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BUILDING
for the
PEOPLE

Also by RICHARD SHEPPARD

CAST IRON IN BUILDING
PREFABRICATION IN BUILDING

BUILDING FOR DAYLIGHT
with Hilton Wright

BUILDING
for
THE PEOPLE

by
RICHARD SHEPPARD
F.R.I.B.A.

London
GEORGE ALLEN & UNWIN LTD

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INTRODUCTION

ARCHITECTURE is a social art. It requires the co-operation of many different trades and crafts which are themselves the product of social organization and technical skill. In combination buildings are erected which express the ideals and symbols prevailing in society. "By their works ye shall know them," and we comprehend medieval society in terms of the castles and cathedrals they built and the urbane architecture of the eighteenth century reflects the domination of a limited oligarchy. For the last hundred years we have been moving towards a different form of society and one that has no parallel in the past. Democracy and universal franchise are comparatively recent concepts and are only made possible by the industrial revolution. We are progressing towards a society in which a large proportion of the buildings erected are paid for from the common pool, are in fact owned by the State and built through its executive agencies, the government departments and the local authorities. A great deal of present day building is thus coming under public control and these buildings, houses and schools, are those which are most critical to the well being and culture of the community.

Towns and villages, houses and schools are largely under the control of the local authorities and these authorities are directly controlled and closely in touch with the electors. The electors are therefore in a position to influence and control the standards of these buildings, and if this is to be exercised beneficially the essentials of good design must be widely understood. To judge and understand these buildings it is necessary to know the physical standards which determine health and comfort, and how these may govern design. The legislative history of these buildings must also be considered—the form in which housing subsidies have been made has affected the planning of houses—and so on.

This book is therefore intended for those who are interested in our national task of rebuilding and planning and who wish to know more about building than can be seen on the façade. Everyone is concerned in some way or another with this task, and these chapters are an attempt to outline the conditions upon which the design of buildings for the community must rest. The aim has been to provide a basis of knowledge of the fundamental needs in housing, education, and health, and to represent the evolution of these needs and the means of improving them.

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CHAPTER ONE

Local Government and Building

(a) Architecture and the Community

(b) The Local Authority

(a) ARCHITECTURE AND THE COMMUNITY

THE buildings we use influence our lives in every direction. Not only do they affect the way we live—our household arrangements, the mechanism of everyday existence, but they also share in forming our modes of thought and social behaviour. The effect may be good or bad, as it assists or hinders our development. History is full of examples of the influence of buildings upon behaviour. The pattern of church services has been modified by the acoustics of the parish church, while according to some authorities, the party system of government has been assisted by the rectangular hall which has always been used by Parliament.¹ The shape of rooms can thus affect both our political and religious forms; much more direct and emphatic is the influence of the buildings we use in daily life—our houses and schools and factories and farms. The slum creates the slum dweller and the slum dweller intensifies the slum conditions. It can be shown that the greatest incidence of juvenile crime is to be found among adolescents brought up in slum areas. That is not to say that overcrowding produces crime; it simply establishes conditions in which the normal restraints and incentives are weakened.

Now that the time has come for us to rebuild our cities and villages, our homes and schools, the evils associated with the past—overcrowding, lack of light and air, dirt and discomfort, are finally to disappear. But if we try to translate this into building terms, it means that our new homes and schools must be well designed and planned—must be, in a word, good architecture—and we are inclined to give a rather guarded and cautious assent. People still think of architecture as something that is applied, something that costs a lot of money, and gilds the city banks with Corinthian columns, or as a term exclusively applied to churches. Architects themselves have been partly to blame for this state of mind. Either they ignored social problems, which is what happened to a great extent in the nineteenth century, or, when they did concern themselves with such problems (as they have in recent years), they often superim-

¹ "The Party system is much favoured by the oblong form of chamber. It is easy enough to move through these insensible gradations to the Left or Right, but the act of crossing the floor is one which requires serious consideration"—*Winston Churchill*.

posed their ideas of living on the occupants of the buildings they planned. But the public too was apathetic, and the public conscience awoke only reluctantly to the conditions under which the mass of the population lived. And, just as a community often gets the kind of government it deserves, so it gets the building it accepts. But we now have the necessary knowledge of ventilation and lighting and the necessary technical equipment for making our buildings warm and dry and healthy. Architects and engineers can satisfy these fundamental conditions if they are given the chance. It is up to us as citizens to see that we do get the best possible buildings. We shall pay for most of them through our own efforts and can insist, if our production justifies it, on the best that modern technique can provide.

Besides these conditions of firmness and commodity—to use Wootton's classic definition—there is a third, delight. If our buildings—the background of our lives—are to be satisfactory, they must give us enjoyment and beauty. Delight is an essential factor and without it the other two conditions are no more than makeshifts. Delight is to building what wit is to life; it is the measure of man's superiority over his environment. By seeing that we get well planned, well equipped, well spaced housing we shall very nearly get beautiful housing—very nearly but not quite. Well designed buildings give people a pride and confidence in their environment, and bring poise and self-assurance to men's personal lives. Good design costs no more than bad; the bad craftsman is more expensive, than the good, and he is often wasteful into the bargain.

Architecture is first of all an economy of means; each part of a building, whether it is a school gymnasium or a kitchen, is planned to do its job efficiently without waste of space and without effort in planning and construction. It conveys delight in the same way—by emphasizing what is there, what is necessary, what is inevitable, and by the elimination of what is wasteful and what is unnecessary or adventitious. Window and wall and the relation of these to one another in line and pattern help to make architecture.

(b) THE LOCAL AUTHORITY

Architecture also means that a building must be appropriate to its position, and its function in the community. The method of construction must also be related to the use which will be made of a building. A school serves a different purpose from a cinema, requires a different position and a different construction, and the appropriate form must be found by an examination of the fundamental conditions which will make each a successful building. It is with this problem that this book is concerned. The factors which go to make a good building will

be analysed. On the purely physical side these factors can be measured and demonstrated—particularly where research into human needs has been carried out. We can estimate the amount of heat required in a particular type of building for all seasons of the year and so design it that the required quantity is produced—no more and no less. These matters are not ambiguous and there is no room for controversy. But the appearance of a building, the expression which is given or denied to its requirements, its methods of construction, is a matter on which two opinions can be held. It will be one of the objects of this book to show that these physical conditions can only be adequately satisfied by the development of new architectural forms and that any attempt to retain the forms of the past and to impose them on the buildings of the present will lead to unsatisfactory and makeshift compromises. It lies in our power, in the face of this tremendous task of rebuilding Britain, to make this island the beautiful place it once was—in the eighteenth century for instance. It will not be done by copying that century, but by the appreciation (and criticism) of our contemporary architects and architecture.

The types of buildings which are examined have been limited to those with which local authorities are concerned, and even in this field certain exceptions have been made. The reason for this arbitrary distinction is that a local authority is ultimately concerned with the community and through that with the individual. The community builds for itself, for the use of its own people and largely at their own cost. The buildings, therefore, are those that the people control, and control can only be effected through knowledge.

Already, after a year or two of peace, it is apparent that the local authorities have the critical task in rebuilding. To an increasing extent the conduct of operations, in housing and education, is being placed in their hands. There is nothing new in this and the Government is simply pursuing a policy which was well established before the war. What is new, and what is important, is the size and extent of the building programmes for which the local authorities have been called upon to take responsibility. A million houses were built by the local authorities between 1919 and 1939, while three times as many were built by private enterprise. The position is now reversed and it looks as though the proportion previously built privately is now to be attempted by the public authorities.

To put this in another way, nearly all the building for which, at various times, the State has been forced to assume responsibility, is under their direct control. General policy—the basis on which loans are issued—rests with the central government, but there is a wide latitude in regard

to its interpretation which is the concern, in the final analysis, of the municipal elector.¹

In mere quantity the annual programme of building carried out by the local authorities is enormous; the size and volume of this programme in the post-war period is discussed in the next chapter. Some of the buildings with which an authority is concerned are subject to special control from the central government; police stations and pit-head baths are examples, and these have been omitted. Others, too large or specialized to be economically administered by the smaller authority, such as lunatic asylums or tuberculosis hospitals, are also omitted.

The buildings which are left are those which have the most immediate and direct effect upon the community. Their design will affect each citizen from the cradle to the grave. They are the expression of the economic ideals proclaimed in the Beveridge Report, in terms of brick and mortar. They range from pre-natal clinics to old age pensioners' cottages. If these buildings are well designed and planned, they will affect the lives and health of a large section of the community. They can also by their influence and example, help to improve the standard of design of private enterprise. Local authorities have seldom been responsible for ribbon development, or for some of the worst excesses in the despoliation of the countryside; but they were not blameless. Where an enlightened authority has been blessed with a good architect, there has usually been a considerable effect upon the standard of design in other fields; the jerry-builder has attempted to incorporate some of the better features of the so-called council house, and even in his site plans, was latterly induced to plant some shrubs and a tree or two.

The local authority is in a better position to influence architecture than any other building agency in the country. The activities of industry and private enterprise although large in aggregate, are made up of a number of building schemes, independently conceived and unrelated to a general plan. Private enterprise developed large areas of land, but these were seldom subject to a single control; piecemeal development is usually wasteful development. But the large authorities have developed housing estates, have planned and built satellite towns—as at Wythenshawe outside Manchester—and carried them out in such a way that they stand as models. More important, perhaps, even than the layout and planning of houses, the local authority is in a position to control the development of such new areas, to regulate the type and number of shops, to allocate areas for schools and open spaces, to transform the housing estate into a community.

¹ The term "local authority" is used here to indicate the body responsible for local administration. The table in diagram 1 shows the type of authority responsible for the buildings dealt with in this book.

Business and industry have complete freedom in planning their own requirements, subject of course to the statutory limitations imposed on all building under Act of Parliament. Government departments are seldom free to initiate building schemes under their own control. The Ministry of Health and the Ministry of Education have a definite and

DIAGRAM I.—GUIDE TO THE CHIEF POWERS AND DUTIES OF LOCAL AUTHORITIES¹

The mark × indicates that the function is normally exercised. The mark — indicates that the service is not normally undertaken, but may be performed in the whole or part of the authority's area in special circumstances, or may be assisted. The mark = means that the function is normally exercised only in boroughs of over 10,000 population and/or urban districts over 20,000.

NATURE OF SERVICE	TYPE OF AUTHORITY					
	County Council	County Borough Council	Metro-politan Borough Council	Borough or Urban District Council	Rural District Council	Parish Council
Infectious Diseases ..	=	×	×	×	×	×
Hospital Ambulance Services	×	×		=		
Tuberculosis and Venereal Diseases ..	×	×				
Maternity and Child Welfare	×	×	×	+	=	
Parks and Open Spaces		×	=	×	=	×
Bath and Washhouses		×	×	×		=
Housing	—	×	×	×	×	
Education:						
Elementary	×	×		+		
Higher	×	×		=		
Libraries	—	×	×	×		=

¹ Reproduced from the *ABC of Local Government*, by C. Kent Wright (Evans, 1939), 45. 6d.

limited function of administering the various Acts and interpreting policy—particularly in relation to loans to the local authorities. While the Ministry for instance, may be responsible to the Government of the day for the total financial outlay involved in a school building programme, the responsibility for the actual work rests with the local authority. It is free to appoint its architect, to draw up plans and specifications to suit its own local conditions and policy. For loan purposes the scheme has to be sanctioned by the appropriate Ministry but beyond this control it can do

little. A diversity of local policy is encouraged under the present system and must be maintained.

In its own sphere, a Government department cannot admit the same latitude in experiment and design which is possible for the authority. A State department has to consider a scheme in principle and is always hampered by the risk of creating a precedent. It cannot afford either to experiment or inaugurate; it must wait until it is pushed by Parliament. The housing committee on a local council can, and does, react immediately to local conditions. A Government department must interpret legislation nationally; it must formulate its proposals in terms which can apply equally in Devon and Durham, in Cheltenham and Middlesbrough. The local council knows no such problems, it is concerned with specific proposals in time as well as place; it has to know the needs of its own people and see that these are met. The local authority, moreover, not being concerned, as a dominant consideration, with profit and loss, can harmonize its new buildings with local tradition and characteristics, can give to its estates and buildings a distinct local identity and interest.

In other directions the local authorities can have a considerable effect upon the standard of building and planning. Under the Town Planning Act of 1932, planning authorities were given powers to regulate the design and location of buildings which were to be erected in their areas. This, of course, is a purely static control; it does little to improve the standards of building; it discourages experiment and emphasizes the mediocre. But, where it operated, it has had some effect. Under the new Act, new planning authorities will be formed, with positive powers for inaugurating planning schemes and carrying them through.

To find a positive direction for improvement is difficult. It is always so much easier to frame a Bill or a bye-law which prevents an individual from doing something undesirable than it is to make one which actively encourages a better standard. By the same analogy, it is easier to shut someone up and thus prevent crime than it is to free someone to do good. Better standards of living and building can only be obtained by example and by education, and the municipal, urban and rural authority is in the best position to do this. For the large city, with its own architect's department, it is easier than for the small authority, the rural district council, whose work does not justify the employment of a whole-time architect. But it is open to such small authorities to engage an architect in a consultative capacity, either singly, or jointly in combination with other similar authorities. The place to begin is with our own buildings; by rebuilding our schools so that it is easy to teach and amusing to learn; by making the material conditions as good as possible. But the design of the

buildings themselves can exercise as great an influence, even where it is not conscious, as any of the more deliberately contrived factors. It operates in two ways—by affecting an immediate environment and by giving each citizen the opportunity of playing a part in the creation of this environment.

List of Books

The ABC of Local Government, by C. Kent Wright (Evans, 1939), 4s. 6d. The title is explanatory—excellent.

A Century of Municipal Progress, Editor, H. J. Laski (George Allen & Unwin, 1936), 21s. A thorough and critical account.

Rebuilding Britain (The Royal Institute of British Architects, 1943). A brief introduction: explains the architect's function and the citizen's duty.

Modern Architecture, by J. M. Richards (Penguin Books). A stimulating, well illustrated book.

CHAPTER TWO

Building for Peace

- (a) The magnitude of the problem
- (b) The building industry
- (c) Towards a solution
 - 1. Standardization
 - 2. Prefabrication
- (d) A standard of building

(a) THE MAGNITUDE OF THE PROBLEM

WE now realize that the end of the war was the beginning of our trouble and we face a building shortage of a complexity and magnitude never encountered before. It is a problem which does not depend upon size alone; not upon the marshalling of men and materials on a sufficient scale, but on other factors; upon the relative degree of priority which can be given to building in this country in relation to the needs of industry and export and to the situation in Europe; upon the relative importance of housing and education as well as to the reconstruction of industry for peace-time needs. We may and we must plan in advance, but such plans can only be approximate until the precise terms of the problem are apparent.

An examination of the causes of the shortage will show why estimates of its size are likely to vary. Quite apart from immediate deficiencies which have arisen out of war conditions in this country, are those problems which have not been affected by the end of the struggle. Estimates of the probable birth rate show that a decline in the population is likely to occur; it will not fall immediately in the total but the number of children of school age is likely to decrease and the average age of the population to increase. These estimates must affect our future plans even though they can have no immediate effect. The main causes of the building shortage may be summarized under these headings.

- (1) Deficiencies in the pre-war programme both in housing and education
- (2) Cessation of civil building in war-time
- (3) Destruction of buildings due to enemy action and other causes
- (4) Transference of population to war factories and the dispersal of industry
- (5) Higher standards both of living space and equipment which are required

- (6) Increase in the number of families during the war
- (7) Shortage of labour and its distribution as between trades.

It is evident that a number of these items cannot yet be assessed. It is only in the last two years that some estimate of the total capital expenditure which is necessary to make up our shortage has been made. The local authorities have prepared plans for rehousing based on an assessment of the number of families known to be living in overcrowded conditions, while the education authorities have been preparing a plan of educational development based on the requirements of the new Act and on child population. These plans are not related to time but to an estimated cost. Today, however, estimates based on time and related to the supply of labour and materials are the only important index and the immediate task is to assess these. Until this is done and applied locally through the different authorities, so that each knows its actual balance in terms of men and materials, programmes and targets are merely the record of aspirations and hopes. We commenced too many houses in 1946 and spread the men and materials too thinly for speed and economy.

There is a certain tendency to assume that the problem will not be so acute owing to the decline in the birth rate and to the fact that bombing did not result in destruction on the scale that was expected during 1940. We shall put ourselves in a very dangerous situation if we rely on these factors. We have no chance, whatever methods we adopt, of liquidating the building shortage during the next fifteen years or so. Moreover, even if the total population does decline as predicted, the number of separate family units will not do so for a long time to come. And if we find that we have more places in our schools than there are children to fill them, the long desired reduction in class sizes may eventually come about. So far as our immediate problem is concerned it seems likely that we shall need more of the smaller family home of one and two bedrooms than of the larger unit of three and four bedrooms. The effects of bombing have been largely felt in the older and overcrowded residential areas in industrial zones, and this housing was very largely obsolete and sub-standard before the war. We may patch it up temporarily for the immediate shortage but we cannot regard the homes and living conditions which it usually represents as being adequate for our standards today. Even where it is undamaged it must be condemned within the next decade or two and as fast as we build so we must condemn obsolete and worn out buildings.

(b) THE BUILDING INDUSTRY

Although the building industry employed something like 1,500,000

men before the war, and was therefore about the biggest industry next to agriculture, it was relatively unorganized and backward in its methods. During the war it was substantially reduced in size (about 400,000 men in January 1944), and the control of men and materials which was imposed gave it unity and flexibility. It has now (1947) been augmented almost to its pre-war level, but it is doubtful whether the output from the industry is as large. Some of the causes for the fall in output are mentioned later in this chapter. The decline in production slows down our national recovery and actually increases the magnitude of our building problem. We had to wait five years after 1918 for the industry to get back to something like its normal output; we cannot afford to wait as long this time. For time enters into the post-war programme and every year we have to wait for full production, every year in which we do not attain the full quota of buildings we require, increases the severity and extent of the shortage in the succeeding ones. Building will continue to be the bottle-neck of reconstruction until drastic action is taken by the Government for the industry is one which is unfitted for rapid expansion.

The building industry in this country is made up of a large number of firms of different size, capacity and character. At the bottom, in point of size, is the small jobbing builder employing one, two or three men. Before the war, this type of firm formed the backbone of the industry and more men were employed by small builders with less than twenty or thirty men on their pay-roll than by the larger firms which employed a hundred or over. The same was true of a number of the firms which supplied building materials, and these ranged from those who stocked the various impedimenta of the trade, from putty to lavatory seats, to the big groups manufacturing bricks or steel.

With such an industry, broad based as it is upon the small man, progress in building methods, the adoption of modern techniques of construction, of mechanization, of scientific principles, is slow and reluctant. The industry in this country has indeed made little progress in its methods in comparison with those of other industries, and other countries. In America, according to the report of the British Mission (*Methods of Building in the United States of America, 1943*), the output per workman is far higher than in this country, as the following table taken from the report shows:

RELATIVE COSTS AND WAGES
(British figures are standardized at 100)

	Great Britain	U.S.A.
Cost of building	100	75 — 175
Hourly wage rates: craftsmen ..	100	350 — 380
Hourly wage rates: labourers ..	100	215 — 245
Cost of materials (excluding timber)	100	110 — 160

It is clear from this that although the American workman earns three and a half times as much as his British counterpart and his materials cost at least as much, the cost of building is not much greater than ours. We can only infer that the methods of building employed over there are very much more efficient. The same report goes on to recommend the simplification of design, improved supervision and co-operation of the various trades, and the greater use of power-driven plant and tools. During erection these are factors which will reduce cost and increase production. A scientific study of job organization and the methods adopted during construction is also necessary. Efficient methods of organization for the construction of large scale housing schemes by firms of speculative builders was commonly met with before the war. The different processes of house building were examined to find the cheapest and most profitable method of execution and teams were built up on this basis. Even traditional methods of construction can be rationalized and broken down in this way. But such methods in the past were concerned with profit and not primarily with output and economy of skilled union labour. Both sides of the industry must be brought together to hammer out building methods which are of value to the community as a whole and not only to one section or another of the building industry. "Co-operation between masters and men for the promotion of efficiency in buildings is virtually unknown in this country."—(*Times*, April 25, 1947.)

Poor organization is also the result of the present structure of the building and allied industries. An efficient contractor anxious to organize his work to secure the maximum output immediately finds himself up against a fixed wage system peculiar to this industry alone. This system, which was imposed on the building industry at its own request by the Government of the day, makes illegal the payment of anything but maximum and minimum rates of pay, and effectively prevents payment by results and piece work. Piece work rates have been successfully applied to every other industry and there is no valid reason why it should not be applied to building. Unfortunately, the leaders of the Building Trades still live in the nineteenth century; the Government itself keeps the door shut between the two centuries by registering freely as building contractors anyone setting up in business without examination of their qualifications or intentions.

The supply of building materials is also inadequate, ill-adjusted and badly distributed. This is partly the result of the war. The larger and more highly mechanized plants were closed down and their labour drawn away, or alternatively, was diverted to the manufacture of other products. When building recommenced two years ago site construction was easier to start up than the plants manufacturing building

materials and consequently a time lag in supply was created almost immediately. Stocks of building materials and components are normally stored in large quantities, and in peace-time a cessation of output of even a year might not have been serious. But these accumulated stocks were exhausted during the war and in the last two years a proportion of these products have also been exported.

Other factors have combined to reduce the output of building materials. The methods used in the manufacture of many building materials, bricks and baths for instance, are antiquated and the conditions of work thoroughly unsatisfactory. It has been difficult to recruit labour to these industries. Coal shortages have also held up supplies, since nearly all building components, from bricks and cement to glass and paint, consume large quantities. It is evident from this brief summary that the position in the building industry is serious, indeed is one of continuous crisis, and is holding up the physical and financial aspects of recovery as well as lowering the standards of quality and space in our buildings. It is also a situation which the industry as a whole, by its own methods, has largely created. It is clear enough that the disparity between our needs and our means is too wide to be overcome by leaving recovery to occur as best it may. Other methods of meeting the shortage must be devised and the industry itself assisted to improve its output more rapidly than it is concerned to do for itself.

(c) TOWARDS A SOLUTION

We shall only get the building output we require by organizing the building industry and planning our future developments in relation to a kind of time and progress schedule. This is partly the reason for the organization of "Zonal Committees" about which so much was heard in the Press in the early part of 1947. These committees are a belated attempt to gear building construction and the issue of licences to the existing and actual shortages of men and materials. Shortages can only be overcome by Government action. The Zonal conferences are only the coupons in the rationing system and their effect is negative. A definite, comprehensive programme is required for the building industry which will deal with the wage rates, price structure, production, output and building methods. Nothing less will serve.

(1) *Standardization.*—One of the most obvious means by which output can be improved is by standardizing all the equipment and components which the building industry uses. Ultimately this process will come about as a matter of convenience, but it must be given direction and momentum. Long before the war doors and windows were becoming

standardized, but the range must now be extended, and the number of different products in each category drastically reduced so as to get the maximum production of the types we really need. There is no excuse for manufacturing hundreds of different types of baths every year; no one needs that range of choice and if he does, he can have one specially manufactured—when there is time. Standardization is often objected to on the grounds that it is monotonous, or cheap and shoddy. A brick is a standard article and yet no one seems to think brickwork monotonous: the Elizabethan and Georgian windows were standardized articles, yet no one objects to their appearance, but when we do the same thing in steel we are told that the appearance of our buildings will be ruined. Standardization need not be shoddy—it simply depends upon the standards of quality we get. And it need not debar the individual from indulging his fancy—provided he can indulge in the cost. Standardization can cheapen the cost of even expensive articles like refrigerators, and put them within the reach of every citizen. It can prevent the process of building from becoming a mammoth assembly of Chinese puzzles specially designed never to fit. Thorough standardization of all the equipment that goes into buildings from cupboard locks to cupboards will produce the required quantity, and will help to solve the problem.

(2) *Prefabrication.*—The coming shortage has brought the same crop of ideas for speeding up production that occurred after the last war. New materials, appliances, devices, gadgets, as well as complete buildings, have been patented and produced. Prefabrication is a much misused word; it is usually taken to mean the factory manufacture of building units—walls, floors and roofs—so that these units can be produced in large quantities and then erected with the minimum of site work. The word can have almost any meaning; a building made up of entirely factory-made parts like that illustrated in Plate 7, or the Arcon bungalow, is prefabricated; and so are bricks, although they require extensive site work. The word has also become one of abuse, and many people are misled into thinking that it denotes something cheap and shoddy. It need do neither, and it would be better if we confined ourselves to describing houses according to the materials of which they are made.

The prefabricated houses, whether temporary or permanent, have proved a substantial addition to the housing programme in the last two years. Quite apart from the merit of the houses themselves (and this very largely depends upon what we want, since they can be made to last five years or twenty-five years according to their cost and the way they are designed), factory construction has increased output without taking a single man from the building industry. The workers

in aircraft factories and shipyards can turn their skill to the production of bungalows.

These methods of construction arouse the fiercest feeling among those who are the most ignorant of what they entail. Monotonous—cheap—ice boxes—draughty—these are the sort of words employed to describe them. Actually, the technical problems of prefabrication have been largely solved, and there is no reason why prefabricated houses should not be as warm, dry and soundproof as those built in the usual way. By the mass-production of such units, it is argued, better standards of accommodation and equipment can be used and incorporated in the house. The development of the motor car in the pre-war years is pointed out as an example of the process. Certainly, the factory-made building is still in its infancy, as was the motor car in 1905, and the development that has already occurred suggests that we are entering a new phase in the history of building. Our ideas on building, social and aesthetic, may have to be revised.

As will be shown in subsequent chapters, homes and schools can only be fully effective if they are woven into the social unit. The policy of population dumping, of building estates without a social core, which took place in permanent housing, was often disastrous before the war. The same methods are being adopted and with prefabricated housing the effects of the cure may well be worse than the disease. As Lewis Mumford says in *The Culture of Cities*, "To conceive of a prefabricated house designed in a civic and environmental vacuum is to conceive of something that is, by definition, half baked, scamped, and inadequate."

The prefabricated houses of all types either erected or in course of manufacture, number over 200,000 and are the result of programmes established and organized as far back as 1944. Many of these houses have proved more expensive than those of orthodox construction and cannot be regarded as economic in this sense. When the orders were placed it was hoped that bulk manufacture might reduce costs, but they were intended to provide immediate accommodation. It was not anticipated at that time that sheet and strip steel, aluminium and other materials would be in short supply. The production of prefabricated houses is being reduced as the number of houses of orthodox construction are completed. It is likely that this process has been undertaken too soon and that it would have been wise to continue the manufacture of prefabricated houses for some years. Once a programme of this sort has been stopped it is very difficult to start again. Moreover, prefabrication is a long term policy. Houses cannot be produced in quantity until factories have been tooled and storage and assembly arranged. If buildings

are wanted badly enough prefabrication will come—and in doing so will only be accelerating a process already apparent in the industry. It need make no dislocation of the industry as we know it today, for all types of craftsmen, and all available materials will be required. It will also have the effect of forcing reorganization and improved systems of control upon that part of the industry using ordinary methods, and which may be threatened with competition by prefabrication.

(d) A STANDARD OF BUILDING

There is always a temptation, in a period of scarcity, to lower standards, and to obtain the maximum quantity at whatever sacrifice in quality. In terms of building this means a decline in health and efficiency which would continue as long as sub-standard buildings existed. This effect has rightly been resisted and a minimum standard has been laid down and the operation of controls and licencing on all forms of building has enabled these to be maintained. This was not the case after the first world war. But all sorts of considerations, material, economic, and social, urge a higher standard for our buildings than any known in the past. The necessity for the establishment of some such level has been recognized, and the Ministry of Works published in 1944 a report on House Construction (*Post-War Building Studies*, No. 1) which sets out a basis for house construction in terms of standards of performance, and includes stability, moisture penetration and condensation, thermal insulation, weather resistance, sound insulation, fire hazard, and other factors which affect the efficiency of buildings. If these standards become operative then the jerry-built house will not be repeated, and we shall have a yardstick with which to measure all forms of construction. There is no longer any excuse for bad buildings. As the preceding section has shown, science and industry between them have given us the means, and this report gives the measuring rods. It sets up higher standards for building than any we have known before.

Today, given an exact analysis of the use of a building, there is little excuse except the perennial one of cost, for failing to design a good one. We can predict, within limits, the effect of the materials of which a building is constructed upon its behaviour. In housing, for instance, we know we need a type of construction which will have a very high resistance to changes in external temperature, so that the internal temperature can be raised and maintained in winter, without undue loss through the structure. Owing to the extremely small loads involved in a house, the strength of the materials used are relatively unimportant. Brick is the most common material for wall construction in this country, and while it

is comparatively strong it is not so efficient for heat insulation as certain other materials. In practice, therefore, a house which is warm is often unnecessarily strong.

This brings us to the question of the physical standards required for health and comfort which are fully set out in this report. Scientific investigation has only recently begun in a methodical way, but the results which have been obtained must make a considerable difference, not only to our methods of planning and construction, but also to the appearance of buildings. The necessity for improvement in insulation against heat loss in housing is referred to in Chapter III. Noise is one of the complaints most often made against neighbours. It is transmitted, whether in a house or a flat, through the air and through the structure. But here again, the study of the ways in which it is transmitted has suggested the means and materials to overcome it. The old party wall of 9-inch brickwork, which has stood unassailed for so many years, letting through the noise of the neighbour's baby and the announcer reading the news, can be vastly improved by building a cavity wall in the same way as an external wall.

As another instance, the investigation of lighting conditions may be mentioned. Hitherto, in schools and houses, the size and type of window has had little consideration. The first essentials in any room are that the amount of light shall be adequate for the use which is made of the room, and shall be sufficient to maintain the health of the occupants. It is now possible not only to determine what lighting conditions are necessary, whether for natural or artificial light, but to design both the windows and the fittings in such a way as to be sure of getting them. A comparison is made in Chapter IV. Plate 43 shows the effect of such investigation in the lighting of a school classroom.

Since the design of buildings must take into account all the factors just outlined, the planning and appearance of buildings is undergoing considerable modification. The necessity for good lighting conditions, and for letting in the sunshine, is affecting the design of schools and classrooms in particular, and these are illustrated in Chapter IV. Similarly, different uses of materials bring about different methods of construction, and these in turn are altering the appearance of buildings. It is fallacious to assume that such changes are for the worse; they are merely different, and they are good or bad in their appearance in much the same way when traditional materials are used. At each period in our history we have used the materials that lay to hand and were convenient for our purpose. We are doing this now, but we have more materials than in the past and their production has radically altered.

The subsequent chapters show the progress made in building design largely as a result of the adoption of a more objective attitude of mind.

The chapter on education will show that the plans are being de-centralized, and that ventilation and lighting conditions are being allowed full expression. In housing, the same factors, as well as others which are particular to the subject, are also evident in some of the examples which are illustrated. These are instances of the work that is being done to make our buildings healthy and pleasant. They indicate that changes in construction and planning are being made and why. In this development the industry has a difficult role to play; not only has it to expand its own production, but at the same time to organize its methods so that the improvements in technique can be realized in practice.

List of Books

Methods of Building in the U.S.A. (Ministry of Works, 1944). The report of our building mission of 1943 on methods used in American industry. Controversial.

House Construction (Ministry of Works Post-War Building Studies, No 1, 1944). For the technician. A survey of inter-war prefabrication; a standard for house building.

When We Build Again (George Allen & Unwin Ltd., 1941). A Bournville Research publication. A concrete example of rebuilding: Birmingham is selected.

CHAPTER THREE

Housing

Section 1: Social and economic factors

- (a) Importance of housing to the community
- (b) The post-war problem: demand and supply
- (c) Brief history of housing, 1840-1939
- (d) Effect of subsidy, 1919-1939
- (e) Future policy

Section 2: Communal services

- (a) Siting and location of houses
- (b) Communal needs: schools, open spaces, etc.
- (c) Layout and aspect

Section 3: Housing design

- (a) Physical needs
- (b) Equipment and installations
- (c) Planning: (i) occupational factors
(ii) special problems of flat design
(iii) room planning

IN their report, dated 1917, the Tudor Walters Committee, speaking of the housing development which characterized the nineteenth century, made these comments:

“In view, however, of the multiplicity of the requirements of human life to be provided for, and the diversity of materials, processes and skilled labours which have to be assembled and combined, each in its due order and under the proper conditions which alone ensure success, the cottage must be regarded as one of the most complicated and difficult of productions. In the absence of traditional skill and guidance, which rapidly changing conditions have largely destroyed, such a product needs scientific study in all its parts and thorough organization of its erection, if a result at once efficient and economical is to be secured.”

SECTION I: SOCIAL AND ECONOMIC FACTORS

The housing shortage directly affects us all, even if we already have a house to live in. It cannot be ignored even if we would, for the absence of houses throws industry out of gear and shortens the supply of goods already scarce, forces up rents and rates and decreases our efficiency as a nation. These are the immediate material consequences and they are perhaps less important than the social and physical damage which is

caused daily by overcrowding and which cannot be easily measured and assessed because it affects the life and habits of the people. We have to build millions of new houses to provide homes for families who are without them, to rehouse families whose houses are derelict or obsolete and at the same time to build better houses so that they are more economic and efficient in operation and pleasant places to live in. All of us, as citizens, have a responsibility in this task and the wider our knowledge of these factors the greater and more effective will be the contribution we can make.

From the national standpoint the problem is one of appalling complexity and involves nearly every controversial issue, from the direction of labour to our foreign policy. In the war years, when reports were being prepared and plans drawn up for post-war housing, it was assumed that the problem was a simple one of supply and demand. All that seemed necessary was to arrange for the adequate production of materials, of bricks and cement, and train the soldiers to use the materials. But where we want houses most urgently there is no labour and when we require bricks there is no coal and no money is available to buy timber overseas. It is necessary to think of the housing afresh, in new terms, and drop the old ones—supply and demand, private enterprise, state control, and so on.

We must begin with the consideration of the house itself—how much space must it enclose and what essential appliances are required in it. The reports produced during the war, like the Housing Manual, assumed that the question was largely one of cost and that a cottage of the type envisaged in the Tudor Walters report in 1917, improved by all the experience gained in between 1919 and 1939, would meet the case. So indeed it would if it still proves to be possible to provide a sufficient number in a reasonable period of time. For many reasons this achievement may not be possible, we may have to alter the pattern of our home lives, to choose, say, between ample space and insufficient equipment and appliances.

The fluctuations in the supply of materials make yet another difficulty. There are certain materials, like steel and iron, which are used in house construction, and which, it was assumed, would be in good supply after the war. These materials are now required for vital exports, while timber, owing to the shortage of foreign currency, cannot be imported. We are thus forced to look for substitutes for these materials in the face of competition from other industries similarly deprived. Indeed, cost and suitability are no longer the prime factors in the choice of materials and technical considerations are subordinated to the paramount needs of national economy. In the past technical considerations were subor-

dinate to materials and labour. Thus the housing problem touches the citizen and the nation at every point.

(a) *Importance of housing to the community.*—Good housing makes for health, personal self-respect and pride; bad housing for disease, apathy and ignorance. The family depends largely upon the house it inhabits. Bad houses make poor homes, poor homes help to produce poor families and irresponsible, ignorant citizens. One instance will be sufficient to show the effect of poor housing and the conditions that go with it—the rate of incidence of infant mortality and juvenile delinquency are lower in modern housing estates than in the slum-infested central areas of large cities. Other factors, of course, affect this, but housing is the easiest to control. So the issue stares us in the face: a falling birth rate, a socially diseased community is the price of neglect. If we want a sturdy, self-reliant community we must make the houses the very best we can design with the materials available. During the late war we related the types of weapon we manufactured to the materials we had. We must do this with houses, even though the result may not be entirely satisfactory. The erection of larger houses which accommodate fewer people with more floor space is controlled for the same reason.

The problem is not a simple one. It is useless merely to take the inhabitants of an overcrowded tenement and re-house them in separate homes, either houses or flats. All kinds of factors must be considered—location on the one hand, and the living habits of a community on the other. Broad generalizations must be adapted to local circumstances, and methods which are successful, for example, in the South, must be modified and revised for the North. Then there is the Houses *versus* Flats controversy which has raged with such vehemence and special pleading that the real issues have been obscured. Both are required: each fulfils a complementary need in society. In this chapter, the word “housing” includes both houses and flats, and where the requirements of the latter are different from the former they are dealt with separately. Flats can be made as pleasant and efficient for family life as houses. The trouble is that the majority of people who dislike them have in mind the bungled anachronisms with which we have filled some of our great cities.

(b) *The post-war problem: demand and supply.*—Comparisons of the problem awaiting us with that which existed in 1918 are misleading. The number of houses we require is far larger. The Ministry of Health has estimated that 4,000,000 will be required in ten years and there have been other estimates, both larger and smaller. Judging from experience after the last war, 4,000,000 appears to be an under estimate. It is probably

more than a coincidence that this is the number that were built between 1919 and 1939, so that we have a yardstick to our means of production. Moreover this number did not solve the housing problem; for at the outbreak of war a million and a half people were living in overcrowded conditions in London alone.

There are many reasons why the housing problem is more urgent now than at any time in the immediate past. For one thing a large proportion of the houses occupied today, perhaps two-thirds, were built between thirty and seventy years ago and are worn out. Even when they are in good repair they are inefficient and obsolete in planning and substandard in construction. They are often inconvenient, damp, and insanitary. Although a large number of houses were destroyed in the last war most of them had reached the end of their period of usefulness and must have been rebuilt within the next decade. Bombing has had little effect upon the over all housing shortage. The cessation of house building between 1939 and 1946, the call-up of building operatives, the diversion of factories turning out building materials to armaments during the war, have probably made a greater difference.

There also exist differences in cost and equipment. Before 1914, housing had not been a matter for State subsidy or assistance, but after the last war about 25 per cent of the houses built in this country were subsidized in one form or another by the State, and this was caused by increased building and land costs. The cost of building rose sharply during the war—in 1943 it was estimated officially at 105 per cent above 1939 prices, and it has gone on rising steadily since then. This rise has already resulted in a substantial increase in the subsidy and there is no doubt that these subsidies will increase if building costs rise. The financial cost to the State of housing is thus increasing and the present situation cannot be compared with the years following the 1914-18 war, when a subsidy of £40 or £50 per house was the practice.

The standards of space, efficiency and comfort demanded in housing are rising. This process is partly the result of the general improvement in standards of living in recent years and partly a matter of economic necessity. The war accustomed the soldier and the woman worker to the control of complex machinery and the elimination of a great deal of drudgery and elbow grease, and the same attitude is brought to housing. Moreover, the country cannot afford homes with wasteful methods of heating and water heating any more than it can afford the cost of overcrowding and epidemics.

Another factor, whose effect we cannot yet entirely foresee, lies in the fact that building has engulfed nearly all the land immediately available round our big towns. We cannot continue to enlarge this built-up belt

as our transport system is already clogged in these areas, and we must find some fresh method of developing new housing areas which will enable us to expand in a socially useful and efficient way. This point is developed in Chapter VII.

With these factors in mind our experience in housing in the years following the first world war can now be compared with those after the second. After 1918, the building industry recovered very slowly, and until 1922 the number of houses constructed annually could be measured in hundreds. By the thirties, however, production was running at the rate of approximately 200,000 a year, and Diagram 2 shows the rate of production during this period. It will be seen that the number constructed under State subsidy steadily increased between 1935 and

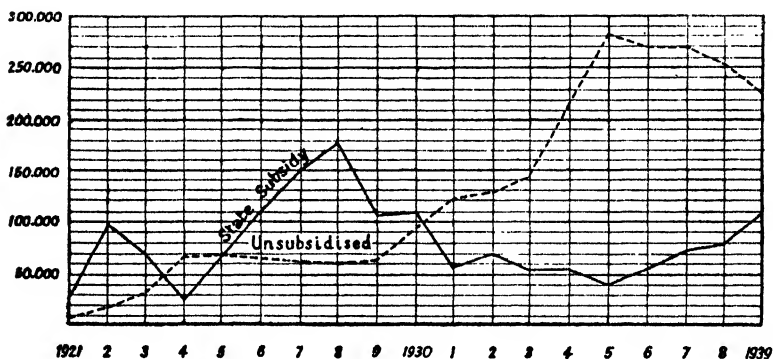


DIAGRAM 2.—COMPARISON OF THE CONSTRUCTION OF STATE SUBSIDIZED AND OTHER HOUSING, 1921-39

1939, and that towards the end of this period there was a slight decline in the numbers constructed by private enterprise. Private enterprise, operating usually through Building Societies, did a big job of work in house building, but failed, in general, to provide houses at low rentals for the low income groups. The municipalities, aided by the subsidies, were providing houses to let at from 6s. to 16s. weekly, according to the size and location of the house.

The situation is very different now. Four hundred thousand houses was quoted as a target in the second year of peace. This performance is largely made possible by the erection of temporary houses, by the repair of bomb damaged houses and the conversion of old terrace houses into flats. The number of new permanent houses under construction in permanent materials is substantially less than this total, as can be seen from Table III.* This number will undoubtedly increase, but there are

many factors present which make it difficult to estimate the annual increase. House building is no longer a question of supply and demand in a free market; the distribution of houses in relation to our immediate industrial needs, the extent to which materials and components needed for export are absorbed in housing, or foreign credit spent on timber and other raw materials, modify the programme. Indeed, technical considerations are increasingly subordinated to long range economic planning.

There is a tendency to consider houses as an expendable commodity and to assume that those which are not built represent a saving to the community. But houses cannot be treated as cheese and the rationed amounts cannot be reduced one year without prejudice to consumption in the next. Failure to maintain output at a level above the rate of obsolescence means that the number of replacements eventually required is increased. If the gap becomes wide enough, standards decline, and for the last twenty-five years our standards of housing have improved and overcrowding diminished. From whatever cause it might arise, a failure to expand house building above pre-war levels will have far reaching and disastrous consequences.

(c) *Brief history of housing, 1840-1939.*—In the early nineteenth century, the movement of the population to the industrial centres broke down the traditions of house building and town planning which had existed in the preceding centuries. A new problem had arisen, and although the process was gradual, it occurred at such a rate that the government, as is customary, only recognized it when it was too late. There is no need to analyse the process by which the new settlements—they do not justify the term town—were built, for our concern is with the housing that was produced. This result is illustrated in Plates 1 and 2. Overcrowding, fever, tuberculosis and the social evils that go with them were the accompaniments of this development, and they persist today. The following quotation from *Town and Country Planning*, by G. and E. McAllister, gives an idea of the effect produced by these conditions:

“That bad housing and bad planning result in markedly lower physique.

“That bad housing and bad planning result in a higher incidence of every kind of disease, but particularly of infectious diseases and respiratory diseases.

“That bad housing and bad planning result in higher mortalities of every kind, general, infantile, tuberculosis, pneumonia, etc.”

So appalling were these conditions that the State was forced to intervene, and protect the occupants of such houses from the rapacity or ignorance of the landlord and the speculator.

Acts were passed in 1848 and 1855 which attempted to clean up some of the worst abuses. In 1866, the so-called Torrens Act laid the responsibility upon the owner, and failing that, the authority. As Gilbert and Elizabeth McAllister so clearly put it, "Parliament declared that people lived like pigs only because they were compelled to live in sties." The Acts had to be enforced locally, and powers were given to the authorities, although most of them failed to use them.

Certain standards of spacing for new houses to ensure air and ventilation, floor-to-floor heights and some form of vent to every habitable room, were made mandatory. They produced the dreary development of road and tunnel house we know and condemn today. Their dreariness is a disaster and their monotony a crime. It is shown in Plate 2. These Acts, while avoiding as it were, the slum, perpetuated poverty—of mind and body and soul. Their effects were derisory, for, according to the McAllisters, only 13,810 buildings were provided between 1890 and 1913, as a result of the compulsory powers of clearance.

Apart from the so-called Cross Acts of 1875 and 1879 relating to the improvement of labourers' dwellings, this remained practically the only official intervention in housing, as far as legislation goes, right up to the end of the last war. The effect of this panic legislation upon our physical environment is obvious enough. What is at least as important, if less obvious, is its moral effect. It produced, by way of reaction, the garden city. The reformers of the late nineteenth century, having before them on every hand the evils of overcrowding and of the legislation of the mid-nineteenth century, rushed to the opposite extreme and insisted that the remedy lay in low density. They recommended eight to twelve houses to the acre. Now, although a lower density may be a step in the right direction, the numbers selected gave no more light, air, and sunshine than could have been achieved with more methodical planning at less cost in land.

It was the same with ventilation. The standard was set up without much consideration and has remained in force ever since. Modern research is beginning to show that the permanent ventilation laid down in the Act is over-generous and that adequate results can be got with less cost in heat. Much of the present legislation in regard to building and particularly to housing is based upon some such reaction; and the physical requirements of human beings in regard to shelter have scarcely been studied. We probably know as much about the conditions necessary for keeping healthy pigs as we do for men and women.

(d) *Effect of subsidy, 1919-1939.*—In 1919, the Government, finding that it was impossible for private enterprise to build houses which could

be let at sufficiently low rentals, introduced a housing subsidy (the Addison). Since then, there has been a continuous succession of Acts, all of which seek to provide houses at the least cost to the State. At the same time, private enterprise had to be considered. It insisted then, as it does now, that it could provide such houses, of reasonable standard at a low rental, in sufficient quantities, suitably located. Housing legislation, buffeted by the exigencies of national economy, was first concerned directly with the production of houses and generally gave a subsidy per dwelling, but as this failed to deal with the problem of overcrowding and the slum, the basis was eventually altered. The 1935 and 1936 Acts set a standard of overcrowding and gave a capitation grant on each person re-housed. Of all these Acts probably the most successful in regard to the number of houses erected under it, was the Wheatley Act of 1924 which produced over half a million houses at a cost to the State of approximately £40,000,000.

The Ministry of Health, the central authority in sole charge of housing, administered the conditions upon which the subsidies were granted. While not committed to any definite standard, it ensured that there was a basis in regard to house area and equipment, which, while it might vary in time and place, did not fluctuate widely and did ensure a certain minimum standard. In fact, some authorities, more aware of the importance of housing or in a better position to face the cost, did provide better houses than others. This policy requires a supple administration for it gives an incentive to the housing authorities to improve their standard and allows them to experiment. There is a danger that the standards established in official circulars and reports may be accepted as a maximum and not regarded as a minimum, and centralization may be dangerous in this respect. The establishment of a central authority charged solely with the provision of housing and with no other responsibilities, might have this effect. It would naturally tend to create a universal standard.

The subsidy and the Tudor Walters report created the form of the so-called 'council house' with which we are familiar today. A density of eight to twelve to the acre, with a total floor area 760 to 900 square feet was usual. Typical examples are shown in Plates 3, 4, and 12. The construction was almost uniformly of brick, latterly with cavity walls, with a tiled or slated roof. While these houses were often poorly detailed and badly planned, and their layout and orientation was not adequately considered, they improved the standard of other types of housing by forcing the speculative builder into competition with them. For a time the action of the subsidy raised the cost. Structurally, these houses were generally better than those built privately, but the equipment

was of a low standard. In area and in garden space they compare favourably with those built in any country. But in space utilization, in services and equipment, in heating and thermal insulation, they fall below the best standards of other European countries; this can be seen in the illustration of a kitchen in a Scandinavian block of working-class flats and one in an L.C.C. flat, shown in Plates 5 and 6.

(e) *Future policy.*—Since the war the basis of the subsidy has been altered. It is no longer dependant upon the number of persons rehoused in a dwelling, and is a straightforward annual grant based upon ruling costs. It is to be reviewed at intervals in relation to the cost of building and at the moment amounts to over £20 per house for sixty years in urban areas and allows for upgrading where land costs are high. Agricultural workers' cottages also receive special treatment.

This subsidy has only been operating a year, and when first introduced it immediately stimulated production, as no doubt it was meant to do. Indeed, there is substantial ground for believing that the production of houses is out of phase with our recovery and that more houses were started in 1946 and the first part of 1947 than could be economically completed. Authorities were tempted to inaugurate schemes and to press for approval by the Ministry of Health in order to take advantage of this grant. The basis of the subsidy and its amount have undoubtedly been successful in accelerating the erection of low rental houses.

But there are other aspects of the present subsidy which are disquieting. Building costs still continue to rise, although wages have not been increased during this period, and price control operates for certain materials. Generalizations about output are apt to be misleading and cannot be considered apart from management and organization, but it is probably true to say that neither has improved since the war ended and the rise in costs may be largely due to these factors. Output and organization are capable of immense improvement. But subsidies also tend to maintain cost levels and even to increase them—as was the case after the last war. There are also grounds for supposing that the ratio of public to private house building maintained at three to one by the Ministry of Health is also having the effect of maintaining costs, since the speculative builder, assured of his market and knowing that he can always fall back on the construction of subsidized houses, is under no strong incentive to cut costs. If the local authorities become the principal building employers costs are not likely to fall, because a builder obtaining a tender with a high price from one authority knows it will increase his chance of getting the same figure accepted by another. Building by direct labour will not meet this problem, nor provide efficient checks

on costs, unless it reached such a volume as to absorb a good deal of the work usually carried out by building contractors. The present basis of the subsidy has therefore stimulated production but has not reduced building costs, and is unlikely to do so. But there seems to be no practical alternative to the present form of subsidy if houses are to be let cheaply.

It may also be doubted whether a uniform subsidy is sufficiently flexible and gives enough opportunity for guiding development in national and local interests. In 1947 we find ourselves overbuilding—that is more houses have been begun than we have labour and materials to finish economically, and more labour is being used in this way than we can afford. But this is only part of the problem. A houseless family is as deserving in one locality as in another, but a house in one area may be of more use to the community than the same house in another. Houses can be a useful incentive to recruitment in undermanned, basic industries. The same principle also applies to the selection of housing sites. With the exception of the largest municipal authorities who were forced to build flats in the middle of cities, the majority of subsidized houses are being built on the fringes of our cities and thus further decreasing their efficiency. Such sites are attractive, they are immediately available, cheap to convert and the surroundings are healthy and pleasant. But lying around the core of most of our cities and towns are whole areas of decaying Victorian houses and villas, waste land and small and ill-equipped factories. The population of these areas was declining before the war as people moved to the fringes. The Act of 1947 must be used to make over these blighted areas. New houses of an urban type, planting and other means can be used to make them attractive, residential areas. This is a case for special consideration in the subsidy.

The present subsidy is directed at the production of houses of uniform types and with one, two, three and four bedrooms. In form and appearance, in finish and equipment their origin will be found in the Tudor Walters report. These houses are designed for the lower income groups, but in a society organized for full employment, with a wages and output policy, it is reasonable to expect that this minimum house will gradually give place to more individual arrangements. In the satellite towns, in the rebuilding of derelict areas there will be a demand for larger and better houses to let at correspondingly increased rentals. To these the subsidy will not apply and utility levels of services like heating and lighting, uniform decorative and wearing surfaces need not apply. It is to be hoped that local authorities will be encouraged to build such houses, not merely to provide estates for families with varying income levels, but to gain useful experience which may be applied to the design of the ordinary type of subsidized house. There is a danger at the present

time of repeating the mistake made between the wars of segregating different income groups in different localities.

During the last years of the war much of the work of the Ministries dealing with local authorities was put out at regional offices. This policy was called decentralization. Regional officers and regional departments of Health, Works, Planning, and so on, were established. These regional offices are to co-ordinate the work carried out by their departments and that of the various authorities within the region. Some such organization was clearly necessary, particularly in the formulation of regional planning. The effect has been to form a buffer between the democratically controlled authority and the Minister, making local autonomy and independence the more precarious by interposing an official layer, an artificially hardened skin, between Whitehall and the country. These regional officials have a limited utility, but since their function is to administer a policy laid down from the centre, their interpretations will often lack that elasticity which a Minister's contacts with Parliament preserve. The uniformity of interpretation and the monotony of many of our new estates in the choice of site, in the lay out and disposition of the houses, as in their planning and external appearance, is partly the result of this method of administration.

SECTION 2: COMMUNAL SERVICES

Too often in the past, a borough housing scheme has simply resulted in the dumping of the excess population in a colony remote from the town and its services. The individuals, not always the most suitable members of the community for pioneering, were left to fend for themselves as in our earlier methods of colonizing the Empire. None of the services which a community requires if it is to be successful were provided—or they came too late—and the new housing schemes often degenerated until, except in form and layout, they closely resembled the slum areas they were designed to replace. This was true both of housing estates on the fringes and of the flats which were built in the centre. Every town—almost every large village—has such estates. They are located too far from the shopping areas, no schools are provided close at hand, they are bisected by arterial roads, they lack open spaces for play and recreation, they have no form—no beginning and no centre—but continue like endemic malaria.

These services are as necessary as water and drainage, but too often they are ignored; the mother tired by shopping, the father wandering afield in search of a pub, are not in a state to be vociferous. The moral is obvious; even though the houses must come first, they must not come alone. The housing estate, whether it is a block of flats in Wandsworth or a new village in Ross and Cromarty, must be designed as a communal

unit, as a grouping of individuals to gain the maximum benefit from their association. The importance of this can be shown by a comparison between Becontree and Wythenshawe. The former, a large estate planned by the L.C.C., was remote and poorly served by transport, and, to begin with, largely without internal amenities. It came to be regarded as a kind of penal settlement. Wythenshawe, on the other hand, was popular from the beginning; it had adequate shopping, transport, and educational facilities. It even had a few pubs. Some of these estates have become communities, have reached an identity which is not just a postal address, and the individual families absorbed into a group. Many estates have failed to achieve this and have remained a collection of houses holding nothing in common with their neighbours but the drainage and water supply. We know very little about the conditions which create successful communities and this problem is further discussed in the chapter on social life.

(a) *Siting and location of houses.*—This is one of the most complex factors in planning. At one end, the size and position of a new estate decided upon by a local authority may result in regional difficulties of administration and supply. Under the 1932 Town Planning Act, the area originally zoned for housing by all the separate planning authorities would have housed four times our present population if it had all been developed. The danger of repetition has been met by the establishment of Regional Planning Authorities, who will co-ordinate the planning carried out by the local authorities within the region. At the other end of the scale the site chosen may be unsuitable for drainage and special works have to be constructed. Moreover, quite apart from suitability of the land for the purpose, the location of housing calls for special consideration in regard to industry and the provision of transport and underground services. The execution of housing schemes and the relation of these schemes to existing urban centres and industrial areas calls for large scale planning, and powers for this control and direction are included in the 1947 Town and Country Act.

The first consideration lies in the connection with the surrounding areas, the location of industry, and the provision of services. In large cities, where flats are to be built this is perhaps less important, since these are closely developed and immediately available. Work and recreation, shopping and educational facilities, must be easily accessible. The estate must, if the cost of these facilities is to be economic, either be of size which will justify its own, or situated on a route which can provide the transport to others lying outside its own boundary.

Again, the position of the estate, particularly if it is a small one, must

be carefully considered in relation to the supply of essential services. Drainage, in particular, may cause difficulty; the extension of a built-up area over a site liable to flooding has been common in the past and has led to great difficulties. If an estate is sited too far from the existing centre, the cost of such services as drainage and refuse collection may be substantially increased in comparison with those in a central area.

Turning from the purely material and negative side of the question, the most positive factors which alone can ensure a good community, are more difficult to assess. They depend upon more subtle psychological factors. Size is important, an estate must have an identity—a positive sense of individuality, a beginning and an end. This is often helped by natural features, whether it is a coppice or an embankment or park. Its eventual size and population must be kept within limits, and additions must be made in the form of other self-contained communities. The site selected should, if possible, have a diversity in contour; a sloping site is by no means a disadvantage in any respect. Plates 8 and 9 show well-planned examples.

Mixed incomes and occupations are difficult to bring together whether in urban or suburban areas, owing to the fact that the occupants of subsidized houses are selected to a large extent on an income basis. Varied incomes mean different standards of living and provide possibilities of comparison and improvement among the tenants, as well as absorbing casual labour. Mixed occupations minimize the dangers of widespread unemployment in the estate with its devastating effect upon morale. These difficulties can be overcome. It is becoming a common practice with certain authorities to buy the land, provide roads and services, and sell the sites to speculative builders for private purchasers. This has the effect of mixing the income groups and is generally profitable to the authority. The Ministry of Health are now recommending this practice.

Then the area should be within reach of a varied range of open space. Children's playgrounds and recreation spaces will be within the area in any case—see Chapter VI—but public parks and large open spaces with variations of character should be easily accessible. This is of equal importance for both flats and houses; a continuous development of either, even where well planned and with adequate amenities, is monotonous.

Lastly the estate having a shape, an identity, must secure for itself a communal atmosphere. In the past, the public-house, the doctor's waiting-room, the church and the doorstep, brought the individuals in the community together. In the future, this communal sense must be given a more concrete form, made an objective in itself; it can be linked at one end with social intercourse. The grouping of the

buildings used by all—school, library, church, and community centre, the directions of the roads and the spacing of the houses can help to create this. The community centre and its relation to house siting is also important. If this feeling is developed, then all the individuals will benefit and their life will be substantially richer.

(b) *Communal needs: schools, open spaces, etc.*—In the previous section the importance of the site in housing was stressed, and attention was drawn generally to the necessity of planning the communal services integrally with the housing. Local authorities on the whole have shown a greater sense of responsibility in this matter than the speculative builder, who was usually content to buy his land, build his houses and leave the area waiting for the other necessities. Often this results in uneconomic development; two schools are built owing to two different areas being developed, where one large building would have been more efficient and economic.

Education, health and recreation are among the most important facilities to be provided in connection with housing schemes. In most cases the individual estate is too small to support the bigger institution, the hospital and the secondary school, and these do not (except in the matter of transport) affect the siting and location of houses. But housing must have a direct relationship to the day nursery and the children's play space. This is considered in Chapter VII on local planning.

The junior school and children's nursery should be closely related to the housing scheme. As the children either have to be escorted or road junctions controlled, it should not be located at a great distance from the houses, and 400-600 yards is often taken as the maximum, under ideal conditions, for the spacing of services for the under-five community. This has the advantage of keeping such schools small and intimate in character. Play space for these young children is always required and conspicuously absent from our towns. The backyard and the road are wretched and shameful substitutes for the little playground which can be combined with the centre. In certain types of housing layout the *cul-de-sac* referred to in the next section provides a natural, safe play space under the mother's eye. For the older child, distance ceases to be so important, but even here recreational facilities should be near. The community centre is often proposed as their focus.

Other types of service—the clinic and consulting room, for instance, may be incorporated in the community centre. In the urban housing schemes, communal laundries have begun to be included, and have been very successful. In blocks of flats they have been placed in a central position in each community: in housing schemes they should again be integrated in some form or another with the centre. They help to take

the women out of the house: and machinery can lessen the strain of the domestic wash. Plate 73 shows how these have been carried out. Many authorities are considering the erection of their own municipal laundry for clothes washing, to be run at cost or as a charge upon the rates. If this practice were adopted the communal laundry and wash house would probably become obsolete.

(c) *Layout and aspect*.—"To-day when every problem has to be thought out afresh it is a practical way of approach even to housing, even to questions of town and country planning to think of them in terms of the use—or abuse—of land."¹

Ours is a small island and we must make the best use of it. We have done our best to ruin most of it in this century and with what remains we must be careful. Another four or five million houses will ruin it entirely if they are located with the same disregard of amenities as characterized building development during the period 1919-39. Every house we put up in the past cost us a tree and future generations will think our barren towns a poor legacy. To plan wisely we must make the best use of the suitable land we have and conserve jealously every natural feature. We cannot afford to repeat the mistake of building over our best agricultural land, for instance.

"In fact, agriculture is the dominant industry of eight-ninths of our country's area, and the delightful picture it presents is not a natural one, though we all call it 'natural scenery,' but is a pattern that man has made in working this industry.

"So in thinking about planning and rebuilding in rural areas, we need to have in mind the two functions of the countryside. Firstly, it has to provide food and other natural products. Secondly, it must provide space for recreation, particularly for those of us who live in cities, though perhaps if our cities were better planned we should not feel the need to escape as desperately as we do now."²

The proper use of land lies in getting the most from it without waste or sterility. It means deciding exactly what is required and then planning for that. Put broadly it sounds rather vague; translated into practical terms, it means that land should not be wasted by providing wider streets and house frontages than are actually required by the traffic and by the occupants; it means planning the roads and boundaries so that the space they enclose can be used; it means disposing the houses on those spaces so that they can grow into pleasant suburbs. In a word, development by design and not by accident.

¹ From *Your Inheritance* (Architectural Press).

² From *Rebuilding Britain* (Royal Institute of British Architects).

One of the biggest mistakes we have made in the past is in the development of our domestic roads. This is partly a legacy from the nineteenth century and it is only recently that we have started—spasmodically—to improve the position. When areas are planned for housing, and industry is located elsewhere, the only use for the roads is to connect the houses. Such roads can be narrow and they need not be continuous since they serve light traffic—the delivery van and the family car. It is an advantage if such vehicles move slowly in housing areas. But most of our towns have been built up along a continuous road system of a uniform width, whether for through or local traffic, of 24 feet. Such roads have wasted land and services. As Frank Pick said, “The promenade is one aspect, the shopping centre another, the secluded residential quarter yet another, and so it runs on. The road engineer thinks solely in terms of traffic and of getting all that anyone will allow him to have.”

The needs of the pedestrian, the cyclist and the car vary, but we do not recognize these differences in our road pattern. Stupid jealousies have held up such separation and although there is no need for it inside the housing estate, it must be considered at the junctions with arterial roads. The continuous road system has usually been associated with that most wasteful and monotonous use of land which goes with the detached and semi-detached villa. The association began, spaciouly and decorously, at Bournemouth at the beginning of the century; it has gradually deteriorated into a sordid and mercenary liaison. The *cul-de-sac* forms a far better system for domestic purposes than the continuous road. Some of its advantages are shown in the illustration of one at Welwyn Garden City, in Plate 12.

Another type of development which has not been much used in England is the system of short terraces placed transversely to the service road. This has much to recommend it: it reduces road costs and does not entail serious hardship for deliveries. In practice the maximum distance from the road should not exceed 60 feet. It does not, of course, allow for private garages in connection with each house. Plate 16 shows an example.

A comparison of the use of land in these types with the continuous road and semi-detached houses is instructive. In all three cases shown in Diagram 3 the area of the houses is similar and they are brought into a single relation by being the same area of land (one acre). It will be seen that the semi-detached type of development, while giving larger individual gardens, results in monotony and gives no advantages in services or aspect. In comparison with terraces it wastes heat through the extra wall and roof space. The reasons for its popularity are obvious; but with good design of the terrace type, they would be fallacious. We seem, as a nation,

to think a semi-detached house halfway to a detached one and the respectability associated with the middle classes. It is believed to afford privacy and more light. It does neither. Roads of this type can be seen around any large town in England.

Another consideration which Diagram 3 also serves to illustrate is that of orientation and aspect. The importance of adequate sunshine penetration into the house is stressed in every report on housing, official and otherwise, but it has so far had no effect upon layout. Most of our houses are laid out with a standard plan that takes no account of orientation. Our roads must be arranged so that the plans of houses can be developed for this purpose, and the arrangement of the blocks should be such that natural vistas and views are not lost, and so that each house has something beyond the neighbour's washing as a prospect. This can be

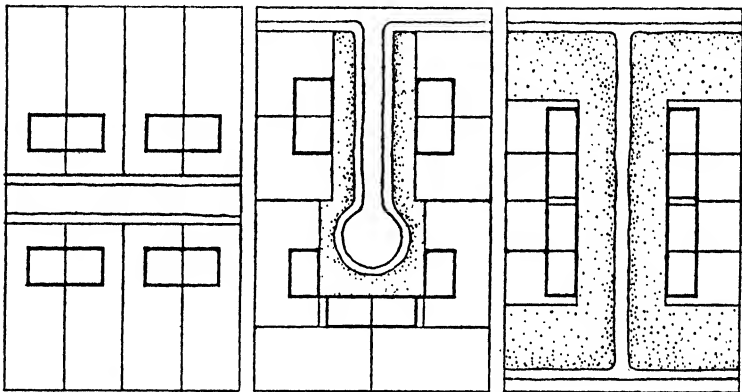


DIAGRAM 3.—SITE PLANNING

Alternative Layouts for a 1-acre Plot

done by staggering and by clever use of contours. The Swedes and Germans have a good record in this respect, and an illustration is given in Plate 8 which shows how orientation and aspect may be obtained.

The same illustration shows how the particular character of a site may be preserved, and even enhanced. Existing trees, shrubs, and hedges should always be preserved and the plan adapted to make this possible. This will avoid monotony and preserve those remaining traces of our heritage. In urban sites it is particularly necessary. Planting is carried out too seldom and roads planted with flowering and fruiting trees cost very little and seldom appear monotonous. If only local authorities could make up their minds well in advance as to what land they required for housing, and plan it and plant it as early as possible, the gawky stage of growth of

young trees, when their foliage draws attention to the rawness of the estate, could be shortened.

Whether the site is in the centre of a big town or on the fringe of a small one, whether it is a block of flats or a row of cottages, its development should be natural. It should proceed from a balance of human convenience and well-being, with the exigencies imposed by nature—it should be organic and spontaneous.

SECTION 3: HOUSING DESIGN

In so far as housing is subsidized by the State, it is first of all a financial and only secondarily, a technical problem. The design of houses and flats must therefore be considered in relation to cost. Criticisms are often made and attributed to the technical incompetence of the designer rather than to the financial stringency of the programme.

This remark is prompted by the fact that few people realize what that stringency meant in the inter-war period. On the whole, so far as stability and durability were concerned, our houses were adequate: but all the available money went into that, and when the question of a few shillings' worth of wood for shelving in the larder came up—it wasn't there. Easing the housewife's burden meant increasing the burden of rates and taxes.

A breakdown of the costs of labour and materials of two typical council houses is given in Plate 78, and these will give some idea of the way in which money is spent in house construction and also a comparison between the standards of house building before and after the last war. In both cases nearly 75 per cent of the cost goes into the structure—into foundations, walls, floors, and partitions, and the two examples show that this relationship has not altered much as a result of the war. It shows that most of the money is sunk below the ground or spent in the erection of those parts of the structure which last longest and require least maintenance. Most of the labour, and particularly most of the building labour, is absorbed in this section of the work. Any economies, simplification or a rationalization which could be made here would have a marked effect upon the total cost.

A very much smaller proportion, as much as is possible, goes into finishes and surface coverings. These have to be renewed at intervals of three or five years and consequently a large sum may well be expended over the length of life of a house. But so much of the cost is absorbed in the structure that usually it is only possible to provide a distemper finish to the walls. Obviously it is prudent to spend the available money in this way; to have elaborate equipment and expensive finishes while the structure was scamped is like spending the American loan on films and tobacco.

The tenant very seldom considers this when the shortcomings in equipment, finishes and appliances are appreciated. He is inclined to think that the architect has been careless or extravagant somewhere else and that an ill-considered economy in house construction has deprived him of a necessity. In fact, the financial stringency of the problem forces the architect to consider the plan—the relationship between one room and another—as the most important factor, as it is the only point at which skill can improve living conditions without increasing the cost. Similarly, very little study has been given to equipment and storage space, because it is usually sacrificed by the Ministry of Health to structural soundness and stability. So it has an important effect upon design and helps to explain the inferiority of our domestic equipment when compared with some foreign examples.

There should be no difference in the essentials of house and flat design. In each the best possible living conditions are required for the occupants, but each, owing to its different structure, has its special problems. In flats, that of noise and access are most urgent, while the economic provision of insulation against heat loss, and refuse disposal are typical of the problems peculiar to houses. But all apply in some measure to both types, and by dealing with them generally it will be possible to indicate how each can be satisfied.

(a) *Physical needs.*—These, of course, are basic: warmth, shelter and light are necessities—although looking at the average house one is surprised at the variations which can exist. But the means we adopt of satisfying them vary with the material available and with our knowledge. Never before in the history of building—the history of man's culture—have we been so well equipped in respect of material. During the last twenty-five years, we have begun to study scientifically the living conditions which these materials must create. It may be thought that the accumulated experience of centuries would have given us sufficient data to go upon. In fact, however, although scientific investigation of such things as ventilation and lighting often verify such experience, it serves to establish a norm from which variation can be controlled. In the future, science will play a large part in the design and construction of houses. The report of the Interdepartmental Committee on House Construction has already been referred to and it is clear that the exact conformity with physical standards will be expected in the future.

Perhaps the most important of these recommendations, considered against the increasing demands upon our coal supplies—is in the conservation of heat. It would not be too much to say that as a nation we have been wasteful in our use of fuel because it has been literally cheaper to

waste it than to build in such a way that we save it. We wrap ourselves up in winter but we lose bodily heat more quickly and we take both to the bottle and our overcoats. But though we light a fire in our house we do not wrap our houses up in any way, and we produce heat simply to lose it through inefficient construction. Our climatic conditions and the cheapness of fuel have made us slower than other countries to give the subject great importance, but the urgency of the national problem, as well as a belated respect for our own pockets, is making us look suspiciously at the coal fire in the hearth. However, the various methods of generating heat are a separate subject; we must ensure that we keep the heat inside our buildings instead of allowing it to be sucked out and blown away, as we do at present.

All types of structure transmit heat; it is given out by radiation from the hot surface to the cold. A wall heated on one side, transmits that heat rapidly—according to the temperature outside. The curious movement known as a draught has roughly the same effect. It cools the air surrounding its path and the bodies in its way. The average small house might be compared to a cage in the way it loses heat. Research has shown that much is lost through a floor of boards and joists: it is blown away by draughts from the freely ventilated space under them. External walls of course dispose of a great deal more, a lot goes up the chimney: more is lost through the roof. It is estimated that by insulating the ground floor and the walls of the living room and the roofs, a saving of perhaps 30 per cent in the heat loss could be made, and houses would be warmer and drier in consequence. To effect these improvements is not expensive—as a capital cost—it could be done for £15 per house, even at present prices, and it would benefit the tenant if not the landlord. It is well known that aspect has a large effect upon warmth. It has been estimated that a room with a south aspect requires 17 per cent less heat than one facing north. Quite apart from the psychological gains, the careful orientation of houses to gain the maximum heat from the sun could thus have an economic advantage. Even with large windows, if the orientation is right, there will be a net gain in heat.

Other countries have been forced to give this problem a place of high importance in building: we have neglected it. The levels of insulation required in the various parts of a house, the methods by which they can be attained, have been decided and officially published. They cost money and for this reason, even at the present time, are often omitted. There are many materials available for the purpose today, and their rate of heat transmission can be accurately measured.

The ventilation of rooms is closely bound up with the methods of heating them. The way in which ventilation is measured is by the number

of complete air changes which can take place in a room in a given time. Standards have been laid down for most large public buildings, but in houses and flats we have been content with some approximate standards laid down many years ago. Research has been conducted recently into this problem and seems to indicate that the standards we have result in too much rather than too little ventilation. This subject is controlled, so far as houses are concerned, by the bye-laws, and their requirements in this, as in other features such as excessive height of rooms—particularly bedrooms—must be revised in the near future.

The main thing to ensure is that the distinction, always apparent to the occupant, between ventilation and draughts, is maintained. We must control the degree of fixed ventilation—apart from windows—and eliminate the draughts caused by badly fitting windows and doors, or straight lines of air movement between doors and windows. It is a matter of planning—one arrangement is shown in Plate 26. Natural lighting presents no great problem in the small house. With at least two external walls there is the opportunity of getting all the light we require, but we do not always use it: prejudices exist against large windows, which are due to a belief that rooms with such windows are colder.

In flats, however, the position is very different. In the past, close spacing of blocks, coupled with small windows, have made them very dark. The spacing of buildings should be determined in regard to natural day lighting by their height, and investigations which have been made into the penetration of day-lighting into buildings and to the effects of obstruction enable us to space and orientate buildings and flats in particular so that they receive all the light and sun they require. It is possible to plan blocks of flats in such a way that every living room receives at least two hours of possible sunshine daily, even in winter, and to arrange the windows and reflective surfaces so that the light is of even intensity all over a room. Buildings can be so designed as the illustration (Plate 27) shows.

Another factor which is far more important in flats than in houses is the effect of noise. It has been possible to do very little about this problem as insulation against it is costly, but planning to isolate noisy elements such as staircases and lifts, can cause a certain improvement though it can never be entirely effective. The transmission of a noise is a complex process: its effects cause more complaint in flats than any other single cause. We must make up our minds that our flats should be as sound-proof as it is reasonably possible to make them, not only between flat and flat but between the rooms in each flat. Like the other factors that have been mentioned, the problem is largely a financial one, since the structure

itself must be designed to minimize noise. In houses, the biggest source of complaints has been the party wall. Here again, planning can help, but cannot eliminate, noise. We can place kitchens and bathrooms against the party wall to cut down the transmission of noise from adjoining houses to living rooms and bedrooms. But to be really effective the construction of the party wall (which is usually in 9-in. brickwork) must be improved, and the report on House Construction suggests the use of a cavity construction in party walls. It will be evident from this brief description that however popular the normal brick and timber construction may be, it leaves much to be desired. We can no longer afford wasteful and slipshod methods of construction, however solid.

(b) *Equipment and installations.*—The equipment installed in small houses is as rigorously limited in initial cost as it ought to be in upkeep and maintenance. Much interest has been shown in improvements in the design of domestic apparatus and to the very real need for its more generous provision. But caution will be necessary: the full benefit of such improvements will only be felt if they are related to increased standards of space. Better equipment and less space for living will not be an improvement.

The rising cost of coal and the fuel crisis have brought us to a situation which should have been considered years ago. We can no longer afford to warm ourselves vicariously, room by room with the open coal fire. We must burn our fuel in such a way as to make the most of its heating capacity, and some decorative effect will be lost in elimination of the open fire as it was known in the past. Investigation has shown that the most economical form of space heating is by means of a slow combustion stove operating at a more or less even temperature and used either as a radiating and convecting element in itself or else as a means of heating such elements by hot water. In fact, we come to a stove of the continental type or to a central heating system. This background heating could as easily be supplied by what is called neighbourhood heating—that is, the metered supply of hot water or steam from a central source along public mains.

Discontinuous, or intermittent higher temperature heating can be supplied in a number of ways, either by gas or electric unit heaters or by small solid fuel burners. In the past the usual practice of local authorities was to leave the choice of fuel and appliance to the consumer where it was possible to do so, but it is evident that complete freedom of choice must be eliminated to secure greater efficiency in the use of fuel. If houses are to be insulated to preserve the heat generated within it is only common sense to ensure that the generating appliance is efficient.

Unfortunately, only a few authorities have been able to instal efficient space heating units, owing to their high cost. Once again the cost of the structure has limited the expenditure on appliances.

To a certain extent, space heating and water heating are inter-related, and the type of house, whether the kitchen is designed so that meals can be taken in it or not, also affects the problem. In general—and it is a matter in which generalization is rash—the most common system has been the use of a stove which combines space heating of one room, whether living room or kitchen or both, with water heating and cooking facilities. The system is economic in the sense that it combines all these requirements in one piece of equipment, but the appliances have not always been as efficient as they might be. Research seems likely to result in improvements and a slow-burning type of this combination grate is promised. Another disadvantage is that in summer, the space heating unit is not required, and auxiliary means both of cooking and water heating are required. In the north this is not so important as in the south. Local conditions of supply will determine the choice of fuel for the auxiliary appliances. Probably the most efficient and economical pattern in the small house is by specialization rather than combination. Space heating can be provided by the enclosed stove just described, and this can also be directed to give some measure of background heating elsewhere in the house. It can also be used to give some hot water, and a topping off appliance in the form of an immersion heater or other appliance can be used. The cooker can be gas or electricity.

The trend is towards dustless fuels, and gas and electricity are becoming more popular for all purposes. Developments are also likely in the coal fire which will control its rate of consumption, and also make it more efficient as a heating unit and less dirty to operate. There has been a continuous effort to make cooking and heating appliances of all types more economical in operation and efficient in use. This is leading to a greater interest in the methods of installing such appliances since their efficiency is often impaired by ignorant or careless layouts. The present methods of assembly by which the various fittings are jointed to the service pipes on the site is wasteful of labour, and there are practical proposals for making the whole of the service assembly of a house—kitchen and bathroom fittings as well as water heating and drainage—into a single factory-produced unit ready for installation in one piece. The system illustrated in Plates 20 and 21 shows how drainage and hot and cold water appliances can be combined in a single unit which can be built into the house in one piece. Several such systems have been designed in recent years.

In both houses and flats methods of supplying hot water or steam from

a central source for space and water heating are being investigated. It has always been customary in luxury flats, of course, but latterly the possibility of a municipal supply from a central source has been under consideration. Many advantages are claimed for it, such as economy in production and supply, convenience, and the elimination of the unending drudgery entailed in lighting, filling, and cleaning the kitchen stove, which at best is a paleolithic contrivance. Another advantage of central heating which can take many other forms beside that of the radiator, is that it enables rooms to be replanned to give more spacious effects. To a large extent the sizes of rooms have been dictated by the heating capabilities of the coal fire. In flats, space is wasted by the concentrations of flues going through many floors. Other methods of heating must be adopted for bedrooms, to reduce the waste of space which the flue entails.

Experiments have also been made to find an alternative to the present methods of refuse disposal. The corporation dust-cart is not the most hygienic vehicle, and the suggestions have ranged from improvements in the design of the refuse container so that it can be removed bodily and a clean one substituted, to the water-borne carriage of refuse. The former, which is more suitable for houses, rests on the design of the standardized container which fits into a truck adapted for this purpose. Water-borne carriage is of greater importance in flats, and the Garchey system is one of the best known. The principles of this system are clearly shown in Plate 22.

(c) *Planning*.—The proper place, it may be thought, to begin a chapter on housing is with planning and design. But as part of the object of this book is to show that good building for the community is the result of careful design, each aspect must be considered in its proper order and relation, from the location of the site to the position of a cupboard. A successful house depends upon its equipment and installation, and must be designed in such a way as to be most convenient for the occupants. And there lies the crux of the problem.

No two families live in exactly the same way, have the same likes and dislikes, the same occupations and relations. If planning is the organization of space for use, it is evident that the house represents the most difficult problem the planner can face. Furthermore, no family ever remains a static entity; the members grow up and grow old. The use to which the house is put even varies from day to day as well as from decade to decade. The parlour is used by the child for its homework at one hour, and by the courting couple at the next. The vagaries of occupation are unpredictable, and the plan of the small house is an approximation of all the uses that it must accommodate. Not only must these activities be con-

sidered, but all the various physical requirements must be satisfied and the two combined in the most economical manner.

In the plan of the small house these activities have been recognized (see Plate 24). The areas and the general arrangement and disposition of the rooms have been arrived at as a matter of experience. It seems unlikely that the basic arrangement of space as between bedrooms and living rooms will alter very much in the immediate future. But in the details considerable variation is necessary. So far as space is concerned, the areas of the various rooms which are shown are typical.

Before 1935 no serious attempt had been made to deal with overcrowding. The Housing Acts of the 1920's had been largely concerned with speeding up the provision of houses rather than with this problem. But in the Acts of 1935 and 1936 a standard of overcrowding was laid down. This Act is not a standard for the design of new buildings. It is a measure of overcrowding and enables an authority to decide when overcrowding is taking place. As this standard is still the basis it must be given in full. It is difficult to think how even the furniture, let alone the inhabitants, can be inserted. The Act says that overcrowding exists when two unmarried persons of opposite sex, over ten years old, have to sleep in the same room. It goes on to lay down the maximum number of occupants of a house in relation to the number of rooms. One room—two persons: two rooms—three persons: three rooms—five persons: four—seven and a half, and so on. A room of 11 feet \times 10 feet is enough, it appears, for two people, and a room 10 feet \times 7 feet enough for one person. A "half person" is, for the purposes of the table, one under ten years old, and gets 10 feet \times 5 feet.

Now, although these measures do not apply to new buildings, they do in fact affect the position negatively, as they establish minimum areas. Wisely, the Ministry of Health have never laid down any definite standards of accommodation, but have relied upon the experience of local authorities and their own powers in relation to loans to establish reasonable standards. There is a considerable local variation, certain authorities providing a higher standard of space per room than others. It cannot be pretended that these areas have been generous.

A greater allocation of room space is one of the principal requirements of our post-war programme. The living room is the focus of family life, and it has been too small for the family to meet in it. The Scottish Advisory Committee in the course of its excellent report entitled *Planning our New Homes*, makes specific proposals for increasing the floor areas of the various rooms. These are based on the assumption that a bedroom of not less than 120 square feet in area is the minimum space for accommodating two persons. With this as measure 180 square feet is proposed as

the living room for a two-bedroom house, 190 square feet for a three-bedroom house, and so on. These areas, although representing an increase—the sliding scale for the living room being a useful device—do not give much space for the bedrooms if the minimum should become operative.

(i) *Occupational factors.*—The primary factor which makes for differences in the arrangement of rooms and the total area of the dwelling—apart from the size of the family—is the occupation of the tenant. The needs of an agricultural labourer are different from those of a factory hand. Old age pensioners need a different organization of equipment from that required by a young childless couple.

The effect of some of these differences is shown in the series of plans which are illustrated in Plate 24. In the plan of an agricultural worker's cottage (Plate 24 [c]) allowance must be made for the fact that an out-of-door, all-weather life makes some space where muddy clothes and wet boots can be removed and dried a necessity, and a small room between the back door and the kitchen must be included. This is also used for clothes washing as the facilities for communal laundries are more limited than in urban areas. A garden shed with ample space for the family bicycles is also a rural necessity—as it is in other types of housing—and a large one should be conveniently placed by the service door. Other differences also exist but these examples serve to illustrate that good planning is the result of a close and detailed study of primary needs.

Equally logical is the plan of the little flat which was designed for old age pensioners. This is a class of the community whose needs are often overlooked and many of them eke out a miserable existence in the solitude of back rooms with none of the conveniences which age requires. All reports stress the necessity for such provision, which is needed for single people as well. Local authorities can seldom cater for them sufficiently as their resources are fully taxed to provide for families with children. But these old people are part of the community and should not be shut off from it—even in the location of their homes. Provision for them should be made in every housing scheme. The flat illustrated was designed to form part of a larger unit attached to a centre where the old could obtain and eat their principal meal. It included a quiet garden and reading rooms specially for them. Cooking facilities are therefore kept to a minimum while solid fuel water heaters are eliminated altogether. Instantaneous heaters serve this purpose and avoid tiresome labour.

Many similar distinctions must be made in our housing. We gave too little consideration to these factors before the war. At the present time it is natural to accept whatever is available, whether standardized or not, and not to bother too much about details like individuals and sickness

and age. But we need diversity of type as much as we need mere numbers. Within limits this is necessary. But the local authority is in a better position to make those modifications which suit the problem and needs of its own locality and it must jealously guard the autonomy and independence it still possesses.

(ii) *Special needs of flats.*—In general of course the flat should possess all the features of the house together with the advantages that communal services can afford. As the flat is an urban form of dwelling, there are fewer disparities between its design in different towns than there are for houses. The special problems of flat design, access, service and refuse disposal, tend to create a certain similarity between the plans of, say, Liverpool and London. There may be local differences which make for different arrangements of equipment, but that is all. But, although the problem is universal, it is not the less complicated, and there are many problems, such as access and sound insulation which have not been overcome. Staircases are expensive features and take up valuable space and many expedients have been adopted to reduce, as far as was consistent with safety, the number required. Balcony access which is illustrated in Plate 14 was the most common method but its disadvantages are shown. Where the number of floors exceeds three—and there are no valid reasons why they should not, lifts should be provided. The practice of building four and five floors without a lift is deplorable. Lifts can be made safe for children and experience in Leeds has shown that they are not abused.

Good orientation for flats is even more necessary than for houses. Moreover, arrangements must be made to obviate some of the disadvantages such as the absence of pram space and storage space, and we might copy some of the features which have been introduced on the Continent in this respect. There, space in roof or basement is partitioned off and divided amongst the tenants. They might be useful for air raid shelters in the future if they were designed with that end in view. Private balconies off each flat have often been provided, but they are not so commonly used as might be thought. Unfortunately we have never paid sufficient attention to the communal services—meals, laundries, crèches, which can accompany flat life. The higher density of population makes the provision of these services cheaper in relation to the individual. When people are asked whether they prefer flats to houses they are therefore likely to compare an obsolete tenement of the Peabody Trust with a modern house. If they thought of the flat in the terms of those illustrated in Plate 10, their answers might be very different.

(iii) *Room Planning*.—The core of the small house is the kitchen. Its disposition, planning and equipment determine the use and position of the other rooms. It can even affect in part, the mode of life of the occupants. This can be clearly seen in the plans shown in Plate 24. In this a combination grate is provided and the living room is used for meals and general living space, while the kitchen is kept exclusively for cooking. However, in the type of plan suitable for an agricultural worker, while a supplementary cooker is provided, a good deal of cooking must go on in the living room. The kitchen thus tends to become a scullery and wash-house and helps to fulfil some of the needs of that type of worker. The reason for this is twofold:—

- (1) it minimizes work for the housewife;
- (2) it avoids the cost of installation and upkeep of two heating appliances; or, to put it in another way, the heat generated in cooking is also of use for space heating.

This double use is also found in Plate 25, where a small house with a dining space in the kitchen is shown. The living room is thus kept free of both cooking and eating and functions to a certain extent as a parlour. The trouble about this simple and labour-saving arrangement is that it tends to encourage the use of the kitchen as a living room.

These three types exemplify the most common arrangement to be found in pre-war dwellings for the arrangement of the kitchen and confirm the statement that its layout will determine the house-plan. All plans are a compromise between a number of conflicting requirements. It would clearly be better if the cooking and preparation of food could be concentrated in a single space; the living room would then be released from this use. To do this would entail the burden of keeping two rooms—the kitchen and the living room—warm in winter. The tendency is always for the kitchen to be used as a living room where there is space for meals to be eaten and this is not desirable always, since it is neither planned nor heated for this use. Several local authorities have experimented with the type of kitchen shown in Plate 6, in which its use, for purposes other than those for which it is intended, is impossible owing to its width. Another instance is that shown in the excellent plan in Plate 24 (b), where space off the living room has been provided for eating, and cooking is confined to the kitchen. This type of plan is likely to be more common if and when central heating is introduced.

Every authority will have its own solution to this question and so long as it is thought of as one which must be considered in relation to the needs of the tenants and the housewife, variations are to be encouraged. Real progress must come from these related factors.

- (a) the design of efficient, compact appliances;
- (b) the separation of function—in clearly defined spaces—cooking area from living space and so on;
- (c) the efficient disposition of equipment, following the sequence of work, and at the proper heights;
- (d) a pleasant outlook, with supervision of the children;
- (e) lessening of the cost of space heating—either by centralized heat or by the means suggested in (a).

The position of the living room will be decided to a large extent by the type of kitchen arrangement adopted. It may have an orientation varying from S to W and should be of a rectangular shape and have windows along one of the larger sides to allow for adequate penetration of sunshine. If possible, the fireplace should be placed at the end remote to the door and cross draughts and movement across the fireplace avoided. It will seldom be satisfactory if the room is less than 11 feet in the clear in the smaller dimension and even this represents the minimum.

The inclusion of a parlour is simply a question of expense. There can be no doubt as to its utility whether it is used for the purpose for which it is normally intended, the storage and exhibition of the household gods, or as a general spare room. To a degree, the use which is made of it will depend upon the methods we adopt for space heating in the future. Abundant hot water is a great civilizing influence, but cheap and dustless space heating will make us appreciate the joys of civilization.

Of the other rooms in the house it is unnecessary to say much, beyond reiterating that they must be planned for use. Bathrooms must be adequate in size; it is a matter of common experience that children require supervision when in contact with water. If it is to be used for clothes washing as well, it is better on the ground floor. Bedrooms must be arranged for health and sickness; they must be provided with cupboards, adequate in size to prevent the expense and waste of moving those vast coffins known as wardrobes. These cupboards can be used to deaden sound transmission between rooms. And naturally there must be room for beds—out of draughts and away from the space used for dressing. It is often surprisingly difficult to fit a bed into a bedroom. There is always a temptation to save bedroom space and devote it to other uses; the smaller it is the more efficient and complete must be the equipment. If heating is available, bedrooms can be used for study and the type which allows space for this purpose and gives the child much needed privacy, should be encouraged.

A house and a family accumulate belongings. The provision of cupboard space—dictated largely by economic considerations—has long been inadequate in this country. Storage of bulk fuel and food has usually been

allowed for, but too little attention has been given to clothes, prams, tools, and the paraphernalia of existence. Houses have often been built without even the means of airing clothes, which is insane where the house is supposed to be for family occupation.

Lastly, come the small items of furniture and equipment which make such an enormous difference to the ease and comfort of a house. Handles which can be opened without barking one's knuckles, locks that shut, taps that do not require constant cleaning, window fastenings that fasten, switches and plugs that are safe and accessible. Everyone knows the irritating small failures and inefficiencies, and has thought how easy it would be to see them arranged differently. Well, we have a magnificent opportunity (unparalleled it is to be hoped) of seeing that these smaller things work. If we get as far as thinking about them, having considered everything else, we shall have gone a long way towards the numerical conquest of the housing shortage and in giving to every citizen of this country, the means of leading a fuller and more satisfactory life.

List of Books

The Houses we live in (Ministry of Health, 1939). 1s. (Out of print.)

Planning our New Homes (Department of Health for Scotland, 1944). 2s. A readable, well-illustrated report. Sets up new and better standards for Housing and might be copied in England.

Housing before the War and After (M. J. Elias. King & Staples Ltd.). The Economics and Sociology of the problem.

Town and Country Planning (Gilbert and Elizabeth McAlister. Faber & Faber). 12s. 6d. Fierce and devastating analysis of housing. Defence of Garden City and decentralizing movement.

Becontree and Dagenham (Terence Young's Survey for the Pilgrim Trust).

Housing Manual (Ministry of Health, Ministry of Works, 1944.) 2s. The English equivalent of *Planning our New Homes*. A general survey of desirable features; proposals for site planning and equipment are included.

CHAPTER FOUR

Education

Section 1: Education and the school

- (a) Education and the design of school buildings
- (b) Legislation and school building
- (c) The present position

Section 2: The siting of schools

- (a) Relation to other Units: School sizes and population
- (b) The selection of sites
- (c) Size and requirements

Section 3: School planning

- (a) Physical and educational
- (b) Planning and plan types
- (c) Construction and finishes

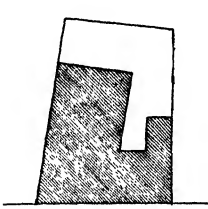
SECTION I. EDUCATION AND THE SCHOOL

(a) **E**DUCATION and the design of school buildings.—Our School buildings are in the same state as our houses. There are not enough and most of those in existence are thoroughly obsolete. The operation of the new Education Act will be jeopardized by shortage of accommodation; the school leaving age was raised in April 1947 to fifteen and at least 150,000 children required classroom space at that date. Every child is to continue with further education after leaving the secondary school until the age of eighteen, even though this is compulsory for one day a week only. Children can enter nursery classes at the age of two, provision must be made for adult education after the age of eighteen. One hundred and fifty thousand school places were lost during the war; the size of classes in the new secondary schools is usually forty. All this emphasizes how urgent is the need for new school building. Schools are needed just as much as houses for the child is father to the citizen, and if we fail to provide the schools to accompany the houses, yet another social evil will be intensified.

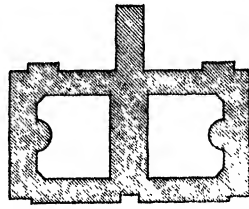
Before the war the rate of school building was too slow to keep pace with educational requirements and the number of black listed schools—schools whose buildings were obsolete, inefficient and unhealthy, was actually increasing. School design was being gradually improved, led by a few of the more far-sighted authorities but progress generally was disappointing and improvements in educational technique far outstripped the design of schools. Many of those erected in the decade immediately

before the last world war were still designed to suit the educational system which obtained in the nineteenth century. This must not happen again and material and labour shortages must not be used as an excuse for unsuitable or substandard accommodation.

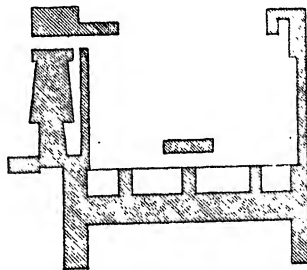
In the Victorian epoch, the school was a place to which children were sent to keep them off the streets and to avoid social disorder. Education began and ended with the acquisition of the three "R's" and the school



(a) Manchester Board School of the 1870's restricted town site



(b) Typical Courtyard Planning, 1920-30.



(c) Open Planning—

News Chronicle School Competitions, D. Clarke Hall—Architect.

DIAGRAM 4.—BLOCK PLANS OF SCHOOLS SHOWING DEVELOPMENT OF OPEN PLANNING

buildings reflected this attitude. Today we aim at the widest development of the individual's potentialities and believe that he should be enabled to go on with that development through life. The Hadow report puts it admirably: "The forming and strengthening of character; the training of the tastes which will fill and dignify leisure; the awakening and guiding of the intelligence, especially on its practical side—these are the ends which we have had in view. . . ."

Not only were many schools erected in the last twenty years out of touch with progress in education, they were often designed with some other purpose in mind. Too often the authority mistook monumentality

for design and the buildings were too solid and inflexible in construction to allow of any change in the interior organization, which may be required subsequently. We built many good schools before 1939 but some authorities were apparently unable to find a type of building which would allow modern educational methods to develop. Sometimes they were monumental, heavy and dark—qualities which are the anti-thesis of those required for the environment of the child. Diagrams 4 show a comparison of block plans of schools over a period of thirty years. The shaded area is that covered by buildings; it is approximately the same area in each case. The way in which the schools have been arranged to get light and air is clear, and the formality and institutional effect which are displayed in the first and second of these examples are just the things to avoid. The third one shows a modern school with an open, informal plan.

The job of both the teacher and the taught is a formidable one. It is far easier to force the child to acquire certain complicated tricks which culminate in a mechanical capacity to read and write than it is to equip him, in the widest sense, to lead "the good life." Imagination, curiosity, enquiry and appreciation are difficult qualities to bring out. Good surroundings, an ordered, well kept and pleasurable environment are as necessary for the purpose as the sympathy and understanding of the teacher. Well planned schools, with equipment sensibly placed, can assist in developing a sense of order and fitness. By creating an apparent and obvious relationship which the child sees and uses, good buildings help that development in other directions. Left to himself, a child naturally exploits his environment; pulls the table to the light, and turns the shrubbery into a jungle. Unfortunately the urban school, wedged between the railway and the disused canal, seldom assists these qualities to emerge. Only childhood can prevail over the stunted surroundings of the sort of school shown in Plate 29, even when the effect on health is ignored. The average child in the average school has his natural vividness of observation, his delight in colours and pattern and proportion, stunted and warped. The chocolate brown dado, the high and inaccessible window, the echoing gloom of long corridors, subdue and eliminate these perceptions. We are all aware of the ruin we have made of our towns, and of a good deal of our countryside; of advertisements and ribbon developments and the sordid vulgarity of our shopping centres. If schools (and homes) were better designed, we, as citizens, might be less ready to tolerate these conditions. We should react positively against them. We have come to accept the counterfeit as legal tender so far as buildings are concerned. Buildings designed to look what they are not, to be as pompous as Selfridge's, as verbose and aggressive in their decoration as a luxury

cinema, are commonly accepted. By contrast there is too little appreciation of well-designed buildings like Peter Jones's store and the new Underground stations.

This raises the question of the sort of buildings we require for our schools. That answer is a complicated one and can only be given at some length. Before we can approach it we must decide in general terms how the aims and methods of education today affect the buildings. One of the most important differences in this respect is the change in the methods of teaching. In the nineteenth century the child assumed a passive role: it was something to be stuffed with certain accomplishments: it sat and looked, and sometimes learnt. We have discovered that the child must take an active, even a dynamic part in its own education. It must, first of all, be interested in the subject and understand the relation of what is being taught to its immediate environment and interests. Through these, by the exercise of its motor faculties, it can learn more quickly and pleasurably. Handicrafts, experiment and physical activity help the child towards its education—and a unity of mind and body. Hence the attention which has been paid to special classrooms, to gymnasiums and to playgrounds, in the last few years. This tendency, which increases the equipment needed for teaching, also lessens the need for heavy furniture and formal classes.

In turn, this attitude leads to another, which has the same effect on school design. The child is encouraged to develop its own interests and to find its own methods of learning at its own pace. Instead of the class of forty acting like an ordered herd, there are groups of children of similar age and activities. The formalism, the imposed discipline is eliminated, and in its place comes a spontaneous grouping based on interest, a direction which is self-reliant. The child is encouraged to exploit its own aptitudes, and is provided with an opportunity to do so.

The buildings must allow for this spontaneous activity and for the flexibility in the curriculum which goes with it. The school must be flexible internally. It should be possible to vary the size, shape and lighting of class rooms according to the conditions; to run a number together, or to divide them into smaller rooms, or to close them into small units. The buildings, too, do not require to be so permanent that they cannot be converted and modified to suit changed conditions. A three-storey building like that illustrated in Plate 32 cannot be flexible, cannot be altered except at a high cost. But the classroom illustrated in Plate 44 is light to erect and cheap to alter.

On the other hand, a limit must be set to this tendency. The influence of the school community, of the identity of the individual school, must be asserted. If a school is built exclusively of light, temporary structures it is

unlikely to be associated with any permanent interest on the part of the children. One of the most hopeful features of the new Act is the extension of education to adult life. Temporary buildings used exclusively in the building of schools will not assist this. But for the classrooms a large measure of flexibility is necessary. The solution is in a combination of both temporary and permanent buildings. The parts that are required for some direct but rapidly changing uses, the workshop, the classroom, can be built as a frankly impermanent, provisional structure. Those, on the other hand, where the school meets as a community, where it has its corporate identity, so to speak, the assembly hall, and the library, can be of a permanent character. These belong not only to the school but to the community it helps to create. At the other end of the scale, the lavatories and changing rooms, where elaborate equipment or costly services have to be provided, may also be of a permanent construction.

(b) *Legislation and School Building*.—The State assumed a responsibility for education at an earlier stage than it did for housing. A review of the various Acts which were passed to control and assist education, explains some of the features which have persisted in school planning down to the present day. The existing classification of schools, as well as the controlling bodies, were mostly established in the nineteenth century. An examination of the various Acts associated with the establishment of compulsory education shows that in many respects, legislation has outstripped practice, and that buildings have outlived the purposes for which they were built. It is only when the Victorian Acts and the schools they brought forth are studied that the true meaning of the phrase "sent to school" becomes apparent. It was indeed a sentence.

Throughout the nineteenth century there was a widespread movement towards popular education which culminated in the Act of 1870. Prior to this it had found expression through the various types of denominational schools, and the Dames' or "minding" schools which flourished in the newly-developed industrial settlements. Grants had been given by the State for some years previous to 1870 and were subject to three conditions—inspection, structural efficiency, and the stipulation that places were kept for poor children. What the basis of inspection was is doubtful, but a description of these schools will presumably reflect the general standards that obtained. They were not subdivided into age groupings or standards, and even the separation of the infants from what we would now call the seniors, was usually no more than an aspiration. The monitors or the senior children conducted the classes under the supervision of the teacher. Planning was designed to facilitate this by providing a long narrow room

without subdivisions or partitions. Such a school is illustrated in Plate 29. and the various features by which it was assumed that light, ventilation, and heat were provided are indicated. The interior with its dignified gloom, is suggestive of the family vault and in this way the spiritual welfare of the children was assured. They were further confined in narrow desks and seldom moved while the alternation of copying and verbal repetition proceeded throughout the day.

The passing of the Act of 1870 marked a great step forward. Hitherto legislation had been permissive, but the local authorities were empowered to provide educational facilities where they were required and in 1876 school attendance was made compulsory. For our purpose the main importance of this Act lies in the immediate impetus it gave to school building programmes. It gave the newly-constituted School Boards the powers to acquire land, levy rates and build. An expansion of school building at a rate unequalled before or since was commenced. In 1870 the estimated accommodation in the schools inspected by the State was 2,000,000. In 1876 it was 3,500,000. This represents a vast programme but our aim is different in kind if not in size. The shape of the schools built at this time can be seen in a large number still in use in our towns, and particularly in our villages, today.

So far as Elementary education is concerned the years following 1870 are notable for extensive progress in teaching methods. The 1870 Act only applied to the ages from 5 to 10 and later extended to 13, when separate infant and junior schools were set up and the Higher Grade Schools were established. Facilities for medical inspection and free meals for necessitous children indicate a shift of attention from spiritual zeal to physical welfare. A medical inspection room, a gymnasium, and a dining room may seem an obvious necessity but they have often not been considered sufficiently important to warrant their erection. Improvements certainly were effected in the design of schools; lighting and ventilation was improved and the division of space into classrooms is a great advance.

Schools of this period are to be found in every locality. It is a common arrangement in urban areas and the same type, and very often the same dimensions, are used whether the school is for seniors or juniors, whether one or two storey. The hall has no direct lighting except by means of clerestory windows high up in the wall or roof and is a corridor for the classrooms. These are lit from one side only and cross ventilated into the hall, so that any noise or disturbance in this room is transmitted to every comer. So, with minor variations, and a host of excellent reports, the position has remained until the present day. The most important features of the 1921 Act—the setting up of separate nursery schools for the 2 to 5 group, the raising of the school

leaving age to 14, are the final touches to a phase of education which began in 1870. The new Act must be the beginning of another phase and not merely the continuation of the old.

While the origins of the Technical School are to be found in the circumstances attending the Industrial Revolution, those of the Secondary School are of more recent date. They were originally established as a by-product, along with secondary education for girls, of the School Enquiry Commission of 1864. Their tradition has been more humanist—in the sense that it has been less utilitarian—than the elementary schools and they have shown a tendency to throw off a large number of variations. Some of these have been so satisfactory that they form the foundation for the new programme of secondary education proposed in the Bill. For our purpose the important feature in both types of school which were formally established by the Act of 1902, is that from their inception a far higher standard of accommodation was permitted. Amongst other things, the study of science was encouraged and it was suggested in 1875 that at least six hours per week might be devoted to it. An excellent account of the development of these schools can be found in the Spens Report, but for practical purposes their new charter, like that of elementary schools, will begin with the operation of the new Act. And at the outset we must see that the buildings do not handicap educational methods as they have so often done in the past. A real solution must await a period of experiment. Too few experiments in methods of school planning and building have been carried out. The Ministry of Education has left development work to the local education authorities and consequently it has not been comprehensive and methodical. The Ministry of Education should initiate and plan investigation into school planning, construction and design—and carry it out.

(c) *The Present Position.*—Most Local Education authorities have now submitted their educational plan and the Ministry of Education has estimated the capital cost of the provisions in the new Act at one thousand million pounds. It is expected that this sum will be spent in the next decade or two. The task of fitting this programme of building—involving as it does large numbers of new schools, reconstructions and modernizations of existing ones, as well as the rapid expansion in the number of places to accommodate the school leavers—into the national building programme has only just begun. The new Bill is tentative in character and is clearly intended to be augmented as the situation clears, while the new Building Regulations which accompanied the Bill call for higher standards in floor space and comfort conditions; this makes an exact assessment of the building programme a very difficult matter. It

will probably be some years before sufficient experience has been gained in the operation of both Bill and Regulations and before any reliable judgment can be formed of their merits.

For the next few years school building programmes will be principally concerned with increasing the number of places available rather than building complete schools. This has received first place in the so-called "Operational Programme" inaugurated by the Ministry of Education in 1946. Even if the school leaving age had not been raised in April 1947 we should still have been confronted with this problem which is due to the following causes:—

- (1) The sizes of classes prior to 1939.
- (2) Provision of Nursery Schools by the L.E.A. where these are required.
- (3) Introduction of part-time education up to the age of 18.
- (4) Increased facilities for Adult Education and physical well-being.
- (5) Construction of new housing estates.
- (6) Changes in the distribution of the population.
- (7) Destruction of schools during the war.

Many authorities have drawn up their own programme of priorities for an emergency period of indefinite length. The Ministry of Education has given immediate and over-riding priority to the construction of classrooms for raising the school leaving age, to the school meals service and to the provision of schools in new housing areas. This programme is likely to be modified by conditions which have nothing to do with education. The shortage of man power may compel the postponement of further education—quite apart from its effect upon the educational building programme—or a decision to reopen the wartime nurseries may cause a reconsideration of the immediate programme. It may well be found, when more schools have been constructed in accordance with the new regulations that these require drastic revision. In short there are a number of factors operating which make the modest programme announced recently difficult of achievement. In any case school building should be geared to housing and the two should proceed uniformly, so that fluctuations in house construction and distribution correspond with school building.

It is proposed that the age of 5 to 11 should constitute the junior phase, and that subsequently all children should attend one or other of the new types of secondary schools. A further feature of these proposals is that the attention paid to vocational, technical and scientific training in the new secondary schools will be considerably increased. The provision of effi-

cient laboratories is practically confined to secondary schools and it is only in recent years that the old senior elementary school was provided even with workshops. Of the three types of secondary school, entry to one of which will be assured to all elementary school children by the Bill (and not 9·5 per cent as at present) at least two—the modern and the technical school require far better treatment in the way of special classrooms, equipment, and scientific and technical apparatus than was the case in the past. Few indeed of our existing senior elementary schools can possess these facilities.

This is further emphasized by the proposals relating to the elementary schools. Some of the figures given in the White Paper are startling. In 1938 there were 10,553 such schools with an average attendance of 1,374,000 and 92 per cent of them occupied buildings dating from 1902 or earlier. Whether these schools are on the Board's black list or not, is unimportant. Whether the difficulties which have stood in the way of their modernization will still exist is unimportant. But no one can claim that such buildings and layout can be otherwise than obsolete.

However, much more than this is, proposed in the Act for what is called compulsory, part-time education, and further education. The former will entail the establishment of young people's colleges which will give facilities for vocational training and in health and citizenship. Of these colleges it is said . . . "In the second place the new system must not start under the handicap of poor and inconvenient premises which are dispiriting to the staff, command little respect from the students, and carry no prestige with the public. The problem of accommodation may be met in different ways in different instances. In some cases provision for the young people's college may be combined with much needed extension of technical college accommodation. In many cases separate buildings will be required, or provision may be on the lines of the Village Colleges of Cambridgeshire. In general, the young people's colleges should link to the future rather than to the past, i.e. they should be associated with provision for adults and adult activities rather than with the schools which the young persons have left." Here again a great and largely unfamiliar problem awaits the Local Education Authority. The college referred to is illustrated in Plate 40.

"Further education," covering the Technical, Commercial, and Art Schools, has been backward in its development in this country. The provision of such education is permissive and not obligatory on the Local Education Authority at the present time. The White Paper goes on, ". . . technical education has not hitherto made that advance which the needs of a highly industrialized community demand. In particular the standards of the buildings and equipment in use have often been

deplorably low, and comparison with what can be seen in many countries which have been our competitors in the world market, can leave little cause for satisfaction." It is therefore proposed to turn this power into a duty and to ask for schemes to be submitted. A contemporary technical school is illustrated in Plate 31, and the force of the remarks in the White Paper will be appreciated from this.

Furthermore, the Act makes the provision of medical inspection and treatment a duty of the Local Education Authority for schools of all types. Proper facilities for physical recreation are also outlined as well as the provision of school meals. These are requirements which have never received their proper measure of attention and have usually been omitted from school buildings.

It is impossible to attempt an estimate of the total building programme that these proposals will entail. In housing it has been seen that the estimates vary, and in schools the problem is made more difficult by the fact that a clear definition of obsolescence and of class sizes has not been made. There is no overcrowding standard and there should be. But it is admitted that a large proportion of the schools in use today must be rebuilt immediately and the Act recognizes this.¹

In any case, to this total must be added the wastage and deficiencies due to war conditions. The war, too, has been responsible for the establishment of a large number of Day Nurseries and for the addition of extra classrooms to existing schools. As all these buildings have been of a temporary character with a low standard of building, they will also need replacement. In many cases, judging by their present state, immediately.

As in the case of housing, if we are really going to come to grips with this problem, we must assess its numerical side against our available supplies of labour and material. It is evident that the building industry, even with the maximum effort it is capable of making, cannot carry this programme along traditional lines. Fortunately, classrooms lend themselves to prefabrication and from a technical point of view, present no great difficulties. There may be other methods of solving this problem

¹ The following extract from a speech by Mr. R. H. Butler, the President of the Board of Education, is quoted from *The Times*, March 22, 1944:—"The first step was to press forward with reorganization. To meet the raising of the age to 15, 391,000 extra places would be needed. Over and above that figure 406,000 places would be required if the age was raised to 16. The nature of the task would be appreciated when it was realized that school building had ceased since the war began, and many children were already housed in huts. Furthermore, some 150,000 school places had been lost owing to war conditions, and would have to be replaced. A great deal of leeway would have to be made up after the war. There was the welter of unfulfilled policy which awaited him when he became President of the Board. A vast number of primary and infant schools would have to be reconstructed, and a proper scheme of technical education had to be introduced. The limiting of the size of classes to thirty—one of the most important reforms of all—would call for between 40,000 and 50,000 more teachers, an estimate which did not allow for replacing the numbers that might leave the profession after the war."

but one way or another new schools must be built. The conversion of private houses, the use of military camps will not do—even as a temporary measure. Such methods wrecked the Education Bill introduced at the end of the last war.

SECTION 2: THE SITING OF SCHOOLS

Our outlook on school siting has swung to the opposite extreme from that obtaining in the nineteenth century. Most urban schools were then built on inadequate sites fronting directly on a main road. A school yard bounded on one side by the school and on the other by a high brick wall was usual. It was surrounded by houses and factories. In the last twenty years, however, sites for new schools have been selected with a certain area of land round them. In most cases this has been obtained by setting the schools in the central area of a housing plot (Plate 30). In this way the schools do not have direct access from a road and are close to the housing which they serve.

While this is undoubtedly an improvement upon Victorian methods it still leaves a good deal to be desired. The siting requirements of schools differ with the type—in the Gladstone Bill there was only one type and one age group so this problem was simpler. Today we can distinguish three evolving types which are represented by age groups, each with their own special needs in siting. The disadvantages of the kind of site selected in recent years are those of amenity and quality. The junior and infant schools should be placed close to an area zoned for residential development, but it should not entirely surround them. One side should be left open even if it is on to a road, so as to give the school an identity and to avoid the idea that it is out of the way. The siting of the schools for the elder children (the 11 + age group) should encourage them to identify their education with that of the community. There is no reason why children of this age should not walk some short distance—from half to one mile, and if the school can be located in some relation to the centres of local government and organization, it will have an educational advantage. One of the most important features of the Act is its emphasis on the continuity of the educational process and on its social effectiveness.

We have also chosen dull sites; land without any well-established trees, and without changes of level, makes it easier to plan schools. But it tends to create a monotony of layout and a uniformity of plan. This is not to say that the style of the buildings should have some feature which will differentiate them from all other schools, but that the site should preferably be such as will make for a definite sense of individuality both in building and layout. Natural features, a break in contour, a clump of

trees or even a lane, can be utilized in the hands of a good architect. In this respect some continental countries are much in advance of us.

(a) *Relation to other units: School sizes and population.*—Each school type marks a definite stage in the development of the child and this is reflected in the siting requirements. As the child grows older so its dependence on the home diminishes and it begins to reach out towards a wider environment. It is at this point—in practice the secondary school stage—that the relation to the community as a whole begins to arise.

This is not easy to translate into practice. First of the number of children in an educational catchment area—the density of the school going population—determines the size and frequency of the schools. In suburban areas it is possible to separate the infants from the juniors and to build two distinct schools; in the rural areas unless one and two form schools are to be built it is almost certainly necessary to combine the two. A further difficulty arises from the same cause in secondary schools. Three distinct types of secondary school, Grammar, Technical and Modern, are called for and it is clear that in a great many areas they will be unable to support three types of school as separate organizations. In country districts this will almost certainly be the case and children will either have to travel a long way to the school they require, or a type of secondary school developed which will cater in one building, in a comparatively small school, for all three types. In the large urban areas the difficulty lies in keeping the secondary schools down to a size which will not be too big for the full development of the child's personality. The L.C.C. propose to get over this difficulty by grouping three types of school in a single educational unit of perhaps 2,000 children. This proposal has been labelled "multi-lateral" both as a form of praise and abuse—and it might also be applied, more correctly, to the usual secondary schools. So the size of the school and its site will be determined by the density of population in the area it serves, and in practice, so far as secondary schools are concerned, the type of school, whether specialized or not, will also be largely governed by this factor.

In the first stages of education the main necessity is that the child should not have far to walk, some authorities say that a quarter mile is the maximum distance. This means that the nursery school will be a small unit which occurs as part of the housing. Every effort should be made to relate the siting of these schools to the convenience of the mother. In junior schools, distance from home, although important, need not be so absolute as in the case of the nurseries. The amount of land required is considerably larger although it will not be necessary to provide the same area of recreation space as for the secondary schools. The play space must

be available at all times to the children, and it must be properly equipped. Too often a space is provided and the void is never filled. It is a common thing to find these play spaces closed during the school holidays and after school hours.

It is difficult to assess the size of the population unit necessary for the support of one or other of the three types of secondary school. It has been suggested that a population of from 5-10,000 people forms a convenient unity for social and communal services. Unless the particular unit was constantly recruited from people of child bearing age, it would almost certainly prove too small to support these schools. Each of these three types of school require specialized classrooms and a highly trained staff; the minimum size for economic working of each is probably in the nature of 240-320 children. This makes a total grouping of between 700 and 900 children for these schools.

While school sizes of this order are convenient in urban areas and, when once the system is fully established, each type of school can be kept separate, it presents a problem of great complexity in rural areas. It is unlikely that the same choice of school which will be open to urban children can be immediately achieved in the country. At the present time the practice of transporting children from the smaller villages to a senior school located in some central position is well established. The radius, having regard to time and cost, of such concentration, is generally limited to 5-10 miles. It must depend largely upon local conditions. In the big urban areas the areas which are laid down for open space and playing fields in connection with secondary schools appear too large to be practical. Most of the larger authorities are already grouping the playing fields in convenient positions on the edge of the town but this expedient does not give them the space required about the school. But whether the school is town or country it is evident that transport from home to school, from school to playing field will be used to an increasing extent.

(b) *The Selection of Sites.*—The Act of 1944 gives a new meaning to education. Its proposals for secondary and further education are clear sighted and comprehensive and the Building Regulations which accompany it allow more space and equipment for both child and teacher. It is the more disappointing to find that the memorandum on the Building Regulations, which is "to elucidate and expand" them, does not make more imaginative and constructive suggestions for the selection of school sites. The size of sites recommended for the various types and sizes of school is increased and areas are laid down both for playgrounds and playing fields. All the memorandum has to say is this:—

“(c) The desirability (1) that the site should be as regular in shape as possible, in order to avoid useless spaces and should be reasonably level in order to avoid undue cost in excavation and levelling. On the other hand for all children and particularly for those under five, some irregularities in the site are a desirable feature. If there is a slope, it should, if possible, be towards the south.

(1) The value of trees and other natural features.”

The site is the most important single feature in a school. Teachers, and classrooms, may come and go but the generations of children are generally anchored to the site. A good site imaginatively used, can compensate for inadequate and inefficient buildings and conversely a bad site will never allow the school, however well designed, to function harmoniously. The selection of the site is perhaps more important than the selection of the headmaster or the architect and in the past far too little attention has been paid to this problem. Cost has been the principal criterion and too often the County Valuer the arbiter of education. It is easy to apply the various considerations mentioned in the memorandum, contradictory though they may be, and to find, when the site has been selected on this basis, that monotony is the result.

First, and most important, a school site must have some individuality—some accidents or features around which its buildings may be designed and to which affection and evocation may be attached. A view, a stream, a valley, a coppice, a lane, a prospect across a municipal park or a church, or even a Lebanon cedar are the ingredients of a pleasant site and a good school. In the other features mentioned in the Memorandum, the importance of unrestricted sunlight, sloping contours are important, too. The obsession for level sites is probably based on the assumption that they are cheaper—as though that advantage was not apparent to the vendor.

With the standardization of school planning recommended in Post War Building Studies No. 2—Standard Construction for Schools—variety in sites and variations in features and contour became increasingly important. There is a danger that the repetition of standard construction, or of standard dimensions, may result in uniformity and a loss of individuality. It is a danger that lies in the future. If to flat, treeless, featureless sites we add long rows of single storey classrooms erected from standard constructional units we shall find we have produced an institution, and perpetuated the hutted camp. A child may pass its life between the temporary prefabricated bungalow and a secondary school of standard construction.

The regulations make a big advance in the minimum areas prescribed

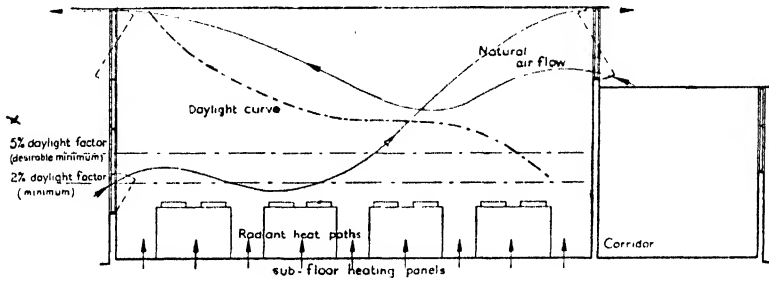
for school sites. These range from half an acre for a one class school to three for a three form entry secondary school. These are the areas for the school and do not include the playing fields which are additional. To give some idea of these a three form entry secondary school requires fourteen acres. Naturally it is not expected that it will be possible to provide such a large area adjoining the school or that each school will necessarily have a separate one. Playing fields are one of our national problems and in our urban—and sometimes our rural, areas, there is a serious lack of public open space and playing fields. Facilities for all forms of physical exercise from hiking to hockey are required. Adequate playing space for schools is only a part of the issue.

The growing realization of the importance of good surroundings upon teaching efficiency, as well as outdoor teaching when conditions allow, should lead to a more generous attitude towards site planting and school gardens. Not only does a garden help to give character to a school but it is also a training in citizenship. If we are to make our towns and cities beautiful we must first of all make them respected. This can best be done through the school, and because the school garden belongs to the school community, it will help the child to make the adjustment.

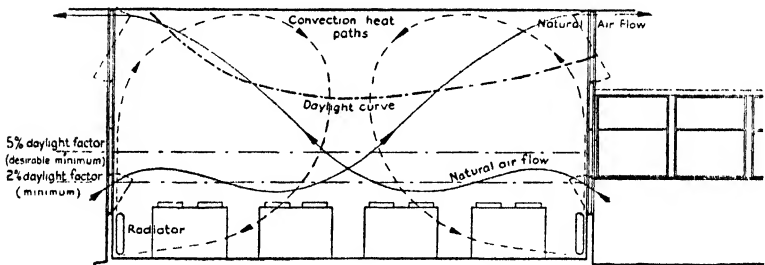
The modern tendency in school planning is towards the dispersal of the different teaching units. The hall, the gymnasium, classrooms, library and so on are dispersed about the site according to their relation to school procedure and the conditions each requires. The gymnasium is placed close to the playgrounds so that physical training can go out of doors in fine weather and because noise does not cause interference. The classrooms are placed so as to get the best sunshine and lighting conditions and to give a pleasant, private and sheltered outlook and so on for all the various activities of the school. This type of arrangement allows for proper day lighting conditions and makes it easier to satisfy the daylight factor laid down in the Building Regulations. It also gives far greater freedom from noise interference between one room and another. These features are all concerned with school planning and are dealt with in the next section but they make a considerable difference to the use of the site. Planning of this sort takes up considerably more space, demands a great deal of attention in the lay-out and disposition of small banks of shrubs and thickets.

In the multi-storey school these conditions are more difficult to achieve. Orientation is possible but natural day-lighting, freedom from noise interference cannot be so complete as in the single storey plan, and most authorities agree that the latter is to be preferred wherever possible. Much can be done by grouping activities according to noise and sunshine and by breaking the blocks up as much as possible so as to secure

light on side walls, and across rooms. In this respect some of the recent Swedish and Swiss schools have been very successful. On confined sites, it will be impossible to avoid multi-storey schools and they are to be preferred to a densely planned single-storey lay out in which buildings occupy nearly the whole of the site in long pavilions.



a) Showing Corridor Access



b) Showing Elbow Access

DIAGRAM 6.—SCHOOL CLASSROOMS
Natural Cross Ventilation.

SECTION 3: SCHOOL PLANNING

A school plan is the result of a balance between the organization of the school and its method of construction. These determine the shape and construction of the various rooms and consequently the general layout of the buildings and their external appearance. A different attitude, a less personal judgment, is required in appraising schools than in houses. Whatever is built in a house will be adapted by the individual householder and the design must allow these adaptations to be made. In a school, the physical requirements of light, air, and warmth, for instance, are based upon the conditions necessary for the health and education

of the age group for which the school caters. The first is individual, the second collective.

These educational and physical factors must be considered before the final plan of a school can be drawn up. In housing so much of the arrangement is traditional that variations are rigidly limited. In the school there is a wider latitude in arrangements and the organization varies with educational policy. When the ideal form of the classroom has been determined—the kind of teaching, the visual and aural aids, as well as the blackboard, the method of heating, the position and size of the windows—it then has to be related to the plan so that the position of the classroom suits the school routine. The plan therefore arises out of the unit in a logical sequence. This process is what the architect means by planning. Since these factors affect all types of schools to a greater or less degree and are matters of principle, they are dealt with generally. The illustrations show their specific effects on the design of individual schools.

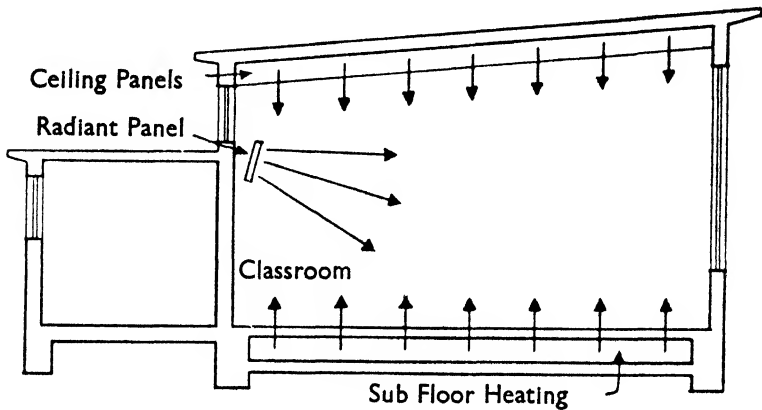
(a) *Physical and Educational Conditions.*—The term physical conditions refer to those aspects of school design which affect the health and general well being of the child and are of equal importance in all types of school. The educational conditions on the other hand, bear upon the internal organization of the school and include the type, age group, and curriculum. The former may be said to control the design of the individual units such as classrooms, while the latter organizes them into a whole.

Physical conditions.—In considering the relative importance which should be given to these factors, it should be remembered that one will affect the other. The size of windows made necessary by the lighting requirements will affect not only the method of heating adopted, but also the ventilation. In fact these requirements often conflict and part of the function of the architect is to resolve them into an efficient whole.

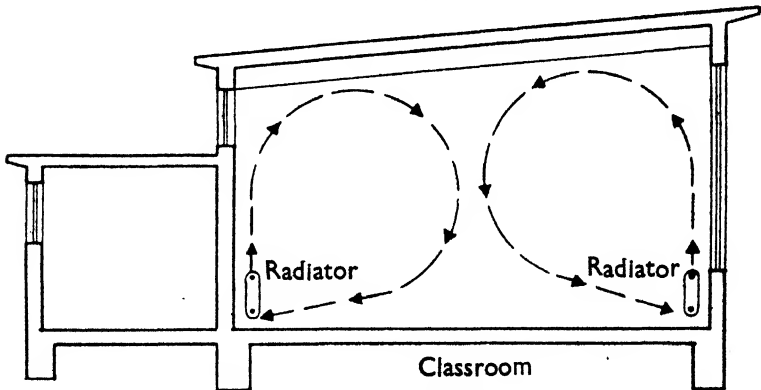
The methods adopted to secure good ventilation vary from those which induce a natural air movement to those in which air is mechanically propelled; that they are closely bound up with the methods employed for heating is obvious since too rapid a rate of air change will waste heat and because heated air rises and thus assists its own movement. The number of air changes required varies with the purpose for which a room is used and with the degree of physical activity going on in it. A gymnasium requires a higher rate of change than a library. Natural ventilation is commonly employed in this country while mechanical has been widely used in America and is capable of being more accurately controlled. Diagram 6 shows how natural ventilation works and how

the windows over the corridor assist the process. Where a large volume has to be ventilated a mechanical system can be used but this will usually only be necessary for assembly halls and gymnasiums or where it is not possible to obtain cross ventilation.

The heating of school buildings also varies with the use to which the



(a) Radiant Heating.



(b) Convection Heating.

DIAGRAM 7.—SCHOOL CLASSROOMS

room is put. Sedentary tasks require a higher degree of warmth than those used for physical activity. Similarly rooms which are to be used occasionally should have a different system which enables heat to be raised quickly, compared with those which are continuously occupied where a uniform level is required. Infants and small children who spend most of their time on or near the floor require different methods of space

heating from those used, say, in the classrooms of secondary schools. Some of the principal methods of heating are illustrated in Diagram 7 (a) and (b). The straight lines represent radiant heating—heat which while warming objects within its path does not warm the air to the same degree as convected heat which warms the air and through that, the surfaces. Convected heat is shown by the wavy lines. It is not suggested that these units will necessarily be used in the positions shown in these diagrams or that they will all be used simultaneously. For classrooms, sub-floor heating although expensive in initial cost, is very satisfactory, but the decision as to the type of heating must depend upon the cost of the fuel and the type of structure. The classroom illustrated in Diagram 6 shows the effect on the interior appearance of cross ventilation, and the neatness and absence of dust-traps (and dust-producing units) which is obtained with sub-floor heating.

The importance of good lighting, whether natural or artificial, scarcely needs stressing. Yet the majority of schools are still far below any reasonable standard, and even in some of the newest, the natural lighting is haphazard and inadequate. There will be no excuse for this in future. Definite standards, laying down the intensity of both kinds of lighting for all tasks have now been announced, and may be found in the Regulations for School Premises, 1945, published by the Ministry of Education. It is possible to measure the intensity of natural and artificial light at any point and to make the necessary allowances for orientation and obstruction. The architect will be able to plan his building scientifically, knowing in advance the intensity of light that will be produced by his arrangements.

Natural lighting has given a great deal of trouble in the past and the evolution of the classrooms has been very largely concerned with better methods of lighting. Plates 29 and 30 show the progress made between 1870 and 1930 and these should be compared to the classroom illustrated in Plate 43 where the plan allows for windows down both the long sides of the classroom. With a window height of 10 feet or so, it has seldom been possible to get sufficient light on the desks furthest from the window and Diagram 6 also shows some of the methods which have been adopted in recent years to overcome this problem.

Each room will require the type of lighting most suitable to its function and the form of the room will be dictated by this. In recent years the importance of orientation for sunshine in all types of building has been widely recognized. Classrooms, particularly those which are in continuous use, should be so orientated as to receive sunshine both in winter and summer. Preferably it should be morning sunshine which is not so hot in summer and gives a deep penetration into the room in winter. In

practice this means that the classrooms will be extended with a uniform aspect. Aspect is of almost equal importance, and every classroom should have a separate and uninterrupted view of a part of the garden. It should not be overlooked by other classrooms otherwise it will be noisy.

Educational Conditions.—The curriculum of the school is the basis of its plan. The movements of the individual classes, the apportionment of the day's work, the amount of class and practical work, the age of the children must find expression in the plan. Indeed, it is only by studying these arrangements that a school can be designed. The educational process is complex, varying from term to term and from winter to summer, and it is only with the co-operation of teacher, educationalist and architect that school design can be improved. Too often a plan has been prepared which, while it is satisfactory in cost, in the grouping of buildings of a similar type, in aspect and orientation, fails to work as an educational centre because the architect has not considered that side of his work.

Few schoolmasters and local education authorities know from actual experience, the difference in outlook and teaching that is produced by a well-organized school plan. In the first place the layout must depend upon the age group. Plates 34, 36 and 39 show the plans of well-arranged schools covering the existing groups. From a study of these it will be evident that in planning an infants' and junior school certain essential distinctions must be drawn. It will be seen that all the necessary lavatories and cloakrooms are brought within a close distance of the playroom. The infant arrives and stays to all intents in the same area, either in or out of doors, all day. He is dumped and it is not desirable to move him. In the senior school, however, the fact that the child is by now responsible, is carrying on all sorts of studies that require special equipment, is utilized in the plans. The lavatories and cloakrooms can be grouped away from the classrooms and the design takes account of his developing capabilities. Naturally in a plan which caters for movement between the classes, disturbance along the corridors is created. If there are a number of classrooms, the special rooms, such as laboratories, should be placed so as to be almost equally accessible to all. In the examples shown the position of the classroom reduces this disturbance to a minimum.

The Act asks for classrooms for all children. At the present time they are only provided for a fixed proportion of the total. It was argued that otherwise the special rooms—workshops and science laboratories, would often be empty. This is rather like saying that as the bedrooms in a house are only occupied at night, another family might come in and use them in the day. It does not produce the corporate feeling that is essential to the class: playing Cox and Box means that one is neither. Under the schedules

laid down in the pamphlet on Elementary School Building in 1937 only about half the forms have a classroom of their own, and apart from this a reduction in the number in each form from forty to thirty is aimed at. These proposals, if adopted, will considerably more than double the total number of classrooms and these must be grouped to avoid unnecessary walking and an uneconomic spread of the buildings. In Plate 41 a proposed plan for a secondary school is illustrated and it may be compared with that in Plate 35, which shows the old order of accommodation.

There has been a great diversity of view over the question of segregation of the sexes. In infants' and junior schools it has seldom been the practice, but many local education authorities, where the numbers justified it, provided different schools for the 11 to 14 group. There is little to be said for such segregation and it is to be hoped that mixed schools will be the rule of the future. With an existing three-stream school there is no compensating economy to be gained by segregation. Another fetish has been in the disposition of lavatories and cloakrooms. It has always been the practice to group all the lavatories and cloakrooms for each sex in different places and each as far apart as is physically possible. Quite what is gained from this arrangement is difficult to see unless it is the long walk that the child makes from his class. With the increased number of classrooms this practice will defeat itself and the dispersal of lavatories in convenient parts of the building will, and should, become the rule.

(b) *Planning and Plan Types.*—There is no ideal plan for a school: certain types accentuate particular features or advantages. In the years immediately before the war there were a number of experiments to find out what plan was most suitable. There is considerable dissatisfaction with the traditional arrangement which often results in monotony while not giving the best physical conditions. The basis of the school is the plan of the classroom and this still depends upon visual demonstration. The loudspeaker enters into the pattern; in the future it must be possible for different programmes to be followed by classes in adjoining rooms. The film is more likely to be used in the assembly hall at present although most local education authorities must agree that provision for films and strips should be made in a number of classrooms.

The specialized classrooms range, in a senior school, from a carpenter's shop to a science room. The growing realization of the importance of scientific and technical education is stressed in the Act. We shall require better equipment and equipment which is particular to the subject taught, and we must avoid the inefficiency that arises when a north-lit workshop is transformed into a needlework room every other day. The clean and orderly disposition of apparatus will assist the educational

process. Plate 45 shows such a room which gives some conception of the complexity of equipment required but shows how it can be arranged in an orderly fashion.

Until the end of the last war a school began with the classrooms and ended with the lavatories. The assembly hall was the next feature to be introduced, and for many years, and in most schools, did its turn of duty as a form room as well. This attitude is now disappearing, but many authorities are reluctant to incur the cost and fail to appreciate the educational and social advantages to be gained from a well-equipped hall. As the Ministry's pamphlet (No. 107) says, it may be "doubted whether its possibilities of service are yet appreciated to the full." It will be used for music, drama, elocution, dancing; for films, lectures, demonstrations, exhibitions. In the rural areas in particular, a lot of these activities will also be public and the hall and its ancillary rooms will perform the function of a social centre. To cope with these manifold activities costs money. A film projection room and the apparatus for projection, a floor which has resilience for dancing, a shape and surface finishes which will make it efficient from an acoustic point of view, are all expensive and require great ingenuity of planning. The position of the hall in relation to the rest of the school (Plate 41) is also important. It should have good access for the public and be cut off from the rest of the school so that it can be used independently. It is the largest and most impressive single unit in the school building.

Wartime experience has shown the value to health of an adequate and balanced mid-day meal for schoolchildren, but very few schools were provided with a separate dining hall. Fortunately the provision of a dining hall in all but the smallest schools is now obligatory, and the bad old days when it doubled in the assembly hall or the girls' handicraft room are passed. The dining hall need not be elaborate and can be used as a general recreation room for indoor games. It should be so arranged that it can be used in conjunction with the assembly hall.

The library is another unit whose use has been neglected. It will be of great importance in the senior schools where with the higher school leaving age, a considerable field for independent study will exist. Ideally, of course, it should be open independently of school hours and where the school has to be used as a community centre as well, it will also be the local library. For this reason it may be advisable to bring it into close relation with the assembly and dining hall as well. It must be well lit and it should be in three sections—the stack room, the reading room, and the space for individual work.

Sites in urban areas are necessarily confined and produce a type of school distinct in every particular from those in open, unrestricted sur-

roundings. Instead of being spread out over the ground it is piled vertically. This means a heavy permanent type of construction, partly because of the loads involved in this type of structure, and partly because a fire in a multi-storey building is likely to be far more dangerous than in a single-storey building. To compare a multi-storey urban school with a rural one is like the old game of thinking that flats and houses are interchangeable at choice. Each has its own advantages and limitations. With the multi-storey building the absence of cross ventilation can be compensated by induced methods of ventilation. The concentration of a number of children in a large building which by its nature must be of a permanent construction, can allow for higher standards both of accommodation, equipment and finishes. Careful planning may secure the advantages of sunshine to the classrooms but it will probably not be so complete. Sound insulation, too, is far more difficult and is usually non-existent. Such insulation, whether by splitting up the plan, or by using deadening methods of construction, is expensive. On the whole the multi-storey school can only be regarded as a necessary evil although it is true to say that the problem has never yet been seriously tackled in this country in recent years. Some of the Swedish schools which are illustrated show that much can be achieved, and in some of the L.C.C. schools playgrounds have been formed on the roof.

The open type of plan is far more popular today and with good reason. It brings the child into close relation with the garden; it is safe; it permits a flexible construction; it enables adaptations and extensions to be more easily carried out. Above all, it allows the physical standards we have outlined to be more easily satisfied. It is always to be preferred, but it is not always possible; two main lines of development can be distinguished:

- (1) What might be called the dispersed plan.
- (2) The continuous plan.

The advantages claimed for the first are that the individual class can become a definite unit. Such a plan is more costly in services and construction than the continuous type. In this, while ventilation and lighting conditions are as easily satisfied as in the former, the sense of privacy and freedom from interference is lost. The classroom illustrated in Plate 43 shows a means of partially overcoming this. The whole school is connected up with enclosed corridors and the child is not exposed to the elements between classes.

(c) *Construction and Finishes.*—It is already evident that school is a bad second to houses in the scramble for materials and labour. The Ministry of Education have countered this by the belated production

of circulars and reports giving advice on methods of school construction which economize in labour and reduce the quantity of critical materials. Standardization of classrooms (and these amount to about 40 per cent of the total floor space) is widely accepted, and a number of authorities have made some extremely promising experiments in the prefabrication of classrooms. Prefabrication is unlikely to save money, it merely transfers to the factory a number of operations which are commonly carried out on the site. The prefabrication of classroom units would enable the present school accommodation to be expanded rapidly and the units themselves to be altered or removed much more easily than with permanent buildings. Certain limitations are desirable with this process however.

The main buildings are better not prefabricated. For one thing the size and width of the assembly hall, with its special and varying requirements make it difficult to design for prefabricated construction. It may also be undesirable. The assembly hall and the library, the recreation room and the staff rooms are unlikely to alter their function. In some cases they will form the community centre, in all they will form the focus of the school and by their design, give to the school whatever distinction and character it may possess. Cloakrooms and changing rooms require special and expensive equipment and services. They are also subjected to heavy wear and are better designed for *in situ* construction.

The internal finishes in our schools have been based on the ignoble standards of the workhouse and the jail. Durability and low maintenance costs have been the sole criteria, and the result has been the monotonous expanse of deep cream walls with a dark brown dado. This may be desirable in the sense that it stays shabby longer but the attitude of mind it displays—and the attitude it creates—are both to be eliminated. In this, we were content with minimum standards and mistook economy for efficiency. The war has increased the production of many materials such as sheet plastics, and new methods of fixing have been evolved. We must develop the use of clean, smooth materials for internal linings even if it means—and it need not—greater replacement. Cold, heavy and dark finishes must go. Even with prefabricated systems of construction much can be done in the selection of lining materials which have a wide range of surface colour and texture. The possibilities of laminated sheet materials, of plastic sheets and cellulose paints has not been even explored or experimented with in our schools. Colour can play an enormous part in making schools pleasant and interesting places, and it should be used to create the right atmosphere—quiet and serene colours or neutral shades in the library, vigorous ones in the recreation rooms, clean, fresh ones in the dining room. Each separate classroom should have its own distinct colour

scheme. This need not be elaborate—just one or two colour variations on the walls, while the colour of fittings and equipment can be the same in the classrooms. Colour has a very definite psychological effect and it has not yet been really exploited in school design. In some of the schools that have been illustrated great care has been taken with the colour arrangement.

Fluorescent lighting is being installed to an increasing extent. Experience has shown that it is perhaps the most revolutionary advance in lighting that has been made in recent years. The light produced by this method is shadowless, and has the same value as far as texture and colour are concerned, as daylight. It is also more economical in upkeep—for the same degree of illumination—than other methods. So far it has not been applied to school design. It will expose with merciless clarity any roughness or inadequacy of furniture and finish.

The design of school furniture requires drastic improvement. A few of the more far-sighted authorities have tried to provide furniture more in keeping with present-day needs, but the majority were satisfied with the standards of the bull ring. The first and most obvious requirements of school furniture are that it must be light in weight and strong. It is possible to get such furniture but it is needlessly expensive. The Ministry of Works have published a Post War Building Study on School Furniture, and the British Standards Institution are preparing a standard.

List of Books

Educational Reconstruction, White Paper (H.M.S.O., 1944). 6d. The basis of the Bill. Good in parts.

The Design of Nursery and Elementary Schools (Architectural Press, 1938). 10s. 6d. A complete survey of modern developments—for the general reader too.

Spens Report. Hadow Report. McNain Report (H.M.S.O.). The groundwork of the present Bill—full of nutrition.

Suggestions for Planning Buildings for Public Elementary Schools (Pamphlet 107, 1936. H.M.S.O.). 2s.

Education, England and Wales—Regulations Prescribing Standards for School Premises, 1945—No. 345. (H.M.S.O.)

Memorandum on the Building Regulations (H.M.S.O.).

The Education Act, 1944 and 1946. (H.M.S.O.).

CHAPTER FIVE

Health

Section 1: Health and buildings

- (a) Present position
- (b) Future policy
- (c) The next five years

Section 2: The siting of medical services

- (a) The clinic and health centre
- (b) The hospital

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- (a) Physical factors
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SECTION 1: HEALTH AND BUILDINGS

OUR hospitals record, in terms of bricks and mortar, a history of our national effort to combat sickness and disease. In many ways it is not an inspiring history; many of our hospitals are obsolete—some were already in use in Florence Nightingale's day; others are an inefficient compromise—a converted mansion or a series of wartime huts—others again are indistinguishable from the workhouse and the asylum from which they have evolved. Institutions for the indigent, their dependence on charity is emphasized by their design. Apprehension about their health is not the sole cause of the distrust and fear that the majority of people feel on entering hospital. It is also caused by the institutional gloom, the dinginess of stone-flagged corridors. There are very few good modern hospitals in this country; there are a great many hospitals whose buildings do nothing to assist the patient in recovery or the staff in treatment.

But buildings are not the only consideration. Behind them there must be some coherent plan for health and this has hitherto been absent. It has at last been recognized that hospitals and clinics must be related to the general pattern of medical services set up for the whole country. In the

last two decades the importance of prophylactic medicine has been increasingly realized. It is obviously better to prevent people from getting a disease than to cure them once they have it. It is probably cheaper as well. Hence the establishment of pre-natal and after-care clinics, and of medical and dental services in the schools. The adult must also be drawn into the national health system. Clinics and health centres have been established in the last decade or two. The Peckham Health Centre is an excellent example of this positive attitude to health. As the pattern develops the hospital will be seen to take its place, not as at the time of Scutari, as the sole centre for medical care and advice available to large sections of the community, but as a kind of casualty clearing station when disease or accident gets past the defence lines which are the positive good health of the whole community. As the White Paper on "A National Health Service" says:—

"Last, but not least, personal health still tends to be regarded as something to be treated when at fault, or perhaps to be preserved from getting at fault, but seldom as something to be positively improved and promoted and made full and robust. Much of present custom and habit still centres on the idea that the doctor and the hospital and the clinic are the means of mending ill-health rather than that of increasing good health and the sense of well-being. While the health standards of the people have enormously improved, and while there are gratifying reductions in the ravages of preventable disease, the plain fact remains that there are many men and women and children who could be and ought to be enjoying a sense of health and physical well-being which they do not in fact enjoy. There is much sub-normal health still, which need not be, with the corresponding cost in efficiency and personal happiness."

The new plan tries to provide an organized and coherent plan for health. It is also a positive attempt to improve the administrative muddles and parochial prejudice which cling to our present arrangements. It carries us some way towards a comprehensive medical service and recognizes that the doctors' waiting-room and the hospital are inadequate by themselves to provide for the welfare of the community.

(a) *Present Position.*—Our present system is a patchwork of many services set up at different times by different authorities. The quilt may nearly cover the bed but it is of varying density and has some big holes. The situation today can only be understood by considering the way it has grown up. Its origin lies in efforts to relieve the suffering of the poor. The early hospitals were in fact similar to workhouses and they often had a common identity which comes down to us in appearance, accommodation and finish. The earliest provision was through the voluntary hospital and it is proposed that they shall be controlled and integrated with the

regional pattern which is to be established. Today, the number of voluntary hospitals is still, it is believed, greater than the number of general hospitals provided by the State, although the total number of beds is less. In 1939 there were over 900 voluntary hospitals with 77,000 beds; the majority of them being in small hospitals of less than 100 beds.

The public hospital came into being at a later stage. The earliest type to be administered by the local authority was the isolation hospital in 1866. Powers were given to the local authorities to establish such hospitals but the general hospital had to wait until 1875. The former did not become a compulsory service until 1929 and in both types powers were given to local authorities to combine to form Joint Boards for their administration. Other and more specialized types of hospital such as the tuberculosis sanatorium were set up later. Today, between the General Hospital and the Public Assistance Institutions, there are 130,000 beds in England and Wales without counting the 50,000 which, it is estimated, have been added by the War Emergency Hospital scheme. It is estimated that there were another 38,000 beds in the Isolation Hospitals although these were mostly in small units. These were administered by about 1,500 local authorities, although half of them had grouped themselves into Joint Boards to ensure more economic and efficient working.

The hospital and the sick bed are only a part of the measures necessary to secure the nation's health. National Health Insurance was introduced in 1912 but although it gives benefit to insured persons being treated in hospital it does not directly affect the provision of buildings. There are also available certain specialist services for the treatment of such things as venereal disease, tuberculosis and cancer. Clinics are also provided by the voluntary hospitals. Under permissive powers, the local authorities set up maternity and child welfare services and these may range from the maternity hospitals to clinics. Then there are the medical and dental services provided in the schools and, of course, the Home Nursing services. It will be clear that the present pattern of State service is incomplete and not under single control: it varies according to locality and lacks co-ordination. More important, it tends to be static; to mend rather than to improve health.

(b) *Future Policy*.—The State health service cuts across the pattern of local administration laid down in the past. In its place comes the Regional authority responsible to Whitehall on one side and to the administrative committees formed from the local authorities and other bodies on the other. There is nothing new in this proposal, for many activities—water, electricity, rivers, are examples—have been more conveniently handled by joint or *ad hoc* committees which bring together

all interests over a wide area. During and since the war the various Ministries have set up regional offices and regional boards are being established for various industries. Moreover, the establishment of the Joint Boards in 1929 was a recognition of the fact that the administrative area of the local authorities might not be convenient for a comprehensive health service. Among the most sweeping of its proposals so far as they affect local authorities are:—

- (1) The control of the hospitals will pass to Joint Hospital Boards. The area controlled by these bodies will be decided by the Minister after a survey of area facilities.
- (2) The control of the clinical and domiciliary services will remain in the hands of the county and the county boroughs although this is subject to revision in the light of the first.
- (3) The school medical service will be administered by the authorities set up by the new Bill.

The reasons for the first of these proposals are obvious enough. It has long been felt that the large specialized institution is likely to be more efficient and economic than a number of small and scattered ones. In the future we shall build bigger hospitals and within them there will be scope for much specialization. The isolation hospital is to be merged in the Acute General hospital.

“The whole trend of medical opinion has for some time been in favour of treating these hospitals, not primarily as places for the reception of patients to prevent the spread of infection, but as hospitals where severe and complicated cases of infectious disease can receive expert treatment and nursing. The small isolation hospital of the past century is not only uneconomic in days of rapid transport but cannot reasonably be expected to keep abreast of modern methods. One result of the new outlook will be the development, in addition to the larger isolation hospital serving the densely populated area, of accommodation for infectious diseases in blocks forming part of the general hospitals. These considerations all indicate that the infectious disease hospitals must in future form part of the general hospital system.”

As outworks to the hospital are the related consultancy services and clinics. These, in combination with the Health centres where groups of doctors will combine under well-equipped conditions, will form the positive centres in the fight against disease and for the promotion of health. In this respect the buildings required are in essence a new experiment with which the local authorities are largely unfamiliar. Illustrations

of one or two such clinics and centres are given later. Concerning them the White Paper says:—

“Where Health Centres are set up, their types will need, particularly at first, to be varied. Scope must be given (with central and local professional guidance) to experiment and to design capable of later adaptation. Broadly, the design should provide for individual consulting-rooms, for reception and waiting-rooms, for simple laboratory work, for nursing and secretarial staff, telephone services and other accessories, as well as—in varying degree according to circumstances—recovery and rest rooms, dark rooms, facilities for minor surgery, and other ancillaries.”

Far as these proposals go, they are still negative. Good health can only be secured for the community at large by good homes, balanced food, and exercise. It is in this last that positive direction must be given. The Peckham Health Centre, the forerunner in this field, sought to develop this by encouraging the family unit to use the Centre as a social club and provided a gymnasium, swimming bath and games room as part of this policy. How far this was successful is irrelevant. Its aim, to link the development, mental and physical, of the individual with positive improvement and maintenance of health (as well as making his “case history”) is a necessary part of our social development and the proper form for such centres must be found by experiment. It is here that the proposals are essentially weak and further provisions will be necessary. At no distant time, the clinics and centres which will be required must be linked up with the normal life of the community. Only thus can they be given positive direction. It will mean that the medical services must be integrally connected with the general welfare of the people not only for health but for social and cultural purposes as well.

(c) *The next five years.*—Unlike the conditions created by the war in housing and education, numbers of new hospitals are not immediately required. The 50,000 beds added under the War Emergency Scheme are greater than the numbers usually built over a similar period in peace. These, however, will not greatly affect the reorganization of accommodation. The wartime hospitals have not been of a permanent construction and it is unlikely that it will be possible for them to be used effectively for more than a limited length of time. Their position has also been fixed primarily with a view to wartime requirements, and does not necessarily coincide with peace-time needs. Still, they can and will, in the building emergency, ease the strain by allowing more immediate priority to be given to other building types.

At the same time the general position is serious. A large proportion of the voluntary hospitals are out of date and require re-building; being mostly in the centres of large towns they have also suffered extensive damage. The hospitals administered by the Joint Boards have also for the most part, to be rebuilt since many of them are at least forty years old so far as their physical envelope goes, and far more antiquated in general layout. Added to this there are the problems created by the reorganization of the State Medical Service, the transference of population, and the poor facilities known to exist in many areas prior to the war. No estimates of the building programme necessary to implement the new health services have been made and until the survey which is necessary has been completed it is impossible to make one. Improvisation must occur in the service in the post-war years; but it must be experimental improvisation, designed not merely to meet the immediate crisis but to indicate the ways in which it may be permanently and helpfully solved.

SECTION 2: THE SITING OF MEDICAL SERVICES

The location of health services must depend upon the type of authority administering them. A joint authority planning the hospital services over a large area will naturally consider the question from two aspects—the proximity of the hospital to the largest concentrations of population within the region, and the balance between economy and efficiency produced by centralization. With the clinic and the health centre on the other hand, the local authority, not having the same rigorous requirements of siting to satisfy, will consider them largely in relation to the local needs of the population and to the developing pattern of social and educational services to which they are related.

(a) *The Clinic and the Health Centre.*—No special requirements of site are required beyond those of convenience of access and a central relation to the community. As far as possible these clinics should be grouped so as to reduce the duplication of clerical staff and medical equipment. Good transport facilities are a necessity particularly where the clinics have to serve several neighbourhoods and they are better placed on or near a 'bus route. This is considered in Chapter VII. The clinics, particularly those for special treatment, are likely to be more sparsely distributed and may be administered by the joint boards and thus be outside the control of the individual authority. If clinics of this type can be placed near a civic centre—whether for shopping or local government, it may prove to be a convenience. Highly specialized ones are likely to remain in close conjunction with the parent hospital.

The distinction between health centres—agencies for the promotion

of health—and clinics, which are intended for diagnosis and treatment, will lead to identification of the first with the local community services and the second with the regional authority. Within this broad pattern there are many difficulties which can only be solved by experiment. The relation of the general practitioner, who will presumably work through the local clinics and yet must be associated with the health centres, is one instance. It may be convenient for the centres to be closely related to communal services—to further education, the County Colleges and the Social Clubs. Health must be identified with a full life and the activities of such organizations as Community Centres and Youth Clubs are very useful in this respect. The Peckham Health Centre did in fact serve such a purpose, and made periodic examinations of its members irrespective of the specific disease or illness.

✓ (b) *The Hospital*—A hospital site should be sheltered without being exposed, open without being bleak. It should have uninterrupted light and sunshine not only to all parts of the building, but to the gardens as well. It should be close to a good road so that facilities for transport are available without being so close that it will suffer through noise and vibration. The site should have some established trees but they should never be allowed to overshadow or grow against the buildings.

There is no such thing as a site which is too big. All buildings last longer than they should and are kept in use long after they are efficient and after the standards upon which they were designed have been out-grown. Similarly, all buildings acquire other buildings, accrete them to overcome the deficiencies or disadvantages of the original ones. Buildings are seldom quite as big as is required and hospitals never are. So the site must be big; about twice as much as appears to be wanted at the time is an excellent principle. The developments in hospital planning also necessitate a large site. In both single-storey hospitals of the cottage type and the multi-storey urban type the open plan which arises from adequate lighting and ventilation means that a larger site is necessary. The total area of land built over may not be greater; the area over-shadowed certainly is. In recent years, moreover, the practice of splitting up the hospital into a number of separate sections based upon the age of the patient and the necessary treatment has increased.

In the large institution there will be further distinctions. So far has this proceeded that in certain large hospitals the building becomes a series of separate blocks; one for the central kitchen, another for the nurses' home, another for the laundry, and others for the different medical sections. Plate 55 also illustrates this tendency. Recognition of the importance of orientation and aspect for wards has also resulted in increased

space being required. Recreational facilities must also be considered. Where the hospital is close to a park or other open space the area required as grounds may be reduced. Ample space for gardens immediately round the hospital itself is necessary not only for their psychological effect, but also for convalescence. The nursing and medical staff must also have facilities for out-of-door exercise.

The exact location of the hospital in relation to the community as a whole depends upon its size and as the hospital transcends the bounds of normal existence, so the distance from the population centre becomes less important. Clinics and schools, shops and houses are necessarily inter-related; the hospital stands in a single relation to the whole. This applies whether the hospital is for fifty beds or for five hundred; in either case it should not be unnecessarily far and the question of transport not only for staff but also for visitors is of great importance. It is essential that the site should be quiet and remote from industrial development. The possibility of atmospheric pollution and the prevailing wind must be considered.

SECTION 3: THE BASIC CONDITIONS

Ventilation and sunshine, light and warmth, are generally required in buildings, and progress lies in the development of our ability to control these conditions. Different types of buildings need different physical conditions and the relation between these factors is always in course of modification. In school buildings, the welfare of the child, in hospitals, the welfare of the patient, determine the design. The patient's welfare should also dictate the kind of organization and therefore the layout of the buildings. Thus architecture often reveals and expresses our ideas and becomes a fascinating study of society as well as a formal art. In the hospital a number of conflicting and diverse factors must be related to one another and yet the building may often be harmonious and beautiful. The various departments must be separated to reduce the risk of contagion, yet arranged so that the staff may go quickly from ward to ward. Cooking must be centralized for economy, yet the food should reach the wards quickly. Privacy is desirable for the patient, but supervision by the staff is also required.

(a) *Physical Factors.*—Good ventilation is essential in all wards. Even where there are less than four beds, the plan must allow for a cross movement of air even though two opposite external walls in so small a room is seldom practical. The importance of this factor has been recognized for so long that nearly all hospitals will be found to have their ward blocks arranged so that the two long sides are external walls. Cross ventilation provides a natural movement of air as well as reducing the risk, where

the bed-spacing is sufficient, of cross infection between the patients. The provision of this natural ventilation gives a distinctive appearance to hospitals whether they are single- or multi-storey.

The number of air changes required vary according to the type of the ward; but the opening units must be arranged so that exact control can be obtained. This is always difficult when windows are for the dual purpose of giving light and ventilation. In the future it is likely that small ventilating units which can be set automatically to give the required number of air changes will be used. The windows can then be designed for the sole purpose of lighting. Plenum systems have been used in American Hospitals but have not been adopted here; the objection is that there is the risk of ducts acting as a path along which contagious diseases may be spread. Plate 57 illustrates the ventilation and lighting adopted in the modern hospital.

Natural lighting is also required. A ward should be orientated so that the midday sun does not shine directly into it in summer but does penetrate all parts of the ward either in the morning or the afternoon. Facilities must be given for the control of the intensity of light at every bed so that each patient can diminish or increase the light within certain limits. This, of course, is only possible where the beds are so arranged that each has an individual window. The windows ought to be low enough to enable a patient lying down in bed to get a view of the garden, although in a high building this is almost impossible, particularly where there are balconies. In deep wards the windows should also be carried up to the underside of the ceiling to get the maximum light. This is shown in Plate 50 and also Diagram 8.

There are several methods of heating. The commonest is by means of ceiling panels, combined with low temperature heating panels under the windows. These may be paired and thermostatically controlled. The ceiling panels avoid dust and distribute heat effectively with the usual ward height of 10 to 12 feet. Individual heating units which may be in the form of radiant panels are required as well for each bed.

✓ (b) *Medical Conditions.*—The practice of dividing the hospital up into a number of self-contained units has already been mentioned. It lessens the risk of contagion, of course, but what is more important is that by grouping the patients according to age and illness, a simplification of routine is achieved and a greater degree of comfort. Old age and youth even when they are suffering from the same complaint do not need the same conditions. Noise and interference are lessened if the wards as well as the service parts of the hospitals are separated and linked only by corridors and what began as a necessary evil, has become an advantage. Even in small cottage

hospitals the plan is dispersed and the administrative, kitchen, and other service units are separated.

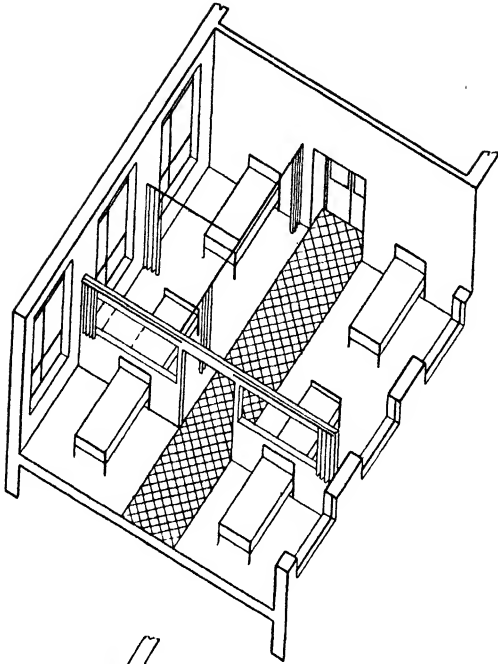
The same tendency may also be observed in ward planning and for the same reasons. Plate 56 illustrates a typical ward in a hospital planned some fifteen years ago. The beds are closely spaced and face the light and the patients look at each other whether they wish to or not. With this plan a great deal of work devolves on the staff in moving and arranging screens but the supervision in this type of plan is good. The medical conditions are better satisfied by the plan shown in Plate 51. This type affords privacy, and allows a greater degree of latitude to the patient. But it is also more expensive in cost and maintenance.

(c) *Service and Supply.*—The open type of plan which has been developed makes for long lengths of corridor, and increases the difficulty of supplying the wards with meals and medical treatment easily and quickly. The perpetual noise of trucks and trolleys is disturbing and the wards must be insulated against sound transmission at the parts at which they abut on corridors. The structure and the building must be separated. The centralization of cooking and laundry services as well as the concentration of medical treatment and surgery have created special problems. These units should be placed in as central a position as possible so as to minimize the amount of movement for patients and staff. If the movement necessary for medical services can be kept distinct from other services it is a great advantage but this is only possible in the largest hospitals. The arrangement of these units in proper relation to each other is one of the most difficult tasks which faces the architect.

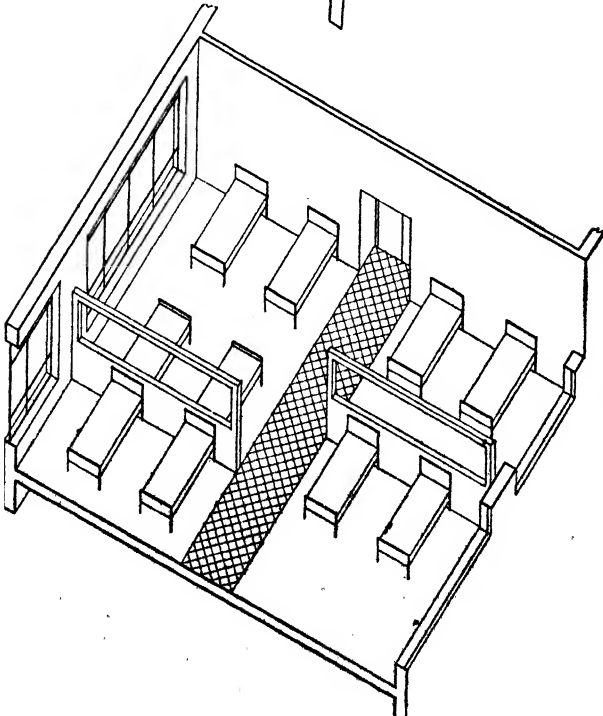
(d) *Health Centres and Clinics.*—In most of the health centres and clinics so far erected in this country the functions of the two have been combined. The scope of the centres have varied with requirements of each authority and no general standard of accommodation has been laid down. In the Finsbury Health Centre, a cleansing and disinfection station forms part of the building. In the Centre at Bilston (Plate 57) no such features are included, but there is a room for health visitors. The two are not comparable in size, Finsbury being the directive centre of the health services for the borough while that at Bilston is not.

In all centres however easy and obvious circulation for the public is of the first importance. A large and cheerful hall is provided—at Finsbury a Lecture Theatre opens off it—from which access to the various departments is visible to those waiting. A play space for children is also necessary.

(e) *Hospitals.*—Each patient considers himself the centre of the hospital



(a) 2 bed unit.



(b) 4 bed unit.

DIAGRAM 8.—SUB-DIVISION OF WARD

and in a sense, he is right. The efficiency of a hospital depends, in the first instance, upon the treatment given in the wards and it is upon their arrangement that much depends. The type of ward adopted will determine the final plan of the building. Everything does, in fact, revolve round them and a good ward arrangement is likely to create in the patient's mind a cheerful sense of his own importance.

The tendency in recent years in ward planning has been towards the reduction in the number of beds in each ward. This is a result of a greater specialization in treatment and applies to all types of hospital. Thirty or forty years ago the ward illustrated in Plate 56 was common in general hospitals but the number of beds has been steadily reduced and twelve beds is now regarded as the maximum. With these are combined a varying number of one, two, three and four bed wards, which can be used for special cases or private patients. The number of these smaller wards has steadily increased in relation to the total number of beds provided. The Emergency Hospitals built during the war are not typical since economy in labour and materials was the dominant consideration. A typical modern ward is illustrated in Plates 50 and 51. From the plan given there the number of the smaller wards can be seen. This tendency is likely to develop in the future and most authorities anticipate further division into smaller units. The ideal is, of course, complete sub-division into single bed units. This system is undoubtedly more expensive; a greater area of ward space is required for each patient; a greater number of nursing staff; and increased costs in services. But the advantages are obvious.

Parallel with this development efforts have been made to avoid the monotony and noise of the old type of ward. Ward space has been subdivided by means of fixed screens which are glazed. Using the kind of screen illustrated the sense of community which helps to keep a ward cheerful, has not been altogether lost. A number of variations of this arrangement have been made and Diagram 8 and Plate 51 illustrate some of them. Opinion is by no means universally in favour of this arrangement; it increases the difficulty of supervision, in particular. The use of two beds and four beds may be regarded as a compromise which avoids the cost of the single bed system, and the draughts and lack of privacy of the large open type. In both single and multi-storey hospitals beds are pushed out of doors as much as possible. With single-storey wards this presents no particular difficulty but with the multi-storey the projecting balconies overshadow and darken the rooms below. They should as far as possible be grouped and staggered as in Plate 48.

Every ward requires its own service room, as well as bathrooms, w.c.s, kitchen, and storage for linen and equipment are also required. It is obvious that these must be as close as possible to the beds so as to minimize

the amount of walking for the staff. A good arrangement is to place the services unit between the main ward and the smaller ones and in such a position that hand trolleys and other deliveries coming from the central part of the hospital can be wheeled straight into it. The ward kitchen is mainly required for heating meals ordered specially for the patients. Developments that have been made since the war in refrigeration and heat preservation may further alter this arrangement which has been primitive and inadequate in the past. Food, by the time it gets to the patient, is usually cold and sodden, and better arrangements can be made. Recreation rooms for the patients are also a necessity and owing to pressure on space they have usually been omitted or adapted in an emergency as a ward and remained as such. If no such room is provided it means that the convalescent patients use the main ward and this is extremely undesirable. The recreation room should be provided with comfortable furniture and ample storage space for communal property—games, magazines, and books.

The planning of the operating theatres, the kitchen and treatment rooms is a difficult problem. Much elaborate and expensive equipment has to be installed and arranged in such a position that it can be most effectively used. The architect is familiar with this problem but the layman who sees the finished result may not be aware of the difficulties involved. It was remarked in Chapter III that the planning of the kitchen in a house depends upon the sequence of operations involved in any activity such as cooking. With a large kitchen the problem is precisely the same but complicated by the fact that several sequences, not all of them distinct, may be proceeding simultaneously and on a varying scale. In the operating theatre the sequence is in two parts, the anæsthetizing of the patient and the sterilizing processes. These may be said to meet on the operating table. Plate 53 shows the sterilising room of the National Hospital, Queen's Square.

With the other accommodation required in a hospital—laboratories and workshops, administration and clerical work the needs become more precise. Their relation to one another and to the wards can be seen in the plan types which are illustrated. The staff quarters, however, are likely to be the subject of much attention particularly since the report of the Rushbrooke Committee. In the past the nursing staff have been shabbily treated in this matter and much of the discontent and hardship produced by hospital conditions can be avoided if their comfort is closely studied. That every nurse should have a room of her own, adequate in size both for study and rest, is now regarded as essential. It should be well furnished and have adequate storage space for personal belongings. In most modern hospitals the nurses' home is placed at some distance from the hospital

and this practice is likely to continue. It has definite advantages; it provides a change of environment and helps to reduce the feeling of continued proximity to work and sickness. It is to be hoped that real facilities will be given for visitors to the resident nursing and domestic staff. The nurses are adult and this fact is seldom recognized. They must be provided with rooms where they can entertain their friends. Until the social life of the nursing staff is relieved of some of the ignominious features which have characterized it in the past we shall never have enough nurses in this country.

Out-patients' departments are a comparatively recent introduction in municipal hospitals. In the future routine treatment will be given in the local clinic, and only those requiring some special treatment will be referred to the hospital. The effect of this will be to reduce the amount of space generally given over to waiting which amounts to something like two-thirds of the whole. The importance of this unit, however, is bound to decline and no one who has seen the queues of people apathetically waiting their turn can regret this feature. A local clinic is illustrated in Plate 58.

SECTION 4: TWO EXAMPLES

(a) *Clinic*.—The Bilston Health Clinic by Messrs, Lyons, Israel & Elson which is illustrated in Plate 57, may be taken as a good example of the smaller type of clinic. It is on a triangular site and has three entrances. The main one which opens into the waiting hall has the administrative section in close connection. One of the others is in connection with the maternity clinic and has a covered pram shelter connected to it. The Clinic is in three sections. One side is concerned entirely with maternity and child welfare, the other with dental surgery and orthopædic treatment. These sections open out of the main hall. The site is well placed in relation to traffic and access to it is easy from all parts of the area it serves. There is insufficient accommodation for consultation, and for the population it has to serve, the building should have been larger.

(b) *Hospital*.—Variations in hospital planning are due to differences in size rather than any other feature; a cramped site will naturally affect the plan and layout in contrast to one on an open site. It is impossible to illustrate the variations that may occur in practice and so the plan shown in Plate 55 has been selected to show a plan of a typical hospital built in the inter-war period. It is for one hundred and forty beds and can be doubled in size by planned extensions. It is situated in an open site and although in certain respects—in the number of beds in the wards, it falls short of the standards suggested—in its general arrangement it is typical of the position which had been reached.

Although the building is in one piece so to speak, the spread is considerable. The nurses' home is an entirely separate block. The site rises a little towards the west and the ward blocks have a north to south orientation so that they are raked by the morning and afternoon sun and protected on the north by the main block of the building. This block includes the administrative centre on the ground floor with staff and special treatment rooms over. On the west side is the out-patients' department which is virtually a self-contained unit, and can be cut off from the main hospital. The kitchen and laundry unit is on the east and forms another complete unit.

The running of the hospital may be hampered as the distance of the kitchen unit from the ward blocks is considerable. Perhaps because this is a voluntary hospital the board room is at the focus of the plan and on the face of it, the whole of this main section might perhaps have been made the service block, with the administrative section placed elsewhere since communication with this section is not so important as with the kitchen. All the staff dining rooms are situated in the hospital and not in the home.

SECTION 5: SERVICES AND CONSTRUCTION

A hospital is the most expensive type of building undertaken by the local authority. Just as the cost of the service when related to the patient is high, so is the cost of the building in relation to the number of beds. There are two factors which account for this; first of all, the medical and sanitary appliances, and the installation for their supply, numerous, specialized and expensive; secondly, because the ancillaries to hospital treatment are each expensive features in themselves. While in a school building practically nothing is required that is not used directly by the children themselves, in a hospital the only thing that the average patient can be said to make personal use of is his bed. Owing to these factors, hospitals are never built as temporary structures—except in an emergency. It is impossible to instal the services—electric, gas, steam and drainage except at high cost. The community must be prepared for a high cost in hospital building. The remedy for this expense does not lie in reducing their standards of equipment but in making more efficient and effective the measures for the establishment of health.

Since the building is costly the initial programme must be of a generous nature and allow for effective standard of finishes and equipment. It is false economy to cut down the initial cost; the architect should be instructed to make the fullest provision for the proper installations of present and future services and to plan them in such a way that they can be modified as fresh conditions arise. In practice this will mean that all the electric

wiring, drainage, hot water, wireless, bells, telephone will be run in special ducts accessible at any point. Furthermore, the wear and tear on a hospital is heavy, particularly on the interior surfaces. These must therefore be selected to reduce maintenance costs and to avoid replacements. A brief consideration of these services as they affect the patient in the ward will indicate their complexity. Each bed must have a wireless outlet, a plug-point for electrical and other treatment, as well as a light fitting controlled from the bed. In every ward furthermore, as well as general lighting and heating, a telephone, a bell installation and vacuum cleaner points must be installed. A microphone and loudspeaker for house calls would be a useful addition. Then in the ward kitchen, there will be both gas and electric fittings as well as a refrigerator and cooker. In the sluice rooms, bed pan washers, w.c.s and urinals, baths, sinks and basins. And so on through every ancillary room in the ward. The number of such services is increasing and the standard of installation in a modern hospital is far higher than it was even twenty years ago. It is evident, therefore, that thorough but flexible arrangements must be made for housing all these services.

For this reason the hospital structure becomes necessarily expensive. Windows and doors, floor and wall finishes should all be the best of their respective kinds—not only in convenience and efficiency, but in upkeep and maintenance. There are no materials other than the best for their respective purpose and to build a hospital on any other principle is fatuous. Floors are washed daily and the walls are also thoroughly cleaned. The floor finish must be non-slip, must be warm, not noisy, and as impervious as possible. The report of the Departmental Committee on Acute General Hospitals 1937, gives a table of finishes. The war has done little to modify this list and although some of the recommendations made in the report err too strongly towards the false economy just condemned, the list is practical in some respects. The possibility of finding materials, permanently self-coloured, with a variety of textures, impervious to water and which can be fixed directly to the structural wall is coming much closer and in the next few years we may have some new materials which will provide an answer to many of our technical problems.

Another feature of modern hospital designs, which the preceding paragraph serves to emphasize, is in the use of colour. The maintenance of hospitals, as of schools, has hitherto been confused with drab and muddy colours and led to the dried blood type of dado which is so familiar in our institutions. The recognition of the physical and psychological effects of colour is too recent to have had much effect on practice but it is likely to give our hospitals a new appearance. Colour schemes will no longer be dependent upon an uneasy balance between the personal predilections of

the architect and the idiosyncrasies of official economy on the part of the treasurer. All the wards will be painted according to their use and function. The children's ward will differ from the adults, and in all, the colour will be considered in relation to the well-being of the patient. Colour can be used to stimulate or to tranquillize, and with the extension of the practice of breaking down the large ward into smaller units, the colour scheme can be varied among them.

Bibliography.—Apart from special articles in the technical papers there is no general book on hospital design.

CHAPTER SIX

Recreation and Open Spaces

Section 1: People and space

- (a) The present position
- (b) Space and density

Section 2: Types of open space

- (a) Housing
- (b) Games and physical exercise
- (c) Parks
- (d) Relation to region

AN open space, it may be argued, is the opposite of a building, and therefore can have no place in a book of this sort. The Victorians put this idea into practice; an open space in a town was almost improper—it was good land wasted—so they covered it productively with buildings. They built up the centres of our towns till they were solid, and developed an unsurpassed skill in filling every inch. But open spaces have a very definite and important relation to buildings. The housing scheme which is built without them will become a slum—as the Victorians indeed found. Open spaces and recreational facilities, so far as they are under the control of the local authority, are so closely linked to the health and well-being of the community that they must be considered at the same time, and in the same way, as the buildings. Like them, open spaces can be wrongly placed or wrongly planned, they can be too small, and too large, useless and ugly; a badly sited park is better than no park—but not much better.

We are beginning to realize the importance of open spaces but we are still a long way from knowing how and where to site them. We suffer at the moment from divided responsibilities, from an *ad hoc* conception of the problem. We shall not improve the situation until we tackle it coherently with each separate need of the community—for playing fields and play spaces, for parks and gardens—recognized and integrated into the development of the whole area. Open spaces for the community begin at the front door and end in the country. This chapter is mainly concerned with those at the front door but even these cannot be considered apart from general recreational facilities. Swimming baths are as necessary to the pattern as football fields and flower beds. The holiday at home movement has even brought the old bandstand into action again and, along with a lot of other wartime innovations, we must not allow it to revert to its pre-war function of litter bin.

SECTION I: PEOPLE AND SPACE

(a) *The Present Position.*—Most people seem to think that open spaces are a beneficial product of legislation in the last few decades, and that it is our developing sense of social responsibility which has brought them into existence. This is only partly true. The greater part of Manchester and Leeds were built in the nineteenth century, and built largely without parks. These have come later, first of all as the result of the generosity of individuals, and later through the action of the municipalities. In older towns, however, this is not the case and often the open space per head of the population in the central areas was far greater in the past than it is today. Of the mediæval town, Lewis Mumford says in *The Culture of Cities*—“. . . as far as usable open spaces go, the mediæval city had at its foundation and through most of its existence a far higher standard for the mass of the population than any later form of town. . . .”

This open space was there for the good of the community. Inside the walls of a town there was space reserved for essential purposes: for athletic and military training, for growing crops. The town was virtually self-sufficient and outside the walls was a countryside where men could walk and ride. With the increasing population that accompanied the industrial revolution, the town not only commenced to grow, thus pushing the real open space—the agricultural and forest land—further away from its centre, but also to build upon the open spaces which were contained inside it. Gradually buildings crept over the whole until open spaces and gardens were blotted out. Like Vesuvius in eruption, the lava of industry rolled over the town leaving an indescribable and unhealthy confusion of house and factory. Plate 59 shows how space was filled in the industrial town of the last century.

About 1820 the jerry builder and the speculator came into their own and started out on their task of providing accommodation for the factory hands. We have seen in Chapter III the sort of houses and flats they produced and Plate 60 shows how these were arranged.

The State was eventually forced to introduce some positive measures to control this development and to lower the rate of death and disease to which it gave rise. The Public Health Act of 1876 sought to overcome some of the evils by laying down minimum road widths and house spacings. In doing so, the backyard and the uniform street width so wasteful of land and so dreary in appearance, were created.

Amongst the various Acts passed in connection with health and housing was one which gave local authorities permissive powers to create public parks. It has not been very successful in operation. For one thing no standards of open space in relation to the population were laid down, and secondly, the use to which such land should be put was not specified.

The industrial town has consequently far less open space per head of the population than a middle-class residential town, and Birmingham and Bournemouth may be compared in this respect.

It is on this foundation that such parks as we have today have been provided. No central direction and encouragement was given to the local authorities; no standard by which their area might be related to the size of the surrounding population; no indication as to the sort of resources that were necessary for parks in different types of town. Parks have been left very largely to the initiative and sense of responsibility of the local authority. Some have shown energy and enthusiasm in developing their resources and making the most of the space available. All have been crippled by the high cost of land in the central and most densely populated areas where they are most needed. The provision of parks in areas like these must be a national responsibility.

The new Education Act asks for playing fields in both secondary and junior schools, and most urban authorities will find it very difficult to provide the standards of space which have been laid down. School playing fields have been slow in coming and very few authorities have made arrangements for fields for the children alone. In most cases they use the public parks and both they and the public at large are at a disadvantage on public holidays and week-ends. The needs of the children should be paramount, and it is a disgraceful reflection upon this country that there should still be hundreds of thousands of children too far from an open space for them to get adequate physical exercise. In the big towns this difficulty will remain and the authorities will continue to transport children to games fields outside the town. But this expedient still leaves them to play in the streets in the holidays and at week-ends.

Legislation in the past has failed to provide sufficient open space for all purposes in our cities. To give a reasonable measure of open space within a town it has been estimated that at least seven acres are required to every thousand of the population. In London the maximum to be hoped for (L.C.C. Plan) is four acres, and in some districts London is already well supplied with large parks. But even four acres is roughly four times as much as the present space available in many areas, and these figures do not include the space required by schools.

(b) *Space and Density*.—Density of population determines the area of open space. The figures just quoted represent the net area required for open spaces over and above those related to housing. There will be a tendency to include the space necessary for housing requirements with the communal open space and this, unless it is recognized, will result in overcrowding. For instance, in an area zoned at twelve houses to the acre, it

will be possible (Diagram 3) to arrange the houses so that only a half of each acre, inclusive of private gardens, is actually occupied. The remaining half must not be classed as open space as otherwise, over a large area, the net result would be a higher density than that laid down, or less open space in relation to the population.

In the case of urban areas where flats are to be built, this tendency is likely to be accentuated. The high cost of land makes it necessary to push the population up to the limit. Moreover, by building higher—and the L.C.C. plan proposes blocks of eight and ten storeys in height—a larger area of open space is released and within certain limits, this increases with the height of the blocks. The land so gained represents the gardens of the flats so to speak, and is related to them in exactly the same way as a house to a garden. This land therefore must not be included as public open space even though in a big scheme of flats it will be both extensive and useful.

The pattern of development in the past was chaotic, and future needs must be precisely defined. At the present time recreational open space for children and adults is considered more important than other uses, and the areas which have been suggested for this purpose are probably too high in relation to other types of space. Planning should distinguish between different social demands and the character of the neighbourhood and the type of development must be defined. The use of land in dense, built-up areas has to be carefully assigned. In the centres of large cities, for instance, the population is largely a daytime one, and it is unnecessary as it is impossible, to allow for playing fields or the larger type of park. Gardens with shrubs and flower-beds, or tennis courts and bowling greens are all that is possible. This sort of development may be seen in the gardens along the Thames Embankment or the Inns of Court. The war has presented us with an opportunity of developing small gardens and open spaces in the middle of the most crowded cities. It has opened the London squares to the children from the basements round them, and the squares have suffered; the turf is bare, and the trees and shrubs are often mutilated. This simply emphasizes the shortage of local open space. We must keep and extend these possibilities.

In a suburban area, however, the park should be extensive. Playing fields, tennis courts, open-air baths, and running tracks can be incorporated, and vistas, rides, and screens of trees developed. In these areas, while individual gardens may be large, the requirements of a residential neighbourhood with its schools and varied age groups must be taken into account. Old people, for instance, must be catered for, and shady and sheltered walks provided as well as those prairies over which the youth of the nation canters after its ball. Whether these differences which are so distinct, can

be accommodated in the same area, must depend upon local conditions. Rural areas, on the other hand, present an entirely different problem. Parks, or general recreation spaces are not essential. A playground for the very small children, properly equipped, is necessary, as well as a field for the older children. But public gardens or large open spaces are obviously redundant.

Local habits and occupations must also have an effect upon the development of open spaces. Sports which are traditional to an area are an important factor. The differences in requirements between an industrial town where a high proportion of the population are active and able-bodied, and a residential district containing a high proportion of retired people will also lead to differences in the layout and spacing of parks. In the first, it is necessary to make extensive provision for games and swimming while in the second, bowls will probably represent the most active pursuit.

The choice and selection of land for public parks and playing fields is governed largely by necessities of spacing and area. It is unnecessary to use good agricultural land which must not normally be developed for housing or industry. We lost 60,000 acres of such land per year owing to the spread of housing before the war. At the same time every effort should be made to avoid monotony in the parks and different configurations of land, of vegetation and surroundings should be allowed to determine their character. The flat, treeless expanse is entirely unsuitable except for games. Parks can be arranged to preserve local features and to emphasize boundaries, and to preserve and create local identity and character. A coppice, a belt of trees, or a small stream is an opportunity to develop a park with its own sudden individuality arising from the natural conditions.

SECTION 2: TYPES OF OPEN SPACE

It has been said that the development of open space must proceed from the particular to the general; from the plot in front of the house to the National Park. Such a method enables the planning authority to deal with those spaces coming within its own area and related to the needs of each locality and then, either jointly with other authorities or regionally, to co-relate the larger open spaces immediately accessible. It was on these lines that London obtained its green belt although the local requirements, particularly in certain areas, are very much below the minimum standard. Foresight in the development of an area can save the community large sums; if London's green belt had been acquired twenty-five years ago, it would have been several miles nearer to the centre and considerably cheaper.

The first necessity is for open space close to the home. This space is

required for two reasons—as a space for the smaller children where they can play close to their homes, and to give a sense of space to the houses themselves. It is obvious that such space is more urgently required for flats than for houses. It is far better that it should be of frequent occurrence or even in continuous strips than in large and infrequently spaced areas. Illustrations of both types are shown in Plates 12 and 16. Neither example, it should be noted, has a separately enclosed front garden. It is too much to hope that the Englishman will surrender this space even though it has been gained at the cost of the community.

(a) *Housing*.—In the chapter on housing some indication was given of the way in which houses may be grouped to make the most of the land available. It was pointed out that the continuous, serpentine road of uniform width is wasteful of services and dreary in appearance. It was suggested that roads in housing estates should be narrow and that their use by through traffic and indeed for any other purpose except in connection with the housing, should be discouraged. Such a system will release land for play spaces. The possibilities inherent in the development of even small spaces are seldom appreciated. They can be continuous, follow the line of a stream or a belt of trees or in the form of squares or *culs-de-sac*. The illustration on Plate 16 shows what can be achieved. Professor Sir Charles Reilly has put forward the idea of siting houses around a series of small greens. These greens will provide an open space for the young child and break the monotony of the continuous road development. If it proves possible to develop this idea it should provide the first and smallest unit of open space just where it is needed.

With flats such sylvan touches are impossible. The great thing to avoid is the courtyard which, as the L.C.C. have conclusively demonstrated, must be finally abandoned. The enclosed court acts as a giant megaphone, exaggerating quarrels and social maladjustments. The space it provides in the centre becomes part of the general circulation and unless enclosed in railings—which the L.C.C. has been forced to do, soon loses its verdure for ever. The parallel block system is a far better development.

The space between such blocks need not be elaborately laid out. Flower beds are not essential so long as there is grass and flowering shrubs and trees. It is not intended as a children's playground and need not be equipped as such. It should be thought of rather as an extension of the individual garden and the less elaborate its treatment the better it is likely to be.

(b) *Games and Physical Exercise*.—It is essential for the health of the nation that everyone from the child to the adult should have properly-planned and equipped playing fields conveniently placed. As a nation we

have disgracefully neglected this problem. There are few elementary schools which have playing fields even within reach. For the majority of our population an occasional game in an overcrowded park on a Saturday afternoon is all that is possible. Yet there are those who complain in letters to *The Times* that we are becoming a nation of spectators.

The sight—as pathetic as it is common in every city, of children playing cricket against the lamp-post and the factory apprentices playing football in the loading bays, is an insult to our responsibility as citizens. The example does, however, serve to illustrate the problem. Every school must have a playing field attached to it or as close as it is reasonably possible, and these playing fields should be distributed according to the population. Every neighbourhood must have its playing field. They need not be large; but there must be definite space allotted to the children, to the adolescents, and to the adults. It is better that the children should be separated and their playing fields kept for them alone.

There must be facilities for all ages—from 6 to 60, from basket ball to bowls. They must be accessible at all times. They must be drained. Changing rooms and showers must be provided, or part of the value of the playing field will be lost. Moreover, they should not be considered or treated as part of the park system. Planting should be confined to trees and windbreaks and the number of paths reduced to a minimum. Although absolutely flat sites are not essential a steeply contoured field is seldom successful. Open-air swimming baths should also be incorporated in the scheme. Such baths are relatively inexpensive to instal and can be managed from the secondary school or social clubs with which it may connect. These baths ought not to be regarded as profit-making ventures, as local lidos, but as a social necessity—like a drainage system.

(c) *Parks*.—The value of the great London parks has never been told—but there is scarcely a Londoner ignorant of them. A brief examination of the use they are put to will serve to illustrate the main types of public park in any big city. The Green Park, for instance, is crowded at lunch-time with office workers taking their lunch and enjoying the flowers and the trees. So are the parks along the Embankment and St. Paul's Churchyard. These serve the office worker. Parliament Hill Fields and Battersea Park are the recreational centres for residential areas and thronged with footballers. Kenwood and Hampstead Heath and Richmond are the picnic spots—at once local and regional and their great diversity in contour help to make them exciting. These are differentiations which arise in use but each of them, central, suburban and outer ring indicate to some extent the pattern which should be developed for use in any city.

Size, in itself, is not everything. A very small site, cunningly diversified in layout and planting and with sheltered walks and seats is appreciated by the aged. Conversely, big open spaces—the fringe area of playing fields, can be arranged for walks and exercise. The park should retain the features of the site—a ravine, a small open wood or a stream—rather than the enclosure of a large space dominated by the municipal band-stand.

(d) *Relation to Region.*—From the standpoint of the local authority, the regional park is a distant shadowy feature. Yet the relation of the town to the country or to some large park on its boundaries has a definite effect upon the parks within its area. If there are ample facilities within easy reach of a town centre, the pattern of the local parks is not so important. They can be small and intricate, leaving to the large-scale park the function of a lung. There are few towns which do not possess on their fringe some large estate which cannot be used in this way. The relation of National Parks and other features have the same effect, and some of the towns in the North where the slopes of the Pennines reach down to their outskirts, or seaside towns where the beach is the natural playground, are examples. The fact that such spaces are there waiting, so to speak, for the week-end crowds, enables such towns to concentrate on the immediate and local necessities.

List of Books

The County of London Plan, 1943. 10s. 6d. A tremendous piece of work, interesting to the layman and the expert. Explains the L.C.C. proposals for parks, neighbourhood units and community centres in particular and gives hope for London in general.

Britain Must Rebuild. Frank Pick. (Kegan Paul, 1941.) 1s. Puts forward a policy for regional planning. As terse as it is valuable.

CHAPTER SEVEN

The Neighbourhood and its Centre

Section 1: A pattern for living

- (a) Development of a Community
- (b) The size of the community

Section 2: The Social Club or Community Centre

- (a) Previous experience
- (b) The siting of the centre
- (c) Accommodation and planning

MANY of the housing estates and townships which were built in the last thirty years failed to establish themselves as communities. The pride of place, that consciousness of local identity, which characterizes our older towns and villages was lacking, and these new settlements were regarded as accidental; chance and the builder had brought them into existence. No tradition of living together in towns and villages was inherited and often none was created. This failure was sometimes due to the fact that these estates grew from small beginnings and developed without any coherent plan in the provision of such facilities as education and transport, and were without definite form or identity. This is a characteristic not only of those schemes built by the local authorities but also of those put up by private enterprise for the middle classes. Generally, they are dormitory estates with the wage-earner working some distance away, and remote from the established town centre. The symptoms of this breakdown manifest themselves in various ways; in badly kept gardens and houses, in apathy to local affairs, in household and family self-sufficiency, and a general indifference to those qualities which make for good citizenship.

To overcome this apathy it is essential for the citizen to realize both his powers and his duties in the social sphere. To accept responsibility and not to delegate it, and assist himself and others to a wider interpretation of life and a fuller and more vigorous enjoyment of it. This consciousness of identity, of belonging, is difficult to define and even more difficult to create. The older communities are long established, often depending upon local industries or ways of life and have built up around themselves a fine and impalpable atmosphere which the new community cannot match. This atmosphere spread itself out and out through the town and often welded each area into the common whole and into complementary parts. This unity has been gradually disrupted in our larger towns, and frequently the suburbs which have attached themselves to the original

town have not been absorbed into its life. We must find a way of creating this community life and local consciousness. Some believe it can best be created by forming "neighbourhood units" with accompanying community centres. The neighbourhood unit is a combination of services into an economic unit capable of control by its members and having preferably a recognizable geographical and political entity, while the Community Centre or Social Club is put forward as a means of expressing and enlarging the potentialities of its members.

SECTION I: A PATTERN FOR LIVING

In previous chapters—particularly in those on housing and education, reference has been made to a frame within which the social, educational, and health services should be organized if they are to become fully effective. This is due to the recognition that the mere provision of houses and schools was only a part, and an incomplete part, of the problem. As has been said, individual families were dumped on the outskirts of large towns and left to their own devices and the only solicitude displayed in their welfare was the visit of the rent collector. Often speculative builders built and sold their houses and the purchasers were left high but seldom dry, remote from schools, buses, and shops, in groups too small to make the supply of these services economic or too large to give the area a positive identity. The same thing occurred, but on different lines, in the large towns, where new roads and transport routes broke through the existing, and largely traditional, pattern, and tore its unity apart.

To give a definite example of this, some of the short-comings and failures associated with inter-war housing estates may be mentioned. In the first place, land was usually built over not because it was suitable but because it was cheap or available. Little control was possible over the development so long as it did not infringe the various acts. In any case since the land was costly, the whole, or as much of the whole as was permitted or profitable, was developed for housing. Coppices, beautifully timbered estates, and pleasant local features were rubbed out to give the uniformity and monotony characteristic of the housing of this period. Such estates had no form, no end and no beginning. They were just a sprawl, and the inhabitants, neglected by the parent community and remote from the features which gave it an individuality, churches, markets, shopping centres, and so on, ceased to assert their own relation to it. Moreover, these estates were usually laid out regardless of the ancillary services. Schools, libraries and open spaces were not placed where they would be most convenient, and had to be added later. Often the children, the housewife, and the husband had to go outside

the neighbourhood for every need from education to shopping. If shopping facilities did exist, they were often badly placed, and there was no regulation of the number of different types of shop, such as occurred at Wythenshawe and Welwyn.

(a) *Development of a Community.*—In part this development must be attributed to the tremendous expansion in housing which took place and which ignored the amenities that tradition had built up in older communities. Certainly most of our smaller country towns with populations of 6,000 to 15,000 exhibit some of the characteristics of unity and compactness which are wanting today. Such towns with their local markets, civic and business centres, and with established local boundaries are definite and individual entities. The same is true of many villages where the church and village hall, the vicarage, the manor and the doctor's house, the local shop and the pub form a kind of social nucleus to village life. Even these simple expressions were absent from many of our suburbs. In the larger towns, the local government ward ignored physical differences of land and use and prevented the growth of any real identity. This can be altered if upper and lower limits are set to the size of the wards and if they are integrated with the geographical unit. The electors in a ward are thus made directly conscious of their responsibilities in regard to the services inside it. For education it is also necessary to find a definite unit of population so that schools can be economically provided. As we have seen, the distribution of the schools should depend primarily upon the age of the child, and the unit of population can be determined in relation to the economical size of the school. This is also true of other services, such as the health centre and the clinic, which must be close to the houses, which in their turn must be sufficiently numerous to support them. All the facilities which an authority is called upon to provide today, the parks and playing fields, libraries, baths, police and A.R.P. services and shops can and should be related, in the sense that they require definite local centres to this individual ward or suburb. Its size must naturally vary according to local conditions. The term "neighbourhood unit" has also been applied to this unit.

(b) *The Size of the Community.*—It has been suggested that the desirable size of the neighbourhood unit should not be more than 10,000 nor less than 6,000 people. Such a unit would be economic for the purposes just suggested, and at the upper limit there would be two infant and two junior schools and one of the new secondary schools. The latter if it were sited on the fringe of the unit could combine with an adjoining one. The unit would be sufficiently large to form a good cross-section of the population and would include the normal range of income levels, and

age groups. Within these limits all could be catered for. As well as the services provided by the authority and centralized within it, it would also contain its own shopping centre, and transport services. Furthermore, a population of this size would make a properly balanced community. In the County of London Plan, 1943, the following passage occurs:—

“The Plan we submit contemplates the conservation or creation of communities which would be divided into smaller neighbourhood units between 6,000 and 10,000 persons related to the elementary school area it serves. It is the intention of our proposals that children living in these units should not have to cross a main road from home to school. Each unit would need a neighbourhood centre, perhaps focussed around the school. The open spaces, apart from the regularly distributed playgrounds, are designed as far as is possible to surround the whole community, forming a natural cut-off between it and its neighbours. New opportunities are now presented for the development or provision of groups of public and other buildings to form nodal points around which the general interest and life of the communities would centre.”

When it is remembered that over 50 per cent of Britain's population live in towns of over 50,000 inhabitants the importance of this local unit can be estimated. In their plan for London the L.C.C. have proposed to adopt this principle and to redevelop on the neighbourhood system. The unit is well suited to the organization of built up areas and ceases to have the same relevance in small and scattered rural communities.

If the unit is to be successful it must be complete in itself. Higher education, hospitals and so on will necessarily be outside and it will be related to them through the central area of the town. The unit must have its own identity and we have already seen how that can be assisted by schools and parks. But this is not enough. We must positively reverse the policy of treating all natural features as obstacles to continuous development. We must use them to create a boundary, to effect a division between one unit and another. For preference this division should be effected by means of parks—particularly the relatively narrow belt type. More commonly, however, the units, particularly where they are part of existing towns, will have as their boundary a radial road or a railway embankment, which, the planners propose, are to be planted and arranged to make them pleasant things.

SECTION 2: THE SOCIAL CLUB OR COMMUNITY CENTRE

The various local organizations such as clubs, settlements, juvenile associations and so forth that have been started in the last decades, both in town and country indicate that there is a hiatus in our society. They also suggest a means of filling it. These organizations are political, social,

educational, or they may be concerned with social security and service, with health, or with culture. Some of them may be vocational, others purely recreational. They are innumerable and they are largely unco-ordinated. They represent a force for the productive use of leisure, for education and help, and all of them are rendered less effective by lack of funds and suitable premises. Throughout this book, it has been repeatedly emphasized that houses by themselves are incomplete. Houses alone do not solve the housing problem. They must be related to the larger entity of the social unit. The same applies to the services provided by the authority. Without local co-ordination and the possibility of variation to meet local conditions, they are rendered less effective.

These two conditions suggest the function of the community centre; it can offer accommodation and focus the divergent interests of the various organizations, as well as bringing cultural and educational services into a definite pattern of development. In providing premises for the activities we have mentioned, the centre can provide efficient equipment as well. Through the director, the service of these organizations can be co-ordinated and extended.

This may be described as the negative side of the picture—the unification of existing facilities. On the positive side, the limit of the community centre depends upon the pattern of the social services provided by the authority and the extent to which the centre operates with them.

(a) *Previous Experience.*—The community centre is a very recent development and we still lack wide experience in its functions. As recently as 1921 Local Education Authorities were offered a subsidy of 50 per cent of the cost of providing youth centres. This, of course, confined the activity of the centre and was not widely adopted. The 1925 Housing Act offered grants in connection with them, widening the range to include adults but limiting their establishment to new estates only. This was subsequently extended by a grant under the Physical Training and Recreation Act of 1937 which encouraged all authorities, in any area, to set up centres. In all these Acts the grant is partial in the sense that the activities of the centre are directed along one particular avenue. Under each of them, however, the bolder authorities ventured to build a centre. Unfortunately, the conditions of subsidy, and the experimental nature of the earlier centres do not make any broad comparisons possible. Some have been provided in connection with housing estates, some with schools and village colleges, while others are linked to factory estates—as at Slough or those erected by the Miners' Welfare. No general pattern of development has occurred and it would seem wise in the future to allow the widest latitude for local conditions and experience.

It is extremely difficult to forecast in what form the centre will emerge from our present difficulties. The war proved their social utility although often along different lines and for different purposes than those that obtained in peace. During the war community centres were successfully used as communal restaurants, soldiers' clubs, rest centres, and so on. Indeed, the war demonstrated the need for social clubs of this sort and they were used by everyone in the community. A successful club demands an identity of interest, some compelling function, and total war brought about conditions in which a reliance and dependence upon neighbours was often necessary for survival. The uses to which the centre may be used vary so much that their purpose can only be stated in general terms. It depends, for instance, upon the sphere allotted to the health centre and the Young Peoples' College. There is a strong body of opinion which would like to see the functions of these co-related and broadened through the centre. On the other hand, since it is felt that the presence of the young people might discourage the adults, complete separation is also favoured. Much must depend on local tradition. On the whole, since the functions of the college are closely related to the objects of the centre, and since it is obviously desirable to extend educational processes throughout adult life and to create an attitude of mind which responds to these aims, a close identification with educational services is essential.

From the foregoing it is clear that the subsidy given to the centre will have to be reviewed to meet the changed conditions created not only by the volume of housing which will have to be carried out, but also by the new acts covering Education and Health. Overlapping of services and of buildings and equipment is to be avoided and the centre should include all those elements which make for a healthy and vigorous social life.

(b) *The Siting of the Centre.*—The centre should be placed at the natural focus of the neighbourhood unit. This is a way of saying that while its position must be central, there must also be some broader features which suggest its location. For instance, in certain areas there may well be an old garden, part of an estate, or a grove of trees as at Impington (Plate 71) which would form this natural focus. The centre must not be planned to dominate the neighbourhood, nor must its layout be developed in such a way as to formalize the approach. Its position should be chosen according to its convenience and to the existing services which it will co-relate. It should appear as an organic part of the unit in much the same way as the village church. Its site should be as far as possible the result of natural circumstances.

There should be an adequate road approach. At Impington the rural community is brought to the centre by 'buses and although this will not be necessary in an urban community, allowance must be made for cars, and bicycles. Then, of course, the site must be large. If it adjoins or can be built in one of the parks or gardens it is a great advantage, as it can be used in conjunction with sports facilities. Consider some of the other features that will be located in or connected with the centre—an open air swimming bath, a communal laundry, a day nursery, so that children are cared for while their parents use the centre, the restaurant, the welfare clinic. All of these can benefit by the gardens that should surround the centre. Even though the building is small at first and temporary in construction, opportunity for expansion must exist or the centre will be muscle-bound before it starts. It will probably assist the public to realize the advantages of a centre if there is a definite membership fee. It gives a sense of ownership and an added interest in control.

(c) *Accommodation and Planning.*—We have said that the plan must be experimental. No one can yet see the final form of the centre nor forecast the changes which are likely to occur in its organization. Local needs, changing social conditions and services, will be reflected in the arrangement. Before the planning of any centre is commenced a survey must be made of the uses to which it will be put by the community, and even then the plan, as in the case of schools, must be sufficiently flexible to allow for subsequent changes. It is an advantage if the construction makes it possible to alter the arrangement of rooms, to throw two or more into one, or to throw out a wing as may be required. A centre may, in fact, be regarded as an organism which adapts itself to its environment. A good plan is an organic plan.

The centre must above all avoid an institutional character. It must avoid that distressing disease "municipalitis" where the building is of a severe and formal plan, pretentious and imposing. On the other hand, it must not have the meretricious modernism we associate with the cinema. It must appear cheerful and intimate and in the use of colours for wall surfaces, the selection of furniture, fabrics and pictures, depressing stolidity can be avoided.

The physical requirements of the building must conform to the standards laid down for buildings of similar type, such as schools. The centre has educational, health, and recreational functions and these must be considered. An open plan of the sort illustrated in Plate 70 is far better than a closed courtyard, for the first allows the building to expand and grow as well, whereas the latter rigidly confines the building to the spaces and arrangements originally built. A plan of this sort cannot be extended.

It is impossible to generalize about the accommodation but certain functions must be provided for. Since the centre must, if it is to be run democratically, manage its own internal affairs, space must be provided for the administration. There will be a warden as well as the various committees and various smaller rooms must be set apart for local activities and club meetings. Social activities organized by the centre will provide one of its key attractions and the assembly hall will form the biggest feature in the plan, not only in size, but also in importance. It must have a well-equipped stage, projection room, and all that goes with it, and the design must be planned to cover a wide range of additional uses, from brains trusts to concerts (Plate 46).

In addition to this there must be a series of rooms for games. Here again local habits—a preference for darts or billiards—will determine their form. Libraries, class, and craftrooms will also be required. A gymnasium with adequate changing rooms is essential, and if a swimming bath is provided these may be shared with it.

This brief description ignores altogether the other buildings, such as day nurseries and clinics, which are likely to be embodied in the centre. The main question is whether they should be directly connected with the centre or separated from it. Although the answer to this problem must depend very largely upon local conditions and upon the size of the neighbourhood, it will be an advantage if the centre can have some direct communication with such buildings. A covered way leading from the entrance of the centre to the clinic or health centre is the way in which this should be treated; these units must not be brought into too close a relationship with the functioning of the centre but they should be part of it.

List of Books

L.C.C. Plan, 1943. See Chapter VI.

Community Centres (F. & G. Stephenson, 1941). 3s. 6d. The only book on the subject. Clear and methodical analysis.

CHAPTER EIGHT

Building and Democracy

IF this book has been successful in presenting some of the principal types of building which are provided by public money for the welfare and housing of the community, it will also have raised the question as to how these buildings can be improved. The local authority is the most effective means we have of effecting this, as it controls, in some degree or another, a great deal of the building normally undertaken in this country besides that most crucial to the well-being of the community. Local control must be retained at all costs, because it has been found that the improvements and innovations effected by one authority can influence others, and even, as in the case of housing, improve the general standard. The authority is in a position to make its views felt very forcibly by the great departments of State. It is in close and continuous contact with the people to a far greater extent than State departments—it is in a position to know exactly what local needs exist and to represent them. It can, indeed, force the pace.

Under the stress of war we have forgotten that certain evils—overcrowding, slums and malnutrition—have existed in this country for years and have been intensified by wartime conditions. There can be no cessation of effort but an intensification of it. Our housing problem, our school problem, were present in an acute form before the war and we cannot allow ourselves to sit back and think that the years alone will bring us the buildings we need. They must be paid for in the same way that we pay for the war—with effort and foresight.

Comparisons between conditions in one country and another are always misleading and are nowhere more likely to be misinterpreted than in building. Standards of living and purchasing power, national habits and industrial traditions, all have an effect upon the finished form of a building. We have been called upon to admire, at various times, different things from different countries, flats in Vienna, pre-fabricated houses in America, and housing schemes in Sweden, and from all these is much to be learnt—and much that depends upon different, unassimilable conditions.

We have all sorts of things to learn about our buildings—and we have a good deal to teach. Many of the illustrations in this book are of foreign buildings and they have been selected because they are better examples than any we have to show in this country. Of course, they are selected examples—let no one suppose, for instance, that the general standard of State-aided housing in the United States is equal to ours. But at the same

time it is possible to make certain generalizations which indicate the aspects of building and planning in which we are deficient. In the siting and planning of our housing estates, for instance, we have much to learn from such countries as Germany, Sweden, and Holland. They have realized that these things can make a great difference to the community not only visually but practically, as in the planting of fruit trees along the edges of residential roads so widely established in Germany, or the open street frontage found in Sweden. Once we had a fine tradition for making our towns and villages practical as well as beautiful. We had a charming and diversified countryside; we have nearly spoilt it with our housing, and this is largely due to the fact that we are lazy and uncritical and have often allowed our estates to be planned and laid out by men who, while admirably qualified to construct our roads and services, were indifferent to the total result as a thing of beauty.

In equipment and the use of space inside our houses we have fallen behind. Our kitchen equipment and planning has been, in the inter-war period, neither so efficient nor so well arranged as those of certain other countries. But those times are past. The women of this country will no longer put up with merely a sink and a larder as equipment for easy and efficient home management. We are beginning to design standard fittings which are practical and convenient and there are plans for their mass production. On the other hand, the space allowed per house both in site and floor area is more generous in this country (so far as State-aided housing is concerned) than in others. Modern opinion has come to set floor space even above the provision of labour-saving equipment so far as the family unit is concerned. In school design we have much to learn from both Sweden and America where experiments appear to have received more encouragement than in this country.

Turning to the broader aspect that this question of space suggests, and considering it in the light of future developments, what may we expect? To some extent, this book is an attempt to suggest, through the various types of buildings required by a community, that a complete pattern of development must be made if it is to function satisfactorily. Broadly this means planning, and unless we do plan we shall be unsuccessful in providing a background for living. We want a national plan for the development and preservation of our resources, human and physical, and it must be based ultimately upon human needs. It must meet the individual where he lives and it must be integrated at the top into a rational policy. We must locate and build our homes and schools in such a way that they will be better homes and schools than they would be if they were just allowed to happen. In the two years that have elapsed since the end of the war we have at least obtained some of the machinery

necessary for positive planning. We have a Town Planning Act on the Statute Book which will enable all forms of development to be controlled and directed.

In the buildings themselves we may expect a much closer and more accurate approximation of means to ends than was possible or practical in the past. They will be more efficient and better considered for their purpose. Science has only recently been applied to building technique and environment problems and we may expect accurate data which will make possible better buildings. Obsolescence—to take an instance, has hitherto been only a legal phrase in its application to buildings. We know when a steamship or railway engine has outgrown its useful life. The majority of buildings are now obsolete but their users, for economic and other reasons, can do nothing about it. Indeed, so used are they to these conditions that they don't even notice them. But suppose the Underground Railway continued to design its stations in the same way as when they first started? Buildings must evolve with changing social conditions and use. We condemn sections of our population to live in obsolete buildings; we build too permanently and too solidly; if our buildings were designed to last a definite number of years and then be replaced, or built in such a manner that they could be easily altered and brought up to date, we should be in a better position. Think of the four and five storey houses still standing today, built at the beginning of the nineteenth century when drainage and water supply were not included: these amenities have subsequently been inserted but at what a cost in human effort and drudgery. Such buildings have been a compromise ever since they were built.

Standardization of the common necessities of life, clothing, and food has put a better range within the reach of all members of the population. In the years before the war it brought a car to something like 2,000,000 people in this country. None complained of that effect of standardization, and yet, for some reason, when anything like it is suggested for building, shrieks of protest are aroused. Gradually a whole range of building components will be standardized. It does not mean that their appearance will be monotonous—colour finishes, pattern and arrangement can vary within the same limits as before—as they do in bricks, which have always been a standardized building component.

Standardization is important at the present time because it is economical in materials and labour. We have to import a great many of the materials used in building construction, while orthodox methods of building are based upon plenty of unskilled labour. We cannot afford to import and we cannot afford to use labour except in the most productive ways. This state of affairs is bound to persist for a great many years, and we

may be in danger of forgetting that standardization is only a means to an end and not an end in itself. If there are immediate advantages in standardizing building as far as may be practicable, there are equal dangers in the process. It can easily produce monotony and mediocrity as an accepted concomitant of building, until at last we begin to look elsewhere than in our cities and buildings for graciousness and elegance.

We have only to look at the suburbs outside London and Birmingham, Brighton and Leeds to understand what quantitative development can mean. The houses built between the wars were largely standardized in arrangement and construction, if not in materials and components, and the majority of these suburbs are now wearisome and monotonous. The Kingston By-Pass is ubiquitous and it is generally criticised as a drab environment. But it is the planning of the By-Pass—the uncontrolled ribbon development which is really at fault—not so much the houses. Today we are putting up temporary and permanent prefabricated houses by the score and we are making the other mistakes. We may not site them on the By-Pass but we do not site them any better by stretching them closely along some concrete ribbon of residential road. In twenty years time the houses and the estates we are planting now may look far worse than the By-Pass—imagine the latter all set about with temporary prefabricated houses.

Planning is the root of our problem. All utility houses could be greatly improved by intelligent and adventurous experiments in layout and siting. But such experiments are likely to be more costly than the platitudes we have come to accept for want of anything better. We think in terms of cost and economy too rigidly and take too narrow and immediate a view. We set too high a value on today's houses and spend too little time wondering how they will appear tomorrow. Numbers, we say, are more important than quality, and though this may be true of some things, it is certainly a dubious proposition when applied to buildings. Utility and austerity are not inimical to beauty provided they are not identified with it. The eighteenth century made a graceful and eloquent relation between convenience and beauty, between standardization and individuality, but in the eighteenth century we had a population of ten million people. Our problem is to manufacture the buildings that forty million people need and to give to our towns and houses that grace and vitality which is our heritage from previous centuries. We are too ready to think only of ourselves and our immediate problems than to those of our children. Eighteenth century architecture was the product of an aristocratic age—what sort of an architecture, and countryside, will the age of democracy produce?

LIST OF PLATES

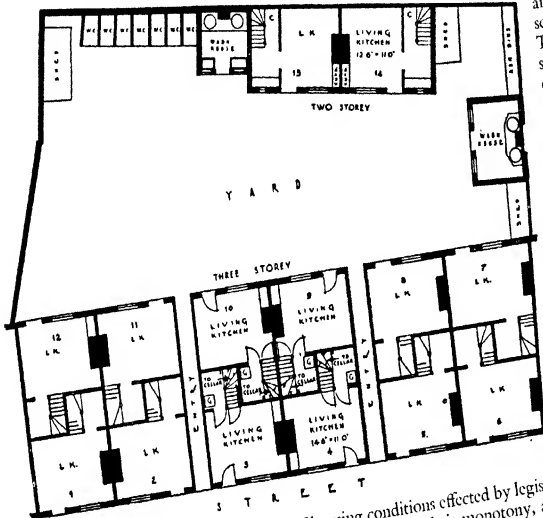
1. BACK TO BACK HOUSING ("When We Build Again," Bournville Village Trust)
2. BYE-LAW HOUSING ("When We Build Again," Bournville Village Trust)
3. TYPICAL HOUSING, 1919-1939 (H.M.S.O.)
4. NON-PARLOUR TYPE (H.M.S.O.)
5. SWEDISH FLAT (Swedish Legation)
6. KITCHEN AT KENSAL HOUSE (Maxwell Fry, F.R.I.B.A., Architect, Ascot Water Heaters)
7. FACTORY-MADE HOUSE (G. Grey Wornum with Richard Sheppard, F.R.I.B.A., Architects, Keyhouse Unibuilt)
8. HOUSING ESTATE IN SWEDEN (Swedish Legation)
9. WAR-TIME HOUSING (G. A. Jellicoe, F.R.I.B.A., Architect, Architectural Press)
10. KENSAL HOUSE (Maxwell Fry, F.R.I.B.A., Architect, Architectural Press)
11. LOUGHBOROUGH PARK (Edward Armstrong, F.R.I.B.A., Architect)
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18. LOUGHBOROUGH PARK (Edward Armstrong, F.R.I.B.A.)
19. LOUGHBOROUGH PARK (Edward Armstrong, F.R.I.B.A.)
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21. KITCHEN-BATHROOM UNIT (Arcon. Chartered Architects, Architectural Press)
22. GARCHEY SYSTEM OF REFUSE DISPOSAL (Scottish Advisory Housing Committee)
23. HOUSING AT ASHFORD (A. W. Kenyon, F.R.I.B.A., Architect, Royal Institute of British Architects)
24. HOUSING (Gerald Shenstone with Richard Sheppard, F.F.R.I.B.A., Architects)
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26. HOUSING FOR THE LOTHINGLAND RURAL DISTRICT COUNCIL, SUFFOLK (Taylor and Green, Chartered Architects, Architectural Press)
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28. PIMLICO HOUSING SCHEME—Aerial View of Model (Powel and Moya, Architects, Architectural Press)
29. A VICTORIAN SCHOOL (Architectural Association)
30. A PRE-WAR ELEMENTARY SCHOOL IN MIDDLESEX (Middlesex County Council, W. T. Curtis, F.R.I.B.A., County Architect, Architect and Building News)
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32. SCHOOL AT COPENHAGEN (Architectural Press)
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34. SCHOOL AT RUSTINGTON, SUSSEX (West Sussex County Council, C. G. Stillman, F.R.I.B.A., County Architect, Architectural Design and Construction)
35. SCHOOL AT RICHMOND, YORKS.—Plan (Denis Clarke-Hall, A.R.I.B.A., Architect, Architectural Design and Construction)

36. SCHOOL AT CROXLEY GREEN (*Hertfordshire County Architect's Department, County Architect, C. H. Aslin, F.R.I.B.A., Architectural Press*)
37. SCHOOL AT CROXLEY GREEN (*Hertfordshire County Architect's Department, County Architect, C. H. Aslin, F.R.I.B.A., Architectural Press*)
38. SCHOOL AT RICHMOND, YORKS—Site layout (*Dennis Clarke-Hall, A.R.I.B.A., Architect, Architectural Design and Construction*)
39. SCHOOL AT WOOLMER GREEN, HERTFORDSHIRE (*Richard Sheppard, F.R.I.B.A., Architect, Architect and Building News*)
40. VILLAGE COLLEGE AT IMPINGTON (*Maxwell Fry, F.R.I.B.A., and Walter Gropius, Architects, Architectural Design and Construction*)
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42. SCHOOL AT RICHMOND, YORKS.—Main Entrance (*Denis Clarke-Hall, A.R.I.B.A., Architect, Architectural Press*)
43. SCHOOL AT RICHMOND, YORKS.—Classroom windows (*Denis Clarke-Hall, A.R.I.B.A., Architect, Architectural Press*)
44. SCHOOL AT RUSTINGTON, SUSSEX—Classroom windows (*West Sussex County Council, C. G. Stillman, F.R.I.B.A., County Architect, Architectural Press*)
45. SCHOOL AT RICHMOND—The Library (*Denis Clarke-Hall, A.R.I.B.A., Architect, Architectural Press*)
46. SCHOOL AT RICHMOND, YORKS.—Assembly Hall (*Denis Clarke-Hall, A.R.I.B.A., Architect, Architectural Press*)
47. SCHOOL AT RUSTINGTON, SUSSEX—Covered Play-space (*West Sussex County Council, C. G. Stillman, F.R.I.B.A. County Architect, Architectural Press*)
48. HOSPITAL AT TURKU, FINLAND (*Architectural Design and Construction*)
49. ST. GEORGE'S HOSPITAL (*Aero Films*)
50. ROYAL HAMPSHIRE COUNTY HOSPITAL, WINCHESTER (*W. S. Sawyer, F.R.I.B.A., Architect, Messrs. Crittall*)
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54. SCARBOROUGH GENERAL HOSPITAL—Site Plan (*Wallace Marchment, Architect, Architectural Press*)
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57. HEALTH CENTRE AT BILSTON (*Messrs. Lyons and Israel, A.A.R.I.B.A. Architect, Architectural Press*)
58. FINSBURY HEALTH CENTRE—Waiting space (*Tecton—Architects, Architectural Press*)
59. LACK OF PLANNING (*Aero Films*)
60. THE STREET PATTERN (*Aero Films*)
61. INDIVIDUAL HOUSES (*Swedish Legation*)
62. A SPORTS CENTRE (*Swedish Legation*)
63. A SWIMMING CENTRE (*Swedish Legation*)
64. A PARK, LINKOPING, SWEDEN (*Swedish Legation*)
65. A PARK (*London Passenger Transport Board*)

66. CASSIOBURY PARK, WATFORD (*London Passenger Transport Board*)
67. HAMPSTEAD GARDEN SUBURB (*Aero Films*)
68. GREENBELT, MARYLAND (*British International Photographic Press Agencies*)
69. CRAIGENTINNY—LOCHEND SOCIAL CENTRE—EDINBURGH (*Leverhulme Trust*)
70. COMMUNITY CENTRE AT KELLS, CUMBERLAND (*Miners Welfare Commission, C. G. Kemp, F.R.I.B.A., Chief Architect*)
71. IMPINGTON VILLAGE COLLEGE—Adult Wing (*Maxwell Fry, F.R.I.B.A., and Walter Gropius, Architects, Architectural Press*)
72. SCHOOL AND COMMUNITY CENTRE IN WOODVILLE, CALIFORNIA (*British International Photographic Press Agencies*)
73. COMMUNITY CENTRE AT LOUGHBOROUGH PARK (*Edward Armstrong, F.R.I.B.A., Architect*)
74. COMMUNITY CENTRE AT LOUGHBOROUGH PARK—The Hall (*Edward Armstrong, F.R.I.B.A., Architect*)
75. OLD PEOPLE'S FLATS AT LOUGHBOROUGH PARK (*Edward Armstrong, F.R.I.B.A. Architect*)
76. OLD PEOPLE'S HOUSING AT MANCHESTER (*John Hughes, B.Arch., F.R.I.B.A., Director of Housing, H.M.S.O.*)
77. PECKHAM HEALTH CENTRE (*Sir Owen Williams and Partners. Engineers and Architects, Architect and Building News*)
78. TABLE SHOWING HOW THE COST OF A SMALL HOUSE IS MADE UP.

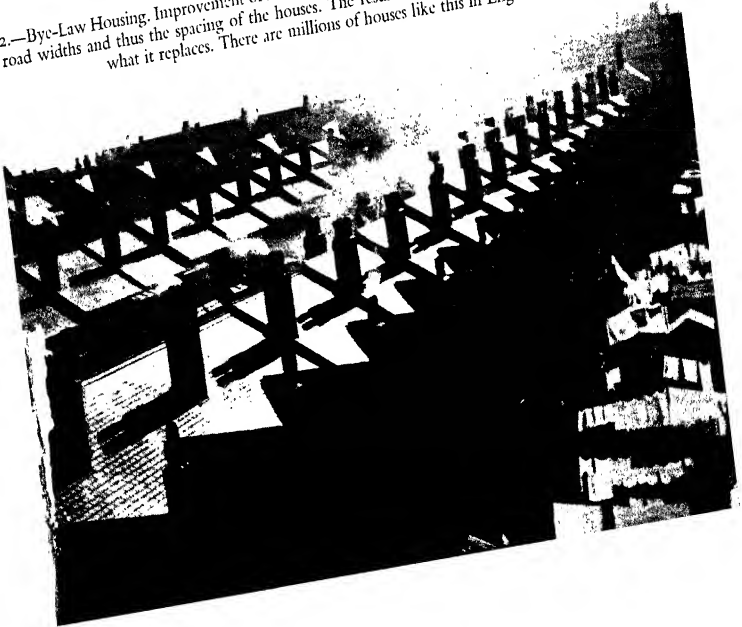
BACK-TO-BACK HOUSES

A TYPICAL COURT OF 14 BACK-TO-BACK HOUSES
 The three general plans are shown in the block adjoining the street;
 the block at the back of the court; and in the inset.



1.—Back-to-back housing. An attempt to cram as many houses into as small a space as possible, and with as few service charges. These are three-storey houses—dark, insanitary, noisy, and badly ventilated.

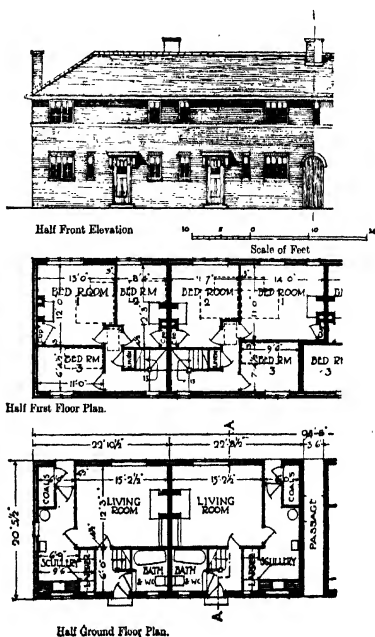
2.—Bye-Law Housing. Improvement of housing conditions effected by legislation which regulates road widths and thus the spacing of the houses. The result is monotony, almost as degrading as what it replaces. There are millions of houses like this in England.





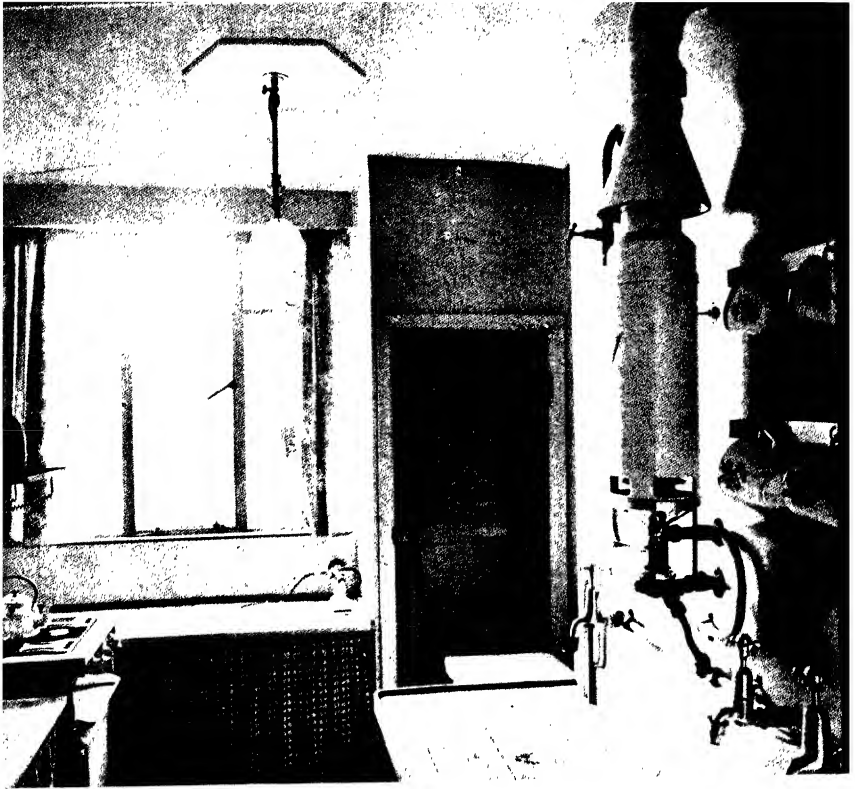
3.—Typical of the housing erected between 1919–39. The Ministry of Health were able to impose minimum standards in construction and floor area by means of the subsidy. The standard—in design, amenity, and lay-out—varied with the wealth and interest of each housing authority.

4.—Plans were generally of 2 types—parlour and non-parlour. The non-parlour type illustrated consists of a kitchen, living-room, scullery, bath-room, and three bedrooms. It should be compared with Plate 24.



5.—We have not paid sufficient attention to equipment and installations in low-cost housing. The standard of design, cupboard space, and equipment of this Swedish flat should be compared with Plate 6.





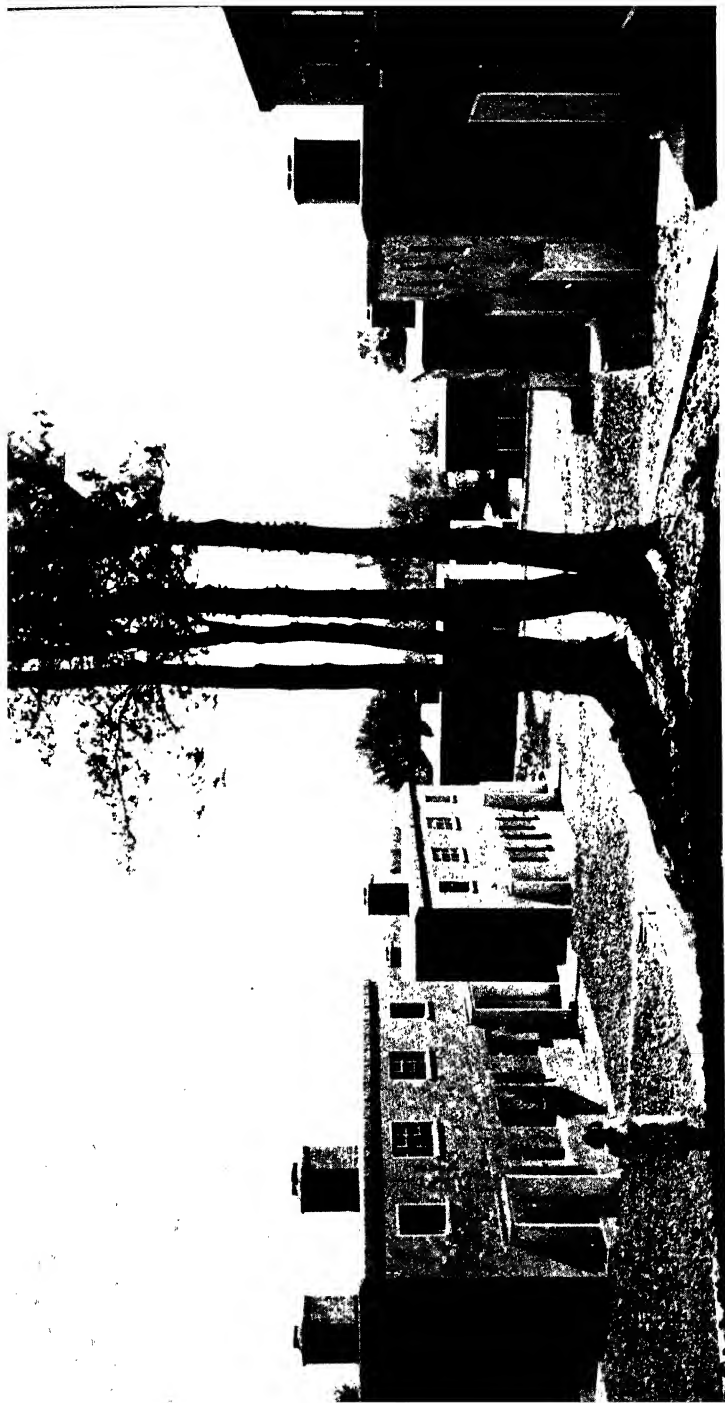
6.—A kitchen in a block of low-rental flats built by the Gas Light and Coke Company in London before the war. This kitchen is considerably better equipped than most built at this time.

7.—The factory-made house. This pair of houses erected at Edinburgh in 1945 was built from large units which were assembled on the site. Good houses can be built by prefabricated methods.





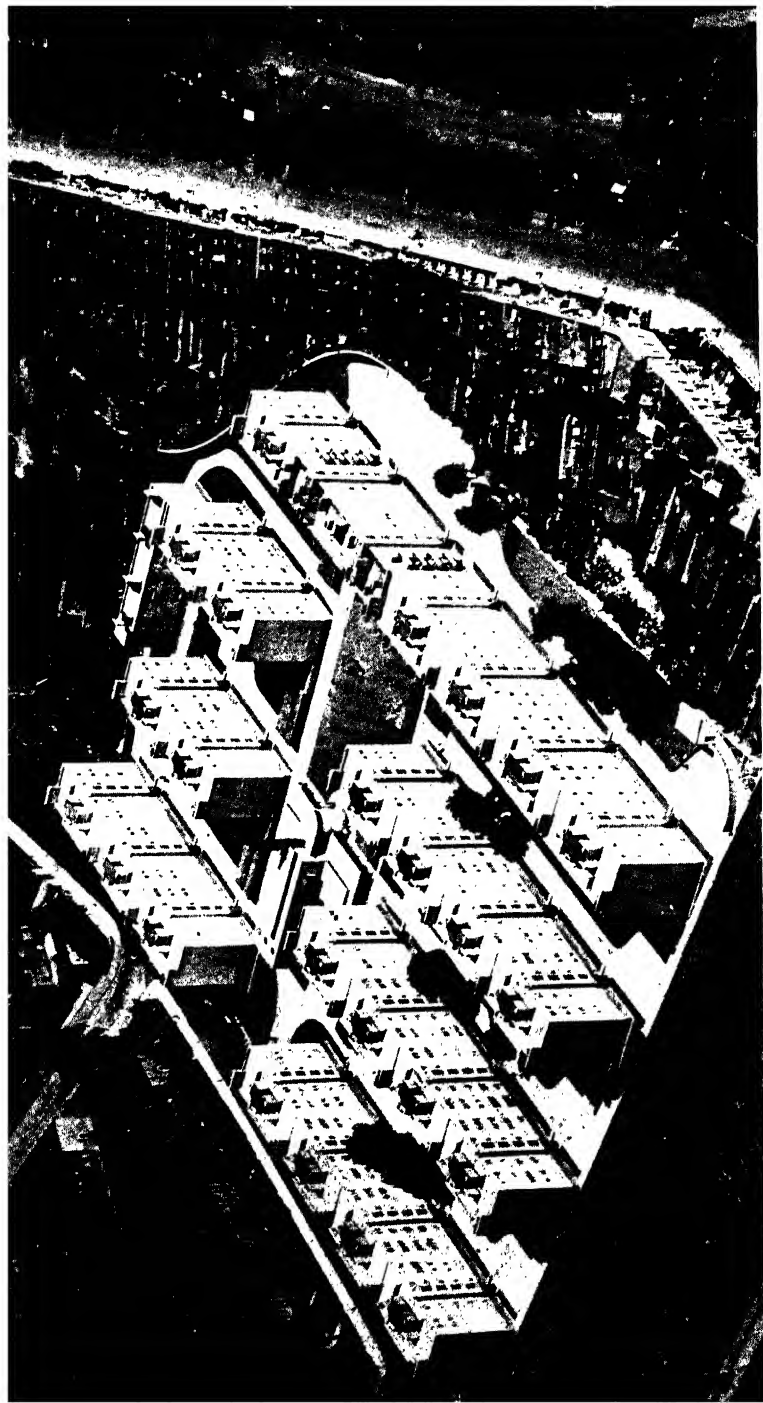
8.—A housing estate in Sweden. The houses are planned on the “parallel block” principle. They are partly prefabricated and largely of timber construction. Siting and landscape emphasize a good design.



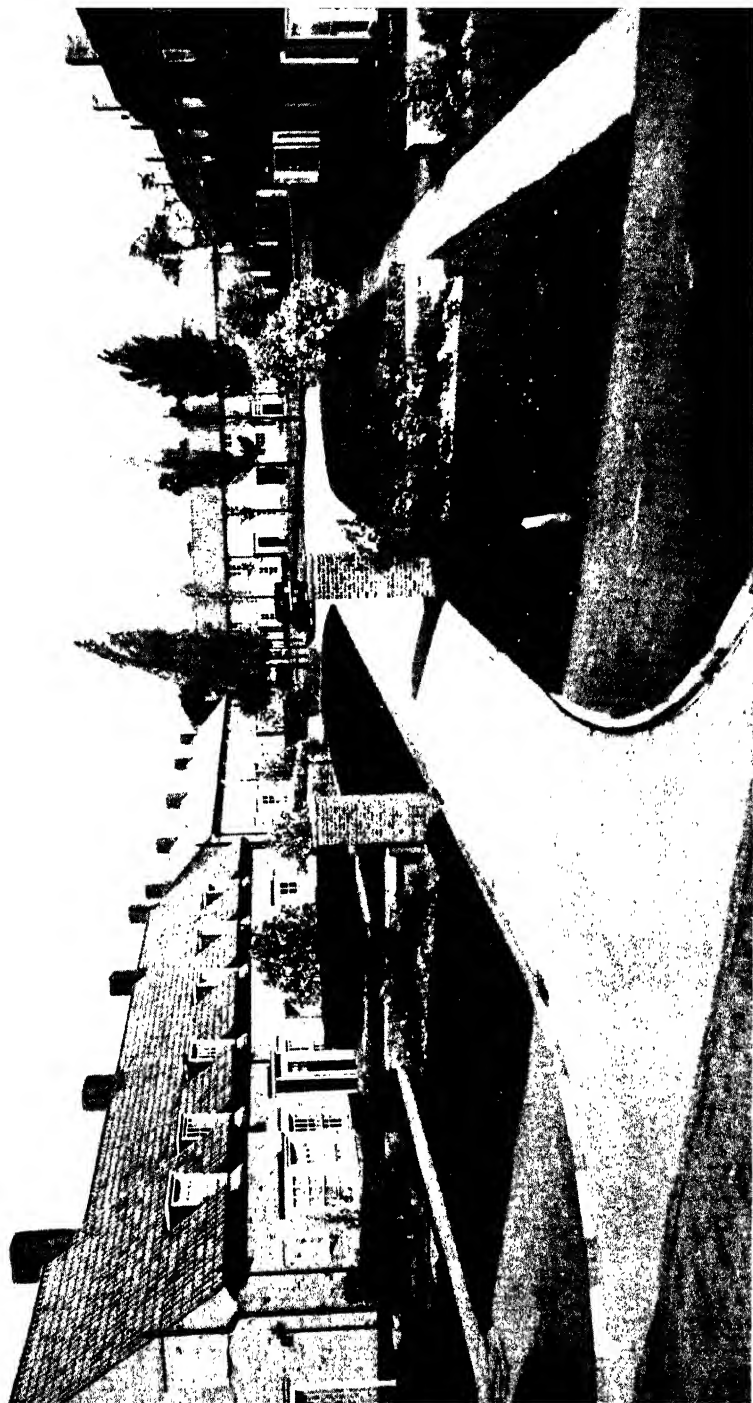
9.—War-time houses for the Ministry of Supply. The stringent control of materials has not prevented the architect from designing attractive houses and arranging them informally on a sloping site.



10.—A general view of the scheme at Kensal House also illustrated in Plate 6. The Nursery School is placed directly in front of the flats and the children and toddlers get to it without crossing any roads. All the necessary communal and social facilities were provided in this important experiment.



11.—Another fine pre-war housing scheme was erected at Loughborough Park. Generous spacing of the flat blocks, gardens, a community centre and an old people's block help to develop another community. Details of the flats and other buildings are also illustrated.

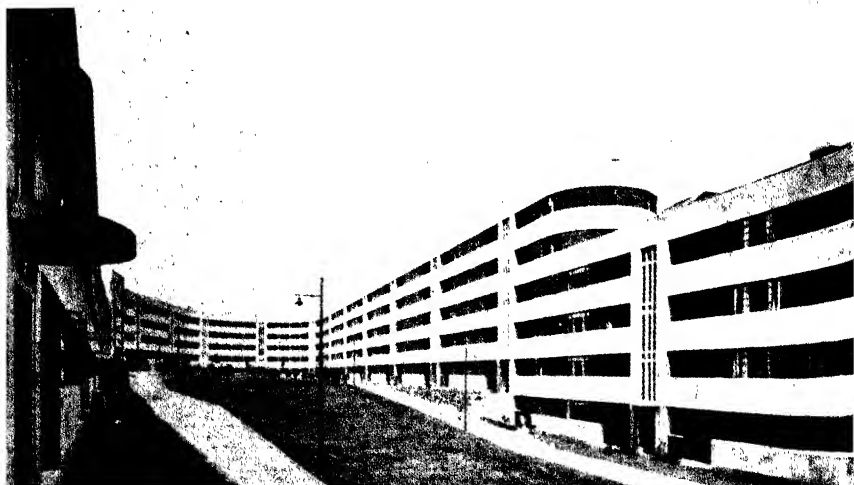


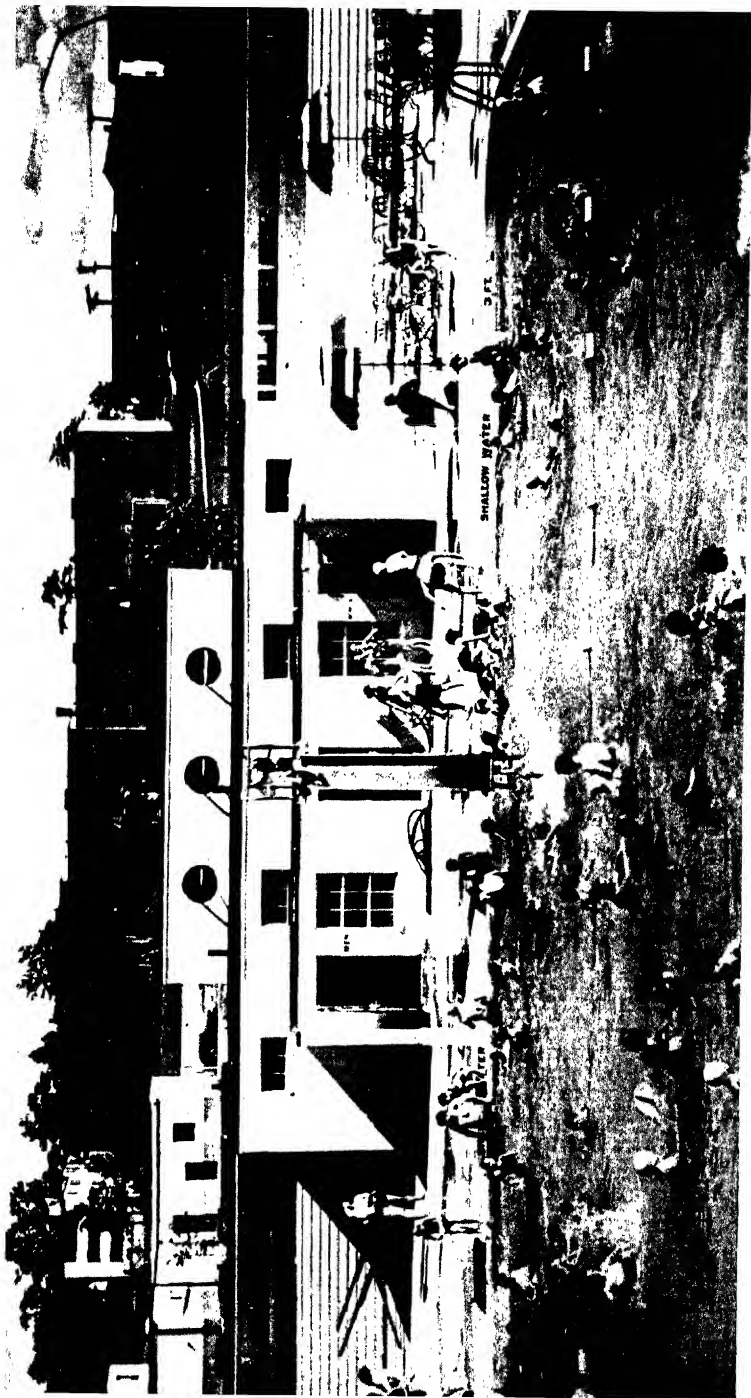
12.—One method of laying out small houses. The cul-de-sac was developed in England in the inter-war period. It provides a communal open space and playground and helps to keep fast motor traffic away from houses.



13.—Two-storey houses built next to multi-storey flats. Freedom in planning and lay-out of this sort has been impeded by town planning restrictions and by an unnecessary formality of design. In Medieval and Georgian England contrast in height was a regular feature in planning.

14.—Uniformity of height and fenestration, lack of variety in the lay-out of the blocks create monotony. Even well-designed flats cannot compensate for a harsh environment.





15.—Houses and flats are combined in a single community at Greenbelt, Maryland. The town houses 2,000 families and offers a variety of accommodation as well as communal facilities.



16.—Houses arranged in a park. The front gardens are continuous; no roads pass the fronts of the houses—only the ends. An informal, friendly lay-out.



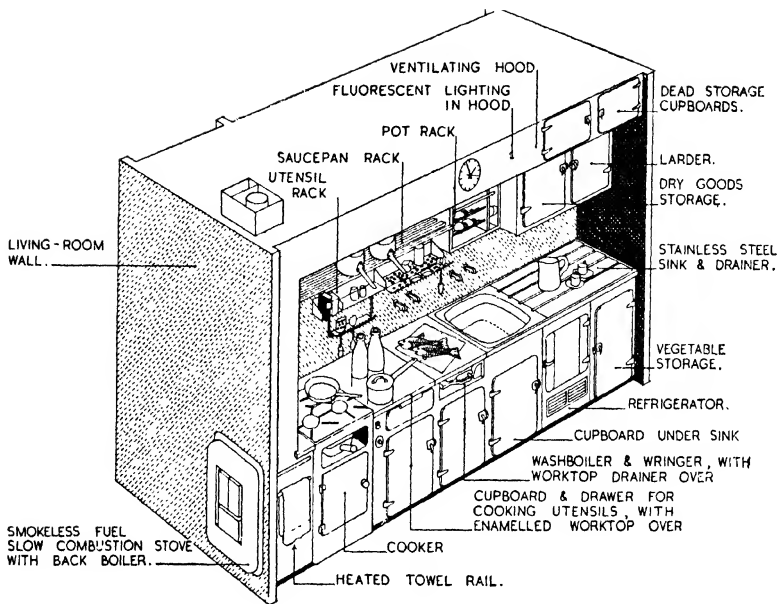
17.—A human and homely arrangement of large blocks of flats in South London. There is ample space between them for light, sunshine, and recreation and the preservation of the trees helps to avoid formality.



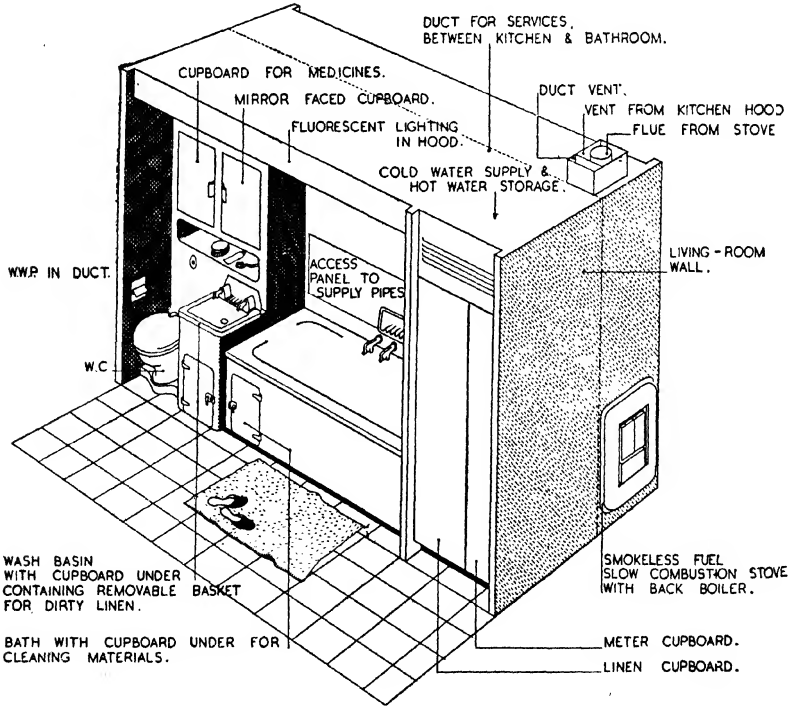
18.—Ample balconies and windows are provided and each block is set back from the

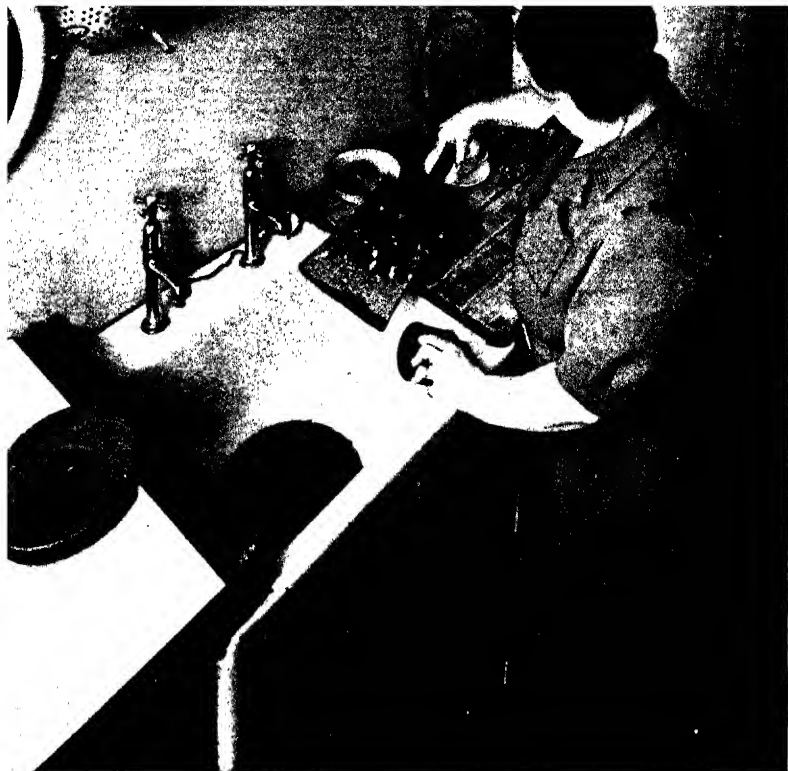


19.—A children's playground and community centre is an integral part of the whole scheme.



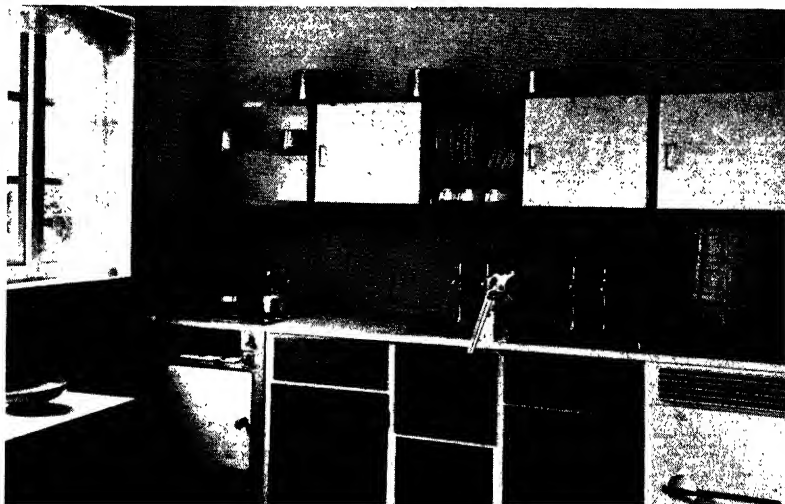
20 and 21.—A prefabricated plumbing unit which includes hot-water heating, and hot-water storage, as well as providing for water distribution and for carrying and fixing appliances.

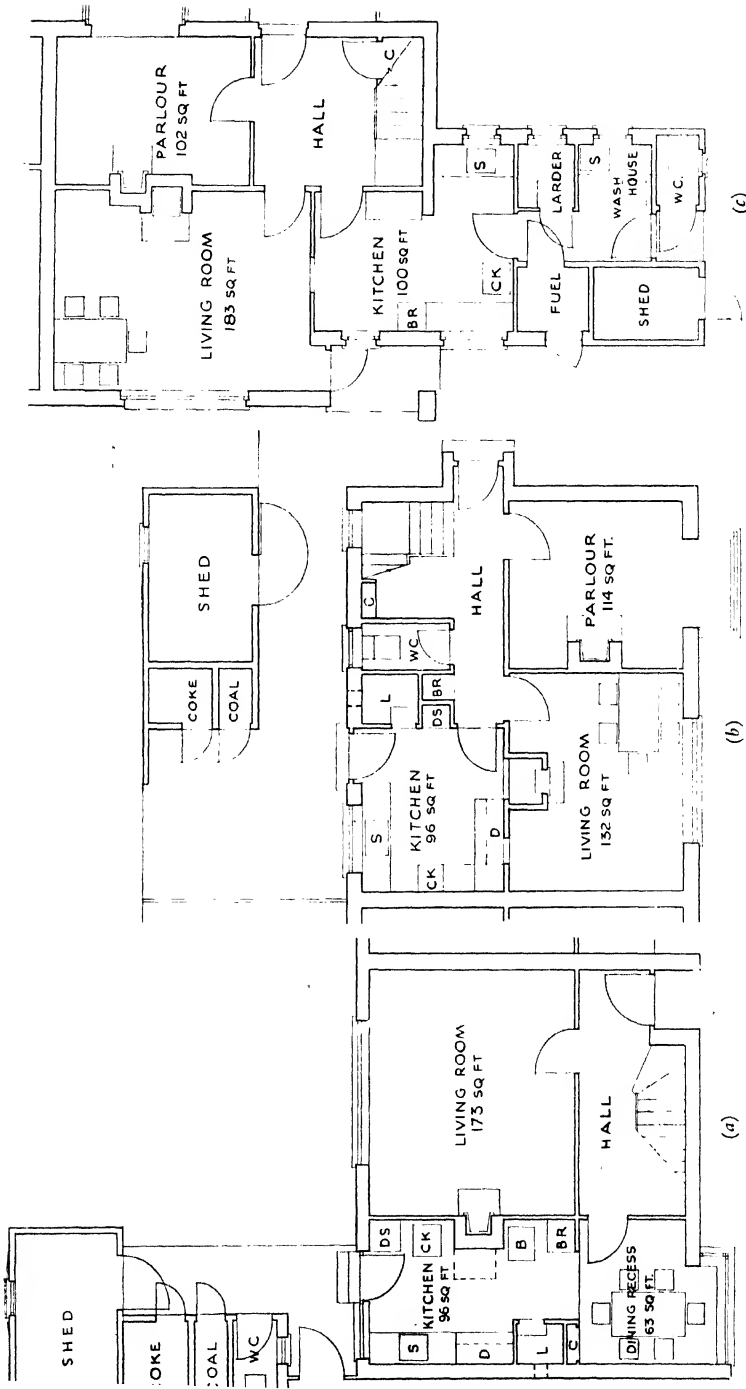




22.—Garchey System. Kitchen rubbish is placed in a special container in the sink and flushed away along special pipes.

23.—A kitchen in a post-war housing estate with well-arranged equipment and adequate cupboard space.

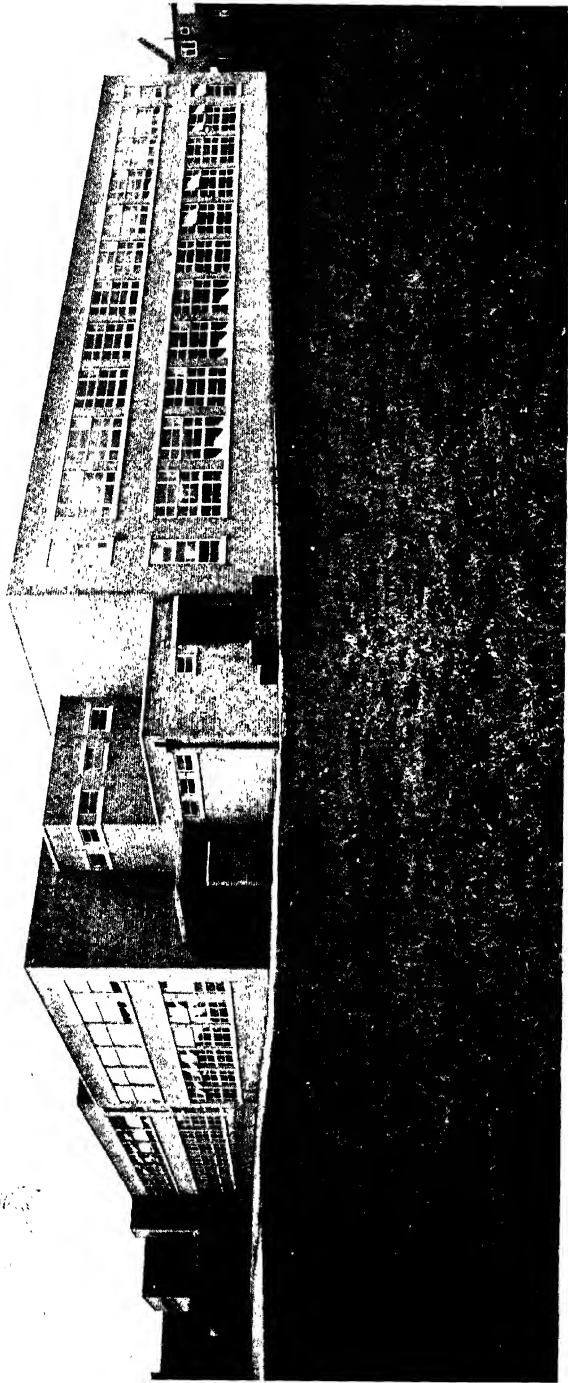




24.—Post-war housing. Three plans showing different arrangements of living space based upon the housing manual.
 (a) Kitchen with dining recess. (b) Living-room with dining space. (c) House for an agricultural worker.



29.—A Victorian school, and better than many erected during the period. Such schools are still in use to-day inflicting every disadvantage upon the child and teacher.



30.—A pre-war elementary school in Middlesex. This school is almost surrounded by housing development. The design is straightforward and aggressively utilitarian.

This school, of the most in Switzer- is divided two sec- the class- ms and re halls are ar- l in multi- construc- and the shops are of e-storey action.

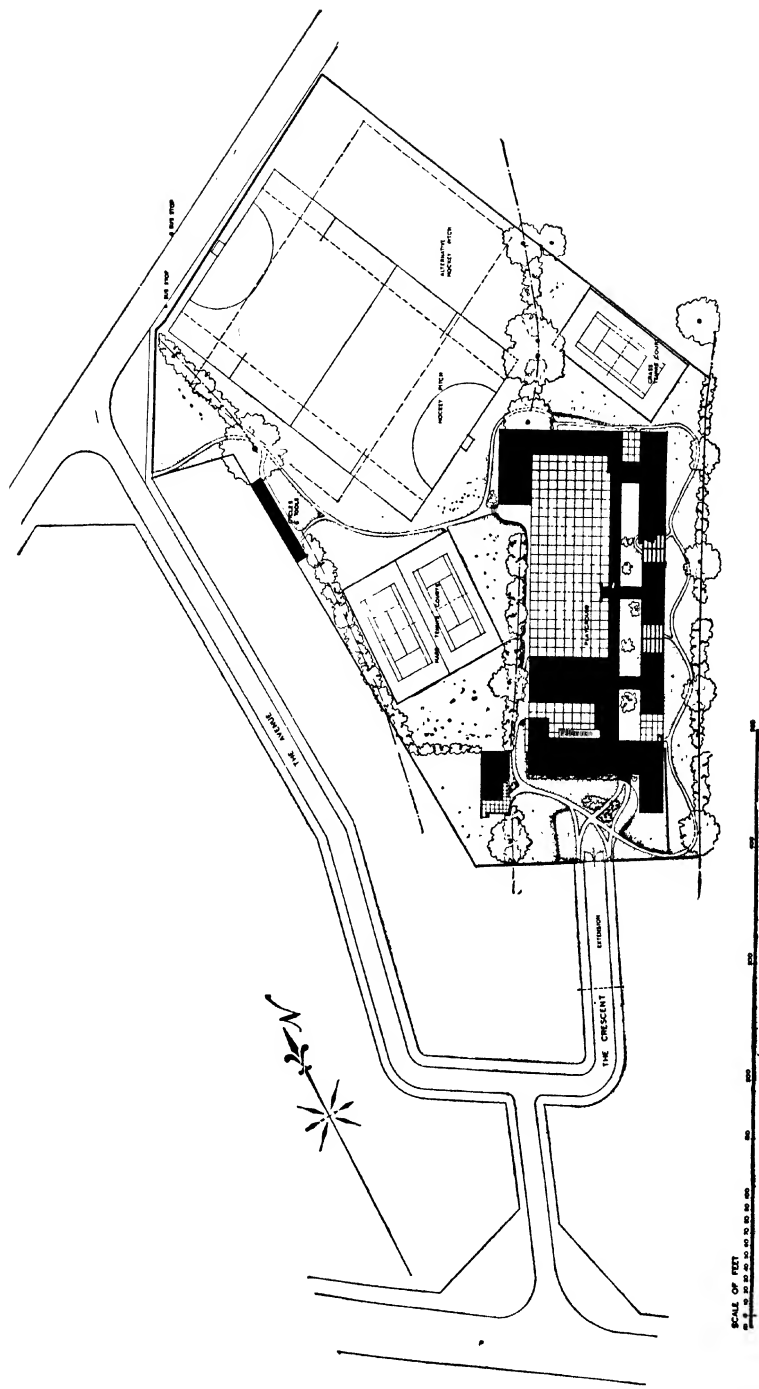




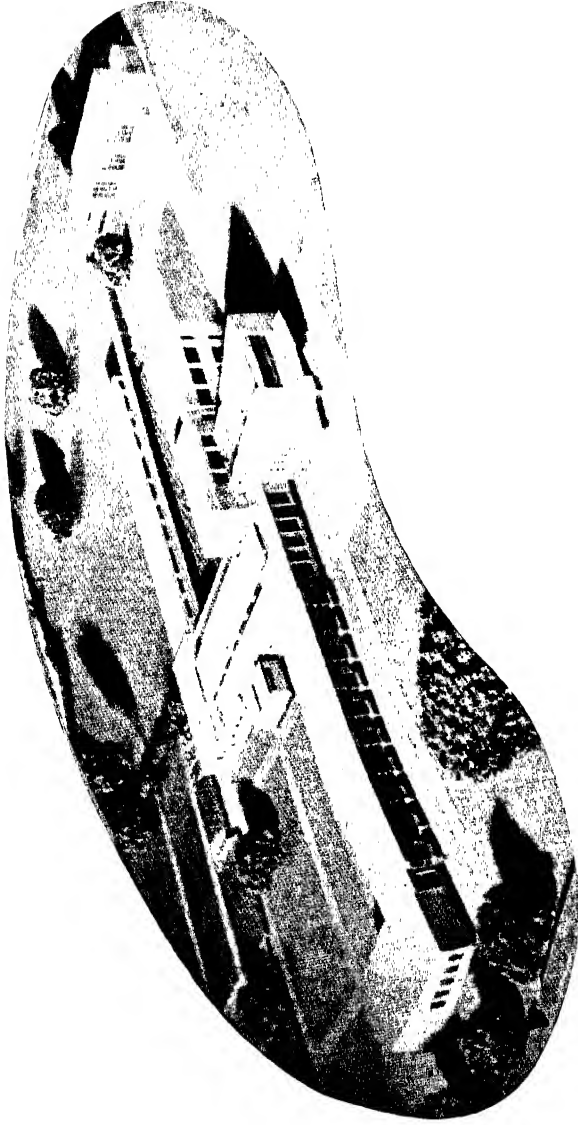
32.—This Copenhagen school is an orderly and logical expression of its plan. The assembly hall and gymnasium are placed in the centre of the building with classrooms on the outside walls. This is not usually a good arrangement since noise and other disturbances are transmitted direct to the classrooms.

33.—An open-air junior school in Amsterdam. This school was built on a very cramped site and the classrooms were built upwards to leave plenty of space for a playground. The windows are folding and sliding. There is a play-space on every floor.

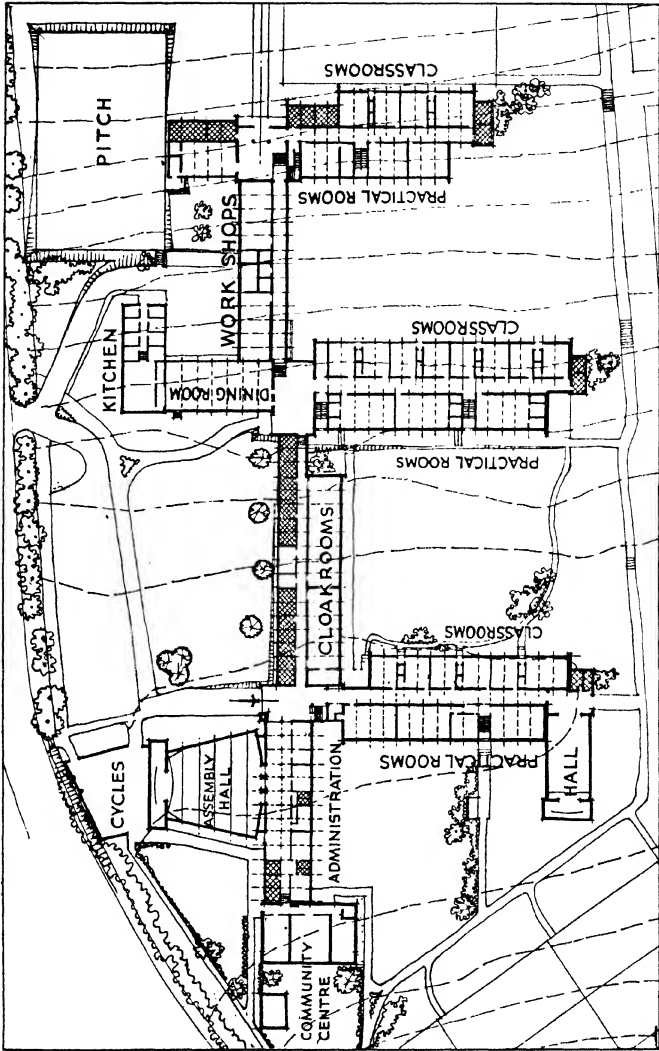




38.—The block plan of the building shows how the rooms are disposed to secure good lighting conditions. The playing-fields (it is a girls' school) and the gardens are related to the school; the hockey pitch and tennis courts are close to the changing-room and gym., while classrooms are placed on the quiet side and face south-east.

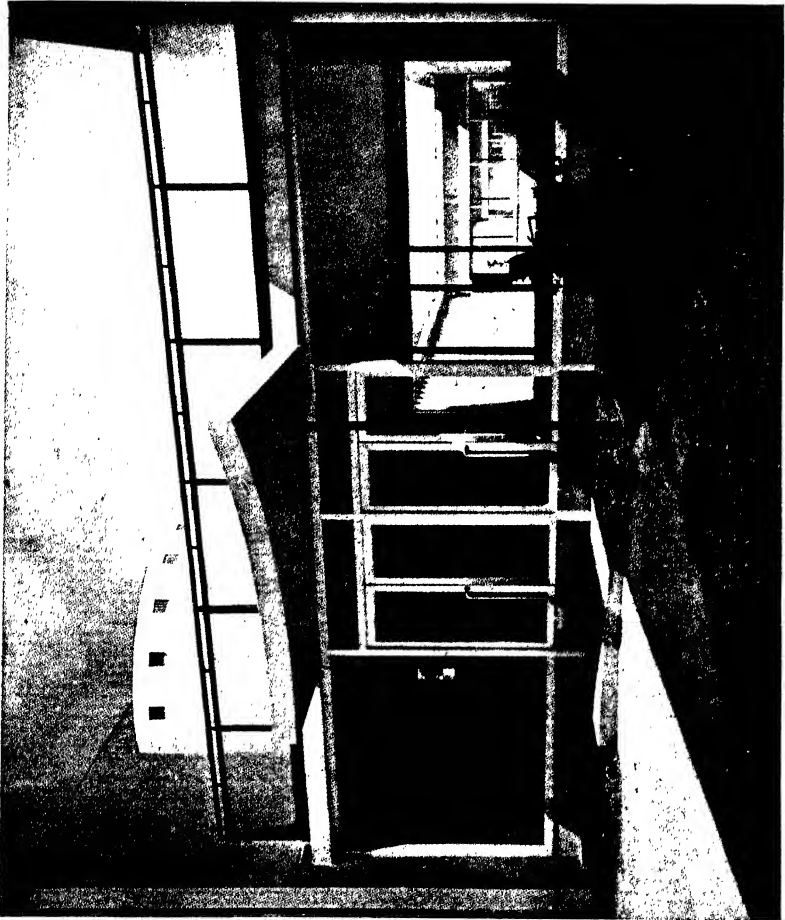


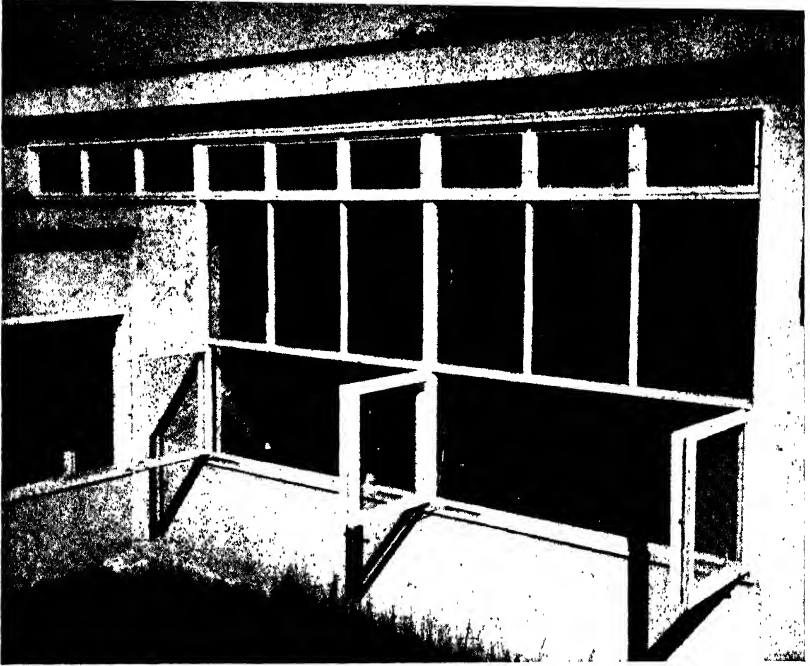
40.—The famous village college at Impington has an open type of plan suited to a rural site and to the many activities for which such a school must cater. The long block at the rear is a row of classrooms and the block in the front houses communal activities.



41.—This secondary school has been planned since the 1944 Education Act came into operation. The classrooms are arranged in three wings of one- and two-storey construction, and the section shows how the windows are arranged for daylighting.

42.—The main entrance of a school at Richmond, Yorks. The interior of the school can be seen as the hall is entered; an open, direct arrangement of plan, structure which is pleasant and inviting—not austere and forbidding as in the past. The child should be encouraged to use—and respect—his school and to enter it at the proper place where its visual effect is greatest—not to be brought through a mean door into the cloakrooms and lavatories.

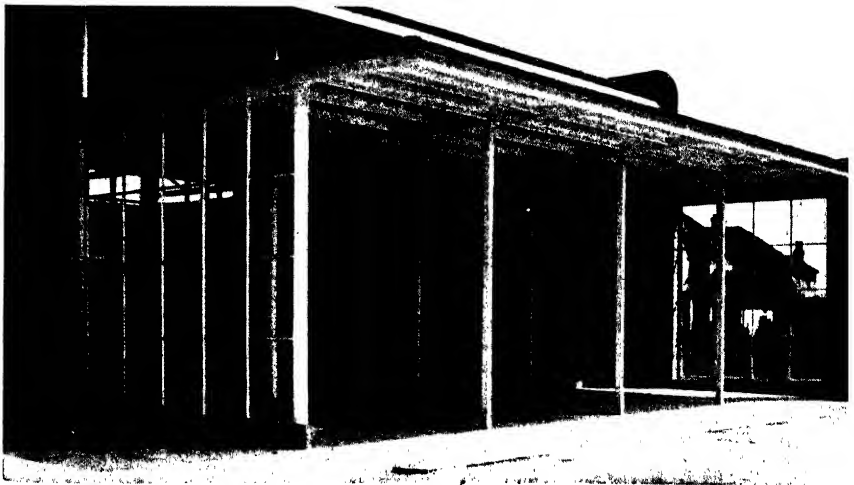




43.—“Elbow” access to classrooms. One side of a classroom, large windows with ample opening areas and good orientation. The small units at the top give cross ventilation where it is most necessary, the centre units are fixed, while those at the bottom can be opened entirely.

46 (*opposite*).—The assembly hall at Richmond School for Girls is extremely light and the ventilation (at high level) very efficient. It has a domestic scale and is intimate in character.

47.—The covered play-space in the junior school at Rustington, Sussex. A covered space of this sort is useful for open-air teaching and also allows some shelter space for the children before school hours. Accommodation of this sort, although apparently unnecessary, is always useful.

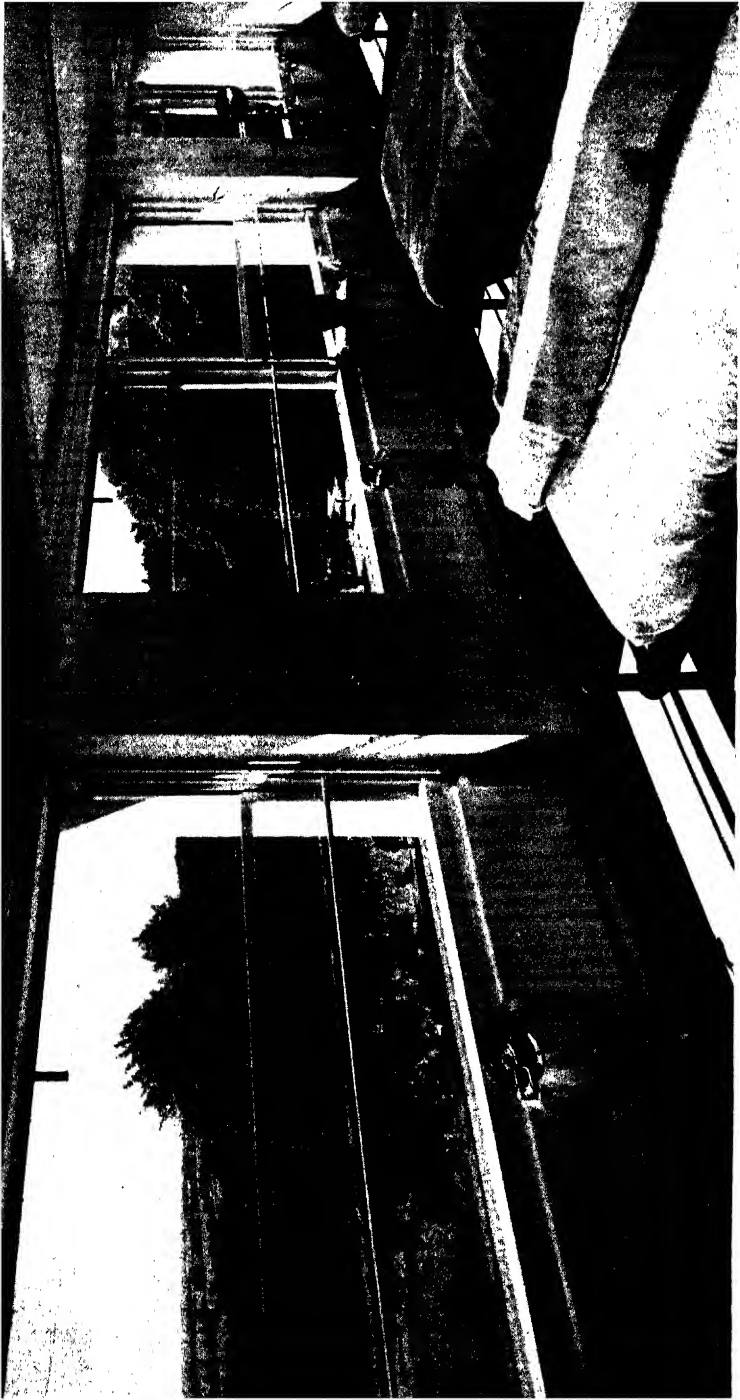




48.—A hospital built at Turku, Finland, before the war. The balconies are deep enough to take beds, the sills of the windows are kept low. The building depends for its effect upon the proportions of the openings and upon the pattern of openings in the wall they create. There is nothing adventitious or unnecessary in the design, yet it is gay and elegant.

49.—St. George's Hospital, Hyde Park Corner. This hospital is surrounded on three sides by roads which carry heavy traffic and suffers through vibration and noise. Its site does not easily permit expansion.





50.—These windows are sufficiently low for a patient to see the country outside from his bed, sufficiently wide and uninterrupted to give a good view. They are made of steel and double hung, the windows disappearing into the cill when they are lowered.



51.—In this ward the beds are placed in pairs, parallel to the windows which have a low cill. The rails suspended from the ceiling carry curtains which are used to screen each bed.

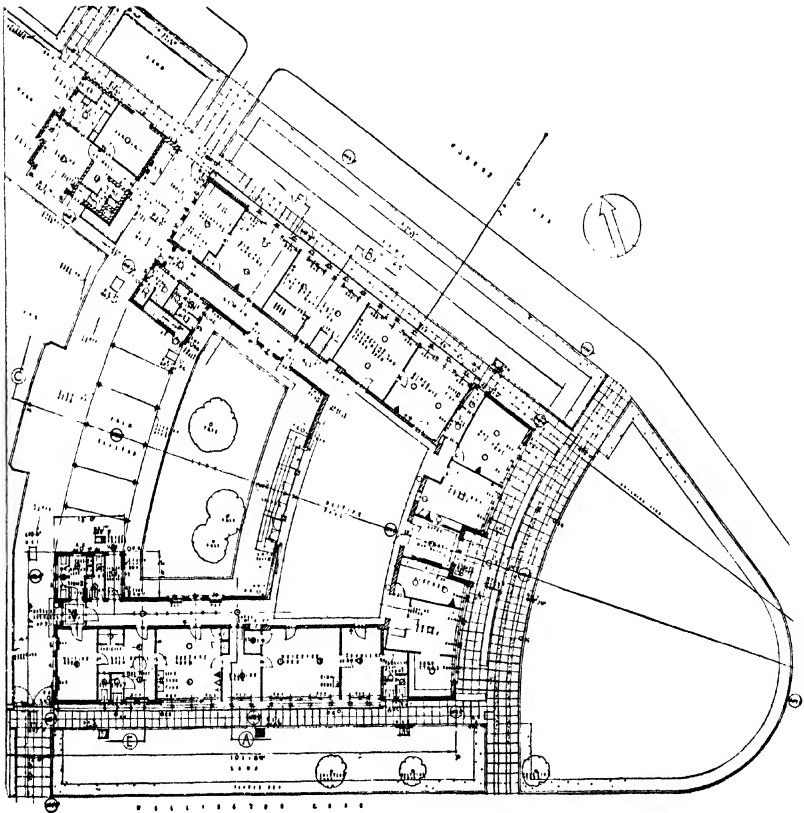
52.—Maternity Ward. These windows give even illumination to the long, shallow room, whose shape is well suited to its purpose.



55 (*opposite top*).—The administrative offices are placed in the centre; they are thus close to the main entrance, to the wards, and to the out-patients' department. The kitchens balance the out-patients' department and create a symmetrical arrangement. Formal planning of this sort is often less efficient in working—and leads to falsity of expression. The service from the kitchen crosses the entire building.

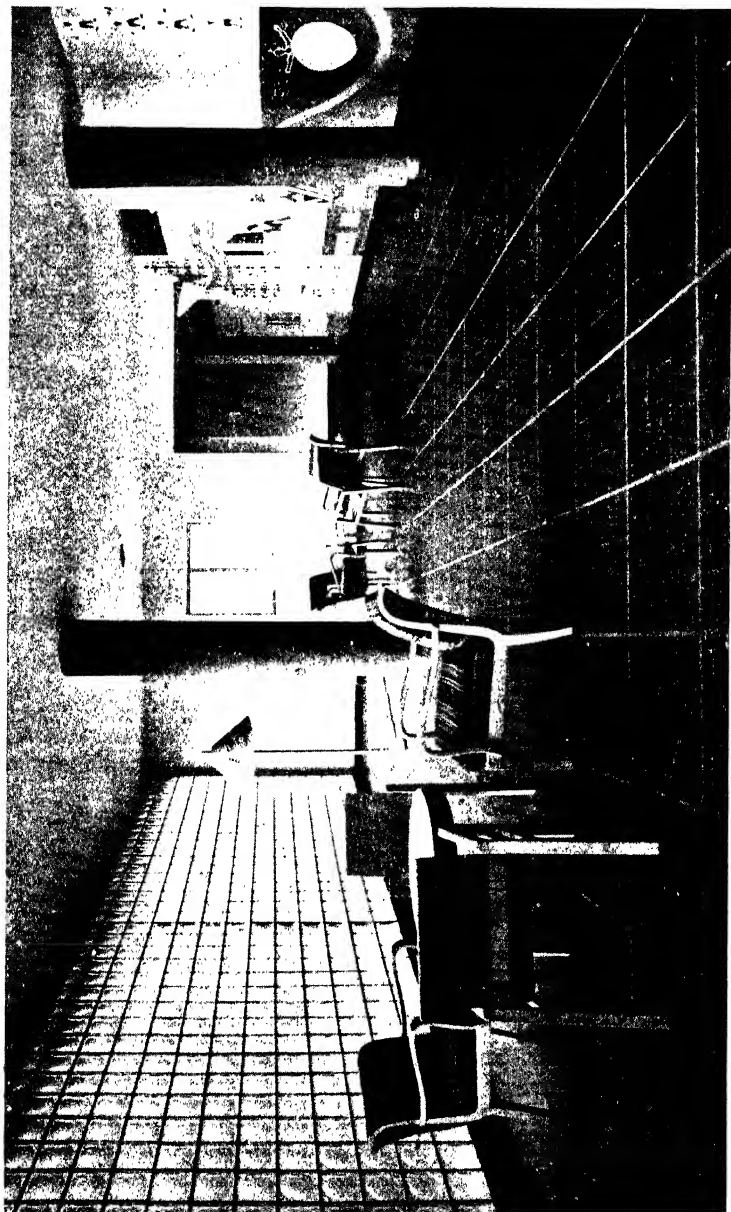
56 (*opposite bottom*).—This is typical of the hospitals whose wards are arranged so that the beds are placed at right angles to the windows. Owing to the position of the kitchen all food for the far ward has to be trucked right through the main corridor. This does not make the administrative block in the centre of the hospital particularly quiet.

57.—The Health Centre at Bilston is at the junction of two busy streets. Orthopædic and other treatment-rooms face the wards, while at the centre, facing towards the apex of the junction, is the main entrance. This leads to a large, pleasant waiting-hall, screened from noise and looking into an enclosed garden. There is a snack bar which serves the waiting space.



P.L.L. 1000

58.—Waiting space
at the Finsbury
Health Centre
The external wall
is made of glass
—lenses.





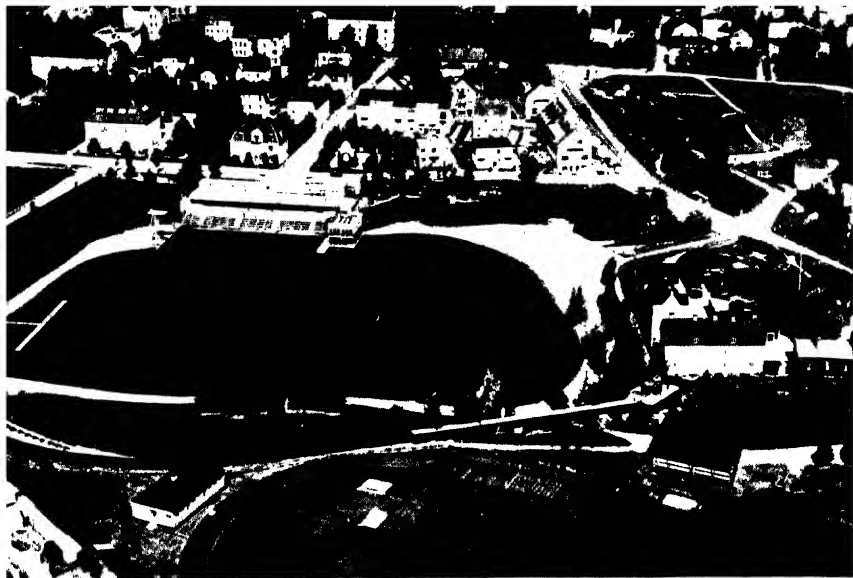
59.—Housing—unplanned; industry—unplanned; and transport—unplanned are concentrated in appalling conglomeration up and down the country. The results are unhealthy as well as wasteful.



60.—The street pattern, the distribution of open space, and public buildings can be studied from aerial photographs. These houses conform to the by-laws of the last century, the roads are of uniform width. The area in the foreground is the natural centre of this community, with public buildings and church and cemetery and, of course, shops. It is an island surrounded by traffic.

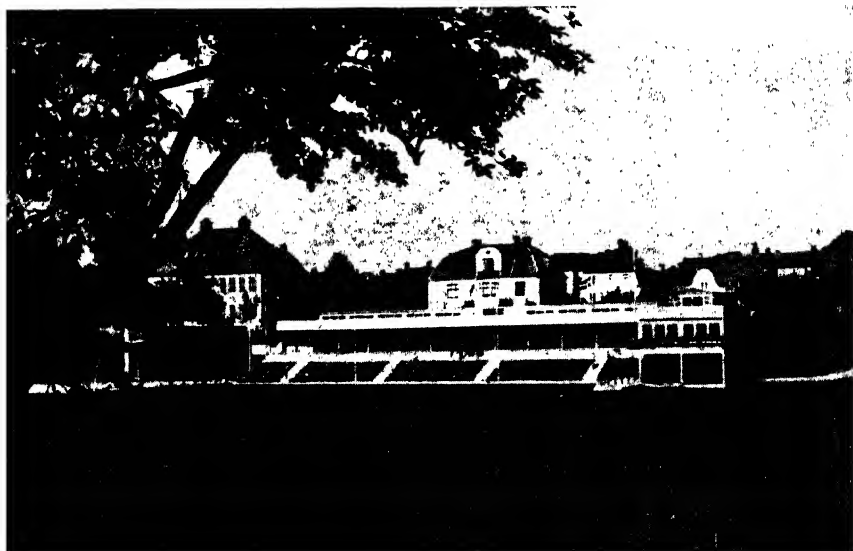


61.—Individual houses are not detached but each has a private balcony which is not overlooked and private gardens are screened by shrubs and hedges.



62.—A sports centre for a residential area in Sweden. The lake is arranged for aquatics, and next to it is a sports ground and running-track.

63.—One end of the lake is arranged to form a pool for racing and water-polo. Restaurant and changing-rooms are arranged with a spectators' gallery in front.





64.—A corner of a park at Linköping in Sweden. A steep bank and a stream and a screen of trees form the background, the light bridge with its delicate and simple ironwork an effective contrast.



65.—Many of our parks have been spoiled by rigid and commonplace planting. Here a variety of trees and foliage is planted informally.

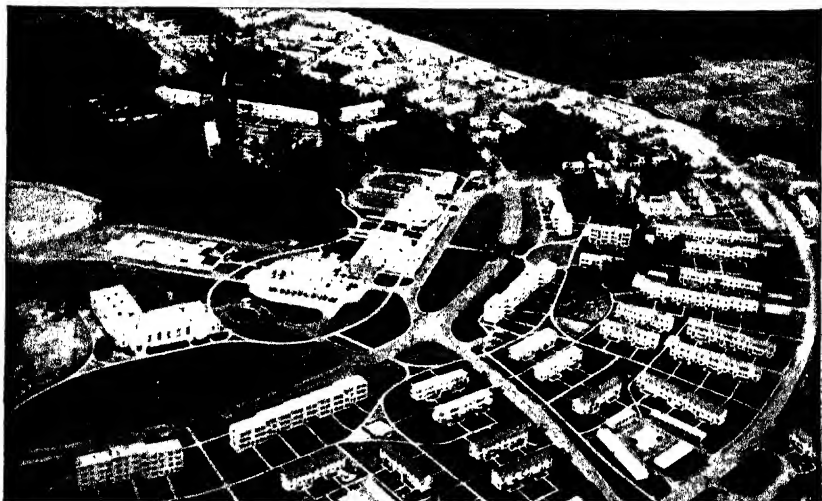


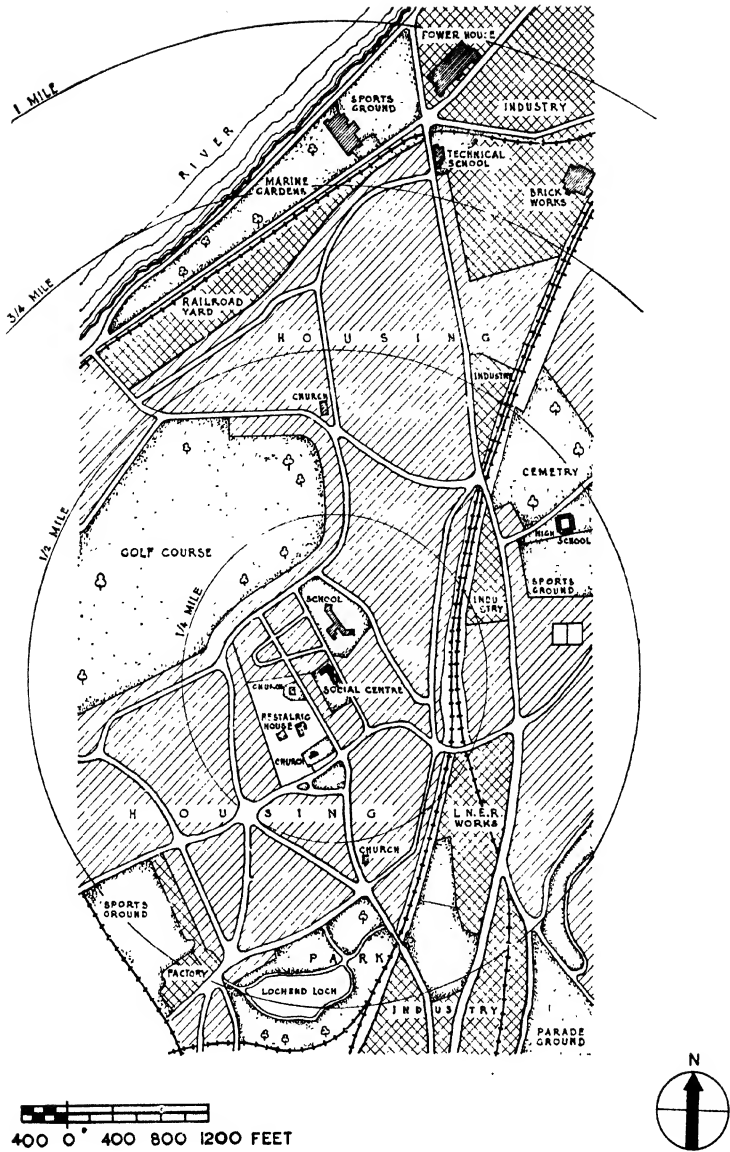
66.—“Horse-chestnut trees near the Canal Bridge, Cassiobury Park, Watford.” There are many canals in London and outside big cities: their banks could be cleared and planted to make waterside parks and walks.



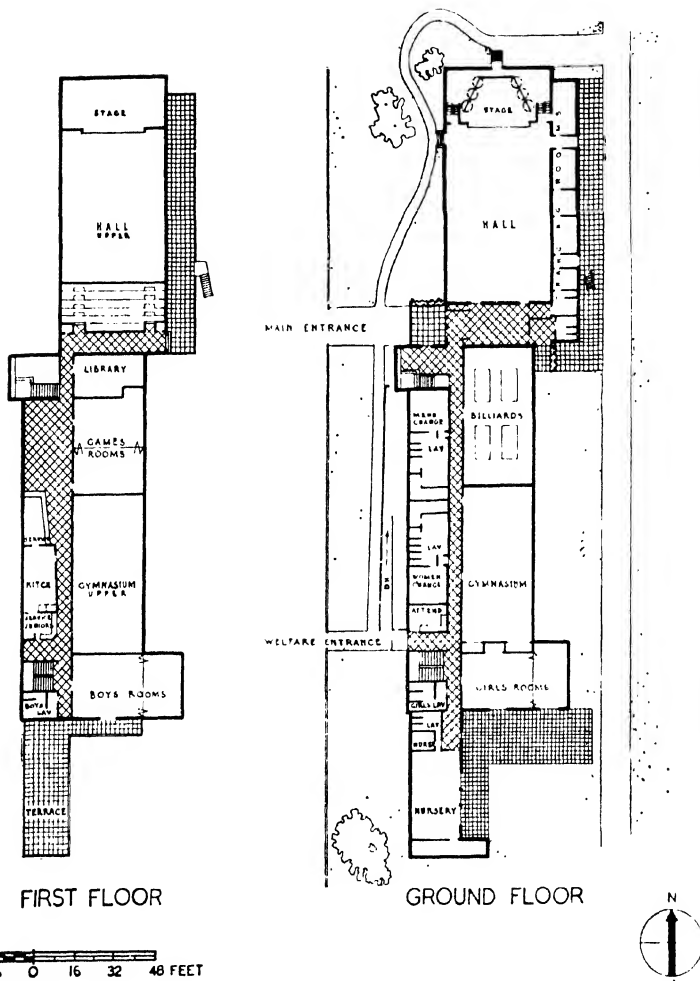
67.—The Hampstead Garden Suburb was one of the first to be built, space is organized for living with quiet roads and culs-de-sac for housing and through traffic kept out. Parks, open spaces, and woodlands are preserved and extend to the centre of the suburb. The formal symmetrical lay-out still persists where these roads radiate from the central square.

68.—The community centre and other buildings are placed in the middle of the estate with housing radiating around them. Roads and footpaths are separated.





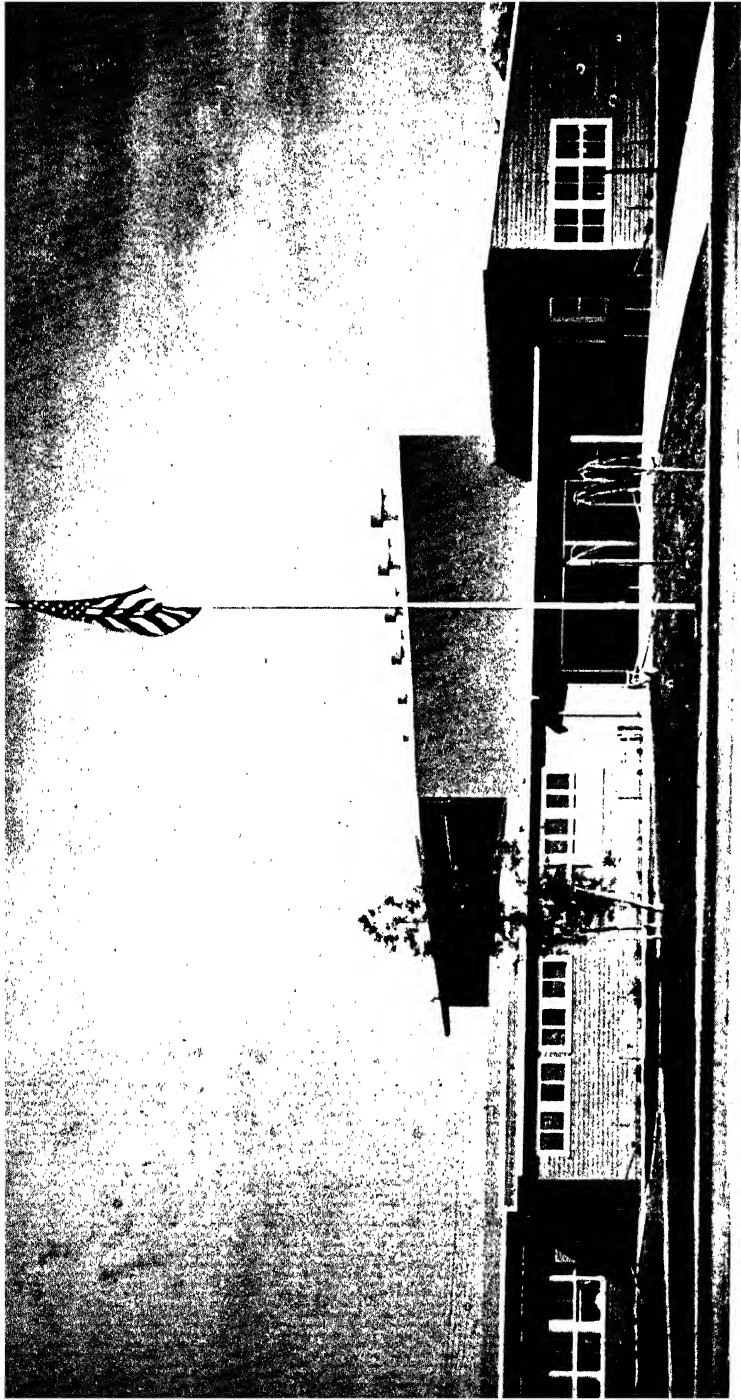
69.—This map is intended to show the area served by a community centre; the concentric circles are placed at $\frac{1}{4}$ -mile intervals. The centre is excellently placed to serve the residential areas and forms a focus—with the adjoining school and churches—for the neighbourhood.



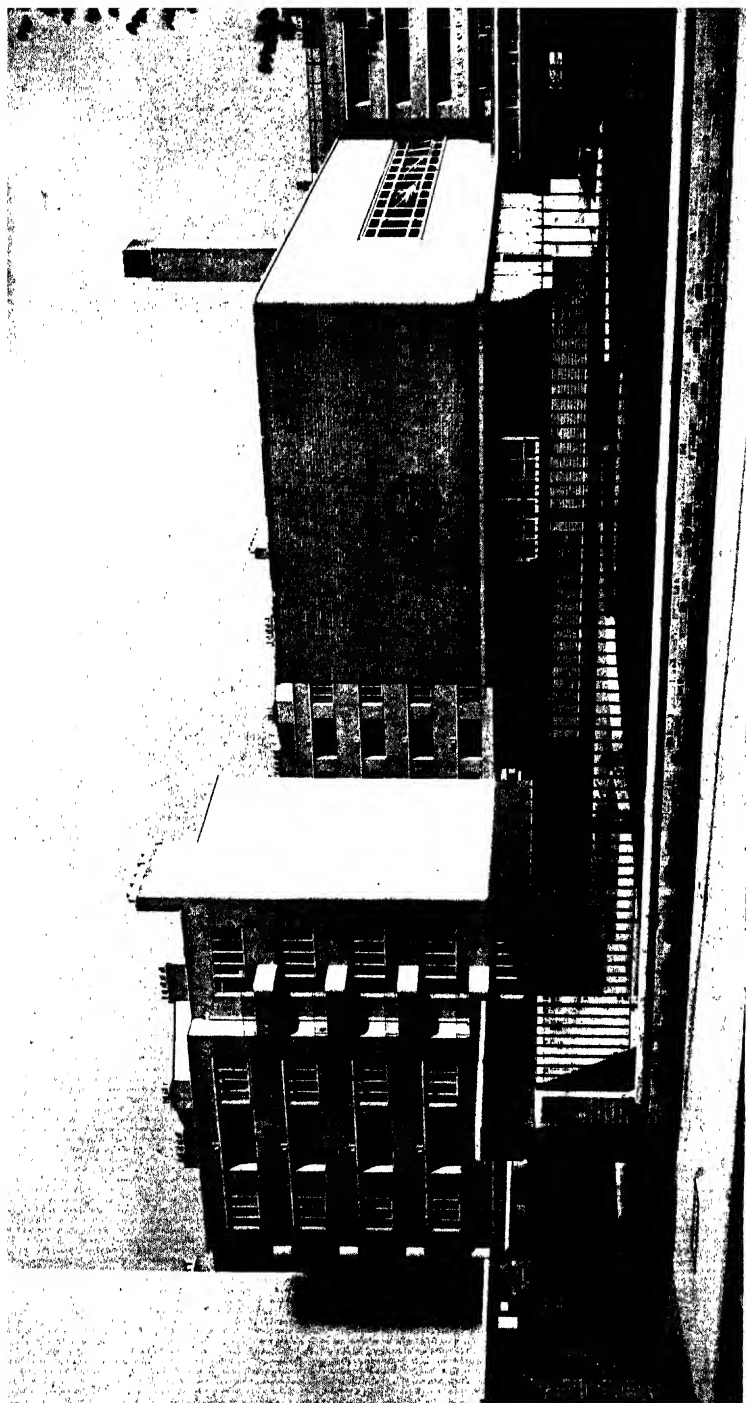
70.—This community centre at Kells, Cumberland, was built by the Miners' Welfare Commission. On the ground near the welfare entrance is a nursery. Separate club-rooms for boys and girls are also provided. The hall has an excellently equipped stage.

This wing
es the library,
s and common
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The use of bay
ows breaks up
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be a flat and
xercising façade
gives more
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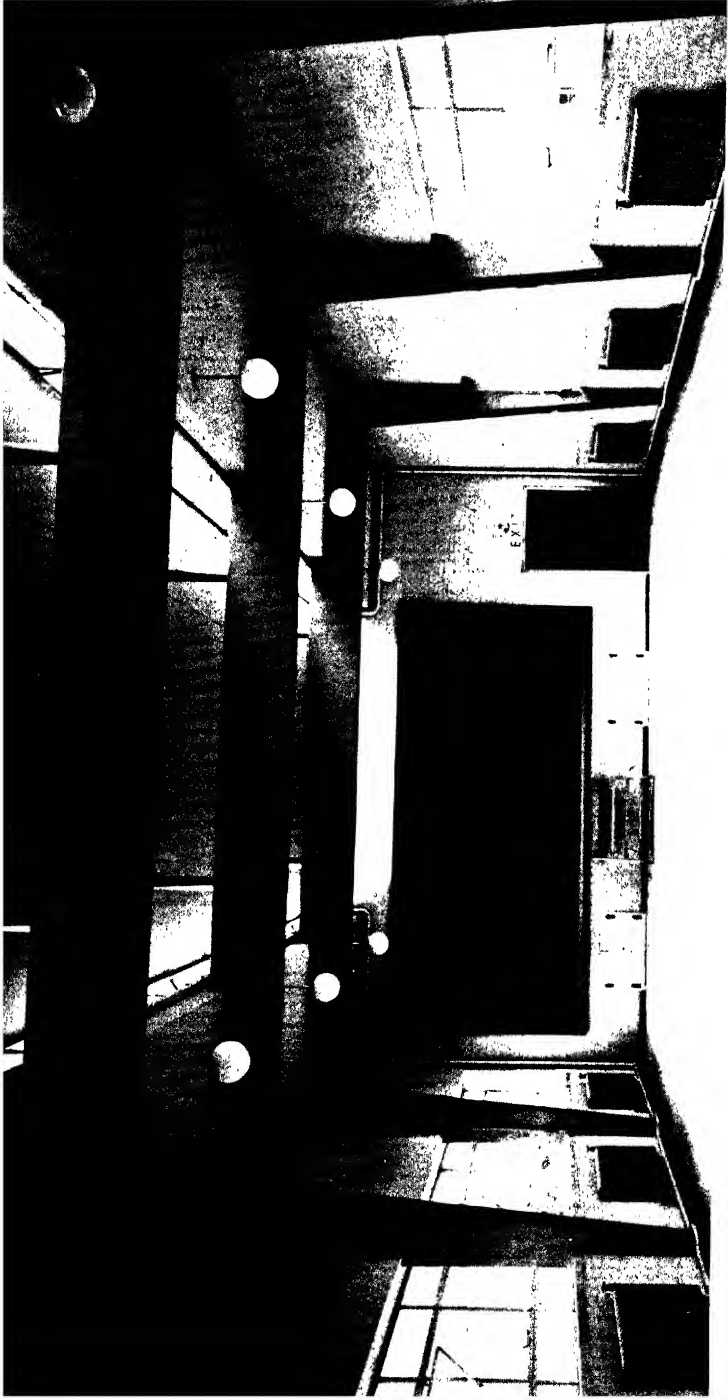




72.—“This school and community centre in Woodville, California, was erected by the Farm Security Administration at a camp for fruit pickers and other migrants.” The building is unpretentious and informal. The main entrance leads into the community hall. The building is mainly of timber.



73.—This centre was designed to function with the estate and is therefore given a central position.



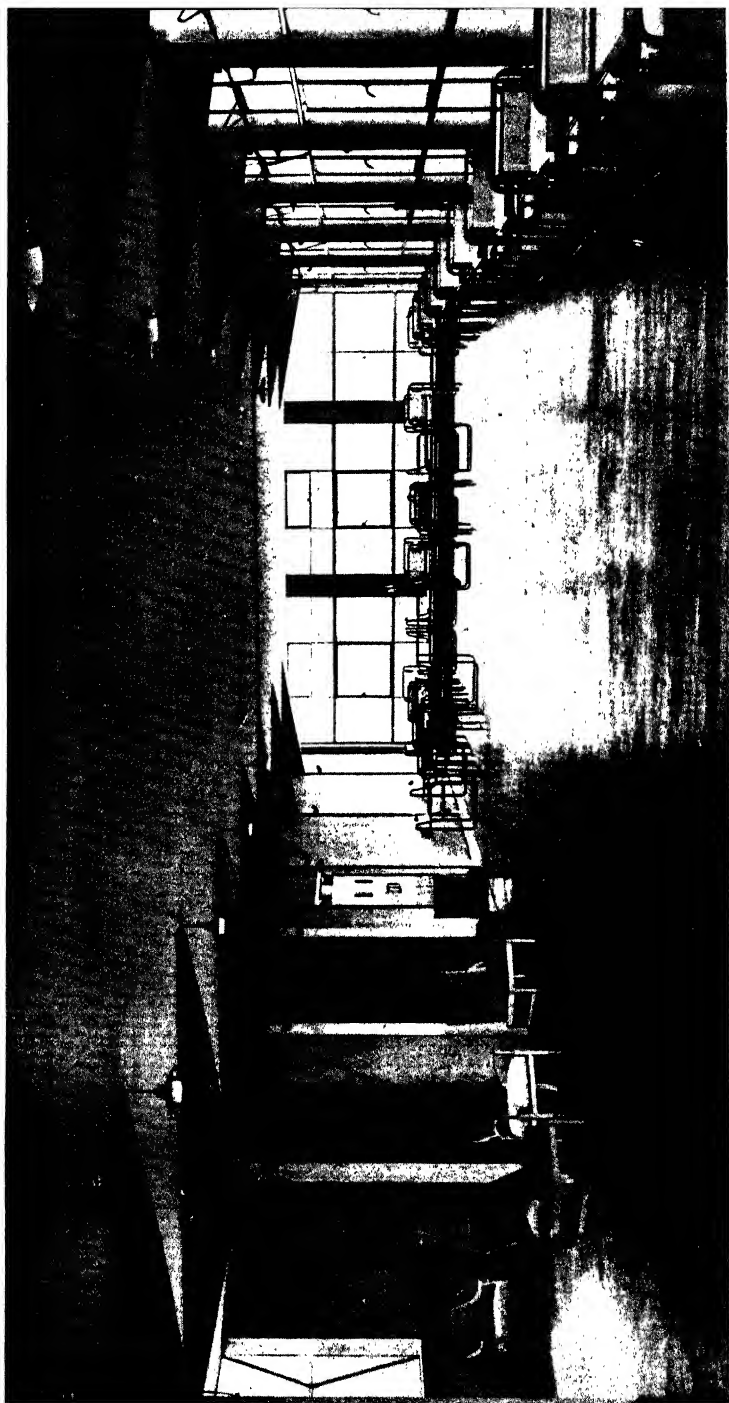
74.—The hall of the community centre illustrated on the previous page. It is an interesting design and the hall itself is extremely well lit, not only by side windows but by vertical windows in the roof. Fair-faced brick-work colour washed is used internally and the concrete frames are also coloured.



75.—To an increasing extent special provision is now being made for elderly and retired people. These flats have been designed specially for them.



76.—In this municipal housing scheme the old peoples' houses have been arranged round a quiet quadrangle.



77.—Health Centre at Peckham. The main clubroom of this famous centre has been arranged so that it can be used for a large number of purposes. It is of reinforced concrete construction.

Description	"1947" Council House of 1,000 sq. ft. 1,000 ft. @ 24s. 9d. per ft. super = say £1,235		"1939" Council House of 1,000 sq. ft. and of equivalent amenity, say £650	
	£ Cost	% of Total Cost	£ Cost	% of Total Cost
1. <i>Site Works</i> , i.e. Foundations, Drainage and Other Services, Paths, Fencing and Out-buildings	272	22	136	21
2. <i>Building Carcass</i> , i.e. Walls and Brickwork, Floors, Roofs and Ceiling Construction; Partitions and Gutters and Down Pipes	420	34	260	40
3. <i>Equipment and Components</i> , i.e. Fireplaces, Windows, Doors, Staircase, Cupboards, Joinery and Ironmongery	247	20	117	18
4. <i>Service Installations</i> , i.e. Sanitary Equipment, Plumbing and Hot Water, Gas and Electrical Installations	160	13	91	14
5. <i>Finishings</i> , i.e. Glazing, Plastering, Painting and Distempering	136	11	46	7
TOTAL	£1,235	100	£650	100

