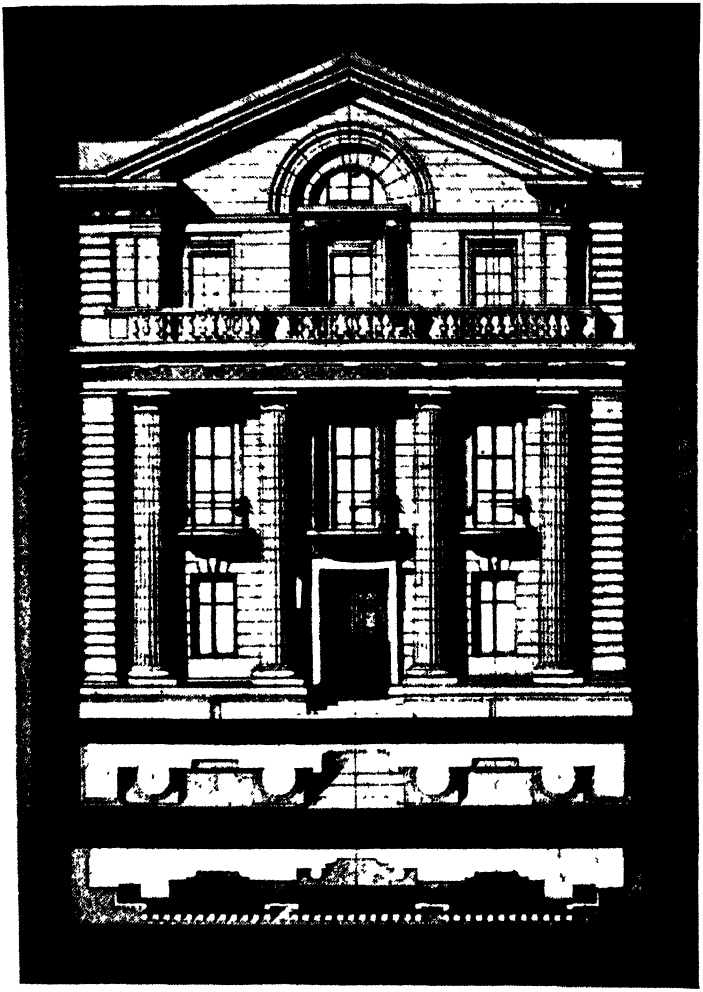
The interior of even a modern brick church could be mellowed by the use of tall windows in pale amber-tinted square glass bricks with arrangements for ventilation. There would be less downdraught in using such double-thickness glazing, for these bricks are hollow inside.

They have been used for angle turrets to staircases and for slender glass spirettes on towers, even to be lit up inside when blackout is forgotten.

All-glass façaded factories, with glass bricks used from floor to sill height on each floor, and a mushroom type of reinforced-concrete framework and therefore no piers in the skin of glass—that is our ultra-modern *par excellence*, Though the spread to the top of each column need not be a harsh straight line from the top of the latter to where it dies out on the ceiling. It is in these things that the architect perfects the whole, though he will find it difficult indeed to approach the fine line of the larger Karnak capitals.

Thermal glass and the glass bricks conserve the heat inside the building, and in summer help to exclude its entry. And in this type of construction neither brick nor concrete facing is required, other than the edges of the floor thicknesses. Even these, if so desired, may also be of, say, coloured glass.

In such a building the surfacing material, being of glass, is cleanable, and may be considered as a proper factory finish inside and not requiring limewash, where white-grey sand-lime brick is usually not considered as such by the factory inspector, though the addition of limewash but adds eventually to happy homes for bacteria behind its shaling surfaces, especially at the joints.



Bank of England—Liverpool.
Greek revival by Cockerell.

A coat or two of surface-sealing compound when finishing would be an improvement.

After the old Georgian style had begun to recede and the interest in its form and detail had passed away, it was succeeded by a composite medley of Classic fragmentations in brick, stone and stucco. From George the Fourth in 1820 and his successor William the Fourth, 1830, and Victoria to 1851, revivals of both the Classic and Gothic schools certainly kept the intelligentsia in a lively conflict, that even now is still in progress. The binding of the once free goddess of architecture with strands of ancient shibboleths of form and usages of ornament and construction, until the poor old lady is all but mummified—resulted in her final strangulation. And yet as long as building work proceeds, or is erected, the lady must still be alive, and her appearance is either good or bad according to whether an architect is designing for his day or for that of his predecessors.

Must we always look death in the face each time a hoarding is removed?

It therefore comes about that one of these death scenes in stone, that would be quite a good design in the day that it would appear to represent, is actually of a lesser value in architectural merit than a contemporary building honest in its modern form and construction but yet of a coarser, less-finished appearance and of little refinement.

Even a Georgian, or a nearly so, house in the open country is only improved by the country. Only a thoroughly modern and equipped town house can really hold one's affection, with the open country missing from its environment, and even then I might in preference reside in suburbia until the right site, locality and urge coincide, but to you, presuming that you are still with me, reader, never leave your building operations until it is all but too late, for you have not saved hard to be beaten at the post.

But few of us like to be State fed, housed or managed.

Post-war promises, when they may be afforded, will not

be for you and me, except as ghost clients only, who pay but do not occupy, though with prospect improvement great advance will await the developer of the building sites.

So, in finality, every building requires a trained architect and trained craftsmen, even if it is built in the so-called machine age; there is skill in keeping the rain out.

Our town plans cannot fail to improve now that it is so definite that architect is to join engineer, with all other experts, in its proper solution, though the picture painter must govern even the crafts of road and sewer, and councillors must not hinder and misread the Act, as some are doing.

However, the new Regional Town-planning Reports and Maps do not portray much of the picture painting of the architect, who in these days is still not yet the controlling author.

It is pleasant, however, to find that enlightened public opinion has not been slow in severely criticising the tameness of the result, after a period of great expectations.

EPILOGUE

A KNOCK at the door, neither double nor glazed.

Enter my old friend, the primitive henhouse architect.

Now, having reached the stage of development where a rooster is living in, so that the house may be self-supporting by producing its own chickens, this proud bird (not being a technician on aspect nor caring two hoots or crows about prospect) has, through infringement of the natural laws of rest, produced great irritation to neighbours and caused dire upset in the pleasantry of primitive egg-production development towards a limited company.

The interrupted periods of sleep now ruling has become a major local crisis, and the problem of amelioration goes beyond the information in the pamphlet costing but three denarii.

Even the low ceiling board over his augustly carnelian-combed head but strangles the first vocal effort. And there followed a succession of new efforts on the lower deck beneath the perch, upon which the first over-balance had produced a precedent for continuous predatory effort with thorax and trachea fully extended and head uplifted.

The result of questioning produced the fact that the house had been improved by a roof-light or skylight amenity, not yet vita, and this, unconsciously, became the clue necessary to enable a single-door architect to personally aid his primitive prototype.

Where his bird had gone wrong was in the fact that its restricted grey matter did not allow it to differentiate between sunlight and moonlight.

Hence, on the rise of the moon, daylight has apparently arrived and the repetitive crow at full blast becomes a dire necessity, to the great annoyance of humans and a lower egg production that was bound to follow.

All, however, is now well in the valley. There is a

blackout curtain over the glazed amenity, and also one large modern functional flat shelf, hood or marquisse over the entrance to keep the moonshine from lighting up the doorway.

Stygian gloom now pervades the egg precinct, with ne'er a crow all through the night.

As the primitive henhouse architect left the top-floor room, with aspect west, he silently dropped a coin into the aperture of a tin box—

" The Architects' Benevolent Fund."

ADDENDUM

Both the coin and the box may now be things of the past, for all people are to enjoy full employment. It but remains to find the celestial means of keeping gross rates and taxes below gross earnings, and, even above all, to name " Jerry design " as the dominant partner in the long-standing and suffered firm of " Messrs. Jerry Building and Partners," so fully represented in all towns, villages and beach-heads—in their subscription lists few indeed are omitted.

Are you to be one of the few ?

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