About this Translation

Joseph Stübben initially published City Building (Der Städtebau) in German in 1890 as part of a handbook on architecture (Handbuch der Architektur). This Handbook was published in Germany by Durm et al. (1890) between 1883-1933. Stübben subsequently published completely revised versions of Der Städtebau in the 1907 and 1924 editions of the handbook. The 1890 edition is still published in Germany as a reprint.

In 1911 Adalbert Albrecht translated the 1907 edition of Der Städtebau into English. This translation is available in the MIT rare books collection, and as a typescript at the Frances Loeb Library at Harvard University. It contains all chapters except for Part V. However, a translation of a summary of this part exists elsewhere.

It should be noted that this translation is not exact (e.g. some sentences are not translated literally but rather in terms of their general meaning). Further, the translator was not a native English speaker and the original as well as translated texts are over a hundred years old. For these reasons, the text is written in old-fashioned “German English” and thus often not easy to read. In this book we publish Albrecht’s translation basically unrevised, as a historical document, with all of its flaws.

The typescript did not contain any figures. Since the value of the book depends heavily on the large number of figures referenced in the text, we added these to the translation (except for the majority of fold-outs). The German reference edition for both text and figures is available as a free e-book. This edition can also be used to access the missing content in Albrecht’s translation, such as the fold-outs and bibliography.

6 Available at https://archive.org/details/derstdebau00stgoog.
Acknowledgments

This translation of the typescript (497 pages) was published courtesy of the Rotch Library at MIT. We thank the MIT library staff, in particular Jennifer Friedman and Jenn Morris, for their assistance. MIT Libraries Document Service was helpful in making the translated copy available to us in image form in 2008. A group of staff and students at Arizona State University then helped transcribe the 497 pages of image files into text format since OCR techniques could not be used. We are especially grateful to Sue Mahalov in this context and also appreciate the contributions of Tyler Eltringham, Geoff Prall, and Tracy Geiger. Amanda Bosse and Dan Bartman were instrumental in formatting the text in InDesign. Thanks also to Aaron Kimberlin for technical support. We thank Peter Swift for his initial encouragement and advice on the historical importance of Stübben’s work. Finally, librarians at the Ludwig Maximilian University in Munich, and Dr.-Ing. Renate Fritz-Haendeler helped with reference searches and the libraries made the original hardcopy versions of the books available. Thank you to all!
Josef Stübben (1845-1936) was one of the most important and widely known city planners of the late 19th and early 20th centuries. Although he was a prolific writer, and he wrote some articles in English, his major work, “Der Städtebau” (“Town building”), an encyclopedic text on the principles and practice of city planning, was never translated into English. The unfortunate consequence is that this highly significant planning textbook has never been made widely available to an English speaking audience. Now, as the lost art of city building is experiencing a rebirth in the U.S., Stübben’s great work is regaining attention.

The first edition of this book was published in 1890. It was the equivalent of an encyclopedia of city planning, Reinhard Baumeister has published in 1876 the first book on City Building. In 1890 Hermann Josef Stuebben published his part of the Handbook on Town Building in a very detailed way. The second edition followed in 1907 and the third in 1924. The 1890 edition was reprinted in Germany, in 1980 and is still considered to be a useful text on city planning, not just a historical document. The final edition of “Der Städtebau” included 900 illustrations, presented in thirty chapters and twenty-three appendices.

Stübben was a Berlin-trained architect who also had a doctorate in civil engineering. He was appointed head of the office of city planning, first in Aachen from 1876 to 1881 and then at Cologne, Posen and Berlin where he worked as Geheimer Baurat (architect to the political institutions and Beigeordneter (member of the community Council). During his career he was involved in city planning studies of more than thirty cities in Germany and abroad. The book “Der Städtebau” uses materials and draws from the experiences of his long career as a city planner.

Stübben was one of Europe’s best known planners, ranking alongside Camillo Sitte and Raymond Unwin as the leading European planning practitioners with direct influence on the development of American city planning. The major works of Sitte and Unwin are in English and are still being published. Unwin’s 1909 Town Planning in Practice was recently reissued by Princeton Architectural Press. Camillo Sitte’s major work, The Art of Building Cities (1889), was translated into English in 1945 and is now widely known to American planners and architects. The lack of an English translation of Stübben’s major city planning text from the same period is an obvious, missing link.

Stübben had a high profile and presented papers at numerous city planning conferences. One of the most important was his address at the 1910 conference on city planning sponsored by the Royal Institute of British Architects in which Daniel Burnham, Ebenezer Howard, Patrick Geddes and Raymond Unwin were
also featured. Also in that year, the U.S. Senate published an official document on the new American profession of city planning that contained examples of German planning legislation under the direct influence of Stübben.

Most historians agree that the basis of American city planning, which was professionalized in 1909, is largely drawn from two sources: England and Germany. Historian Brian Ladd, in his 1990 book Urban Planning and Civic Order in Germany, 1860–1914, wrote: “The academic discipline and administrative practice of city planning as we know it today, however, was born in Germany during the decades before World War I” (p. 1). It is also recognized that the roots of German planning have not been as widely studied as the English roots. That Stübben was never translated is probably due to the fact that the U.S. fought two major wars with Germany during the 20th century. One scholar noted that the volume of German material being cited and translated in architectural journals went from “a generous proportion in 1900 to a mere trickle in 1911”.

Yet before World War I, German city planning was much admired in America, during the time when American city planning was in its formative years. Many American planners, among them Daniel Burnham, Frederick Law Olmsted, Jr., and John Nolen made regular trips to Germany during this time to study how the Germans, generally regarded as exemplary city planners, were addressing their planning problems. Daniel Burnham took a grand tour of Germany in 1901 and wrote that he believed the Germans were far ahead of the Americans in their planning expertise. The German approach was heralded because, the American planners believed, the Germans were able to achieve the fundamental goal of planning at the time: the merger of the goals of beauty and efficiency (what was practical was beautiful and vice versa).

**Current Relevance of Stübben**

The translation of Stübben’s book is relevant on two fronts: as an important historical document and as a still-relevant manual of town planning practice. As a historical work, the book will provide important insights into early city planning practice in the U.S., because of Stübben’s influence here. But perhaps more importantly, “Der Städtebau” is still useful and relevant today, as planners seek to revive the lost traditions of town planning that were at the forefront of planning in the early 20th century.

Stübben’s work will be of particular relevance to the many people involved in what is known as New Urbanism, an urban planning and design movement with about 2,000 paying members working to reform the way cities are built in the U.S. This movement extends beyond the New Urbanist organization itself and is now
embedded in much of the current thinking about city planning practice.

The basic agenda is to reform all aspects of real estate development, including new development, urban retrofits, and suburban infill. In all cases, New Urbanist neighborhoods are designed to be pedestrian oriented and contain a diverse range of housing types and land uses. There is support for regional planning for open space, appropriate architecture, a more prominent and well-designed public realm, historic restoration, safe streets and green building, among other principles.

Importantly, the New Urbanists have worked to revive the art of city building by looking to past practitioners. Planners working in the first decades of the 20th century are particularly relevant precisely because of the specificity of their planning proposals. They were deeply involved in formulating the design of urban places, from streets to plazas and squares, to complete neighborhoods, parks, and all other fundamentals about how cities can be beautifully designed. To the New Urbanists and many others working to revive these lost traditions, this was city and town planning at its finest.

Obviously, the principles of city planning that Stübben detailed in his encyclopedic work will not be directly transferable in all cases. But they are a critical resource for understanding the logic of planning cities in a way that merges practical, technical and artistic notions of human settlement. How these elements of the urban environment are put together is something city planners, and especially the New Urbanists, are dedicated to understanding, reviving and implementing.

Stübben’s “Der Städtebau” will be a much needed addition to the lexicon of the art of city building.

Emily Talen
Julia Koschinsky
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PART I

THE FUNDAMENTAL PRINCIPLES
OF CITY-BUILDING
Introduction

City building prepares the ground on which individual constructive activity unfolds. It creates local preliminary conditions that must exist for dwelling, city traffic and pubic affairs; it makes the frame that surrounds the competing elements, according to which private and public building activity and traffic large and small must be carried out.

Laying out of a new city or part of a city – as well as the improvement of old city districts – must be based on the local needs of daily life, of commercial activity, of traffic, and of the community.
It must start with local customs and endeavors and, improving and changing them, work towards a more perfect development.

Before we detail the different phases of city building, we must first consider in section 1 the fundamental principles of city building, namely:
• The housing problem with consideration of social and commercial conditions;
• City traffic in its relation to streets, railways and waterways; and
• Public works in their connection with the city plan and their influence on it.

We next apply these considerations in Part II, which is to treat the design of the city plan in detail according to outlines and levels.

Part III deals with the city building plan as a whole, that is for whole cities or whole city districts.

Part IV is concerned with the carrying out of the city plan, the practical application of the design.

Part V deals with the technical and artistic equipment of streets and squares, with drainage, structures in the streets, and artistic ornamentation.

Finally in Part VI, garden areas will be discussed, namely rows of trees, planted squares and parks.

The Appendix contains some legal regulations, local ordinances and recommendations of societies.

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1 Because of the awkwardness of the translated text, the Introduction was edited by Emily Talen and Julia Koschinsky. We were careful to maintain Stübben's original meaning and intent.
A brief consideration of the methods of housing lies in so far essentially within the scope of city-building as the various solutions of the housing problem have a decisive influence on the form and arrangement of the city plan. The design for a new city or a new part of a city should conform to the local style of architecture but should also be used to improve and remodel it. This, of course, concerns the architecture of cities and their suburbs, not country dwellings which are not considered here at all. The question of city dwellings is to be regarded from three points of view, namely:

1. according to the relation of the house to the building lot,
2. according to the number of dwellings in the house and
3. according to the kind of residents and their requirements.

The Relation of the House to the Building Lot

1) Detached Houses

We distinguish between detached houses and blocks. The detached method of building requires that the house should be free on all, or at least on three, sides (semi-detached). Houses free on all sides are the rule among the better class of suburban residences of villas (fig. 2). The house receives air and light from all sides; it is entirely surrounded by the garden or park, in which the stables or utility buildings and any other secondary buildings that there may be are placed as unobtrusively as possible. The buildings are usually set back from the line of the street making the line of the houses a different one from that of the street, as among other things is provided for in 91 of the Prussian law relating to flush lines (see appendix). Fig. 1 shows how a whole block, surrounded by four streets, is formed of separate villa sites. The space between the building line and the street line is generally arranged as a front garden and is enclosed by an iron fence along the street.

Buildings free on three sides are the result of building two houses side by side with a common party wall, but treated in other respects as has just been described. This is the way double or semi-detached villas are built (fig. 3.)

This inclusive grouping can also be extended to three or more houses of which the middle ones lose their free position. This is called building in “groups” and “half-open” rows.
A very desirable way of using this method of building that is also applicable to middle class and workmen's dwellings, is to build the two long sides of a block closed leaving the two ends open so that the rays of the sun, light and air have free access to the backs of the houses. In order to keep the methods distinct it is well to use the term “group” for the method of building illustrated in fig.4, the designation “row” for that in fig.5.

The distance of the houses from the neighboring boundary varies greatly, being from 3m to 10m and more. In some places a distance of 3m from the boundary, that is 6m between the houses, has been found too little where the buildings have upper stories; the house should stand at least 4m better 5m from the boundary so that the intended effect as regards beauty and health may be realized. It is quite right that in many building regulations the distance should be made dependent upon the depth and height of the building; the latter is important in order that the rooms which are situated in the side of the house get the light at the proper angle. Low outbuildings may be erected on the boundary at the back of the lot with certain definite restrictions.

In many old towns the provision for a so-called “yield” resulted in an intermediate method of building between the detached and the block styles. This provision required that every house should “yield” a certain space to the neighboring boundary. The yield provided for in the Prussian statute book must measure between the buildings 0.75m (= 3 feet). In suburbs and between separate houses of the better class broader yields contribute to the picturesque and open appearance of the town, of which the out-lying city-gate streets of Frankfurt a., M., where the yield was provided for by law when the city was still a free-town, are a particularly beautiful example. In the centre of old cities, for instance, in Westphalia and Hessen, however, the narrow boundary strip lying between every two houses is apt to be a menace to safety and cleanliness; it generally receives the water from the rain gutters on the roofs and from the yard gutters, is also used as the passageway to the buildings at the back, as a place for garbage receptacles, as a convenient spot for lavatories and suchlike. It is clear that this modification of detached building is not advisable for new construction. Altogether for central city districts the detached method of building will be found desirable only in exceptional cases; in such districts building regulations are quite right in encouraging rows of buildings1.

The Stuttgart “Pavillon system” is a similar

connecting link between detached houses and blocks. It also probably is an outgrowth of the old custom of “yielding.” In Stuttgart it is provided by law that on one side of the house there must be a passageway at least 2.30m broad and on the other side a space at least 0.565m broad, making together an uncovered space of 2.865m (= 10 feet, Württemberg measure). This regulation does not apply to buildings at the back and sides of the house. Fig. 6 shows such a block of Stuttgart houses. In designing new streets and in several older streets where it was desire to retain as far as possible the existing unobstructed view, the building regulations in Stuttgart provide for a wider space up to 14m between the houses and at the same time limit the height of the buildings.

Also in Saxony, Bavaria and other states of the empire detached building is regulated by state and municipal laws. In Prussia it is no longer disputed that simple police regulations can make it as much the duty of property owners as any other kind of graduated density in building. A more detailed treatment of the subject is contained in chapter 7, from paragraph 4.

The detached or semi-detached style of building can also be introduced by private individuals, lots being sold on condition that the buildings to be
Fig. 4
Grouped Development

Fig. 5
Half Open Development
erected thereon be detached or semi-detached. The permanence of villa districts that have been laid out as such either voluntarily or owing to privately imposed conditions of detached building, is unfortunately not always assured. Only two often detached villas have gradually given place to rows of high houses as soon as some property owner has found it to his advantage to make a beginning in that direction. Thus for such districts supplementary police regulations are also desirable.

The advantages of detached building are not limited to graceful, pleasing appearance, better effect of the architecture and greater convenience for the occupants. It is also, in certain districts of the city, an important precaution for the health, not only of these districts, but of the whole city. With their supply of fresh air and their wealth of plant life buildings erected in this fashion benefit also the neighboring districts. They have a healthful effect similar to that of public gardens and parks and are therefore the more necessary the poorer the city is in parks and open green spaces.

The greatest advantages of course are enjoyed by the occupants of the villas themselves, as they are liberally provided with light and air, the rooms of their houses are bright and sunny and they are practically undisturbed by neighbors. By way of illustration several ground-plans of villas are given in figs. 7 to 12.²

The plans in figs. 7, 8 and 9 require very little space. For a house 7.80m broad and a space of 4.00m from the neighboring boundary on both sides fig. 7 requires a building lot of 15.80m in breadth; 11.80m is sufficient if the house is attached to another which is permissible as one side contains no windows. The American villa in fig. 8 cannot be attached to another and therefore requires a lot 16m broad; in America such little wooden country houses are kept in stock ready to be set up. Figs. 9 and 10 cannot be attached and require lots 16.30m and 18.50m broad respectively. Fig. 11 may be attached, allowing 3m “yield,” on a lot of 16.40m broad. The larger American country

house in fig. 11 requires a lot of 19.50m broad. The depth of these lots is generally from 30 to 50m. It may be said in passing that still smaller plan and lot dimensions are by no means impossible. On the other hand it is of course clear that really pretentious villas demand much more space; generous dimensions of all the localities in and about the house are most significant of its class.

2) Block Buildings

The advantages of building in blocks are that less ground is required for a dwelling house, that the buildings are better adapted for business purposes, that the cost of construction is less and heating easier and finally that a place of property accessible only from the front usually ensures greater safety. It would therefore be folly to make detached building the rule in cities. What is desirable is rather that certain districts, especially suitable on account of their locality, should be reserved for detached houses and that at the same time the disadvantages of block and row buildings should be reduced as far as possible by appropriate building regulations, especially by careful graduation of the latter.

These disadvantages are of three kinds: first, the detraction from the architecture consequent on the crowding together of facades of different heights, and other inequalities in the buildings, second the encouragement of a number of nuisances which are largely brought about by unnecessary common conveniences, as, for instance, common partition walls, common chimneys, common plumbing and water closets, common entrances and the like; but above all, third, the danger of interfering with the supply of air, light and sun.

As regards the first kind of disadvantage the authorities can scarcely do anything; the nuisances of the second kind can be successfully prevented by the authorities forbidding the building of disadvantageous common conveniences such as common cesspools, drains, chimneys etc. To forbid any conveniences to be used in common would evidently be to go too far and could not be carried out; thus the prohibition of party walls, which are the cause of many difficulties, would be very detrimental on narrow properties and in addition could scarcely be enforced in countries where French law is used.

The third kind of disadvantage arises chiefly from the fact that houses in blocks receive air and light only from two sides, from the street and from the yard and that buildings about the latter frequently curtail the supply on that side. Police regulations are directed against this evil in all cities but scarcely anywhere with entire success. The regulations concern principally the height of the buildings, the space that must exist between the windows and neighboring walls and the amount of space on each lot that must not be built on. This subject is more fully discussed in part IV, chapters 2 and 7.

The close fitting in of the houses that so often accompanies the block method of building is clearly seen in figs. 13 to 18 which show six building blocks in Berlin, Magdeburg, Cologne, Vienna and Trieste. The spaces for light are
generally reduced to the lowest permissible size in the corner lots which, as a rule,
are very closely surrounded by the neighboring buildings. The blocks in Berlin, Vienna, and Trieste however show throughout the greatest poverty in open yard space.

In distinction to villas or detached dwelling houses, the buildings adjoining one another in a row are called “built-in” houses. A built-in house is one that, besides the covered surface has only a court of lightshafts.

Figs. 21, 22, 26, 27, 28, 29, show the ground-plans of such built-in houses in Berlin, Magdeburg, Budapest, Paris, Madrid and London, some of them of the most extreme type. In figs. 21 and 24 the garden has not yet wholly disappeared. In figs 25, 26, 27 and 28 lightshafts have been resorted to in order to brighten to some extent the inside of the buildings. Even the mansion in fig. 26 is without any garden; its place is intended to be supplied, according to the Italian custom, by the gallery surrounding the court. In fig. 28 the narrowness of the building lot is less keenly felt as the house is occupied by a single family.

In the central districts of old cities this close construction was, and is, due to the narrowness of medieval building lots. In new cities, particularly in the great centres, it is caused by the extremely high price of land which has been much advanced by speculation and business competition.

More pleasant, healthier and more worthy of imitation are those built-in houses that have gardens adjoining their yards. Figs. 15, 16, 30, 31 and 32 show examples of such houses in Cologne and Brussels. This is the usual arrangement in the cities of northwestern Germany, Holland and Belgium, except in the business districts. As the little gardens often lie beside and behind each other a garden area of considerable extent, divided only by low boundary walls, can be formed in the inside of the block; examples are given in figs. 19, 20 and 33. Recently an effort has been made to compel property owners to keep the inside of the block open by establishing a so-called rear building-line which must not be encroached upon (compare chap. 7). In England the system of connected garden plots has been developed in such a way that the dividing walls are sometimes left out thus making one large garden in the inside of the block which is used in common by the occupants of the houses surrounding it.

On the Continent this English fashion of a common private garden, which also often forms a block by itself surrounded by streets, has been imitated very little. On the other hand many of our most pleasant dwellings are built in closed rows and the streets on which they stand are beautified by rows of little front gardens on either side, such as were mentioned above in connection with villas. In business streets these front gardens (figs. 1, 2, 3, 19, 31, 33) are out of place, but so much the more decorative and pleasant in the quiet residential

3 Deutsche Bauzeitung 1884, S. 381
4 From: Centralblatt Deutsche. Bauverwaltung 1884, S. 299.
Fig. 13
Housing block in Berlin

Fig. 14
Housing block in Magdeburg

Fig. 15
Housing block Cologne

Fig. 16
Housing block Cologne

Fig. 17
Housing block in Vienna

Fig. 18
Housing block in Triest

Fig. 19
Housing block in Cologne with gardens and front yards

Fig. 20
Block of single family homes in Rotterdam
Fig. 21
Residential house with inner courtyard and garden in Berlin

Fig. 22
Residential house in Berlin

Fig. 24
Residential house with inner courtyard and garden in Berlin

Fig. 25
Multistory house with four apartments per floor in Vienna

Fig. 26
Residential housing for elites in Budapest
streets whose traffic breadth may safely be somewhat reduced as the space above the gardens helps to provide light and air. The depth of the little gardens is usually from 3 to 10m (see also the street cross sections in part II, chap. 5)

b) Number of Dwellings in the House

The number of dwellings in the house, or in the majority of the houses, affects the shape and size of the building lots and thus also indirectly the appearance and development of the city. In this connection we distinguish between the house that is intended for a single family and the building intended to be occupied by several families. The former is called a one-family house, single house, private house; the latter a tenement house, flat-house, apartment house. Both kinds of houses are to be found in all cities. In some places however only the highest class of the population lives in private houses so that the appearance of the city is little affected whereas in other countries the middle class urban population also lives in private houses which
thus become a main factor in the appearance of the streets and the way they are laid out as well as in the mode of life, though the flat-house is found occasionally.

If an approximate semi-circle is drawn from the coast of the North Sea to the coast of the English Channel, embracing the cities Bremen, Münster i. W., Cologne, Coblenz, Luxemburg and Amiens, in the section of Europe lying to the northwest of this line and in England private houses are more or less exclusively used while on the rest of the Continent flat-houses are the rule. Thus we find that England, northern France, Luxemburg, Belgium, Holland, the Rhine Province, parts of the provinces of Westphalia and Hannover, and finally Bremen and Oldenburg are the countries of the private house, which begins to be mixed with flat-houses of medium size in northern France, the Rhine
Province and Westphalia. The urban population in central and southern France, on the contrary, and in the other Latin countries, in northeastern, central and southern Germany, in Switzerland, Austria, Hungary and Russia lives as a rule, in large flat or apartment buildings each of which houses a group of families. From a social point of view and also from considerations of health, the private house is doubtless the better of the two models of living; but in the personal feelings of many, habit and local customs are apt to influence the judgement.

The apartment building—so called because each story forms one or several separate units—has its advantages too; it offers, especially in the lower stories, comfortable dwellings, the rooms of which are all on one floor and are better adapted for housekeeping and entertaining, at less expense than is possible in the single house because the cost of stairs, court, roof etc. and also the cost of the building lot, which is usually from 20 to 30% of the whole, is divided among several units lying above and beside one another. This reduction in the cost of the lot however is outweighed by the fact that as soon as high and dense building is permitted the price of land rises. Although it necessitates frequent going up and down stairs, owing to the rooms being on different floors, the private house is incomparably more comfortable and homelike but generally more expensive.

Apartment houses form a line of imposing streets fronts but unless they are planned with special care they are apt to be of barrack-like uniformity. The custom, particularly common in southern countries, of treating flat-houses architecturally as group buildings, or even like palaces, always has something false and therefore inartistic about it; at its best it is only sham stateliness. The architecture of private houses, as long as they are not turned out wholesale according to a stereotype pattern, as is unfortunately the case in England and America, is individual according to the taste and needs of the occupants and therefore offers considerable scope for artistic treatment even in the simplest houses, though less “imposing” than apartment buildings.

The private house has two or three stories; seldom more; the apartment house has four or five stories, seldom fewer. In Paris and Rome seven-story houses are nothing unusual; in New York the number increases up to fourteen in apartment houses, business buildings being still higher. Private houses would require but few police building regulations, for everyone is the best guardian of his own interests. It is for apartment houses in the interest of future inhabitants, that the great number of ordinances and regulations is necessary which are constantly being increased; yet they do not prevent the disadvantage of several families living together, nor quarrels among the occupants about property used in common.

The first purpose of the apartment-house is the investment of capital, based on the general demand for dwellings; its business is to yield as high as income as possible, as its German name “Zinshaus” clearly shows. The business of the private house is to provide as pleasant a dwelling as possible suited to the
particular circumstances of the family occupying it.

The apartment-house changes its occupants and its owner as goods change hands; it has no intimate, one might say sympathetic relation to those beneath its roof. It must suit everybody, must renounce all individuality. The occupants do not love their house; they care only for the parts of it that they use. The entrance and stairway are really adjuncts of the public street and as a rule open to everyone. A special porter or janitor must take care of the house and see that the stairs are lighted at night for general use. The care and cleanliness of parts of the house, particularly of the courts and gutters, often leave much to be desired; the conditions are favorable to impure air and the spread of infectious diseases. A garden attached to a flat-house is a rarity; if it does exist it can generally be used by only one family among all the tenants.

The private house, on the contrary, is, or at least should be, built to meet the needs of some one particular family. Unless it is put up by some speculator in order to be sold it seldom changes its owner and occupants; it is suited to the settled middle classes; it is home, in the narrow intimate sense of the word. “My house is my castle,” says the Englishman. The occupant of a flat-house cannot speak of his castle in this sense; his child has no home.

Apartment houses may be divided into three kinds:

1) the ordinary flat-house which contains two or three dwellings besides that of the owner;
2) the medium-sized apartment house, often elaborately appointed, containing dwellings for from six to eight or ten families;
3) the tenement house for more than ten, sometimes for as many as a hundred families.

In places where the price of land is high small flat-houses are found quite frequently even in cities where private houses are the rule and, as the result of economical necessity should not be condemned; in cities where the population is housed almost exclusively in flat- and apartment buildings they are the best means of relieving the above-mentioned disadvantages. The medium-sized apartment house, if well arranged, may also provide an acceptable dwelling, though it must always be objected to on principle. The large flat-house and especially the tenement house containing more than twenty dwellings is the result of speculation in real estate and is to be combated everywhere as the grave of comfortable living.

In English and Dutch towns where private houses are in very general use, not more than from 150 to 250 persons live on a hectare, although the houses are built close together. In the large Continental cities, on the contrary, the number of persons per hectare often rises to 500. In some parts of Berlin the figure even exceeds 700. In Naples where the roofs, and in San Francisco where even the
cellars and sub-cellar are inhabited, the density is still greater in spots.

As the erection of the first dwelling house marked the end of the first stage of man's history and the foundation of the first town the beginning of a higher civilization, so the accumulation of many families in a strange house is, if not a step backward, at least an extremely shady side of our civilization.

In eastern Germany not less than from 90 to 96% of the inhabitants live in rented dwellings\(^5\); an increasing number, which, as long ago as in 1871, amounted in Dresden to 10% of the population, live as lodgers. In 1880 in Dresden 28,7% changed their places of residence!

In 1890 the average number of inhabitants to each piece of property was 7 in London, 7,6 in Lüttich, 8,4 in Rotterdam, 9 in Philadelphia, 9 in Brussels, 14 in Cologne, 16,8 in Düsseldorf, 17,5 in Aachen, 18,5 in Dortmund, 22 in Stuttgart, 28 in Munich, 34 in Chemnitz, 36 in Paris, 47,5 in the Magdeburg suburbs, 50 in Breslau, 55 in St. Petersberg, 63 in Vienna and Berlin. In 1900 these figures had risen to 17 in Cologne, 20 in Düsseldorf, 19,4 in Dortmund, 23,2 in Stuttgart, 34,4 in Munich, 52,8 in Breslau, 77 in Berlin. These figures which, in the last mentioned cities, seem to be still on the increase, show clearly the differences between cities with private houses and those with flat-houses. In Vienna and Berlin each house contains on an average from 12 to 15 family dwellings! In 1900 39% of all the dwelling houses in Berlin were regular barracks with more than twenty dwellings each. In the cities just mentioned those of the Rhine and Westphalia with their mixed housing system and Stuttgart with its “pavillon system” form the transition from one extreme to the other.

After what has been said there can no longer by any doubt that from a moral, social and artistic point of view, as well as from considerations of health, the private house should be preferred to the flat or apartment house. As Luthmer fittingly expresses it, the private house should be the “normal house.”\(^6\) The right of the flat-house, especially of the smaller and more intimate type, to exist must not be denied. For the great army of clerks and officials who are likely to be transferred from on place to another at any time and for the numerous families who cannot afford to buy or rent single houses, the flat-house is a necessity. We may even go so far as to say that under our city conditions, formed as they have been by real estate and building speculation and by industrial development, the flat-house is more practical and can less easily be dispense with than the private house.

This brings us to the recognition that the mixed system is what we are striving towards. Not that we would recommend, in places where the single house is now generally used, that it should continue to be built and be enlarged by additions and extra stories so that the resultant mongrel-house is too large for

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6 See: Der Zeitgenosse 1883, S. 139.
one family yet unsuitable for more owing to the lack of privacy and independence in the grouping of the rooms. Examples of such a mistaken development are unfortunately only too numerous in the cities on the Rhine and in Belgium. We mean rather that private houses and flat-houses, kept entirely distinct in type, should house the population of such cities. It is not noticeable that the two modes of dwelling, the “vertical” and the “horizontal” system as they have jokingly been called, are actually beginning to establish themselves in those cities that lie near the geographical boundary mentioned above. In Lille, Cologne, Düsseldorf and Dortmund the flat-house, principally owing to land speculation, is unfortunately fast gaining ground; to which fact the increase in the number of residents in a house, as cited above, bears witness. In Mannheim, Frankfurt, Hannover and other cities the private house seems to be becoming more popular. It should be the endeavor of all those who are interested in the problem to combat the erection of large, barrack-like flat-houses and to further the building of small flat-houses and especially of private houses particularly in cities where custom and the real estate market act as hindrances.

The development of North American methods of housing, based on the English and Dutch custom of private houses, shows little that is worthy of our imitation, but is very instructive. Underlying the whole American housing system is the size of the building lot—25 feet wide and 100 feet deep; it is the site of the usual “three window house.” Out of this normal single house (figs. 34 and 35), which differs from European single houses in that the depth of the lot is used to a greater extent, still narrower houses have been developed (figs. 36 and 38) by using two lots for three houses or three for four, so as to reduce the cost of construction and also to make it possible for families of scant means to occupy a whole house. On the other hand this same 25 foot broad building has been turned into a tenement house (fig. 37), or again several such lots have been used as the site for a large flat or apartment building (figs. 39 and 40). The unusual depth of the lots and the consequent lack of air in the interior of the single houses must arouse our misgivings; this evil is of course much augmented if the ordinary three window house is turned into a tenement house with four dwellings on each floor (fig. 35). For smaller dwellings the arrangement of the flats in fig. 40, with a janitor, elevator, common localities for washing, heating, children’s play etc. is a decided advance, though here too the inadequate provision for light and air is regrettable. Suitable dwellings for families in comfortable circumstances, with private corridors like those in European houses but with more centralized housekeeping, are found in the large apartment houses, of which one is shown in fig. 39.

Flat-houses seem as yet to have had little influence on the appearance of American city plans. As the ordinary building lot is 100 feet deep by 25 feet

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wide the blocks are almost always rectangular extending 200 feet in one direction, 1000 in the other
(compare the combination of the two kinds of houses in fig. 41).

Although the coming into general favor of the flat-house in America is, in some respects, to be greeted as an advance, the fact must yet be emphasized that objectionable developments of such houses are particularly noticeable there. In New York apartment houses have been built 36m high with 14 stories and containing 100 and more dwellings! To prevent such exaggerations new building laws have been made limiting the height of dwelling houses to 24.38m that is 80 feet. This corresponds to the law existing in German, French and Italian cities forbidding the erection of more than five-story dwelling houses. It does not however hinder the construction of so-called sky-scrapers. Another American development that has already been introduced in London and Paris is the apartment hotel. (boarding-house). Large houses are furnished with common refreshment and housekeeping rooms, kitchens for the service of all the occupants, common reading rooms etc. thus forming the connecting link between a European flat-house and a hotel. In the interests of family life and the bringing up of children we should like to keep also this monstrosity out of our cities.

Plans of European private houses built in rows have already been given in figs. 28, 30 & 32, further in fig. 43. The interiors of Belgian three-window houses in particular are most carefully adapted to family life; we find a similar
treatment of the modest private house in Bremen. Peculiar but scarcely worthy of imitation are the old Dutch houses on extremely narrow and deep lots with the rooms in a row one behind the other⁸. In London there is a lamentable lack of variety; the ever recurring repetition of the same house not only makes the streets uniform and monotonous in appearance, but prevents the interiors of the houses being adapted to the individual needs of different families. On the Rhine

and in the suburbs of Munich and Berlin the practical arrangement of both the exterior and interior of single houses is very creditable.

Flat-houses in European cities are shown in figs. 22 to 27, 29, 42, 44 to 46, 47, 48 & 49. The Stuttgart plan is of a detached two-family house. Both it and the Vienna plan illustrate the southern German custom of grouping the rooms of a dwelling about a common entry or small hall, a practice that is becoming more and more general in the private houses of northern Germany. In the Magdeburg and Berlin plans attention is called to the so-called “Berlin” corner rooms lying on the side next the court, the backstairs and back corridor, the place of which is taken in fig. 24 by a gallery. The Paris house in fig. 27 is divided into front and court dwellings, those in Vienna, Hamburg and Madrid are each divided into two dwellings lying side by side. Floors containing four or more dwellings are not rare. In the Hungarian plans the courtyard is surrounded by a gallery according to the southern custom, from which the different rooms or dwellings are accessible. The Magdeburg plan and the two French ones shown in figs. 47 & 49 are of dwellings in corner houses. Of the Cologne plans that shown

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9 Centralblatt der Bauverwaltung. 1884, S. 299.
11 Nach: Deutsche Bauzeitung 1884, S. 381.
in fig. 42 is only 11.3m wide; usually in the Cologne and Stuttgart houses each floor is arranged for only one family and there are no backstairs\(^\text{12}\). The breadth of a house on the street is called front breadth (or front

The front breadth of the built-in private houses in the examples given is at least 4.80m; in old towns even narrower breadths are sometimes found. As a rule the breadth of three-window houses varies from 6.50 to 10 m, of four-window houses from 9 to 13 m. The depth of the lot on which a private house stands (depth of the house plus yard and garden) may be from 20 to 50 m, generally it is from 28 to 35 m. Really pretentious private houses, whether detached or not
require larger building lots than those given.

The dimensions of building lots for flat-houses are of course larger than those for private houses as all the household requirements are on one floor. The type of house that is dominant in a city also governs the form of the building lots and the blocks. According to whether the front breadth of the house is divided between two dwellings on each floor or belongs entirely to one, the measurement varies from 9 to 40 m, averaging about 18 m. There is also as great a difference in the depths of the lots. As the garden of a flat-house is of secondary importance and also does not thrive well on account of the great height of the building, we may conclude that such houses do not require as deep lots as single houses.
On the other hand the larger wings of a flat-house, permissible because of the demand for more rooms, may extend farther back than in a private house. As a rule therefore the property consists of the front house, side wings, rear building and a courtyard, without a garden (fig. 50). If the lot is very deep the side wings and rear or cross building can be repeated at will, to the disadvantage of the occupants. In Berlin, for instance, there are cases where five courts and cross buildings stand behind one another and more than 200 families live on the same property (fig. 51). This high number of dwellings is comprehensible when we remember that only the very poor would inhabit such a house and that therefore the whole group of buildings is divided into very small dwellings. Thus we see that if from 30 to 40 m is the normal depth of a lot for a flat-house, still depths of 15 m or 100 m may be found, the latter being by no means a blessing to the occupants.

In the depths of building lots extremes are to be avoided. If the depth is too slight the owner or builder is obliged to be contented with the smallest permissible yard. If it is very great the lot may be built on, up to the limit allowed by the police, so as to increase the income from the property.

Where private houses are the type most in use lots up to 40 m in depth are desirable as they encourage the possession of small gardens, even depths of 60 or 70 m are not serious defects, except as regards cost, if the space behind the house is used for a garden or business purposes. The apprehension that the inside of such deep blocks might be used for storehouses and suchlike generally prevents their creation. In exceptional cases attractive garden dwellings are erected on the back of very deep lots (fig. 52). This cannot be recommended as a general practice. It is clear that it is better to keep the measurements of the blocks moderate and thus provide every house with a street front.

Even when used for private houses corner lots require longer street fronts than the usual breadth of a single house. In any case however the corner lot has generally to dispense with a garden and is therefore not very suitable for a private house. It is better adapted for flat-houses (figs. 23, 39, 47, & 49) as the long street front makes it possible for most if not all of the rooms to look on the street; in any case however the absence of a large, light court or yard will considerably lessen the attractiveness of the house.

c) Types of Occupants

Different classes of the population require different kinds of houses. The prince’s or millionaire’s palace, the rich man’s private house, the house containing shops, the restaurant, the hotel, the house with workshops, the mercantile building with offices and stores, the factory, the workingman’s house and other kinds of houses require that attention be given to certain considerations that do not enter

into the erection of the ordinary dwelling house. All these considerations cannot be discussed in detail here; it will suffice to emphasize certain points that might affect the planning of the city.

Palaces and the best class of private houses require, on the one hand, extensive building lots and, on the other, positions convenient to the traffic lines of the city. The streets on which they stand must also be of the finest type. The lots must be arranged to contain a front court (cour d’honneur), a garden, stables and coach houses, if possible with separate entrances from side or adjoining streets. The street should be one of those designed for residences in the city plan, with rows of trees and containing garden areas and artistic decorations; it should be of considerable breadth, if possible affording attractive landscape and distant views but at the same time should be near the main business streets and places of recreation.

Residences of a lower rank, for gentlemen of independent means, high officials and others belonging to the higher middle class, do not require such prominent sites. Quiet streets, not too far from the centre of the city, with little or no teaming, but yet much used for driving and walking, are particularly adapted for houses of this kind; front gardens, detached and semi-detached construction are especially desirable.

Shops and other business houses on the contrary belong in the main traffic streets. The closer we get to the centre of the city the more choices there are in the wares displayed and the greater is the variety; on the main streets leading to the suburbs are the shops for people coming in from the country, in the heart of the city are the art dealers, jewelers, and merchants of other valuable wares. Corner lots are always preferred for shops, owing to the extensive street frontage and to the fact that a corner building strikes the eye and impresses itself on the memory.

Hotels and restaurants (cafes etc.) are also situated in the principal traffic streets. Corner lots are favorites for these structures, deep lots not unsuitable for hotels and restaurants.

Large building lots are necessary for workshop buildings and mercantile houses owing to the space required for the workshops and storerooms. It is not essential that they should stand on the main business streets, but convenient entrances for loading and unloading and good connections with all the transit lines, express and freights depots of the city are indispensably. It is very desirable to have the building accessible from two streets, the dwellings from a main street, the yards, storehouses, offices and workshops from a side or back street. For this reason, among others, differences in the breadths and arrangement of parallel streets, such as are particularly noticeable in English and American cities, are exceedingly practical.

A factory requires more space for its buildings than the ordinary dwelling or business house. For factories and similar structures therefore the city-plan
needs more extensive parcels of land in an appropriate locality where there are suitable, if possible direct connections with rail and waterways and where the price of land is moderate. The neighborhood should either already contain houses for the workmen or should be such that they could conveniently be erected there. If in the suburbs the land lying between the main streets leading out from the city is left undivided and the uses to which it might otherwise be put are provided for in the city plan in other quarters, the rest may safely be left to its natural development.

With the expansion of the city the provision for workmen’s dwellings\textsuperscript{14} becomes a difficult and most important matter. Careful and active measures should be taken to meet the demand particularly in places where the working people, steeped as they are for the most part in discontent, have real cause to complain of the housing conditions. In large cities the workingmen are frequently subjected to “house usury” that compels them constantly to reduce their standard of living. The number of fourth and fifth story dwellings increased ninefold in Berlin between 1861 and 1880; in 1900 it amounted to nearly 18% of all the dwellings, in Dresden 16%, in Düsseldorf only 1.3%. Of all the dwellings in Berlin 49% had only one room that could be heated, in Dresden 48%, in Breslau 46%, in Königsberg 50% of the dwellings were of this type.

Conditions in the great workingmen’s “barracks” where numerous families often live on one floor in one or two rooms, are piteous in many cases. The provision for light and air, for cleanliness, drainage and water closets is often wretched. The swarms of children are obliged to play in the half-dark corridors, the narrow, high-walled courts and the streets. The parents can take no pleasure in their home; outside recreation, immorality, crime are the results. The letting of workmen’s dwellings is a disagreeable occupation. Well-meaning people therefore seldom invest money in such houses. Real estate speculators too are little inclined to put capital into them for it is difficult to find purchasers of such properties. So it happens that the business of letting small dwellings easily falls into hand that make more or less a usurer’s business of it. The smaller a workman’s income is the larger, as a rule, is the percentage of it that must go for rent.

It is difficult to find remedies. Besides adequate building regulations and provision for proper inspection it is a question whose business it is to provide suitable workmen’s dwellings and how they should be arranged and equipped. The problem may be taken in hand by the municipal authorities, by individual

\textsuperscript{14} Among the many publications existing on the housing of the working population attention is called to the following:
manufacturers, public benefit stock companies or endowment societies. The municipalities have in general not done much in this respect; much credit is due to the cities of Ulm, Freiburg i. B., Frankfurt a. M., Düsseldorf and several others for their activity in this direction. On the other hand the number of employers who provide dwellings for their workmen is very large, prominent among them being: Dolfus in Mülhausen i. E., Krupp in Essen, the Administration of the Prussian State Railway, the Administration of the Prussian mines in Saarbrücken, the Bochumer Verein für Bergbau und Gussstahlfabrikation(fig.65), Schöller-Mevissen & Bücklers in Düren, Felten and Guilleaume in Cologne. The number of building, benevolent and endowment societies that are concerned with the erection of small dwellings has lately increased encouragingly. It is certainly an urgent duty of state and city governments to support these societies and associations in their benevolent work.

The type of workmen’s houses is developing in the direction of flat-houses rather than towards single houses. However philanthropic the theory may be of making the workman the owner of his home, in practice it has its disadvantages as experience has shown, for instance, in the Mülhausen colony. The purchase of a house sometimes binds a workman faster to one particular factory than is well for him. As the owner of a house the workman, like everyone else, lets rooms and the old evils crop up again, overcrowding, the renting of beds etc. Sometimes he is persuaded to sell his house and the purchaser carries on a lodging house under unfavorable conditions. Nevertheless in rural factory places and in the environs of large cities the erection by employers or philanthropic societies, of small single workmen’s houses with space for gardens, or even the establishment of whole workingmen’s colonies, consisting of one and two family houses, can be of benefit if effective measures are taken in selling and renting the houses, to prevent the evils mentioned above. Fig. 53 shows the ground-floor plan of such a workman’s dwelling, built by the “M.-Gladbacher Aktien-Baugesellschaft;” only the two front rooms have attic rooms above them. The houses are built in groups of two and each dwelling has at least 114 sq.m of land.

Other examples are shown in figs. 54, 55 & 56. Figs. 57 & 58 show similar houses in whole blocks and colonies.

Such houses however are not suitable for towns and especially large cities because of the high price of land and the difference in the workingmen. In cities we are concerned with the erection of practical tenement houses with small

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Trüdinger, O. Die Arbeiterwohnungsfrage und die Bestrebungen zur Lösung derselben etc. Jena, 1889.
Verhandlungen des Deutschen Vereins für öffentliche Gesundheitspflege zu Frankfurt 1888 und Strassburg 1889.
Deutsche Vierteljahrschrift für öffentliche Gesundheitspflege. 1889, S. 1ff; 1890, S. 20ff.
dwellings grouped as independently as possible. In the Werkstättenbahnhof Leinhausen near Hannover the needs of a workman’s family were found to be fully satisfied with a living room of twenty, a bedroom of twelve, and a kitchen of eleven square meters. In most large cities a workman requires, according to the amount of his wages and the size of his family, two or three rooms that can be heated. In some families the addition of a third, in others of a fourth room would be not only unnecessary owing to the lack of need and furniture, but even disadvantageous because it might lead to taking lodgers. A little garden is all the more unnecessary because a city workman would not know how to care for it. A kitchen living room is nearly always preferred to an extra kitchen; a separate water closet on the other hand is essential.

How many such small dwellings should be contained in one house depends on local conditions and considerations of price. In outlying city districts where land is comparatively cheap, four-family houses, with two dwellings on each floor will be found practical and desirable. As long ago as in 1851 Prince Albert exhibited such a house at the international exhibition in London. The detached eight-family house divided criss-cross on each floor into four dwellings is similarly arranged (fig 59, 60); each dwelling has a ground space of 64 square meters. The price of the land and the cost of construction are frequently so great that a comparatively high rent has to be asked and the object of the whole undertaking is thus defeated. To
reduce the cost it is generally necessary to build the houses in close rows with common party walls and to add second and third upper stories (figs. 61 to 63). More than twelve families however should not be housed in one building.

In the endeavor to keep down the cost of the land and construction takes the form of building as many dwellings or rather rooms as the building regulations allow on every floor, in the wings and rear building, facing the courts and corridors; if in addition the dwellings are not grouped as independently as possible and separate water closets, cellars and attics are not provided; if finally a superintendent is employed whose principal duty is to squeeze as much income as possible out of the property, who is pitiless in demanding the rent and in proceeding to ejection, whole families are often packed into single rooms and the wretchedness of the great metropolitan tenement house holds sway. Fig. 51 is an unusual example only in that the great depth of the lot has led to the erection of the numerous rear buildings. That housing conditions are growing rather worse than better is shown by the fact that in a period of five years in Berlin the number of occupants of rear buildings increased by one third whereas the number of those in front buildings increased by only one eighth.15

To combat this evil is the duty of the cities, associations and philanthropic societies that are concerned with the proper housing of the working population in large centres. They must build smaller flat-houses in the suburbs and larger ones in the city proper, in order, on the one hand, to offer a large number of working families comfortable homes at moderate rentals and, on the other, to compel, by competition, the owners of existing large tenements to lower the rents and to make improvements in their properties. The latter result would perhaps be of greater value than the former. If however, as may be anticipated, such measures should not prove sufficient to remedy the present wretched conditions, the worst houses would have to be suppressed, by means of legislation and

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Fig. 60
Open bloc of worker’s dwellings

Fig. 61
Smallest apartment house for worker’s families

Fig. 62
Apartment houses for workers

Fig. 63
Apartment houses for workers

Fig. 64
Closed bloc of worker’s dwellings

Fig. 65
Workers’ subdivision Stahlhausen in Bochum, showing playground and elementary school
municipal police regulations, and a high standard required of all houses erected hereafter. England has been the first to take such action in the Torrens and Cross acts. In Germany, owing to Miguel’s endeavors, the “Deutsche Verein für öffentliche Gesundheitspflege” has proposed that the least requirements of sanitary dwellings should be regulated by law. In the mean time laws relating
Fig. 67.
Krupp's worker's dwellings in Altenhof near Essen
Arch.: Schmohl.
A. Evangelische Kapelle.
B. Katholische Kapelle.
C. Erholungshaus.
D. Konsumanstalt.
E. Pfändnerhäuser.
F. Feuerwehr.
G. Korbflechterei.

Fig. 67
Krupp's worker's dwellings in Altenhof near Essen
A. protestant church
B. catholic church
C. recreational center
D. Coop store
E. Pfändnerhäuser (retirement homes for workers of Krupp
F. fire department
G. basketery
Fig. 68
Worker’s dwellings of the Solvay factory
A. school  B. pool  C. restaurant  D. Coop store
E. bakery and butcher
to dwelling houses have been passed or are in preparation in various German states; the housing problem is also constantly before the German parliament. The stricter the law and the police become in preventing the use of inadequate houses however, the more necessary it is to provide suitable ones.

The two kinds of workingmen’s dwellings that should be erected, particularly by philanthropic building societies, are three or four-story flat-houses with from one to three separate dwellings on each floor, and large block buildings. The erection of English block buildings which generally cover a whole block surrounded by four streets and are provided with extensive inside courts, is based on the fact that cheap dwellings in the city proper are only possible in large, four or five-story structures that are partly occupied by shops. According to Schmoller the experiment has been successfully tried in England of building these houses with all the entrances open right up to the doors of the separate dwellings so that they can always be overlooked from the street or the court; the stairs are built outside; the courts are surrounded by galleries in the Italian fashion; there are no common water closets; other conveniences to be used in common are limited to as few as possible. The effect of this method on morality, health, family life and mortality is astonishing; strict house regulations, weekly payment of the rent and careful management are, of course, necessary. Such block buildings have recently been erected with good results in Berlin, Dresden and Leipzig.

In Germany much interest and activity is beginning to be displayed in the problem of housing the working classes; it is to be hoped with the best results. These can only be accomplished if the practice of letting rooms and taking night lodgers be suppressed as far as possible by legal and police regulations as well as by the erection of buildings for unmarried workingmen. Such workmen’s barracks or lodging houses cannot be otherwise than highly beneficial. An excellent example of this sort is the boarding house for 1500 unmarried workmen built by the Bochumer society that was mentioned above16. Luje Brentano declared the erection of numerous such houses to be of the utmost importance in dealing with the problem of housing the working classes, because they are the best means of combating the practice of letting beds.

It would be a mistake to mass the workingmen’s dwellings together at one point in the city or suburbs. The daily needs of life and occupation require the intermingling of the classes. It is not indeed necessary that this intermingling should be carried into the dwelling houses (as is the case in Berlin) or worse, that it should be artificially produced; there are however in nearly all parts of the city certain less valuable sites on which it would be quite practicable to construct workingmen’s houses, and such undertakings should be encouraged by the authorities. The building lots for these houses must not possess too great depth as that, as far as possible, unpleasant courts and rear buildings may be avoided.

The small workman’s flat-house with only one dwelling on each floor requires a lot with a front breadth of 5.50 to 6 m and a depth of 17 to 22 m. A house with two dwellings in each story, entered from the same stairway, requires, if both dwellings are to look on the

16 See Part III, vol. 4 of this “Handbuch” (p. 261 in the 1st ed. p. 360 in the 2nd.).
street, a 10 to 12 m front breadth with a depth of 18 to 22 m. By the use of additions and wings the number of dwellings can of course be increased if the depth is greater, but this is not desirable. Thus it appears that the depth of blocks for workingmen’s houses should be twice 17 or twice 22m, that is 35 to 45m. A depth of 35m and somewhat more is also suitable for detached workingmen’s houses with the ground-plan divided in four and with from two to three stories (figs. 59,60). For large tenement houses and block buildings the depth of the blocks should be great enough to allow of plenty of light and air at the front and a common or divided yard in the inside of the block.

Examples of workmen’s colonies near the city and the place of employment are shown in figs. 65 to 68 and fig. 58.

The Kolonie Stahlhausen consists of 4-part dwelling houses (some of them with stables), a provision store, day nursery and children’s playground. The Kolonie in Agnetapark in Delft was founded on cooperative lines by the employer van Marken: it consists of 4-part and singlehouses charmingly arranged and is equipped with the common utilities mentioned in detail in fig 66. Although in fig 67 (Krupp’sche Kolonie) and fig 68 (Solvay-Kolonie) the pleasing lines of the streets and the arrangement of the main buildings are worthy of note, in fig 68, further the "framed“ marketplace and the variety introduced by the use of detached houses, rows and groups of houses.
PART I

CHAPTER 2: Urban Traffic

The public streets and squares serve the city traffic in the narrower sense of the word. In its wider sense it also embraces those means of conveyance that usually run on special lines beside, over or under the city streets and independent of them, like street railways, railways, and waterways.

a) Different Directions of Street Traffic

City streets are used both for traffic and for residences. If we distinguish between traffic streets and residential streets this classification merely means that traffic predominates in the one kind, and that the residential character is more pronounced in the other. In general it is impossible to make any sharp distinction between the two.

With the growth of regular traffic on a city street its value as a site for business houses increases and this value is of different, definite degrees though they cannot be expressed in figures. If the amount of traffic passes a certain limit the street is no longer as pleasant and suitable for residences and at the same time gains in favor as a site for business buildings and shops. The best "business position" is generally there where the traffic is greatest. If the latter reaches a certain point, as in parts of London, Paris, Berlin, and even in some streets of provincial cities like Cologne and Leipzig, the houses are gradually transformed into shops and stores and are only provided with janitor’s rooms for safety’s sake, while the dwellings of the tenants and even of the shopkeeper are crowded out into other quarters of the city. The traffic street has lost the last vestige of its residential character and has become entirely a “business street.”

The amount of traffic on a city street is not a matter of chance or caprice but is directly due to its position in the city plan. Even individual buildings to and from which there is a great deal of traffic, such as railway stations, post offices, city halls, market halls, etc., do not affect it to the extent that is commonly supposed. It is influenced far more by bridges, gates in fortifications and similar structures that confine or restrict the network of streets, because the constant streams of traffic in the central districts of the city are, as a rule, superior in strength to the irregular pulsations of the traffic at certain points. In some cities there are certain streets, bridges and other points where the traffic can scarcely be accommodated while the street leading to the railway station, the City Hall square etc. are almost empty except just after the arrival of a train, during a citizens’ meeting and on similar occasions.
In every city, that traffic is the greatest that is directed towards the centre, that is, the central or radial traffic. In the heart of the city it increases and is so distributed that the definite direction is lost while from this district it usually stretches out into the country in long lines or rays. The centre in this connection is not to be taken in its actual geographical sense but rather as meaning the centre of gravity of the arteries of traffic. If, on a city plan, the streets are drawn as stripes the breadths of which correspond to the amount of traffic and the centre of gravity of this network be determined, that point will be the centre of traffic. The less it differs from the geographical centre the healthier is the development of the city.

The centre of traffic is not a fixed, immovable point; its progress in the direction in which the city is growing is often noticeable. With the movement of the centre of traffic land values increase in the one direction, decrease in the other. The relative decrease in the value of the land need not however be absolute; it would perhaps be more accurate to speak of the rapid advance in value in the one direction, the less rapid advance in the other. For an all-round healthy economical growth of the city an unchanging centre of traffic is even more desirable than its agreement with the geographical centre.

In some large cities, like London, Paris, Vienna and Hamburg, a district of dense business traffic is grouped around the centre of traffic—the so-called “city.” In other large cities, like Berlin, Budapest, Rome and Marseilles, the main business and traffic streets are distributed in different parts of the city. The latter arrangement is undoubtedly preferable.

The radial streets leading into the heart of the city might be called “primary radial streets.” They diverge towards the outside and bound extensive sector areas which have to be split again by “secondary radial streets.” These run into another kind of streets whose course is circular or ring-like.

This brings us to the second sort of street traffic— the peripherical. Apart from the streets that are used mainly for pleasure driving and walking, the peripherical traffic is largely confined to connecting the radial streams or to purely local movements. It is therefore not as great as the radial traffic, though, like the latter, it increases as the centre of traffic is approached. Only in a few cities, like Paris, Geneva, Cologne, Vienna and Budapest, is the ring traffic, in these cases the inner ring traffic, equal to or greater than the radial traffic; peculiar local conditions, such as very narrow streets that make the centre of the city difficult of access (Vienna and Cologne), or steepness (Geneva), or a ring street very near the centre of traffic (Paris), are responsible in such cases.

If the traffic lines are limited to radial and peripherical directions the traffic scheme is incomplete, for in this case, in passing from one radial direction to another, the traffic is often obliged to take a circuitous course and to turn sharp angles. Consequently, with the growth of the city, the increase of the traffic and its accumulation at certain points, diagonal lines become necessary. It is of
course better to plan these streets at the beginning than to be obliged to cut them through afterwards. These diagonal streets start and terminate at the points where the radial and ring streets intersect one another: open spaces, railway stations and other structures towards which traffic is directed. Just as stays are necessary to hold the framework of a structure together, so too diagonals streets are essential to the completion of the scheme of the streets; in both cases however moderation must be observed.

It is scarcely necessary to say that the geometrical terms used – radial, peripherical, diagonal – have only an approximate meaning in a good city-plan which is by no means merely a geometrical piece of work.

At the junctions of the radial, peripherical and diagonal streets the building line is naturally set somewhat back thus forming open spaces that afford the opportunity to pass from one line of direction into another. This particular kind of open space is called a traffic centre; most open spaces serve other purposes, as is explained in part II, chapter 8. Traffic centres are characterized by extensive street crossings; they are the most difficult points at which to control the traffic. Their number should not exceed the demand; their proper technical and artistic arrangement and treatment is no easy task. The regulation and relief of the traffic at these points is not generally found in making the open space as extensive as possible but rather in limiting it and arranging for a suitable intersection of the streets.

The residential and other streets lying in the areas of land between the main highways are not included in the city traffic proper, that is, in the traffic from one district to another. They need not therefore conform to the radial, peripherical and diagonal directions, but may be as closely as possible adapted to property boundaries and other local conditions as well as to sanitary requirements.

The three traffic directions: radial, peripherical and diagonal do not appear clearly in all cities. In towns and in inadequately planned large cities the diagonal direction is often either completely lacking or insufficiently developed.

In cities laid out according to a rectangular scheme (Mannheim, Krefeld, Nancy, Turin, North American cities) and similarly planned city districts (Berlin, Chemnitz, Cassel, Munich, Wiesbaden, Darmstadt) the place of the radial and peripherical directions is inadequately supplied by long and cross streets; in such plans however diagonal lines have been found necessary.

The radial traffic system is based on the supposition of an approximately circular or semi-circular outline of the city. The semi-circular outline is frequently found in cities situated on the bank of a large river (Cologne, Basel, Antwerp, Orleans, Szegedin); the circular form is the rule in large cities which either do not lie on a river at all or through which a comparatively small river flows (Paris, Vienna, Milan, Bologna, Brussels, Aachen, Dortmund, Leipzig, Moscow). The fan-like scheme of the streets in Karlsruhe is based on aesthetic considerations in connection with the Residenzschloss (palace), but it does not meet the demands
of traffic because the palace is not the centre of traffic of the city. A rectangular scheme of streets presupposes of course an approximately rectangular city outline (Krefeld, Wiesbaden, Turin).

Often however the length of a city so far exceeds its breadth that the main traffic is almost exclusively in the long direction. This is especially the case in cities lying in narrow valleys or on the sea coast, like Elberfeld, Barmen, Karlsbad, Trieste, Fiume. It is equally true that the system of traffic directions becomes more or less blurred in cities through which a broad river flows, like Florence, Lyon, Lüttich, Stettin, Danzig and Dresden. This leads to decentralization of the traffic, to the formation of several centres of traffic of different values, a condition that is also found where several places have grown together and formed a city (London, Antwerp, Budapest).

b) Different Kinds of Street Traffic

On the public streets and squares traffic is composed of foot travel, bicycling, riding, teaming, carriage traffic (cabs, private carriages, motor cars) and street railways. For foot passengers special portions are reserved in front of the houses (pavements or sidewalks) or in the middle of the streets and squares (promenades, isles of safety); they are usually protected from vehicles by being raised above the level of the roadway, or, not so frequently and less practically, simply by curbstones or railings. Riding paths and bicycling paths are similar divided from the roadway where the width of the street permits and the necessity is felt; they can never be laid out directly in front of the houses and only in exceptional cases directly adjoining the sidewalks, as they would interfere with the approach to the houses.

The street area that is not separated by being raised or in some other way is open for general traffic, principally for teaming, driving and street railways. On very wide streets, under particularly favorable conditions, these three kinds of traffic may also be separated; but as a rule the same roadway serves for them all. The separation is easy, if a wide street has several roadways; for instance one paved with stone for teaming, a macadamized or wood-paved roadway for driving and several planted ways for riders and foot passengers; but it may also be found unavoidable in narrower streets as soon as the volume of traffic exceeds a certain limit.

Traffic is measured by ascertaining the number of persons or vehicles that travel on 1m of street-width hourly; as an approximately reliable limit the number of vehicles may be placed at 100, the number of foot passengers at 1000. When

17 Official statistics of traffic are unfortunately not available in sufficient numbers. In a period of ten minutes the author counted on London Bridge on an average 188 persons and 35 vehicles a minute, thus, with a pavement width of 6.4m and a roadway width of 10m, the figures were hourly per meter 1200 persons and 210 vehicles; the carriage traffic however was blocked at interval. — In the same way during a noon hour the author counted on the Langen Brucke in Berlin 840 persons and 90 vehicles per hour and meter. — On Old Broad Street in New York, according to Genzmer in 1906, the hourly traffic was 838 foot passengers and 42 vehicles for one meter of street.
the traffic is great it is necessary for the police to control it by excluding vehicles driving in one or both directions from the overburdened street and directing them into neighboring parallel streets. If this is not feasible the only alternative is to make new streets, which generally means cutting them through. Foot traffic cannot of course be excluded from any street. Carriages cannot be prevented from driving up to the houses in a street unless it was designed to be used entirely by foot passengers, as, for instance, arcades, glass-covered passages, etc.

The chief factor in urban traffic is the street railway, which has been in general use with us for scarcely three decades but is much older in America. In all countries it is being greatly developed. The way in which our cities are built and the plans of the suburbs often seriously hamper this development because the existing traffic lines are already fully occupied by other traffic, and, in regards to curves, connections, angles and ascents are usually little suited to tracks. By demolishing houses that hindered at corners and in narrow parts of the streets, by cutting through connecting and “overflow” streets old cities have had to accommodate themselves to the new demands and will have to continue to do so. Plans for suburbs and city expansion that do not take this factor in the traffic into account must be altered. Careful attention should be given from the beginning in new city plans to the requirements of the streets railways.

In providing for street railways lines the kind of motor power to be used has but little influence. During the last decade horse power has nearly entirely given way to electricity. The over head trolley system has come into almost universal use. Underground conduits are expensive; storage batteries have not proved successful in the long run. Steam is found on the outlying radial lines that usually receive the traffic from the suburban railways. The cable car system, in use in America, has not been introduced into Europe.

Street and suburban railway systems are more fully discussed in part II, chapter 10. The greater the distances become the more necessary it is to establish an independent quick transit system that runs on other lines than those of the city streets.

c) Traffic not on the Streets and Squares

Traffic that is independent of the city streets is conveyed either on railways or waterways. Railway service is of two kinds: local and long distance. The former is concerned with traffic in and about the city (Berlin, Vienna, Budapest, Paris, London, Liverpool, New York); the latter with traffic to other points. Waterways also are either local (Hamburg, Amsterdam, Cologne, Budapest) or long distance (lake, river and ocean traffic). Even though this kind of traffic be independent of that in the city streets yet the arrangement of railways and waterways stands in close relation to the street plan because city streets, rail and waterways in
their situation as well as in their levels must be accommodated to one another. In addition, railways station squares, embankments, land places, etc. form the connections between the various kinds of traffic and must therefore be placed organically in the city-plan on the one hand and in the plan of the rail or water ways on the other. This interdependence is particularly close where the railways or waterways penetrate to the centre of the city or where the growth of the city extends around and beyond them. This is the case with some of the terminal and “through” stations in large cities (London, Birmingham, Munich, Hamburg, Hannover), with the expansion of Berlin, Düsseldorf, Mainz, with the canals and harbors in Amsterdam, Antwerp, Hamburg.

In such cases it is one of the most difficult and complicated of tasks to satisfy all the demands made upon the city-plan from various sides. It would be desirable if the problem could be considered and presented from one source, or at least, if the authorities and companies concerned would frankly make their needs and wishes known to one another. But the one-sided manner in which opposing interests are represented often leads to a clash and obstinate struggle among them until finally a compromise is effected that might have been more completely and satisfactorily brought about at the outset. This is a sore point in city-building, connected with many abuses, to abolish which individuals have striven in vain. Its cure should be the grateful and effective task of the highest government authorities.
Besides the public places discussed towards the end of the last chapter, there is still a whole series of public buildings and grounds that stand in mutual relation to the arrangement and development of the city-plan. As railway stations, landing places, harbors and wharves accommodate and control the directions of certain parts of the traffic, the same office is performed to the same or similar degree by structures belonging to the post, telegraph and telephone; the markets (market-places, market-halls and stockyards); the administrative, court and assembly buildings; the churches and schools, the hospitals, exchanges and banks; the museums, exhibition buildings, libraries and theatres; the orphan and other asylums and prisons; the club and society buildings and places of recreation, parks and promenades; the abattoirs; the barracks and parade grounds and finally the cemeteries.

The influence of these and similar institutions on the city building plan is twofold owing, first, to their position in the city plan as a whole and, second, to their position in relation to the neighboring streets.

a) Geographical Position in the City-plan

Public buildings and grounds are divided into three groups: central establishments, to be concentrated as near as possible to the centre of traffic; distributed establishments, to be distributed in the different quarters of the city; outlying establishments which, either for practical reasons or of necessity, are placed in the outlying districts or even on the extreme edge of the city.

Central establishments include the City Hall, stock exchange, main post office, banks, court and parliament buildings, hotels, museums and libraries.

To be distributed over the various districts of a large city are the branch post, telegraph and telephone offices, churches and schools, state and municipal administrative buildings, open and covered markets, exhibition buildings, theatres, club houses, public baths and laundries, fire engine houses and barracks of the fire department, finally, asylums, places of recreation, playgrounds, parks and promenades. In smaller towns these establishments will seek to group themselves as near as possible to the centre of the town.

Outlying establishments are barracks and parade grounds, prisons, hospitals and orphan asylums, large recreation grounds, parks and cemeteries,
abattoirs and stock (cattle) markets, finally, gas factories and establishments for the care and disposal of the solid and liquid city refuse. It is necessary that the last-named factories and establishments should be removed from the city and that the cemeteries, abattoirs and stock (cattle) markets should be situated on the outskirts, not so much for sanitary reasons as for the sake of convenience and on account of the city traffic, for it is disagreeable to live in close proximity to these establishments and as structures they are usually extensive enough to act as traffic hindrances. Furthermore stock (cattle) markets and slaughter houses must be directly connected with the railway so that cattle need not be driven through the streets; cemeteries, parks and large recreations grounds require no railway connection it is true, yet it is desirable to have them near railway stations.

The reservoirs and similar structures belonging to the city water works also, as a rule, should be outside the city, not only on account of the lower cost of land and construction, but also where river water is used, because the latter is purer there.

Railway stations and harbor buildings are also in general to be regarded as outlying establishments. The cost of property and construction leads in most cases to the establishment of freight and passenger stations and shunting yards on the borders of the city. The greater the city becomes however the more insistent is the demand for passenger and freight stations nearer the centre. In such cities either several main railway stations are necessary or one main station and several branch stations for the accommodation of passengers and freight; in such cases the stations take their place among the establishments whose distribution in different quarters of the city is highly desirable. (Compare also part II, chapter 10).

The above also applies to wharves and storehouses; the larger the city the more necessary it is to distribute them.

In large cities, although the business life is more concentrated in the heart of the city and the stock exchange, banks, post and telegraph offices must therefore be situated near the centre of traffic, the difference between the other central offices and establishments and those in the outlying districts is much slighter than in smaller cities. If all the public institutions and establishments were concentrated in the middle of a large city the outlying districts would lose to a great extent the conditions that further their development and the centre of the city, already overcrowded, would suffer under the burden of traffic and interests in a manner that could not but be injurious to the community. Those contrasts in the traffic of a large city which are expressed in crowded main streets and dead side streets, in dense, artificially increased traffic in the central and forsaken desolation in the outlying districts, are just as disadvantageous for the life of a city as the sharp contrast between the rich and the poor in social life. It is an important task in city-building to tone down these contrasts and to equalize the traffic as far as possible so that all parts of the city shall enjoy the healthy glow
of throbbing life and no districts or streets shall, like numb limbs, handicap the whole body.

**b) Position and Arrangement in Relation to the Neighboring Streets**

For practical reasons it is advisable for a public building to be accessible not only on one side but, even if it is built in a closed row of ordinary houses, to have entrances on, as well as light and air from, two streets. The latter consideration indicates that a site should be chosen facing a broad street or an open space. In addition such a building is easier to find if it stands on the axis of a street, if possible the principal street of approach. Or it may be placed on the hollow side of a broad, curved street or on the principal side of a decorative area, an artistically arranged square. In addition the approach may be not only along the usual radial and peripherical or long and cross streets but direct diagonal streets and special street connections or a square may from certain distances direct the traffic and the eye to the edifice.

Considerations of beauty require that the building shall form the terminal point of one or more streets, that it shall attract and hold the eye of the visitor by its raised and prominent position. It should also appear in pleasing perspective, be distinct from the ordinary buildings about it and stand out clearly in the general architectural view. In placing a building on the axis of a street however, care must be taken that it does not interrupt the course of one or another important street, that it does not interfere with the traffic and make a circuitous route necessary.

Figs. 69, 72 and 73 illustrate defective positions; the Elisabeth Church in Vienna as well as in a much greater degree the City Hall in Philadelphia are keenly felt hindrances to traffic. The Opera House in Paris (fig. 70), on the contrary, does not interfere with traffic although it forms the terminal point of the Avenue de l’Opéra and, apart from the surroundings of the long sides, occupies an artistically effective position. Other buildings
that do not hinder the traffic are shown in figs. 71, 74, 75, 76. In the first one the church stands on the axis of the street of approach and, seen from the choir side, the effect of the architecture is united to that of the water. In fig. 74, on the contrary, the position of the principal building on the axis of approach, with groups of other imposing structures
round about, is unfortunately combined with too limited an open space. This defect is avoided in figs 75 and 76 with several public buildings grouped about an open space.

The position of public buildings, especially on or bordering on open spaces, is treated in detail in part II, chapters 6 and 7.

Public buildings that do not stand in artistic relation to the lines of the streets or occupy some other prominent site are not only difficult to find; they also contribute much less to the beauty of the city because they are less seen. Owing to the arrangement of its streets Paris seems to be exceedingly rich in majestic works of architecture, whereas in Berlin and other German Cities many of the public buildings have to be sought out in rows of built-in houses and other insignificant positions. A site on a broad straight street without other artistic relations does not suffice either for the edifice itself or for its effect in the general view of the city.

The more important a public building is for the traffic or in an artistic sense, the more closely should it conform to the requirements of beauty. Mere practical considerations require that churches and theatres, museums and exchanges shall be detached on two, three, or four sides. In choosing the site for a majestic building space for suitable front squares and street relations should be determinative. In Germany too little value is still set on a position that satisfies the demands of beauty and art.

It is true that not all public buildings can fully meet the artistic requirements. If the building concerned is not one of the very first importance it will often be necessary to compromise between what is artistic and what is locally feasible. The nearer one approaches the heart of the city the more modest must the demands of beauty become. Here the architect must be governed largely by existing conditions and the high price of land. It would however be a mistake with disastrous consequences, in making plans for city expansion and suburbs, not to provide sites for public buildings which fully satisfy all practical and artistic demands. This defect is still unfortunately often found in plans for city expansion.
Fig. 75
Neuer Rathausplatz zu Kiel.

Fig. 75
New Place of the City Hall in Kiel

Fig. 76
Dom Pedro Place in Munich