CITY BUILDING
JOSEPH STÜBBEN

published by
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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 In this book we publish Albrecht’s translation basically unrevised, as a historical document, with all of its flaws.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.

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4 Typescript translation by A. Albrecht of the 1907 edition, Cambridge, MA, 1911 (497 pages).
6 Available at https://archive.org/details/derstdtebau00stgoog.
Acknowledgments

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Foreword

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.

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PART I

THE FUNDAMENTAL PRINCIPLES
OF CITY-BUILDING
Introduction

While in the first 8 half values of the fourth part of the *Handbuch der Architektur* the different kinds of buildings have been considered, the present (9) half volume aims to embrace all the kinds of buildings in city building which is the common foundation, the common frame of the individual buildings.

City building in this sense has for its subject all those parts of construction that make possible to the urban population on the one hand the erection of practical dwellings and structures where work is carried on, the traffic in the city and exercise in the open air and, on the other make possible to the community the erection of structures for administration, worship, instruction, care of the sick, supplying provisions, safety, and amusements, art and science, traffic and for all other public purposes. Hence city building prepares the ground on which individual constructive activity unfolds, it creates local preliminary conditions which must exist for dwelling, city traffic and public affairs; it makes the frame that surrounds the competing elements the programmes according to which private and public building activity and traffic large and small must be carried out.

Hence the life in cities, commercial life, distance and local traffic, communal institutions are the points of departure and the aims of everything that falls under the head of city building. The laying out of a new city or part of a city and the improvement of old city districts must be based on the ruling local needs of living, the commercial activity, the traffic and the community; it must start with local customs and endeavors and, improving and changing then work towards a more perfect development.

Before we go on to the different phases of city building we must 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.

The result of this consideration we shall seek to apply in part II which is to treat of the design of the city plan in detail according to outlines and levels. The third part deals with the city building plan as a whole, that is for whole cities or whole city districts while the fourth part will be concerned with the carrying out of the city plan, the practical application of the design. The fifth part will deal with the technical and artistic equipment of streets and squares, with drainage, structures in the streets and artistic ornamentation while finally in part 6 garden areas will be discussed, namely rows of trees, planted squares and parks. In addition the appendix will contain some legal regulations, local ordinances and recommendations of societies.
PART 1

CHAPTER 1: CITY DWELLINGS

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 buildings\(^1\).

The Stuttgart “Pavillon system” is a similar

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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\textsuperscript{3}, 27, 28, 29\textsuperscript{4}, 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

\textsuperscript{3} Deutsche Bauzeitung 1884, S. 381

\textsuperscript{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; 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. Petersburg, 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.” 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 one 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

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, 299, 42, 44 to 4610, 47, 4811 & 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

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\textsuperscript{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 breaths 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)\(^\text{13}\). This high number of dwellings in comprehensible when we
remember that only the very poor would inhabit such a house and that therefore
the whole group of buildings id 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(fig52). 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 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

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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
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. 63
Appartments for workers

Fig. 61
Smallest appartmenthouse for worker's families

Fig. 62
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 Miquel'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. 66
Fig. 67
Krupp's worker's dwellings in Altenhof near Essen
A. protestant church
B. catholic church
C. recreational center
D. Coop store
E. Pfründnerhäuser (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.\textsuperscript{17} When

\textsuperscript{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 Brücke 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

width.
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 of 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 peripheral 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.
Neuer Rathausplatz zu Kiel.

Fig. 75
New Place of the City Hall in Kiel

Fig. 76
Dom Pedro Place in Munich
PART II

COMPONENT PARTS OF THE
CITY BUILDING PLAN
PART II

CHAPTER 1: Building Blocks

The areas in the city building-plan surrounded by streets and building lines and intended to be built on are called “building blocks” or simply “blocks.” They are formed when the areas lying between the principal traffic streets are further divided by side and cross streets until they are reduced to a practical size for building purposes. This division is frequently not undertaken at the time the street-plan is designed and carried out, but is put off till later, sometimes until construction has actually been begun on the areas in question. This practice has both disadvantages and advantages. The former consists principally in making it uncertain at what points on the main streets, where building is constantly going on, the side streets will cut in. Consequently new buildings are often erected on sites which are later found necessary to use for the cross streets, or houses intended for corner structures find themselves in the middle of a block while buildings with bare, unsightly sides disfigure the corners of the new streets. Such examples are unfortunately not rare in the modern parts of our cities. The later division of the blocks has however the great advantage that one can be more sure of meeting and satisfying the most important requirements in the laying out of the cross streets and in determining the measurements of the blocks. It requires much care and foresight to accomplish this and at the same time to avoid the evils mentioned above if the cross streets are laid out in the beginning. It is best of all to design the whole building-plan with all its details but to carry it out only step by step, with the necessary alterations, as the growth of the city demands it.

The requirements that are to be made of blocks and sites, which were discussed in a general way in part I, chapter 1, are very various. Factories require extensive, undivided areas; for workmen’s houses on the contrary narrow blocks are desirable. Business districts need large street frontages and direct, also diagonal, traffic lines; corner lots with acute angles are favorable for business purposes under certain conditions. Blocks for private houses require suitable spaces for gardens, whether the houses be built in closed rows or detached; a corner site, particularly an acute-angled lot, is little suited to a private house that is built in a row. Blocks that are rectangular or approximately so are especially desirable for such houses. With flat-houses the gardens are as a rule a negligible quantity but airy courtyards should be provided for; blocks of little depth prevent the building of rear houses being carried to extremes which lead to improper housing conditions. Corners are desirable for flat-houses.
Suitable measurements for building blocks are as follows:

For manufacturing plants.
100 m (328’) deep, 200 (656’) m long
and more

For single houses
80 m deep, 160 m long
for detached houses
up to 100 x 200 m

For flat- and business houses.
60 m deep, 120 m long.

For workingmen’s dwellings.
From 35 to 50 m deep,
from 100 to 150 m long.

In these block measurements the relation of the depth (breadth) to the length is usually 1:2, for workingmen’s dwellings 1:3. These proportions and measurements are however only the approximate average which can have but a relatively small influence compared to the demands of traffic and the local manner of building. The latter, as well as existing ways and property boundaries, must always be taken into consideration as far as possible. Figs. 1, 6, 13 to 18, 19 & 20 show blocks in Dresden, Stuttgart, Berlin, Magdeburg, Cologne, Trieste, Rotterdam, and Vienna in which wide variations appear. Even in the same city the blocks should not be made of uniform size as the requirements of depth and space differ greatly.

With the exception of those designed for public buildings and workingmen’s dwellings, blocks of from 120 x 300 m to 50 x 100 m are desirable. Smaller building blocks than those containing 5000 sqm are indeed undesirable but often cannot be avoided at the intersection of important streets. In the suburbs of Cologne the largest block (which may yet perhaps be divided¹) contains 65,000 sqm, the smallest 2,200 sqm, the average size being 13,000 sqm. If necessary even very small blocks can be used for building; in the old city in Cologne, for instance, there are some of only 130 sqm. Too small blocks have the disadvantage of too limited court and garden areas. Too large blocks are just as undesirable because the single building lots are too expensive and this delays their purchase and use, and in addition, they invite the erection of rear buildings. Though the inside of a block may be open when it is first built one cannot be sure that it will permanently remain so. When the property increases in value the space is frequently used for rear buildings of all kinds, even for workshops, places of amusement etc. that do not require street frontage, thus bringing about a condition that is more unpleasant for the dwellings than the limited space of a small block. As a rule, therefore, blocks of medium size are the most desirable but due consideration must of course be paid to conditions prevailing in that part of the city and to the purpose for which the block is designed.

¹ Has since been divided.
Blocks or parts of blocks for public buildings require an attractive situation and should be suitably regular in form; the size of course varies greatly. Churches, for example, require as a rule from 30 x 50 m to 40 x 70 m, market-halls about 3000 sqm, high schools about 5000 sqm.

A popular arrangement of blocks for workingmen's dwellings is shown in the Stahlhausen colony near Bochum (fig. 65). The detached houses, each of which is divided on the ground-plan into four dwellings, occupy building lots of 4 x 170 sqm. It may be said in passing that these houses are by no means to be recommended as the most desirable workingmen's dwellings. The plan of the streets might be less uniform. If the houses are to have cattle stables the latter should be made accessible by group-building(fig.57) or by providing roads in the inside of the blocks.

Oblong blocks are the easiest to build on and generally the most advantageous. Consequently the endeavor to make as many rectangular or nearly rectangular blocks as possible in the city plan has always predominated. From the standpoint of traffic and beauty however it is a wrong-headed method to make the formation of rectangular blocks a chief, or worse, the sole aim, particularly if it results in that monotonous checkerboard pattern that we find, for instance, in Mannheim and in many American cities where the streets and blocks are numbered and lettered and actually can scarcely be distinguished from one another except by their numbers. This does not meet the real demands of our life and still less does it suit the conditions that now exist in old cities and well-planned suburbs where nearly every street and nearly every block has a pronounced individuality of its own.

The square block is less practical for building purposes than the oblong. As the endeavor to use all the fronts of the block must predominate the building lots in a square block are usually so arranged that it is very difficult to provide suitable yards or gardens (fig. 77). Oblong blocks (figs. 79 & 80), on the contrary, with the exception of the corner lots, provide a large number of practical and pleasant building lots of suitable depth. The figures mentioned show also different arrangements of the property boundaries at the block corners.

If much traffic turns the corner it is sometimes practical to slant it off at an angle of 45 degrees, partly to make it easier for pedestrians to turn, partly so as to be able to round out more decidedly the crossing of the traffic lines (figs. 81 & 82) and partly in order to gain an entrance at the corner, which is particularly desirable for business houses. The width of the beveled corner, measured diagonally, is usually from 2 to 4m. The general use of such an expedient is not however to be recommended as it weakens the effect of the buildings. The cutting off of obtuse corners especially almost always produces an unsightly result; acute-angled corners, on the other hand, require beveling not only to improve the outward effect but also for the sake of convenience within the building. The beveling of acute angles should be greater than that of rectangular corners. In the
former case the bevelled surface usually measures from 5 to 15 m. Frequently corners cut off to this extent may be made the basis of bay or bow windows. In many cases, particularly if there is a front garden the corner may be rounded off instead of bevelled\(^2\) (fig.83,84,90). It would of course be going too far to prescribe that the corner of any building, standing within a front garden, should be cut off. Figs. 83 & 84 show practical arrangements of bevelled, rounded off and full corners. A charming effect is sometimes produced by cutting off the corner of only the lowest story on account of the traffic and building the corners of the upper stories out as usual. In order to increase the width of the roadway where the traffic is great and to facilitate the change of direction “notched”

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corners may also be recommended(fig.85, 120).

A third block form is the triangle. It is true that it is even more difficult to divide triangular than square blocks into convenient building lots; but this difficulty is offset by the advantage, not only to the city building-plan but also to the lots, of diagonal streets, which are responsible for the formation of triangular blocks. The corners A and B in fig. 78 with extensive street frontages on the main traffic lines, are favorite and good business locations. Unskillful architects or builders have sometimes, it must be admitted, failed to use such corner sites to advantage, often, for instance, placing the building with its back to one of the streets in an unsightly manner, as shown in fig.86. But figures 87 & 88 give an idea of how satisfactorily all the sides of such buildings, with open or closed yards, may be treated. Buildings adjoining the corner houses are also frequently built with their back on the other street, making unlovely spots in the street view. With some skill also this arrangement can easily be avoided. Other block forms are of course to be preferred to the triangular wherever they are possible; but difficulties connected with the arrangement of the houses on the latter should not hinder their being laid out wherever the traffic really requires it, whether it be on a plain or on the side of a hill.
In French plans for city expansion triangular blocks are so frequent that sometimes whole districts are made up of them. Whereas in Germany a large area lying between ring and radial streets is usually divided into four rectangular blocks, the French divide a similar area into four triangles by two diagonal streets that cross each other. They put up with the building difficulties that are thus produced and sacrifice somewhat more land to the streets but gain an advantage in that the diagonal streets attract traffic and that property on them therefore increases in value. When detached houses are erected the difficulties of building on triangular, in fact on any kind of acute-angled blocks, are not so pronounced as it is unnecessary to place the buildings that are set back from the line of the street parallel to the latter; it is customary and pleasing in effect to round off the corners of the front gardens

Perfect regularity of form in the blocks of a city building-plan is neither attainable nor desirable. Trapeziform and irregular blocks, such as are shown in figs. 90 to 93, are therefore frequent. The illustrations also show how rectangular building lots may be obtained by slanting off acute-angled corners in other ways than by cutting them off diagonally.
The arrangement of the building lots in figs. 89 to 92 is such that the lots on the more important streets, the frontage on which increases the value of the property, are deeper than those on the other streets. Figs. 94 & 95 show the extremely small lots used in Belgian cities. Fig. 90 illustrates how the inside of a block that is too deep for ordinary building lots, is combined with a lot which serves as an entrance and is used for a purpose that requires no street frontage. The inside of a block may be similarly used for a public garden, a school building, etc. Fig. 89 represents a block in Budapest, divided into large building lots (for flat-houses); unfortunately it is very densely covered with houses (compare also figs. 13 to 18).

Merely because of their oddity it should be mentioned that there are said to be city districts in America laid out according to a hexagonal pattern (fig. 80). Apart from other considerations the fact that no through traffic streets are possible in such a plan would stamp it as absurd.

Unless existing property boundaries make it impossible the building lots should be divided at right angles to the flush lines if the houses are to be built in closed rows. With detached houses this is not so necessary as oblique boundary lines between the gardens are not objectionable.
Eintheilung eines Trapezeblocks zu Ostende.

Fig. 90
Division of a trapeze block in Ostende

Fig. 91
Block with 4 corners, irregular shape

Fig. 92
Irregular trapezoid block

Fig. 93
Irregular triangle block
Eintheilung eines Rechteckblocks zu Ostende.

Fig. 94
Division of a rectangular block in Ostende

Baustelleneintheilung zu Blankenberge.

Fig. 95
Division of construction site Blankenberg


Fig. 96
American hexagonal block

Fußweg zur Durchquerung eines langen Blocks bei offener Bauweise.

Fig. 97
sidewalk to cross a long block with detached constructions
PART II

CHAPTER 2:
Different Kinds of Streets, their Widths and Lengths

a) Kinds of Streets

The streets that are placed in the city plan according to the demands of traffic, construction, health and beauty, as well as streets that have become historical, are outwardly distinguished by their names, in which something of their character is expressed. Among street names we find such designations as: lane, steps, court, cloister, cité, passage, gallery, row, terrace, black-road, way, dam, garden, embankment (quay, pier, slip, canal, dike, wharf,), alley, walk, ditch, rampart, street, allee, promenade, circle (bastion, boulevard), avenue corso (cours).

These designations might be called the surnames, the different members of the same family being distinguished by first names (Elster Lane, Gereons Court, Broadway, Louisa Terrace, etc). In a few exceptional cases the first and surnames have become one, as, for instance, the “Graben” in Vienna and Prague, the “Linden” in Berlin, the “Kuckelke” in Dortmund, “Unter Fettenhennen,” “Im Laach” in Cologne, the “Büchel” in Aachen, the “Zeil” in Frankfurt, the “Treille” in Geneva, the “Canebière” in Marseilles, the “Corso” in Rome.

The surname “Gasse” which was formerly so much respected in all German towns and still is in Southern Germany and Austria is no longer popular in Northern Germany because to people there it erroneously suggests the idea of narrowness and dirt. Yet also in modern plans lanes are sometimes practical and necessary to divide very long blocks. They are particularly to be recommended where the houses are built detached, and on hillsides where they are generally

Fig. 98.

Treppenstieg zur Durchquerung eines langen Villenblocks an einer Berglehne.

Fig. 98

stairs to cross a long block of villas along a hillside
combined with steps (fig. 97, 98).
While blind alleys, that is, alleys with only one entrance, as well as the numerous uninhabited narrow lanes in old cities, are very properly gradually disappearing (the latter by being closed, sold to the abutters and so on), the courts are still holding their own.

These were formerly for the most part private streets or pieces of property that gradually, in the course of pulling down and rebuilding the houses about them, became extensive common courts with two subordinate entrances or only one entrance. The majority of these courts will eventually be sacrificed to improved traffic conditions, or at least be turned into cross streets, as has already been done with the Sparwaldshof in Berlin and the Gereonshof in Cologne.

The cloisters which are still found in considerable numbers in mediaeval cities are related to the courts. Like the latter they originated in the altered courts
Fig. 103
Kaiser Galerie in Berlin

Fig. 104
Pedestrian passageway in Rotterdam

Fig. 105
Galerie Mazzini in Genoa
of old cloisters or diection in the cloisters and the cloister-gardens themselves, that have since taken on the character of public streets or squares. They are often very picturesque.

Not so much in German as in French and English cities does it happen that such blind alleys, "courts" and "cloisters" are laid out anew by private individuals or companies. Especially in Paris there are numerous so-called cités, in London innumerable courts, places, buildings and such like, that cut into the building blocks as blind alleys, hook-shaped passages or in some similar form. They are open to the public in the day-time but are generally closed by gates at night. Figs 99 - 102 give as examples the Cités Beaujon, Bergère, and Trévise in Paris and Featherstone Buildings in London. The purpose of such courts and places is to gain more complete use of large properties, which have not sufficient street frontage, for construction. In Paris it is generally the extremely large building blocks that are the cause of the cités. It is important in planning them to provide opportunities for vehicles to turn. The entrances to the French cités and the English courts are frequently built over, with charming architectural effect but sometimes not without detriment to the ventilation. The places shaped like an elbow that are often found on private property are not usually considered permissible for public streets though they do occur occasionally (Nowack-Anlage in Karlsruhe, Quirin-Strasse in Cologne).

A modification of the cités are the passages or galleries of which there are many in German cities. They are generally intended only for foot passengers, are built over above the entrances, are provided with glass roofs and lined on both sides with shops, cafes, and such like. Among the most important passages are: the Kaiserpassage in Berlin, elbow-like in shape with a width of 7.85m and a
Fig. 107
Victor Emanuel and domed plaza in Milano
length of 125 m (fig. 103); the Passage of Rotterdam, 8.10m and 5.70m wide and 95 m long (fig. 104); the Galleria Mazzini in Genoa, 10.50m wide and 190 m long (fig. 105); and the Galleria Vittorio Emanuele in Milan (fig. 107), 14.50m wide, in the form of a cross, the arms of which are respectively 210 m and 105 m long. The passages in Rotterdam and Genoa connect streets that are on very different levels. In Rotterdam steps are used whereas the Galleria Mazzini slops up its whole length and the side façades are divided into parts the different heights of which are made possible by domes that interrupt the horizontal sections of the glass roof.

Such covered passages in the central districts of large cities containing jewelers’ and photograph shops and such like, are both practical and pleasant and still more so as promenades. From an artistic point of view they are welcome and attractive connecting links between streets and interior architecture and are often finely decorated. Nevertheless as investments they frequently do not fulfill expectations. They should be at least 6 m wide; passages that are narrower than this, like the Galerie du commerce in Amiens (4m wide), the Augusta Halle in Cologne (3.92m wide) and the Passage Lemonnier in Lüttich (3.80m wide), leave much to be desired in the way of ventilation and light in the adjoining localities. The Galerie St. Hubert in Brussels (fig. 106) which is 5.75m wide may be considered the least permissible limit as regards width.

The English lanes are generally single-tracked streets, the “rows” streets with houses on one side only, the “terraces” separate groups of houses (compare fig. 332). Terraces, “places” and English back-roads, which form the rear approaches to properties that front on other streets, are little used on the Continent. The back-roads have the disadvantage of being dangerous at night and requiring increased police supervision. Otherwise they have so many advantages that their use in business and factory districts might well be considered.

The names “way, dam, garden, hill, bridge, island, bank” etc. have their origin directly in local conditions, in so far as ways, dams, gardens are the descendants of former country ways, dikes, rope-walks, etc., while “hill, bridge, island” etc. are directly suggestive of the nature of the locality. Finally the terms “bank, quay, landing, wharf, embankment” etc. are used to designate streets along the banks of rivers and other bodies of water.

The terms “Twiete ” (alleys) and walk are used in Northern Germany, particularly in Hamburg, to designate narrow cross streets and walks, in which two vehicles cannot pass, somewhat similar to English lanes. Walk is employed for narrow, crooked lanes for foot passengers only.

The names ditch and rampart carry us back to former lines of fortification; sometimes they are the most prominent, at others the most insignificant streets in the city. This depends on whether they are laid out anew on the site of old fortifications of whether they are the remnants of old conditions along the fortified line, affording shelter to the poorest of rowdiest class of the population.
In cities the surname “street” is used for all kinds of highways, from the narrowest lane to the most stately and beautiful street. In the naming of streets we do not distinguish clearly between centrally situated, paved streets and outlying, usually macadamized, highways leading out into the country. In France the central streets are “rues,” the outlying ones “routes.” The English similarly distinguish between streets and roads.

The roadway in the middle, the pavements (sidewalks) on the sides; this is the universal division of all these streets as long as rows of trees do not lead to some other arrangement.

In Italy there is a widespread custom of building the sidewalks as covered ways into the lowest stories of the houses or along in front of them. This arrangement is also found in Southern France and, under the name of “Lauben” (covered walks: literally, arbors or bowers) in parts of Switzerland, Germany and Austria (Berne, Strassburg, Münster, Lübeck, Prague, Meran, Bozen etc.).

Broad streets are capable of being very handsomely developed if they are intended principally for pleasure driving, walking and riding and, partly for decoration, partly for the sake of the shade, are planted with trees. Thus are formed those streets that are known under the name of “allees” or “promenades” or if they are situated on former fortified lines, “ramparts, bastions, boulevards” etc. They are also sometimes called “Rings,” girdles, circles, if it is desired to emphasize the fact that they encircle the city. The French name “avenue,” also in use with us, implies rather that the direction of the street is radial or diagonal. It is generally employed for a street planted with trees, loading from a suburb or outlying district into the centre of the city, or for the approach to a city gate, a park, a palace etc.

In New York the streets that run in the long direction are called avenues, the cross streets, streets. In Hungary the radial or peripherical direction of the street is clearly expressed in its name; the radial streets are called Sugárút, for instance, Vásárhelyi Sugárút; the ring streets Körút, for instance, Váczi Körút.

The most pretentious street name is corsc or cours; it is not commonly used in Germany. To Italians corso suggests the street in which all the pleasure driving in the city is concentrated (the promenade for foot passengers or the park driveway is called passeggio); the Corso in Rome is only from 12 to 15 m wide. The French however demand of a Cours that it be particularly wide and stately, containing at least one separate roadway for carriages and one for riding. For a street of this character the Italians use the term Largo or Viale. In this case however, as in all, the name only partially expresses the significance of an object. The subject of street names has been treated in detail here only because it offered the opportunity of reviewing the wide differences in city streets. Besides its position in relation to the traffic, the buildings along it, its profile and the way in which it is decorated, the main factors that determine the rank of a street are its width and its length.
b) Widths and Directions of Streets

In respect to traffic, streets are divided according to their width, in the orders of the Prussian Department of Public Works for putting into effect the line of flight act of July 2, 1875 (see appendix), into side streets of from 12 to 20 m width, traffic streets of medium rank, 20 to 30 m wide, and main traffic streets, 30 m wide and wider. For the busy districts of great cities this classification is undoubtedly correct. For medium sized cities with considerable traffic, like Leipzig, Frankfurt, Hannover etc. the measurements are large enough and to spare; for these cities the division into three classes of, respectively, from 10 to 14 m, from 15 to 25 m and from 26 to 30 m width would probably better correspond to the actual conditions. For ordinary traffic conditions smaller measurements are sufficient; but in addition to traffic, health, beauty, decoration and cost are also to be considered in determining the width.

The above measurements apply only to parts of the city that are yet to be laid out for in the old city districts the streets, even the main streets are not so wide and even where new streets are cut through the rules that govern the widths on a free area cannot be applied.

The Hochstrasse in Cologne may be mentioned as one of the narrowest main city streets; in parts it is not wider than 5.50m and only now is gradually being widened to 8.16m by setting all new structures farther back. To the narrowest side streets in existence belong the Vico della pace in Genoa, 1.53m wide and lined on both sides with nine-story houses, and the Calle stretta in Venice, which is only 0.72 m wide and contains houses six stories high! Not under southern and still less under northern skies, are such narrow streets to be approved. When new buildings are to be erected the opportunity should be used to widen even the narrowest streets to at least 6 or 7m and in laying out new streets they should never, even under the most unfavorable conditions, be less than 8 m wide. In cutting through streets where the traffic is considerable the last permissible width should be set at from 13 to 15 m. If the streets be one of the first rank a width of from 20 to 25 m is required; the Kaiser Wilhelm-Strasse in Berlin, for example, has been made 22 and 26m wide.

For the new city districts in Düsseldorf an expert report recommended street widths of 15, 20, and 26 m and in addition peripherical streets of 30m in width and more. Recently cross streets for residences of 10m width have been introduced.

In the Cologne suburbs the widths of the streets are graduated as follows: 12, 14, 16, 18, 20, 22, 26, 30m, further a varying width of from 32 to 100m for peripherical streets. Here too side streets of 8m in width have been laid out.

In Lübeck the rule is 7 to 9m for residential streets, 10m and over for secondary traffic streets, 25m for main traffic streets.

Bremen contents itself with graduations of 10, 14, and 18m as the least
permissible widths.

In Leipzig the side streets are required to be at least 13m, the main streets at least 17m wide. 17m is also the least permissible width of the traffic streets in Hamburg. For new streets in Vienna the measurements of 15, 19 and 23m are considered practical; this is of course apart from promenades and "luxurious" streets. – In Munich 13 to 16m is the width established for residential streets, 18 to 25m for secondary and 30 to 40m for main traffic streets\(^3\).

26m is named in §15 of the Prussian flight-line law as the width up to which the cost of the street construction must be borne by the abuttors on either side, each being responsible for the area lying between his house and the centre of the roadway. This is also the greatest width required by business street-traffic under ordinary conditions.

Beyond this measure we enter the realm either of metropolitan street traffic or of "luxury," an entirely justifiable luxury by the way, if not carried to extremes, for rows of trees and promenades benefit the whole population and even riding paths and carriage driveways for the well-to-do portion of the inhabitants cannot be dispensed with as long as that class of people is not considered superfluous.

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\(^3\) Compare: Stübben, J. Der Stadterweiterungsplan und seine Durchführung in den “Neuen Untersuchungen des Vereins für Sozialpolitik über die Wohnungsfrage in Deutschland und im Auslande.” Bd.I. Leipzig ’01.
The least width of a promenade street is 22m, as this is the narrowest on which a row of trees can be planted on either side of the street at a distance of at least from 6.00 to 6.50m from the houses. The width may increase up to 100m as will be discussed in connection with cross sections in the next chapter.

The streets in American cities, even those without rows of trees, are usually of extensive width. Residential streets are generally from 20 to 30m, traffic and business streets from 40 to 50m wide; it is true however that, as a rule, abutters are allowed to use a considerable portion of the sidewalk for business and other purposes.

In Germany in designing city plans the custom is growing of making sharper distinction than formerly between traffic and residential streets, the latter being intended to accommodate only the traffic of the residents. Whereas the width of the former is dependent on the amount of traffic that is expected to use the street, the width of the latter is determined by the height of the houses as this affects the lighting of the lower stories on the opposite side of the street. The width of residential streets may therefore be reduced to from 13 to 10m, or, if there are front gardens, to 8 m (roadway 5 m, pavements each 1.50m).

The requirements of health, as regards the width of a street, are as a rule filled if the traffic conditions are properly considered, assuming that the height of the houses is in proportionate relation to the width of the street, as is provided for in most building regulations. Some regulations simply require that the houses, from the pavement to the eaves mouldings, shall not be higher than the street is wide.

Other regulations state that on narrower streets a height of, for instance, 10 or 12m is always permissible, also that no dwelling house may exceed a certain height, for example, 20 or 22m (Munich, Berlin, Cassel, Düsseldorf). The majority of the cities however take a middle course by providing that between the absolute figures limiting the permissible height the latter may exceed by several meters (3 to 6m) the width of the street (Frankfurt, Stuttgart, Cologne, Hamburg). In Karlsruhe the greatest permissible height is one and a quarter times, in sunnier Rome one and a half times the street width. Trélat advocates making the street 1 1/2 times as wide as the buildings are high in order to insure sufficient light in the living rooms. Modern building regulations which are graduated for different parts of the city and provide especially for more space in the new quarters than in the old city districts, show wide differences in the relation of the height of the houses to the street width in the same city.

4 City building regulations are constantly being developed; the figures we give have undergone various changes since 1890; nevertheless fig. 90 is probably still of fundamental value.

A leading sanitary point of view requires that the daylight shall enter every living room at an angle of 45 degrees and penetrate if possible to the wall at the back. Although it would at first appear that this demand should not be difficult to fulfill, both as regards courts and streets, yet most building regulations have been obliged, particularly in old parts of the city, to allow the construction of such small courts that it is out of the question for the light to enter the lower stories at the above angle (compare figs. 13 to 18 and 89). Frequently the requirement is not met even in the rooms of the lowest stories facing the street.

It is much more difficult, often impossible, to arrange that the direct rays of the sun shall shine into all the living rooms for at least one or two hours daily. This depends not only on the width of the streets (and courts) but still more on the direction of the street which is generally already definitely settled or governed by the traffic, and on the position of the adjoining and rear buildings. It is to be regretted that also in this respect much more attention is often paid to the size of a house and the income to be derived from it than to the sanitary requirement of sunniness. Both architects and house owners might in many cases place their houses in better positions as regards sunlight than is generally done; they would thus add much to the comfort and health of the occupants. At the same time it remains the duty of the city planner so to lay out the streets that, as far as possible, a direct northerly course is avoided. Though the sun can have but little influence in establishing the directions of the streets it should be a decisive factor in determining the position of side and rear buildings. Though the sunniness incidental to detached construction cannot be enjoyed in all parts of the city yet by paying careful attention to the above considerations the disadvantage of building in closed rows can be considerably diminished.

Extremely wide streets and extensive traffic centres are by no means an aid to sanitary conditions, as the dust from the street with its sand and particles of decaying matter are far from being healthy for the lungs, and the lack of shade is often unpleasantly felt. The houses too are apt to be very high on wide streets thus producing similar conditions as regards light and sun to those in narrower streets while the inconvenience of living in high buildings and the disadvantages attendant on density of population are increased. As a rule therefore a street should only be wide enough to provide for the traffic and for sufficient light in buildings of a moderate height.

Where, for special reasons, very wide streets and squares are laid out, public health demands that the surface not devoted to traffic shall be planted with trees or lawns, in order that it may lose its injurious character, and at the same time, the height of the buildings should be limited by police regulations.

The portion of the city area that is occupied by streets and squares usually varies between 20 and 50%; a good average is 35%. The lowest limit of 20 or

6 See also: De la hauteur des batiments en dehors de voies publique. Gaz. des arch. et du bat. 1878, S. 1.
25% generally indicates that the plan is incomplete, the streets too narrow or the open spaces insufficient in number or area; it may however be perfectly adequate where the blocks are large (for instance, for villas or factories) and the traffic light. The percentage increases, quite properly, where the blocks are small and the traffic streets wide. The above limit of 50% shows that the city is much cut up and the houses built in closed rows on small blocks; in some modern parts of French cities, for instance, in Geneva where the architecture is entirely French in character, the percentage of street area is even greater. To require that open spaces and streets should form a certain definite percentage of the street area would be of no great value, as the requirement could not be applied in city plans that lay out only the main lines, and the inclusion of large parks, gardens and factory settlements would defeat its object.

Beauty too demands that the width of a street be moderate. Unpleasant and gloomy as streets of 8 or 5m in width are, as a rule, unnecessarily wide streets of from 20 to 30m with little traffic and rows of low houses are just as monotonous and disagreeable. Careful graduation of the widths of the streets according to the traffic and the buildings along them is therefore necessary. A planted peripheral street, a promenade, in short all the principal streets must be clearly distinguished in their whole appearance from cross and residential streets.

Owing to local conditions it may sometimes be necessary to make a street wedge-shaped, that is, of the same width as a straight street at one and gradually diminishing along its whole length. A well-known example is the Neustädtische Hauptstrasse in Dresden (fig. 109). This might be considered an aesthetic advantage similar to that in mediaeval choirs where the tapering off of the breadth enhances the effect of the perspective. This is only true however looking along the street in one direction; viewed from the opposite direction the
Fig. 110
street of changing breadth in extension plan of Munich

Fig. 111
street of changing width in city extension plan of Brünn

Fig. 112
“tooth” street according to proposal of Hénard

Fig. 113
“saw” street according to Hénard’s proposal
effect is the reverse of beautiful. But for practical reasons a diminishing street width is often very desirable, for instance, in the merging of different flush-lines or where broad streets come together at a point of intersection.

Streets the widths of which vary at different points are quite common in villages and cities that are not built according to uniform alignments this may make an impression of disorder and irregularity, but it may also produce most picturesque effects, as many mediaeval cities prove. In the hand of the designer with artistic understanding the departure from the parallel course of the street walls is an excellent means of beautifying the city. The new streets in Munich and Brünn (fig.110,111) may serve as examples.

Varying street widths in the geometrical forms of a “tooth” street and a “saw” street have been proposed by Hénard in Paris; (fig 112, 113) their occasional use may be advisable.

One of the most essential requirements of beauty is variety in the treatment of the streets, variety in the general form, in the width, profile and decoration. According to whether the latter is to consist simply of rows of trees, or of lawns with ornamental shrubbery, or of larger garden areas, ornamental ponds, fountains, statuary etc. the street width may be increased up to 100m and more, producing in its variations the most attractive city scenes. Examples of long streets of varying widths are the Maximilian-Strasse in Augsburg, the Boulevards in Brussels, the outlying Boulevards in Paris, the new Ringstrasse in Cologne (compare part III) to which we shall return later, and finally the Andrassy-Strasse in Budapest7. (see fig.1 on the plate facing page 74)

This magnificent street with it unusual length of 2320m would have been extremely monotonous if its designers had not provided for variety in the width, in the profile and in the architecture. The first division of the street is 34.14m wide and consists of a roadway and two sidewalks with rows of trees; it is followed by a part 45.50m wide, the cross section of which shows two middle allees between three roadways. The cross section of the third part shows in addition front gardens on either side, each with a depth of 5.70m, that lead up to the final division which is lined with villas and terminates in the city park.

c) Length of Streets; Straight and Curved Streets

From the standpoint of traffic the course of a street should be as straight, or better, as visible as possible. From a sanitary point of view it is advisable carefully to limit the length of a street, if for no other reason, on account of the dust, which, because of the sharp winds that prevail in long straight streets, particularly if the latter lie in the direction from which strong winds usually blow, is especially disagreeable on such highways. Beauty also demands that a street shall not be too long. If it is to be pleasing in appearance and the traffic on it is

7 Compare: Wochenblatt für Baudenkmäler. 1886, S. 476.
not to tire but to satisfy the eye, its length must be, so to speak, a function of its width. As in the proportions of living rooms and reception rooms the relation of the length to the breadth must not be greater than 2:1, so too in city streets there are certain proportions of beauty that should not be ignored. The “Linden” in Berlin and the “Hohenzollernring” in Cologne, both of them well proportioned streets that impress one as being long but not exaggeratedly so, show the relation of the width to the length as 50m to 1000m and 36m to 700m respectively. On the well-known stretch of Boulevards in Paris, Italiens, Capucines, Madeleine, the relation is about 1:30 which may be said to exceed the limit of beauty. From an artistic point of view the relation should not be greater than 1:25 for straight streets with a steady slope, of unvarying width. We would also warn against straight streets of unvarying width that exceed 1km in length, for the eye is directed to the far end of the street where it can no longer distinguish objects. Straight streets like the Boulevards de Sébastopol and de Strasbourg in Paris, 2.30km long, the Friedrich-Strasse in Berlin, 3km long and the Rue de Lafayette in Paris which, with the Rue d’Allemagne forms a straight line of more than 4.50km, obviously overstep the bounds of beauty. The relation of the width to the length may perhaps be extended to 1:40 or even 1:50 if, as in the Andrassy-Strasse, variety is provided for in the width and profile of the street, if it has a concave slope – treated of in the next chapter – or if it is curved.

Curved streets are not subject to such strict rules as regards their length and level as straight streets, for they offer much greater variety of scene. They possess the great advantage of bringing the houses on the concave side fully into view one after another, as one passes along them, thus affording a constant change of scene. The fact that in a curved street the gaze rests
on the street fronts also gives it a more intimate, comfortable character than the long perspective of a straight street which requires some special object at its terminal point to complete it, when indeed it may be far more imposing and magnificent than a curved street. The drawback in curved streets is that the houses on the convex side are disadvantageously placed and that when the curve is sharp the traffic is less easily surveyed. In any case curved streets supply a welcome change in a straight-line scheme; it would therefore be unjustifiable to exclude them from modern city-plans. In many cases, as a means of passing from one street direction into another, where straight streets are difficult to adapt to property boundaries or to hills, where old buildings are to be preserved or villa districts laid out, slightly curved streets are both beautiful and practical. It would be absurd to make all the streets curved and just as inadvisable to set up as models to be universally imitated curved and irregular mediaeval streets, picturesque as they are. Straight and curved, regular and irregular streets are all practically and artistically justified. Everything depends on the purpose for which the streets are designed and the local conditions. If both are carefully considered and if the designer keeps the future corporeal appearance of the street in sight, the result will be not a mediaeval or Renaissance city it is true—for purposes and conditions have changed—but a similar variety and change of scene to those we enjoy so much in many old cities.

The use of a polygon line instead of a curve is unnecessary and generally ugly; a straight line instead of a curve may however be employed for the length of the individual house fronts.

Fine examples of curved streets are the
Canale Grande in Venice, the “Anger” in Erfurt, (fig 114) the “Zeil” in Frankfurt, the Königstrasse in Nuremberg, the Maximilian-Strasse in Augsburg, the Place Meir in Antwerp, the Rue Esquermoise in Lille and the Hansaring in Cologne (see part III). A curve alone will not make a street beautiful as is clearly shown in Regents Quadrant in London where the same monotonous five-story facades are carried out the whole length of the street and even beyond the cross street.

The fact that in curved streets the concave side is so prominent, the convex side so subordinate, has led to the laying out of streets both sides of which are bent outward in a concave line so that the street is somewhat lens-shaped in form and can be decorated with lawns, statuary, fountains and such like. Local conditions may make such streets not only perfectly justifiable but even one of the chief beauties of the city. It would however be a mistake to try to carry out such exceptional schemes where local conditions are not especially suited to them. A fine modern example is the Square d’Avroy in Lüttich, designed and executed by Blonden.

The favorable conditions in Lüttich were that the west street front was already in existence, that the curved east front forms the extension of the Guillemins-Strasse leading to the station and further that the lens-shaped garden area occupies principally the place of a former basin for boating. Also the new concave street front on the bank of the Maas in the same figure is effective. – Antwerp possesses a grand concave street on the bank of the Schelde; the concave street along the bank of the Rhine in Cologne has recently been designed by the author.

In 1878, following the Lüttich model, the author proposed in the Dresden Building Plan Competition, a doubly concave street whose west roadway forms the extension of the Elbe bridge while its contraction at the opposite end is naturally brought about by its introduction into the Albert-Platz (fig. 109). In carrying out this plan it would be easy so to alter it that not only the Hauptstrasse but also the Neue Strasse and the Königstrasse would be included.

The main streets (Föutcza) in Kaschau in Upper Hungary (fig. 115) is somewhat similar in outline and is made particularly attractive by using the strip in the middle for the erection of public buildings, especially the cathedral.

In the Middle Ages and in the period immediately following them the custom of placing fountains and monuments in the centre of broad streets was very popular. One of the finest examples of this sort is the Maximilian-Strasse in Augsburg, the building line on one side of which is concave whereas that on the other is straighter and leaves just space enough for two fountains.

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8 Faksimile-Reprint after: Zeitschrift des Architektur u. Ingenieur Vereins zu Hannover 1878, Bl. 743.
PART II

CHAPTER 3: Longitudinal and Cross Sections of Streets

a) Longitudinal Profile

The longitudinal profile of city streets must take into account the requirements of suitability and beauty. The considerations of suitability refer to traffic, drainage and building.

Traffic demands that the streets shall be no steeper than is necessary. According to the orders of the Prussian Department of Public Works for putting into effect the flush-line act of May 28, 1876, in main traffic streets a descent of not more than 1:50, in secondary traffic streets, of considerable length, a descent of not more than 1:40, is to be aimed at. In planning the expansion of cities where the country is flat or on the plain in a valley, such gradient relations will be found necessary only in exceptional cases, for instance, at railway crossings or where there are other local obstacles. As a rule a descent of from 1:100 to 1:80 will be sufficient. A greater descent than 1:70 carries with it the disadvantage that it is not admissible to pave such a steep street with asphalt. In cities situated in a hilly or mountainous country ascents of up to 1:25 or 1:20 often cannot be avoided even in the principal streets; in the side streets ascents of even 1:8 have to be put up with and sometimes flights of steps have to be used to connect the different levels.

From a financial point of view the longitudinal profile of a street should be so established that the annual cost of interest, cancellation, maintenance and transport is kept at a minimum.

Drainage requires that the streets should not be too flat. A longitudinal descent of from 1:200 to 1:400, according to the nature of the surface of the road, is regarded as the least admissible descent of the side gutters. Streets that are flatter absolutely require subterranean drainage and such an arrangement of the
gutters that their slope is broken and inclines more towards the openings into the drains than does the general slope of the street.

In order not to render construction unnecessarily difficult the level of the centre of the street should not be too high above the building land. A practical difference between the bottom of the building block and the middle of the street is from 1 to 2m as the earth dug out of the cellar and foundation excavation can then be used to raise the yard or court and the garden. If in order to satisfy other requirements it is found necessary to cut the streets into the earth (in Marseilles there are streets cut into the rock to a depth of 15m) or to raise the middle of the street more than 2m above the land (in laying out the suburbs of Cologne some streets were raised to a height of 6m), these are disadvantages that have to be put up with for the sake of gaining certain advantages, for instance, immunity from high water, proper sewerage, suitable gradients etc. or in order to avoid worse evils. Only under such conditions is it permissible to make city streets of such levels.

The aspect of beauty is just as important in determining the longitudinal profile of a city street, for it influences the perspective view of the street to the same degree as the latter’s position, direction, width and length, or even to greater extent than these.

The finest level is a concave one (fig. 116), that passes from a horizontal level or slight slope into a steeper slope. Whereas on a steadily descending or ascending street the more distant objects on or beside the street are hidden from the eye by nearer objects, on a street with a concave profile things at a distance are separated from nearer objects in whichever direction the street is travelled. If the “head of the street is raised” the latter looks statelier, the scene is richer, the perspective more effective, the traffic more easily surveyed. The length of the street, that is, the proportion of the length to the width, may exceed, on this kind of street, the relation of 1:30, recommended under marginal heading 130, because from whichever direction the street is viewed, its end is more clearly seen. The Avenue des Champs Elysées leading from the Triunphal Arch to the Place de la Concorde in Paris and the Rue Lafayette leading down from St. Vincent de
Paul are magnificent examples of streets with concave levels. Other examples of this sort are the Boulevard du Jardin botanique and the Boulevard du Midi in Brussels, the Via Nazionale in Rome, the Via Rome in Genoa and the Olga-Strasse Stuttgart. A concave level is also very effective in large open squares, for instance St. Peter's Square in Rome which will be described in chapter 6 of this part.

It is an uncommonly attractive scene in the evening to follow the garland-like lines of the lanterns on such a gently sloping street, between which, if there is much traffic, a swarm of carriage lamps flies back and forth; the effect on the Champs Elysees, for instance, is at times marvelous.

An evenly ascending or horizontal street looks stiff and empty in comparison. Just as a straight street continued for miles without a curve makes an unsatisfying impression, as if, for instance, the city had been cut in two with a knife, like a cake, and the portions pushed slightly apart, so too a straight street of considerable length with no change of slope is unattractive and wearisome. Many modern streets owe their monotonous, uniform appearance as much to this as to the straight unbroken line of the houses.

The street with a steady slope might be called aesthetically neutral; but

if the level is convex, that is, if a ridge is formed in the longitudinal profile of the street, the effect is positively ugly. The surface of the street is seen only to the top of the ridge; beyond that point it disappears or is suddenly foreshortened (fig. 117). Examples are: the Theaterstrasse in Aachen, the Königstrasse in Altona, the Königstrasse in Stuttgart, the Boulevard de la République in Marseilles and a number of streets in the southern part of Darmstadt which are laid out in straight lines up hill and down dale (Heinrich-, Wilhelminen-, Hügelstrasse). Cities in American are generally laid out with even less regard to the hills. In old San Francisco for instance the ugly street formation described above is very common. Beyond the line of the ridge the houses look as if they were sinking into the ground. People and vehicles on the other side of the rise are only partially visible. As at sea the top of the distant object is seen first. We catch sight of a man's head, then the upper part of his body becomes visible, then the lower part; the legs are not seen until one is near enough to the top of the ridge to look over it. As, according to this the first ridge cuts off, to a certain extent, the view of the street, it is clear that it can afford no effective perspective; in any case the perspective view must suffer considerably. Where such convex slopes are unavoidable they should at least be so treated that a man standing upright can see the surface of
the street beyond the top of the ridge. In plans for city expansion however, it is far better to lessen the unpleasant effect of the unavoidable ridge either by curving the street (fig. 118), or by bending or dividing it at the top of the ridge (fig. 119, 120). Setting the building line farther back, without interfering with the traffic, may also help to lessen the unsightly effect (fig. 118, 121). The necessity of changing the direction of the street at the top of the ridge will perhaps bring the altered part into the line of another street or an interesting fork may be formed; in short, another, perhaps charming, grouping of the city-plan takes place. Curving the street makes the slope less striking; under certain conditions it ceases to be noticeable at all. The division may be either in a horizontal place, by forking (fig. 120), or in a perpendicular plane by so developing and emphasizing the summit of the ridge that the eye rests there and the farther view is closed. In order to do this it is advisable to combine the summit of the slope with a street intersection or widening of the street so that the erection of a suitable fountain, monument, look-out mount, terrace, or something similar is possible. As an example may be mentioned the connection of the Karolingerring with the Sachsenring in Cologne, where a pleasing effect has been produced by placing a mound, which is to serve as the site of a monument, on the summit of the slope (fig. 122). A much finer example however is the triumphal arch on the Place de l’Etoile in Paris which stands not only at the terminal point of the streets directed towards it but also at their summit. (Compare fig. 369\textsuperscript{11}).

b) Cross Sections

The value and rank of a city street is most clearly expressed in the treatment of its transverse profile. Hence the choice of the latter is an important problem, in the solution of which all local conditions must be carefully taken into account. Apart from walks and glass-covered passages which are horizontal across their full width, and should be so as far as possible along their length, as well as very insignificant lanes and “courts” which are provided merely with one flat gutter in the middle, all city streets up to from 25 to 30m in width are usually divided into a roadway in the middle and a sidewalk on either side. Some Italian cities form an exception either by paving the whole surface of the street with marble without separating the sidewalks from the roadway, like Genoa and Palermo, or, like Turin and Milan, where the streets are paved with rubble-stones in which, and on the

Fig. 102. Fig. 103.

Fig. 104. Fig. 105.

Fig. 106.

Fig. 107. Fig. 108.

Fig. 109. Fig. 110.

Straßen-Querprofile.
Figs. 126 - 134
Street cross-sections
same level, are tracks or roads of marble or granite flagging which serve partly for foot-passengers, partly for the carriage wheels. The gutters are so distributed between these flagged tracks that each division of the street is separately drained in the middle. (figs. 222, 223, 228 and 229)

As a rule however the walks are raised from 9 to 16cm above the roadway and are bordered with curbstones. In Germany the raised walk is called Bürgersteig, in France trottoir, in England simply footway. The purpose of raising it is to prevent vehicles from driving onto it, to provide a particularly smooth and safe way for pedestrians and to protect the houses from being struck by the wheels of vehicles. In common streets with heavy traffic the sidewalks generally occupy b, 1/5, the roadway f, that is 3/5 of the street width s, thus b = s/5 and f = 3/5s. Where the traffic is lighter it is advisable to reduce the roadway to one half of the street width, the sidewalks to a quarter, thus b = s/4 and f = s/2. This arrangement combines economy in the cost of construction with a pleasant aspect (figs. 123 -125).

Another factor in determining the width of the roadway is the number of vehicles abreast that it should accommodate. If we assume the average width of the track of a dray (measured from the outer edge of one wheel to the outer edge of the other) to be 1.80m, the width of the load to be 2.30m, or allowing room to pass, 2.50m, we find, if the load is not to project over the sidewalk, that 2.50m is the least admissible width for a single-track roadway, 5.00m for a double track and 7.50m for a triple track roadway that contains space not only for two vehicles to meet and pass but also for a third to stand still at the same time. A four-track roadway requires a width of up to 10.00m. This measure is also the least that will accommodate double street railway tracks and still leave room on either side next the sidewalks for the traffic or ordinary vehicles; thus with a sidewalk width of from 3 to 4m such a street is at least from 16 to 18m wide.

As however a large number of narrower vehicles, particularly cabs and handcarts, travel on the streets and as, in addition, the traffic can move with greater safety if the tracks do not lie too close together, all the roadway widths lying between the extremes mentioned have their purposes and justification. In old cities the measurements given above may be still slightly reduced if necessary, the double track roadway to 4.50m, the triple track to 7.00m, if the narrowness
of the environs is such that one is obliged to take advantage of the fact that, in order to pass another, a dray may proceed with the wheel close to the edge of the sidewalk and the load projecting slightly over it, that is, that it may claim a strip of the sidewalk amounting to \((2.30-1.80)/2 = 0.25\).

Assuming the relation to be \(b = s/4\) to \(s/5\) streets of 18m in width are equipped with fairly broad sidewalks; with a street width of 20m it is already possible to plan rows of trees along the edges of the sidewalks. It is true however that trees cannot be expected to thrive on streets that are less than from 22 to 26m wide; on a narrower street the rows must frequently be replanted and the trees will not develop such beautiful forms (fig. 126).

It is more sure therefore in streets of from 20 to 23m in width to plant a single row of trees on the sunny side or along an approximately middle line, a method that gives rise to the unsymmetrical cross sections shown in figs. 127
to 129. The footway in the middle in fig. 129 is convenient from which to enter street cars or cars; for walking a wider path in the middle is advisable as shown in fig. 130. This gives us however a street width of 26m which allows two rows of trees to be planted, arranged either symmetrically or unsymmetrically as desired (figs. 131 to 133). Fig. 131 is the typical street with two rows of trees on either side of a middle walk; fig. 132 shows the trees along the edges of the sidewalks to which front garden plots are added in fig. 133. The average distance of the trees from one another and from the buildings is 7m. On walks of 6m in width, which

are very pleasant if the traffic is light, the distance in the long direction between the trees should be from 8 to 9m (fig. 131).

If the sidewalk is broad enough to accommodate two rows of trees we have the contre allée so popular in French cities. It is usually a gravel walk above which the ordinary sidewalk is raised by a curbstone with a gutter (fig. 135). Even with only one row of trees on either side of the street a strip is frequently separated from the sidewalk in France (fig. 134) which, however, is only to be recommended if the strip is used for some special purpose, as, for instance, bicycling.

Streets with two rows of trees on either side require a width of 40m, for a middle walk with three rows of trees (between two roadways) a street width of 44m, for two middle walks with two rows of trees each (between three roadways) one of 50m may be considered the average (figs. 135 to 137). A middle walk with four rows of trees is shown in fig. 138.
It is clear that a great variety of symmetrical and unsymmetrical street profiles can be produced by the different arrangement and number of the rows of trees and especially by combinations of middle and side walks and the introduction of bicycle paths, lawns or ornamental shrubbery. Symmetrical treatment is by no means essential everywhere; it depends on the character and architecture of the properties along the street. If, for instance, one side of a street is lined with houses, the other bordered by a park, rows of trees may be planted along the latter, while a broad, free sidewalk is generally to be preferred in front of the houses. Unsymmetrical treatment is equally appropriate if one side of a street is occupied principally by business houses and shops and the other by private houses – an arrangement that is not unusual on wide peripherical streets (for instance in Brussels). Streets on one side of which the houses are detached while those on the opposite side are built in closed rows may be similarly treated; also streets on river banks, panorama-
streets etc. For streets that are alike on both sides, especially for extensive radial streets, avenues and other main highways symmetrical treatment is, as a rule, to be preferred.

A remarkable difference is produced by middle and side walks with trees. The former are more popular in Germany and Belgium, the latter in France. The advantage of placing the walks on the side is that the traffic on the broad middle roadway is more easily surveyed and the effect produced by the street and the traffic is more unified and impressive. On the other hand the fact that when the trees have grown large they partly conceal the facades of the houses and that the distance from a vehicle at the curb to the house is unnecessarily lengthened both for people and goods, speaks against side walks with rows of trees.

Profiles of streets with middle walks are less stately in appearance but more convenient both for walking and for the occupants of the houses; the view of the latter is also obstructed. In designing and laying out city districts however neither method of planting in rows should be used exclusively, as uniformity is to be avoided. Besides, a broad, undivided roadway is more important in one street, pleasant ways for walking and riding in another.

A short explanation of the cross section illustrated in figs. 139 to 238 will aid in understanding the peculiarities, drawbacks and advantages of certain treatments.

Of the three Berlin streets in figs. 139 to 141 the Landgrafenstrasse has
front garden plots and sidewalks with rows of trees, the Bülow-Strasse a middle walk and front garden plots, “Unter den Linden” had formerly four now only two rows of trees in the street and a riding way to the north of it. – An entirely modern streets profile is shown in the Bismarck-Strasse (50m wide) in Charlottenburg (fig. 142). It has one main and two side driveways, a separate riding path and a special division for two street-railway tracks. There are strips of grass between and beside the tracks. The electric underground railway runs underneath the main carriage way.

The profiles of two streets in Königsberg are shown in figs. 143 and 144. Both are suitable for moderate traffic conditions.

The Palmaille in Altona (fig. 145) is laid out like Unter den Linden but is little more than half as wide. The four-meter promenades on the sides as well as the roadways and
sidewalks are decidedly too narrow; the trees cannot be expected to thrive.

A beautiful treatment intended less for heavy traffic than for people on foot is shown in the Esplanade in Hamburg (fig. 146). In the same city a street designed for heavy traffic, the Reeperbahn, is shown in fig. 147. The main roadway is 15m wide; the profile of the street is unsymmetrical, showing on the north side a contre allée, rarely seen in Germany, the outside row of trees, which is unfortunately too close to the houses; on the south side a special division of the street, 12m wide, is reserved for market booths and side-shows.

The Bahnhofstrasse in Hannover (fig. 148) is laid out on too small a scale; the walk in the middle and the roadways are too narrow; owing to a lack of curbstones the trees are frequently bruised. In this case a middle roadway of about 13m in width and sidewalks with rows of trees would be prettier and more
serviceable.

The Westwall and Ostwall in Dortmund (fig. 149) show a pretty arrangement for light traffic; the combination of rows of trees with a slightly sunk garden area on the Westwall is very attractive.

The Alleestrasse in Düsseldorf (fig. 150) possesses a broad main roadway on one side, a narrower one on the other; the wide walks in the middle form an exceedingly pleasant promenade. Asphalt pavement for the roadway has since taken the place of the macadam.

On the Monheimsallé, a part of the Ringstrasse in Aachen (fig. 151), the roadways are also of different widths to correspond to the amount of traffic on each. The garden area in the centre is beautiful but would be much more so if it were sunk below the level of the walks.
Two beautiful, unsymmetrical cross sections are seen in Wiesbaden in the Wilhelm-Strasse with its riding path and walk along the Kurpark (fig. 152), and the Röder-Strasse with a contre allée and front garden plots on one side (fig. 153). The Adolfs-Allée (fig. 154) shows a stately division into three roadways with two middle walks and in addition front garden plots of 8m in depth on either side, all within a width of 54m; the measurements used, which are sufficient only for a medium amount of traffic, are the lowest admissible for a street treated in this manner.

The unsymmetrical profile of the Ringstrasse in Frankfurt a. M along the Untermainanlage (fig. 155) is most practically carried out; the walk is in the pleasantest, the riding path in the most unobtrusive situation. There
would be room for a row of trees on the sidewalk in front of the garden plots but it would interfere with the view of the park from the houses and of the houses from the park.

The Kaiserstrasse in Mainz (fig. 156) is similar to the Monheimsallée in Aachen, but is symmetrically treated, so that the carriage and foot traffic can be equally distributed. The sunken garden area is most effective; the lower level of the roadways on the right side is only temporary until it can be permanently paved.

The profile of the Ringstrasse in Mannheim (fig. 157) is similar, but its dimensions are too small for greater traffic.
Fig. 145.

Hohenheimer Street in Stuttgart

Fig. 166

Ludwig Street in Würzburg

Fig. 167

Maximilian Street in Munich

Verbreiterte Maximilian-Straße zu München.

1:500

Fig. 168

Street cross-sections: Extended Maximilian Street in Munich

Fig. 149

Ringstraße zu Wien.

Fig. 169

Ring Street in Vienna

Fig. 146.

Via dell’Acquedotto zu Triest.

Fig. 170

Via dell’Acquedotto in Triest
Serviceable street profiles of 30m in width taken from the city expansion in Strassburg are shown in fig. 158, with a pleasant middle promenade, and fig. 159 in which the sidewalks are planted with trees and there is a broad roadway in the middle. The cross section of the most important promenade in the old city of Strassburg is also of interest, the Broglie-Platz (fig. 160), which shows a roadway on one side of the broad promenade in the middle and on the other a sidewalk of 6m in width in front of the gardens belonging to the cafés.

Narrower streets planted with trees, in Freiburg i. B., are shown in figs. 161 and 162. The outer Kaiserstrasse which is 21m wide shows the sidewalk divided into a flagged walk and a gravel strip planted with trees. The Eisenbahnstrasse (27m wide) has broad front garden plots of 5.50m in width on both sides. Only in front of the post office is their place taken by a paved front square for the sake of the traffic.

The Königstrasse in Stuttgart (fig. 163) is 24.80m wide and is not planted with trees; the lively traffic and the nearness of the houses would not admit of the latter but the width of the sidewalks might very well be increased from their present 4.40m to from 5.50 to 6m. An attractive profile for light traffic is that of the Olga-Strasse (fig. 164) which is ornamented with front garden plots. The trees on the double sidewalks of the Hohenheimerstrasse (fig. 165) cannot be expected to live as they are only 4m apart; as the whole street is only 28.60m wide one row of trees on each side would have been sufficient and the width of the roadway might then have been somewhat increased.

The profile of the Ludwig-Strasse in Würzburg (26m wide) is well conceived; a somewhat greater depth for the front garden plots would have been desirable however (fig. 166).

The portion of the Maximilian-Strasse in Munich shown in fig. 167 is 23m wide and affords an example of the frequently occurring improper planting of trees; these should be planted not on the roadway but on the sidewalk, at a distance of from 70 to 120cm from the edge of the curbstone, so that they will not be destroyed by vehicles and that dirt will not collect around them. Protecting the trees by surrounding them with stone is not enough, apart from the fact that such stones are ugly and an inconvenience to traffic. The improper placing of trees is also to be seen in that part of the Maximilian-Strasse that is 83m wide. Except for this defect it shows a very stately profile (fig. 168). The side roadways are connected at many points with the middle roadway; the whole street would look still more cheerful if the garden areas were slightly sunk.

The Ringstrasse in Vienna (fig. 169) is one of the most magnificent city streets in existence; the profile, which consists of three roadways and two middle allées is stately and practical. One allée serves for walking, the other for riding. The whole treatment will be more fully described elsewhere.

The Via dell’ Acquedotto in Trieste (fig. 170) is one of the narrowest promenade streets, being only 21m wide; the roadways, which, in contrast to
Fig. 171
*New Ring Street in Budapest*

Fig. 172
*Andrassy Street in Budapest*

Fig. 173
*Tisza-Lajos Ring Street in Szegedin*

Fig. 174
*Street cross-section: Older Ring Street in Copenhagen*
fig. 161, lie at the sides, are too narrow, in consequence of which the trees also suffer.

The Ringstrasse in Budapest (fig. 171) has sidewalks planted with trees which, in the interest of the latter, might have been made wider than 6.50m, as the roadway is wide enough and to spare. The cross sectional arrangement of the Andrassy-Strasse in the same city is excellent (fig. 172).

The Tisza-Lajos-Ringstrasse in Szegedin (fig. 173) is not practically arranged in that the outer row of trees on the two sidewalks stand too near to the houses as well as to the inner rows of trees; they should be removed so that at least the young trees in the inner rows might thrive.

The Ringstrassen in Copenhagen (figs. 174 & 175) are distinguished by the arrangement of the rows of trees on them, their width and side roadways being the same. The roadways might be wider; otherwise the arrangement of the new Ringstrasse, is excellent for a street in which it is desirable to provide a special track for riders. – Unusual but stately are the profiles of the Friedrichsbergalles (fig. 177) and the Strasse Osterbro-Gade (fig. 178), though they afford an excellent example of the disadvantage arising from the very wide
Fig. 177
Friedrichsberg-Allee in Copenhagen

Fig. 178
Østerbrogade in Copenhagen

Fig. 179
Sophie-Laan in Haag

Fig. 180
Willem Street in Breda

Fig. 181
Chaussée de Malines in Antwerpen
sidewalks which increase the distance between the houses and the roadway.

The two streets in The Hague (figs. 176 & 179) are prettily arranged but suitable only for light traffic. For the sake of clearness the ground-plan is also given in fig. 176.

The Wilhemstrasse in Breda (fig. 180), the garden area in the middle of which is broken by the necessary cross-roads, is also only suited to light traffic.

An unsymmetrical profile, the ground-plan of which will be given later, is shown in the Chaussée de Malines in Antwerp (fig. 181 a,b). The profile of the Boulevard Leopold in the same city (fig. 182) has not proved practical; the distance of 5m between the trees is not great enough; the latter must therefore be clipped from time to time and kept artificially slender; the roadways and walks are also too narrow. The plan for changing the profile of the street and making it one with a single promenade in the middle, has probably already been carried out. The arrangement of the Hauptringstrasse (60m wide) is very stately. The wide roadway in the middle, the two walks and the narrower side roadways are excellently adapted to metropolitan traffic (fig. 183). It is to be regretted that in Antwerp, as in Vienna, the profile of the Ringstrasse remains the same for its whole length of several kilometers.

In figs. 184 and 185 the cross sections of the Ringstrasse in Gent with a width of 40m are shown; the unsymmetrical one is the more interesting. The middle promenade (15m wide) of the other will look bare until the trees have grown very large unless, for the present at least, a strip of lawn with shrubbery and flower beds is laid out on the axis of the street.

Brussels possesses a great variety of beautiful street profiles. Fig. 186 shows the Boulevard Central or Anspach which has been cut through the old
Fig. 184
Boulevard of the *Citadelle* in Gent

Fig. 185
Boulevard of the Hospice in Gent

Fig. 186
Boulevard Central in Brussels

Fig. 187
Boulevard de Waterloo in Brussels

Fig. 188
Boulevard de l'observation in Brussels
city; it is 32m wide and without trees; the sidewalks might easily have been made somewhat wider. Figs. 138 187 to 189 illustrate the variety of the east Ringstrasse. In each instance it was found feasible to separate the walks, bicycle paths, riding paths and driveways from the ordinary sidewalks and roadways for heavy traffic.

Several magnificent streets in Lüttich, all of which are more or less unsymmetrical, have already been shown. An interesting proceeding is the planting of a narrower walk with young trees beside the wide one with old trees on the Quai Cockerill, also the omission of the trees on the new east side of the
Fig. 191
Grabengasse in Winterthur

Fig. 192
Bahnhofstrasse in Zurich

Fig. 193
Bahnhof Street in Ragaz

Fig. 194
Boulevard St. Gervais in Geneva

Fig. 195
Boulevard des philosophes in Geneva

Fig. 196
Boulevard du théâtre in Geneva

Fig. 197
Street cross-section: Cours de Rive in Geneva

Fig. 198
Boulevard Hausmann (and other Boulevards) in Paris
Square d’Avroi so that an unobstructed view of the garden area may be obtained from the houses.

A cheerful suburban street in Basel is shown in fig. 190; the division
between the footway and the roadway is a strip of grass with flower-beds under the row of trees. The charming Ringstrasse in Basel will be discussed later. – Fig 191 shows a simple and pretty street in Winterthur, with a middle walk; fig. 192 a somewhat crowded arrangement of rows of trees on the sidewalks, in Zürich; fig. 193 a street in Ragaz of only 12m in width with rows of trees; this is the narrowest possible width for such an arrangement and is of course unsuitable in larger cities; the houses on both sides are detached.
Among the streets in Geneva (figs. 194 to 197) those are most striking that show the unusual arrangement of a footway along the axis of the street with one row of trees (fig. 196) and the broad, free corso arrangement in fig. 197.

In regard to the treatment of streets, Paris, more than any other city of modern times, serves as a model. It affords an abundance of practical and attractive examples; a few only are given in figs. 198 to 204. Fig. 198 is the common profile of a traffic street running through the centre of the city; figs. 199 and 200 are streets in one of the finer out districts; figs. 202 and 203 are outlying boulevards. It is doubtful whether the trees standing nearest the houses on the Boulevard d'Italie will thrive. Fig. 204 shows the unusually wide and free profile of the promenade street leading from the Champs Elysées to the triumphal arch, on which the traffic is generally very great.

The street St. Sauveur in Lille (fig. 205) is too narrow (21m) for trees where the traffic is so heavy, as their condition plainly shows in this case. The Lille streets Nationale and de la Gare, without trees, are therefore much statelier. There is no fault to be found with the streets laid out according to fig. 207 if they are intended to accommodate considerable traffic.

Fig. 208 is a street of moderate width in Rouen; figs. 209 and 210 are examples of streets in the same city, with promenades along the sides. Figs. 211, 212 and 214 are streets with trees on the sidewalks and side promenades, in the neighboring town of Le Havre. The Cours du Midi in Lyon, shown in fig. 213 is also used for public shows; it is 125m wide. Two extremely wide portions of the Ringstrasse in Nîmes are shown in fig. 215. There is little traffic on this street which is lined with low houses. The street leading to the railway station, shown in fig. 216 might also be somewhat narrower; yet its appearance is pleasanter because the houses are higher and the traffic areas better distributed.

Beautiful streets in Marseilles are given in figs. 217 to 219. The Cours Belsunce is much used for walking; the Avenue de Meilhan the greater part of which is lined with front garden plots, is finer, but the stateliest of all is the Cours du Prado which is splendidly arranged for carriages, riders and foot passengers. The Rue Longchamps (fig. 220) is very narrow for the rows of trees which are otherwise well cared for. The same profile might be desired for it that is seen in
Fig. 206
*Rue de la Gare and Rue Nationale in Lille*

Fig. 207
*Boulevard de la Liberté (and other Boulevards) in Lille*

Fig. 208
*Rue de Crosne in Rouen*

Fig. 209
*Boulevard Cauchoise in Rouen*

Fig. 210
*Boulevard du Mont Ribondet in Rouen*

Fig. 211
*Boulevard de Strasbourg in Le Havre*

Fig. 212
*Cours de la République in Le Havre*
the station street in Nice (fig. 225).

In Italy rows of trees in the streets are less frequent. In order to obtain shade it is preferred to limit the width of the street and to place the sidewalks under arcades. In the latter case there are no raised footways on the real width of the street and they are not always found even where there are no arcades. Fig. 228 shows the usual Turin street without, figs. 222 and 223 with arcades; the flags for driving on and those constituting the footways are laid in the street pavement. Figs. 221 and 224 show the stately Corso Vittorio Emanuele and Corso Regina Margherita in Turin. Similar cross sections of streets in Milan are shown in figs. 226, 229, 230 and 233, all without trees. In Genoa some of the streets are paved across their whole width with marble blocks, others have ordinary raised sidewalks in front of the houses, more rarely arcades. In Florence ordinary sidewalks predominate; the Viale Principe Eugenio (Amadeo and Margherita) have rows of trees which, owing to their unskillful arrangement, do not provide shade (fig. 231). In contrast to this the really imposing arrangement of the Galleria degli Uffizi must not remain unmentioned; it is approximately 150m long, 19 wide and is bordered by the colonnades of the well-known Uffizi on the long sides and at one end; carriages can enter at the open end; the arches at the other end form a portal through which the Lungarno

12. The tracks of the street railways shown in the figures do not, of course, project above the street pavement.
is entered; steps separate the colonnades from the roadway.

The old streets in Rome are generally paved across their entire narrow
width with cobble stones; ashlar stones laid obliquely on the same level as the roadway serve to mark the footway. Only a few Roman streets, like the Corso and the Via de’ Condotti possess ordinary sidewalks like ours (fig. 227). The recently cut through extension of the Via Nazionale has fairly well kept rows of trees (fig. 232); several streets in the new part of the city are treated like fig. 236, with double walks on both sides, the outer row of trees on which will have to be sacrificed when the houses are built.

Several London streets are illustrated in figs. 234, 235, 237 and 238. The simple profile of Farringdon Street (fig. 237) is found in nearly all the traffic streets of London, generally with a width of from 15 to 30m; only very rarely are young rows of trees seen on the sidewalks, as shown in fig. 235. An example of a street in a “square” such as are very numerous, is shown in fig. 234; the houses, with small yards in front of them, lie on the outer side of the street which surrounds a square or round common enclosed garden. As rich as London is in
Fig. 221
Corso Vittorio Emanuele in Turin

Fig. 222
Via Massini in Turin

Fig. 223
Via di Po in Turin

Fig. 224
Corso Regina Margherita in Turin
Fig. 225

Bahnhof Street in Nice

Fig. 226

Corso Vittorio Emanuele in Milan

Fig. 227

Corso in Rome

Fig. 228

Via San Domenico in Turin

Fig. 229

Corso Venezia in Milan

Fig. 230

Via Broletto in Milan

Fig. 231

Viale Principe Eugenio (Amadeo and Margherita) in Florence

Fig. 232

Street cross-section: Via nazionale in Rome

Fig. 233

Street in Milan
parks and squares, it is very poor in stately promenades and handsome streets with rows of trees and other vegetation. Boulevards and avenues such as are found in Paris are almost entirely lacking. Many streets have been cut through in the city and the West End but only the requirements of traffic were considered. People who walk or drive for pleasure, and riders find the only suitable streets to be those beside or in the parks, of which the Mall, the approach to Buckingham Palace, leading through St. James Park, is an eminent example (fig. 238).
Fig. 238
Street cross-section: The Mall in London
Local conditions often make it necessary to introduce into the plans of new city districts, or the old city, streets of a special kind that differ in some way from those discussed in the preceding chapter. Among these are streets with houses on only one side, hillside streets, double streets, streets with steps, ascents and, finally, streets on which the footways are either considerably higher or lower than the roadways.

Streets with front garden plots, that is streets in which the building line is set back from the street line, and streets in which horticultural treatment predominates, are discussed in detail in part VI.

Streets with houses on only one side are found on the banks of rivers or other bodies of water, along the borders of parks and public squares. They also occur on the slopes of hills where one side of the street is too steep to be built on or is purposely left open in order to afford a free view. All these streets are built like ordinary ones on the side where the houses stand whereas the treatment of the opposite side depends on local conditions.

The arrangement of the water side of quay streets (wharves, docks, banks, shores etc.) depends on the requirements of shipping and therefore comes under the head of waterfront construction. We only need to mention here that, in all cases, that part of the street that is used for general traffic should, if possible, be separated in some way from the actual quay traffic. If the bank is not used for shipping, or only for passenger boats, the street along the waterfront is generally laid out as a promenade.

Various examples are shown in figs. 239 to 259.

On the side next the land the Victoria Embankment in London (fig. 239) is partly lined with buildings, partly with garden areas, the Embankment Gardens, while a wide footway leads along the side next the Thames.

The Jungfernstieg in Hamburg, formerly 30m wide but which has recently been broadened, is known as a much travelled street and promenade on the water side of which the Alster boats dock (fig. 240). The Königsallee in Düsseldorf (fig. 241) shows a favorite walk on the side next the former fortification ditch; there is little traffic on the Kanalstrasse lying opposite.

The Leyenstapel in Cologne (fig. 242) shows the separation of the ordinary city traffic from that along the bank of the Rhine. On the Rheinuferstrasse in Mainz (figs. 243 & 244) the city roadway, the promenade for foot passengers and the Rheinwerft are still more distinctly separated from one another. The
Victoria Embankment in London

Fig. 239

Jungfernstieg in Hamburg

Fig. 240

Street profile from Düsseldorf (Königsallee and Canal Street): Quai Streets

Fig. 241
Schaumainkai in Frankfurt a. M. (fig. 245) is similarly treated.

The five waterfront streets shown in figs. 246 to 250 show various arrangements in Zürich which is very rich in bodies of water; on the Limmat-promenade and the Kasernenstrasse the rows of trees on the water side stand in

Fig. 221.
Fig. 245
Schaumain Quai in Frankfurt a.M.

Fig. 246
Platzspitz Promenade in Zurich

Fig. 247
Casernen Street in Zurich

Fig. 248
Geßner Allee in Zurich
grass borders which at the same time form a practical division between the street and the water. The Gessner-Allee and the new Alpenkai are very much alike; the Uto-Kai shows the separation of the quay street from the city highway.

If the trees are not to obstruct the view of the water from the houses on the land side of the street, their tops are cut, as if often seen in the Rhine towns where the streets along the banks of the river are ornamented with low, bushy, bower-like walks. Figs. 251 to 253 are examples in Lüttich, Paris and Lyon with paths and roads lying along the lower level of the river banks; the quay along the Seine in Rouen (fig. 254) shows city and wharf traffic separated but on the same level. The Rhone Quay in Arles (fig. 255) shows a peculiar arrangement in that the sidewalk of the highway is raised on steps and thus separated from the quay street and protected from high water. The Lungarno in Florence (fig. 256) has not only a raised sidewalk on the water side but the sidewalk itself
is covered by a two-story colonnade called the Galleria Pitti which connects the Uffizi with the gallery of the Ponte Vecchio and thus with the other bank of the river. In Rome, where the banks of the Tiber have hitherto remained in the most neglected state imaginable, the Lungo Tevere (fig. 257) is now being constructed, with an uncovered footway on the side next to the water and a colonnade on the opposite side.

Streets along the seashore in Ostende and Nice are shown in figs. 258 and 259. On the former the broad promenade without trees is protected on the side next the sea by a low parapet; in the latter rows of trees standing in shrubbery border the promenade.

Streets that border on parks and public squares may be treated with just as great variety.

Examples in Wiesbaden, Frankfurt a. M. and Zürich have already been given in figs. 152, 155 and 246. A magnificent example is seen in the Boulevard du Jardin botanique in Brussels (fig. 260) where, from the height of the footway one can look down into the beautifully cultivated botanical garden. The “Nizza”, a garden area lying on the lower Rhine in Frankfurt, may be compared to this, where a fine view is obtained looking down from the street along the banks of the Main. The Bastione di Porta Venezia in Milan (fig. 263) is somewhat similar, dipping in places into the public garden and in others affording a view of the outer boulevard that leads round the old fort ditch. The Boulevard St. Charles in Amiens (fig. 261) belongs to the same group of streets. It bears some resemblance to the street shown in fig. 241, but the place of the ditch in the latter is taken in fig. 261 by a railway excavation the slopes of which are decorated in places with
vegetation. Frequently in cities railway excavations may be combined with such promenade streets if, from the outset, the plans are made with this end in view.

Merely in order to make the examples complete and for later reference, two illustrations of city promenade streets are added, in figs. 262 and 264, which are not intended to be built on and would therefore properly belong to the parkways. They are somewhat similarly treated in the division of the ways and of the grass and shrubbery about the trees, but the Stradone delle Cascine in Florence is double the width of the Promenadenstrasse in Baden-Baden.

The construction of streets with houses on only one side on the slopes of hills or mountains is sketched in figs. 265, 266 and 268. The houses are sometimes placed on the upper, sometimes on the lower side. The former arrangement is
to be preferred in city building-plans because the view remains unobstructed for people passing through the street and also because the fronts not the backs of the houses are then seen in looking up from the valley. As a rule however, the other arrangement, that is, the placing of the houses on the lower side of the street, is more pleasant for the occupants because the house stands freer, the view from the front windows is of the street while the valley is seen from the back. If the houses are built detached the view from the valley looking up may still be made attractive. Construction on the upper side of such streets is often made easier by an arrangement of front gardens which, if they are built up like terraces above the street level, form a larger building plot (for instance in the Nerotal in Wiesbaden). The construction on hill slopes of streets both sides of which are to be built on is usually connected with difficulties; fig. 267 shows the cross section of such a street of which there are many in Stuttgart. Where the nature of the
Fig. 259
Promenade des Anglais in Nice

Fig. 259
Promenade des Anglais zu Nizza.

Fig. 239.

Fig. 260
Boulevard du Jardin botanique in Brussels

Fig. 260
Boulevard du Jardin botanique zu Brüssel.

Fig. 240

Fig. 261
Boulevard St. Charles in Amiens

Fig. 261
Boulevard St. Charles in Amiens.

Fig. 241.

Fig. 262
Promenade in Baden-Baden

Fig. 262
Promenaden-Strasse zu Baden-Baden.
ground is like that shown in fig. 268, in Tübingen, where the side of the street next the mountain is formed by a high wall\textsuperscript{13}, construction is possible only on one side.

Double streets are used on hill slopes so that both sides can be built on (fig. 269) and also in the reconstruction of existing parts of the city to preserve existing street relations or conditions. In laying out new streets on land that is already partly built on it is often necessary, as a protection against high water or in order to obtain proper conditions of ascent or drainage, to place a new high street beside an already existing way, which, when the houses now standing on it are rebuilt in years to come, is to be raised to the level of the high street and add its width to that of the latter. Occasionally however such streets are seen as permanent arrangements in the centre of the city or beside the approaches to railway stations and bridges. Examples are: fig. 270, the St. Margarethenstrasse in Basel; fig. 271, the Boulevard Helvétique in Geneva; figs. 272 and 273, the Boulevard Jeanne d’Arc in Rouen; fig. 274, the Hirschengraben and Seilergraben in Zürich. The differences in level are overcome either by walls or slopes. For foot-passengers the former are generally provided with steps, the latter with steps and ascending paths. Geneva is rich in double streets; the Rue des Casemates and the Treille are among them. The Boulevard Helvétique, illustrated in fig. 271, has foot-walls on both sides of it in places and slopes with ascending paths in others. A peculiar treatment of streets on different levels is seen in Smithfield Square in London, where the

\textsuperscript{13} See: Deutsche Bauzeitung. 1887, p. 544.
Fig. 264
Stradore delle Cascine in Florence

Fig. 265
Street towards the valley with development on the mountainside

Fig. 266
Street on the mountainside with development towards the valley
approach to an underground freight station descends in spiral form between walls (fig. 275).

To make a hill or mountainside accessible for ordinary city construction two kinds of street designs are mainly used. Either a more or less straight-lined network of streets is laid out, the lines of which are approximately parallel to the contour-lines, hence nearly horizontal, while other streets ascend the slope obliquely (fig. 276; Stuttgart); or the whole network is composed of curved lines in such a way that the main streets ascend gradually while in the cross streets a somewhat steeper ascent is admissible (Ulm fig 277). The first method is more suitable for close, the second for detached construction. In addition ascending foot-paths and steps are often found which may be used as short cuts (compare figs. 98 & 276). Not only in mountain villages but also in towns, especially in
health resorts, a favorite arrangement is to build single or even whole groups of rows of extra houses higher up than the street, which are reached by steps, paths or short streets. This may be regarded as an admissible expedient but not as an organic part of ordinary city-building.

Even the carriage ways that lead up to the side of a mountain or hill often take on the character of streets with steps. Sometimes the steps with landings occupy the whole width of the street, sometimes the carriage way ascends steeply and is bordered on either side by steps with long landings, for foot passengers. The Lorenz Strasse in Stuttgart (fig. 278) is an example of the last named treatment. Defective street formations are seen on the Côte d’Ingouville in Hâvre, the landscape of which is so beautiful. An example is shown in fig. 279 where a footway with steps leads out of the highway where the latter turns at an angle of 90 degrees. A long street with steps, the houses on which are entered from the
landings, is the Ruprecht-Stiege in Vienna (compare examples in Marseilles, figs. 295 & 296).

Streets with steps and ascents are also not rare in the central districts of cities. Rome, Genoa, Geneva, Lüttich, Elberfeld and nearly all hilly cities have many such ways, which are if possible to be avoided in planning city expansions or at least limited to footpaths that serve as short cuts. Nevertheless they are often very imposing. One of the finest examples is the flight of steps leading from the Piazza di Spagna to the open space in front of the church Trinità de' Monti in Rome (compare fig. 509). More modest examples are illustrated in fig. 280, Scala della Zucca in Genoa; fig. 281, steps between the Kaiserstrasse and the Adlerstrasse in Nürnberg; fig. 282, steps leading to the Strandstrasse on the height in Blankenberghe. Also the public squares del Popolo and del Campidoglio in Rome (figs. 367 & 437), Colombo and Corvetto in Genoa (fig. 470 and 374), which will be described in chapter 6 of this part, showing combinations of ascents and steps. Ascents are always to be preferred for traffic; they may be so slightly inclined that it is possible to drive up them, or they may be divided by steps at intervals thus forming an intermediate thing between an inclined driveway and a flight of steps, like the ascent to the Roman Capitol.
Fig. 273
Boulevard Jeanne d'Arc in Rouen (cross-section of Figure 251)

Fig. 274
Two-lane street in Zurich

Fig. 275
Smithfield Square in London
Fig. 283 shows two ascents that cross each other, leading up to the Appellhofsplatz in Cologne; unfortunately they are laid out on somewhat too small a scale.

The approaches to bridges must be considered as a special kind of streets. They begin either in the centre of the city and lead directly to the stream, or they are laid out parallel to the banks as side approaches. In the former case the street along the bank has usually to be bridged over (London, Cologne, Coblenz); an old street that leads straight down to the river often ends at the foot of the approach (Cologne) and other streets lying parallel to the bank are connected with the approach to the bridge by steps (Würzburg, fig. 284). Examples of the second sort are, Mainz and Rotterdam (fig. 285); unless there is space enough to set the side ascents some distance back from the river bank, as in Mainz, they interfere with the traffic along the bank and are usually an inadequate connection between the bridge and the city streets.

The treatment of the highway on the bridge itself belongs to bridge construction. It is only necessary here to mention the fact that in some cities bridges also serve as approaches to islands in the river and are thus still more intimately related to the city plan, as, for instance, in Zürich and Geneva (fig. 286) where a bridge with
three arms connects a formerly fortified island with the city, and in Paris and Rome where the bridge also “picks up” the street system of the river islands.

Sidewalks that are either considerably higher or lower than the roadway are seldom found in new city plans but are often used in old cities as make-shifts, if railway structures, bridge approaches, or other subsequent changes in the city, necessitate the raising or sinking of the street. If a street is sunk one or more meters in order to carry it under a railway track, it is often necessary to leave the sidewalks on their original level so that the houses remain accessible, and to avoid extorionate claims for indemnification. At one of both ends the sidewalk must then be connected with the new street level by steps or a steep incline. Sometimes only short portions of the original sidewalk are left standing which suffice to make the houses accessible by means of steps or steep slopes. In such cases it is even more desirable than when the whole sidewalk is raised to provide another sidewalk, narrow though it may be, on the level of the roadway (fig. 287).

The reverse is the case when a street is raised to carry it over something, or where a bridge or the cutting through of a street requires its elevation; then sidewalks sometimes remain on the lower level in front of the houses. Also where the whole length of a street or a portion of the city is raised (above high water) such cases are frequent, for instance, in Mainz, Hamburg, Paris and Brussels. A number of streets in Paris have steps along their whole length or in places leading from the roadway up or down to the sidewalk level (fig. 289).

Such streets can be regarded as permanent only in exceptional cases, for instance, the Boulevard St. Martin in Paris (fig. 288). As a rule new structures are required to be built on the new street level so that the irregularities gradually disappear.
The introduction of two-story streets in the future has often been discussed; as yet however no street fully answering this description has been built. The Royal Traffic Commission in London has proposed plans for the future “main avenues” in that city, according to which streets of from 40 to 50m in width are to be laid out in two stories one above the other. The upper level is divided into two sidewalks in front of the houses, two roadways (with street railway tracks) and an automobile road in the middle. The lower level contains footways in front of the house cellars, two roadways for drays and other heavy vehicles, and storehouses in the middle (under the automobile road). A suspension railway above the automobile road would represent a third story for traffic.
Fig. 281
Street with stairs in Nürnberg

Fig. 282
Street with stairs in Blankenberge

Fig. 283
Landscaped ramps at Appelhofs Plaza in Cologne
In a measure the street traffic on Mansion House Square in London (marginal heading 177) moves on two stories. The foot passengers can cross from sidewalk to sidewalk by means of tunnels which at the same time form the entrances to a station of the underground railway. Curiously enough, also in the old English town of Chester covered walks have been in existence since the Middle Ages which extend along the ground stories and the first upper stories of the houses in the main street.
PART II

CHAPTER 5:
Street Intersections,
Expansions and Connections

a) Street Intersections

The right-angle crossing is the most convenient for construction. Cut off (beveled, “notched”) corners, as has already been explained under marginal heading 95, are advantageous under certain conditions in order to gain an entrance at the corner. But only if there is a great deal of traffic turning the corner is it justifiable to require beveling; as a rule it detracts from the effect of the buildings and its frequent or general use produces ugly street views. In figs. 290 & 291 beveling would be useless. Fig. 290 illustrates in addition how a side street on which there is much traffic can be brought into a wide main street in a practical way, by forking.

At the same time oblique crossings are to be avoided in a naturally developed city plan, particularly on uneven ground. In this way acute block angles are formed which require to be cut off on account of the traffic as well as for conveniences in building (fig. 292); and obtuse block angles which do not require beveling and are often very ugly when so treated. In some cities, for instance in London and Brussels, corners are generally rounded, instead of cut off, a practice that is perfectly feasible where the angles are obtuse or acute.

Fig. 265.

Fahrstr

Bürgersteig

Rampe

Senkung der Eigelfstein-Strasse zu Köln.

1:500

Fig. 287
Lowering of Eigelfstein Street in Cologne
Sometimes, particularly where new streets are laid out in districts already built up, intersections of streets on different levels occur. Figs. 293 shows the bridging over of such a street in Paris; steps load down from the sidewalks of the Rue Bauduin to those of the Rue Bellefond, while it was found impracticable to connect the roadways of the two streets. The corner houses on the lower street are one or even two stories higher than those on the upper level. In the construction of the Holborn Viaduct in London (fig. 294) stately stairways leading from the upper to the lower street have been placed in the four corner houses. In fig. 271 the bridging over of the Boulevard Helvétique in Geneva, by two radial streets, has already been shown.

An interesting treatment is seen in Marseilles where the Rue de Grignan and the Rue d’Aubagne are carried across the Cours Liautand (figs. 295 & 296). While the Rue d’Aubagne, with an ascending roadway on iron arches, crosses the Cours Liautand, which is cut through the old city, at about 30 degrees, for the Rue de Grignan only a footway leading down to the Cours has been constructed, which is continued on the other side as a street with steps, ornamented with sloping flower beds, while the houses are entered from the landings. All these streets are connected by a winding stairway.

Under marginal heading 141 it has already been mentioned that, particularly where there is a slope, the flush-lines may be set back in order to shorten the line of vision in a street. (fig. 118, 121) It is clear that such offsetting in main thoroughfares cannot be disadvantageous to the traffic. The offset flush-lines in figs. 118 and 121, as well as those in figs. 297 to 300 are admissible and enrich the street view. An offset street as illustrated in fig. 301, on the contrary, would be inadmissible if A B were a traffic direction, for it is obvious not only that the space x y would be congested by absorbing both the traffic directions A B & C D, but also that it is not easily surveyed and is therefore likely to be a source of danger and collisions. The fact that the traffic cannot be surveyed in the direction in which it moves is a greater hindrance than its congestion at
this point. Moreover we need only imagine the line A B to represent double streams of traffic to recognize the difficulty they would experience in winding their way around the sharp curves of the space between the point where the road terminates on entering the main thoroughfare and where it branches off on the other side. Even if this space were widened, as indicated by the dotted lines, the difficulty would not be overcome.

We have entered more fully into this question of offsetting the directions of traffic, because others have falsely concluded that by such an arrangement they might relieve traffic. Fig. 302 shows that where one street simple branches off from another there are three intersection-points of the lines of travel; a simple cross-roads, on the other hand, has sixteen such points as shown in fig. 282. This misled people into thinking that, if in place of the cross-roads two branch streets were brought into the third from opposite directions, that is if the traffic direction were offset according to fig. 301, the difficulties at this point, which consist mainly in these intersection-points of the lines of travel, would be relieved. The false conclusion was based on the fallacy that the points of collision at a crossing would thus be reduced from 16 to $2 \times 3 = 6$. But this is not the case.

If all the lines of travel at a cross-roads (fig. 303) be drawn in on an offset crossing (fig. 304) it will appear that the number of intersection points is not reduced but increased from 16 to 18, because we have the unnecessary addition of the two intersection points of the lines of travel C – B and D – A which now form one course. Hence the offsetting of traffic directions not only adds to the congestion of the traffic and makes it more difficult to overlook, but it also increases the danger points; yet the greatest of those disadvantages is that...
it cannot be easily surveyed, for this renders every driver uncertain and increases the danger of collisions.

At irregular crossings suitable treatment of the block corners often results in deviations in the flush-lines as was shown in figs. 298 to 300 and as is further illustrated in figs. 305 and 307. As in this case the traffic directions are not affected, there is not only no cause for hesitation but, on the contrary, the possibility of producing a picturesque street effect, which is very desirable.

Figures 306 and 308 cannot be called crossings; they are rather branches or forks. The widened spaces that result give the street area and the building blocks a suitable form. Fig 306, at the same time, closes the lines of vision of the three streets that converge at this point.
Figs. 309 and 310 are regular, figs. 311 and 312 irregular five-way junctions. Such irregular treatment often produce spaces like public squares and picturesque grouping may often be formed thus, particularly if the streets converge without intersecting one another.

Junctions of more than five ways generally produce difficulties in building and the regulation of traffic. As a rule it is better to avoid such arrangements as are illustrated in figs. 313 to 316.

One of the busiest street junctions in the world is Mansion House Place in London (fig. 316) where seven thoroughfares converge. Owing to the closely built-up condition of the London city district it was not possible at this point to
provide a larger space for the better accommodation of traffic; four isles of safety and several policemen have to suffice for the regulation of the enormous traffic. It often requires great skill to cross safely from one pavement to the other. At such points the expediency of connecting the sidewalks with one another by bridges or tunnels immediately suggests itself; in this instance the idea has been carried out by footways underneath the street that are also the entrances to a station of the electric underground railway. How pleasant, contrasted with this square, is the oval junction ornamented with a garden area in Verviers (fig. 314).

Although as a rule larger open spaces are quite unnecessary at a four-way intersection, square, octagonal or round open spaces are often found at such points (figs. 317 to 324).

A great disadvantage of diagonally placed squares at street intersections (fig. 317) is that, although they make it easier for vehicles to turn into the other street, they oblige foot-passengers who are going straight on to cross three roads instead of one. If there are no isles of safety at the points indicated the pedestrian crosses the whole length of the diagonal without protection among the vehicles, unless he takes a circuitous route. Squares of this shape, which are unfortunately so frequent in our city extensions, have not even picturesqueness or sanitary
advantages to recommend them; hence, if the traffic really requires an enlarged space at such a point, simple beveling of the corners is as a rule to be preferred.

In figs. 318 and 319 the “frame” of the square is indeed somewhat more pronounced; but they possess the same difficulties as regards foot travel. Fig. 318 has the added disadvantage of a hindrance to carriage traffic in the shape of a monument in the centre.

In the same way octagonal and circular spaces (figs. 320 to 322) are usually not practical and do not meet the demands of beauty unless they are surrounded by uniformly monumental buildings. The unused spaces that are formed behind the line of the
sidewalks are generally unclean and useless. In London circular spaces at street intersections, called circuses, are very frequent. The edges of the sidewalks, in contrast to those in figs. 321 and 322, run parallel to the line of the houses; hence the spaces lying between the regular lines of travel and the footways are parts of the roadway and generally serve as cabstands (figs. 323 and 324). The space thus gained for this purpose may justify the laying out of such circuses in the London city district where the whole street surface is usually covered with traffic and stoppages at the crossings often occur; the pedestrian however can scarcely be said to profit by them.

If the spaces are of considerable size these disadvantages partly disappear as the square can be differently treated and ornamented (figs. 325 to 327). But even if such spaces are made attractive by garden areas and artistic decoration, their shady sides are yet obvious. In figs. 325 and 326 the garden areas are unpleasantly cut up by the main streets; the side streets in fig. 326 are almost unused. In fig. 327 the vehicles travelling in the cross direction are obliged to drive round a half circle.
It is interesting to note that the garden area in the centre is laid out on a horizontal plane although the Rue des Héros ascends sharply; an arrangement that necessitates the use of steps for foot passengers who cross the space in the direction of that street. In all the cases illustrated here the decoration would be more effective and the space less cut up if another site had been chosen for the square. It may be accepted as a general rule that four-way intersection is a suitable place for a square only under special local condition.

b) Street Expansions.

At points where streets intersect or branch off as well as in closed street sections expansions are often introduced for the sake of variety or in order to make certain points prominent. They are usually simple in character, as shown in figs. 328 to 333.

Designs like those shown in figs. 329 and 330 sometimes serve to conceal a slope (marginal heading 141).

An attractive design is shown in fig. 331. The houses grouped about the little garden area enjoy, to a certain extent, the double advantage of a situation on a traffic highway and seclusion from the dust and noise of the street; the beveled corners prevent the accumulation of dirt that is otherwise likely to occur at such points. Excellent designs of this sort are found in London (figs. 332 & 333 where a side street serves as the approach to the houses lying behind the front garden plots, so that the occupants enjoy the advantage of living on a main thoroughfare without being inconvenienced by its noise.

A large number of city squares are nothing more than street expansions. As examples may be mentioned the Place des Minières in Verviers (figs. 334), the Place de la Posta in Geneva (fig. 335), the Piazza San Carlo in Turin, with a monument, (fig. 336), the Place Masséna in Nice, surrounded by arcades (fig. 337. The Salvator Platz in Breslau (fig. 339), the Zentralbahnplatz in Basel (fig. 340) and even the beautiful Promenadenplatz in Munich (fig. 338) may also be included in this group. This is the case to an even greater extent in the Opernplatz in Berlin and the Schwarzenberg-Platz in Vienna, both of which are in reality parts of the street surface.
Fig. 308
irregular street deviation

Unregelmässige Straßenabzweigung
Fig. 308
irregular street deviation

Fig. 309, 310
regular intersection with 5 arms

Fig. 311, 312
irregular street intersection with 5 arms
Finally, those street expansions that are designed to unite different street directions are of much importance in the city plan. Such spaces have already been illustrated in figs. 309 and 310. Other examples with horticultural decoration are shown in fig. 341, the alteration in the course of a main street, and fig. 342, the connecting point from which two diagonal streets branch off.

This brings us to

**c) Street Connections**

By street connections we mean the connection or adjustment of different street widths, street profiles or street directions. Figs. 343 and 344 show narrow street profiles led into wide ones, fig. 346 the alteration in the profile of the Chaussée de Malines in Antwerp, fig. 347 that of the Elisabethen-Strasse in Wiesbaden, fig. 345 that of the Kaiser Wilhelm Strasse in Breslau; in the latter the building line is straight while the roadway is curved which results in considerable variation in the depth of the garden plots and variety in the profile. Variety in street cross sections was discussed in connection with the Andrassy-Strasse in Budapest. It is important in connecting these profiles that the main axis or certain main lines should be continued beyond the point where the change is introduced and that parts of the second profile (edges of the footways, rows of trees etc.) should not protrude into the line of travel or the lines of vision. Setting forward the building line, on the contrary, adds to the attractiveness of the street scene.

The points at which streets from different directions converge irregularly
and are connected, often form open spaces, as in figs. 348 to 353.

In fig. 351 it would have been easy to have connected the Rue Bleue with the Rue Cadet by straight lines but a very wide sidewalk was preferred as it was convenient for pedestrians and provided space for the erection of two booths and a lavatory.

Many so-called “squares” are in reality nothing more than expansions of the street surface used to connect the various street directions that converge at this point. They are often skillfully laid out, sometimes contain garden areas and statuary but in some instances are awkward and unserviceable.

The decoration of the Holbein-Platz in Basel (fig. 354) is attractive
and worthy of imitation. It consists of a single tree within an enclosure in the centre and small planted areas along the curved portions of the sidewalks. The Kranzplatz in Wiesbaden (fig. 355) which was originally nothing but the junction of several streets, has become, owing to its horticultural and artistic decoration, one of the most beautiful spots in the city. A Belgian arrangement of the same sort but one that is not so well adapted to the traffic directions is seen in fig. 356, the Place Delcour in Lüttich.

A special sort of street connection is that, frequently recommended by Sitte, which is like a turbine or windmill in form (fig. 357). Where the traffic is light and the local conditions favorable, that is in regard to property boundaries, this kind of square is to be thoroughly recommended because the view from each street is of the closed side of the square.

Practical and worthy of imitation as these street connections are, others are in the same degree ugly and unserviceable, for instance figs. 358 and 359.

The Königsplatz in Breslau is only recognizable as a unified design on paper; on the spot itself it is impossible to see the separate portions as parts of a whole. The Oranien-Platz in Berlin is still more unpleasantly divided by the Landwehrkanal: the whole surface is so cut up that the designer’s intention of forming a square is hardly to be recognized, just as it is difficult to see that the Dresdener Strasse is continued on the other side of the canal.
Fig. 321
Intersection plaza with four quarter circles at the corners

Fig. 322
Circular intersection plaza

Fig. 323
*Oxford Circus* in London

Fig. 324
*Ludgate Circus* in London

Fig. 325
*Pelikanplatz* in Zurich

Fig. 326
*Tauenzienplatz* in Breslau
With skillful treatment street expansions and connections may be combined so as to form charming designs, which are the more attractive the more the peculiar character of the locality is considered. An example is given from the suburbs of Posen (fig. 360).
PART II

CHAPTER 6:
Open Spaces According To Their Importance In The City-Plan

The ornamental streets, described in the foregoing chapter, whose purpose is not so much to leave larger spaces open for traffic as to render the aspect of the streets and the properties along them pleasing to the eye, form the connecting link between streets and street crossings, and open spaces. The latter have various purposes: to absorb the traffic coming from different directions and distribute it in others, to offer available space for market-places and other public utilities, to provide ornamental spots, generally garden-like in character, and finally to create appropriate places for the erection of public buildings and monuments. Thus open spaces are classified
Fig. 331
Side street extension with landscaping

Fig. 332
Nottingham Terrace in London

Fig. 333
Lorain Place in London

Fig. 334
Street extension with landscaping in Verviers
Fig. 305
*Place de la Poste* zu Genf

Fig. 306
*Piazza San Carlo* zu Turin

Fig. 307
*Place Masséna* zu Nizza

Fig. 308
*Promenaden-Platz* zu München

Fig. 309
*Salvatorplatz* zu Breslau
as traffic centres, useful areas (market-places, people’s gathering places), garden areas (ornamental areas, squares) and architectural areas (monumental areas).

It is by no means unheard of for one space to serve two or more of these various purposes, or for two spaces differing in purpose to be connected. Examples of the first sort are the great radial areas in Paris (figs. 370 to 372) which absorb and redistribute traffic and yet are ornamented in the centre or along the edge with flower beds, fountains and so on; also playgrounds surrounded by trees and foliage and those useful or ornamental spaces which at the same time form the foregrounds of public buildings. Two spaces of different character, connected so as to form one design, may be called a “double square” and the union of several such spaces forms a “group of squares.”
Street extension with beautification and landscaping

Fig. 342

Fig. 343
Street medians in Wiesbaden

Fig. 344
Street medians in Brussels

Fig. 345
Kaiser-Wilhelm Street in Breslau

Fig. 346
Mechelner Landstraße in Antwerpen
A) Traffic Centres.

When the intersections and connections of streets discussed in the preceding chapter are extended beyond what is required by the shape of the building sites and the street areas so as to provide greater space for traffic, real traffic centres are formed which, in accordance with the purpose for which they were created are entirely given up to the passage of vehicles, street railways, etc. Figs. 361 to 375 are examples of these, but the French radial spaces are scarcely to be recommended. If the diameter of the space is small the circular form of its circumferential line is inconvenient for building. The streams of traffic, all directed towards one point, interfere with one another. For pedestrians, who must either cross the centre unprotected among the moving vehicles, or take a circuitous route along the sidewalks, such spaces are altogether undesirable. This disadvantage is somewhat decreased by placing “islands” with or without lampposts within the open space as an aid to pedestrians (fig. 365).

Such a division of the open space becomes the more necessary the more extensive the area is. On the one side such a division tends to distract from the impression of the space as a whole, on the other it contributes to the beauty of the details, as the islands may be ornamented either with vegetation or by fountains, statues etc. The railway station squares in Strassburg and Hannover (figs. 366 and 368) for instance contain flower beds and trees. The Place d’Eylau in Paris, (fig. 371) the Piazza del Popolo in Rome (367) and many other are adorned with fountains, and both vegetation and fountains are liberally used to decorate the Place des Nations and Place d’Italie in Paris (figs. 370 and 372). We find monuments on a centre island in the Corvetto Square in Genoa (fig. 374) and in the above mentioned station squares in Hannover (fig. 366). City gates or triumphal arches adorn the Place de l’Etoile in Paris (fig. 369) and the squares alla Croce and San Gallo in Florence (figs. 373 and 375). The Piazza del Popolo in Rome in particular shows the imposing appearance of spaces formed by the confluence of various directions of traffic although being open in their nature they cannot possess the artistic charm of other, enclosed squares.

Though a circular or polygonal form is seldom advisable for a traffic
centre and the dislike of a so-called radial space therefore well-founded, the form of a semicircle or square appears to be thoroughly practical in the many cases in which traffic coming from one direction is to be distributed like the spokes of a fan in different directions, especially at city entrances, bridge-heads and in front of railway stations.

The above-mentioned Pizza del Popolo in Rome (fig. 367) possesses a peculiar form of great charm.

Coming through the city gate one enters an elliptical space from the side. In the centre stands an obelisk with four drinking fountains and at the ends there are also fountains behind which
arched entrances to driveways ornamented with plastic work surround the space. The east driveways wind up to the Monte Pincio. Along the minor axis of the ellipse, on the side towards the city, lies a distribution space from which radiate the Via di Ripetta, the Via del Corso and the Via del Babuino. The two domed churches between these three rays of traffic and the two buildings at the side of the city entrance enhance the truly majestic character of this magnificent place.
Fig. 355
Kranzplatz in Wiesbaden

Fig. 356
Place Delcour in Lüttich

Fig. 357
Turbinen- oder Windmühlenplatz.

Fig. 358
Plazas as medians: Königsplatz in Breslau
An irregular, medieval traffic center, The Hopfenmarkt in Wismar is illustrated in fig. 376.

Modern traffic entrees of irregular form are shown in figs. 377 to 380, taken from the suburbs of Posen, Cleve, Brünn, and Munich. It is noticeable in these examples that the view from nearly all the streets running into the space is of the opposite wall so that although in reality open the impression received is that of an enclosed space and further that the different directions of the streets do not intersect one another at any point.

“Street islands”, called réfuges in France and resting places in England, are of great importance for the passage of pedestrians. They are also frequently found on broad street crossings, widened parts of streets and spaces connecting streets. They are most used in the great cities, Paris, Berlin, London where the neutral space between the main lines of traffic is generally raised a step, often enough without any consideration being given to the pleasing form of these islands. Their shape, their symmetrical position and their distribution could, and should, be much improved. The curbstones of these islands are usually laid so that they are on a line with those of the sidewalks thus enabling the pedestrian to continue on his way as directly and comfortably as possible. Where the islands are large enough, they are used for lampposts, columns for placards, even public toilets, sale booths and street car waiting rooms. Trees, flower beds, and fountains are permissible only when the islands are large enough to accommodate them without affecting the foot travel.

Carefully placed islands are also more an advantage than a hindrance to street traffic because they oblige vehicles to keep to the regular lines of progression and thus prevent confusion.
Monuments, ornamental arches and other larger structures are seldom erected on traffic centres; a few examples have been cited above. One charm of the Parisian radial spaces is that, standing in the middle of the space, one can enjoy one after another the perspective views of several streets diverging more or less like rays so that a series of metropolitan street scenes is unrolled before the spectator like a panorama. No visitor to Paris can ever forget the cycloramic views from the Place de L’Etoile, the Place d’Italie, the Rond Point and other points; the splendid perspective of the streets, generally beautified by rows of trees, emphasized by artistic terminations, is well calculated to bring to the minds of many the pettiness of home conditions. Yet there is much striving after effect in these areas which appeal less to German feeling than do the irregular forms in figs. 376 to 380.

Without the metropolitan life and varied architecture that occupy and surround them there is a suggestion of the gaming dial about these radial spaces that makes them confusing. Other centres of traffic too, are, as a rule, uncomfortable spots in the city. They are a necessary evil whose shady sides are more than balanced by their brilliant points only in rare cases (Rome, Florence, Paris) In general and especially in making plans for the expansion of medium-sized and small towns it is well to limit the establishment of real traffic centres to what is absolutely necessary and to avoid entirely open spaces designed for traffic. Ordinary street crossings and carefully planned connections between streets will in many cases fulfill the same purpose without the same disadvantages.

b) Useful Areas.

The name indicates that we have to do with open spaces that are not devoted to general street traffic but are intended to be used for business purposes, trading, shows, people’s gatherings and so on. In this sense we speak of market-places, fair grounds, exchange squares, exhibition grounds, commons, etc. They form, in so far as general city carriage traffic, at times even ordinary foot travel, is excluded from them, the exact opposite of the traffic centres just discussed.

In provincial towns, particularly in old places, the “market” is generally the open space in the centre of the town where the town hall, the stock exchange, the police station, occasionally also guild halls, stand, and in the neighborhood of which rises the principal church. Here buying and selling went, and go on, on certain days or, when convenient, at the time the above-mentioned public buildings were visited; here shows, public merry making and military reviews took, and take place. In Silesian and Bohemian towns it is the “Ring”, in Belgian and French towns the Place d’armes, in smaller Italian towns the Piazza or Signoria that unites all these purposes in itself.

A connecting link between open market-places and enclosed, covered market-halls is formed by the custom that prevails largely in Belgium, France, Italy, Austria and some Southern German towns of building on the marketplace
or round about it open halls in which either booths are rented separately or the whole serves as a shelter for the market people in bad weather.

At the present day the effort is made everywhere, particularly in larger cities, to provide enclosed and covered halls which take the place of open market-places. Nevertheless the need of such open places for the sale of vegetables, fruit, flowers and for fairs and shows will always be felt both in the out-lying districts of large cities and in medium-sized and small towns. In making city-plans and plans for city expansion provision should therefore always be made for suitable market-places (useful areas) at the risk – if it can be called risk in this connection – of these areas being diverted in the future from their original purpose and becoming, for instance, planted areas, playgrounds or sites for public buildings. About one square meter of useful space for every ten inhabitants is the least that will meet the need.

A market-place should be as near as possible to the traffic centre of the particular district of the city in which it lies or, in the case of smaller places, of the town itself; the main stream of traffic must pass along at least one side and wherever possible this should be the traffic of a street coming from a city entrance or of some other that leads conveniently to the suburbs; wagons and street railways should under no circumstances cross the place at any point. It is seldom easy in making the plan of a city to fulfill these three conditions and for this reason it is so difficult in a city that has outgrown its old market-place to make a new one out of one of the other open spaces.

Market-places are better adapted than traffic centres to be planted with trees and ornamented with fountains and statuary. Rows of trees are advantageous to the arrangement of the booths and pleasant for passerby; drinking fountains for men and animals are very desirable.

For markets that are entirely or partly covered the same fundamental principles should be observed as for open-market-places. In addition they should be regular in shape and as far as possible should possess good connections with the railways, especially the suburban railways; finally, when more pretentious, they require cellars and cold storage rooms.

Market-places are also suitable, if adapted in size and position, for the other uses mentioned above, such as a shows and fairs, peoples fêtes ect. The dimensions should be equal to these demands, as a rule considerable measurements are necessary.

But above all in large cities the artistic arrangement and adornment of fair grounds and commons should receive much more attention than has hitherto been given them. In this respect the Greeks and Romans might again become our models. Open halls or terraces might surround the open space; in order to afford a better view of it the latter would have to be sunk several steps below the level of the surrounding streets. It cannot be doubted that the folk-dances on the
Fig. 361
*Straßburgerplatz* in Lille

Fig. 362
*Ferdinandsplatz* zu Dresden

Fig. 363
*Golden Sporen-Plaats* zu Kortryk

Fig. 364
*Victor-Emanuel-Platz* in Turin
Piazza Navona in Rome and the carnival festivities on the Neumarkt in Cologne would offer a doubly charming picture if the scene of the fête could be overlooked from streets and terraces about it, whereas today only the upper stories of the surrounding houses offer full enjoyment of the spectacle. Arches, columns, obelisks, fountains may serve to decorate the area which would then also come under the head of architectural areas, to be discussed later.¹⁵

Figs. 381 and 382 represent the Altenmarkt in Cologne and the Marktplatz in Düsseldorf (fig. 383); the market-place in Brussels which at the same time by virtue of the buildings that surround it and its fine proportions is one of the most beautiful architectural areas that exist. Figs. 384 & 385 show the normal plan on which the market-places of almost all the medieval colonial towns in the German East were laid out (for instance, Glogau, Posen, Pilsen, Neustadt in Upper Silesia, Waldenburg, Dirschau). The streets become narrower where they run into the place, at the corners, and the sides are sometimes bordered

¹⁵ compare: Heuser, G. Public squares and their arrangement for festive purposes etc. Deutsche Bauzeitung 1889, p. 508
Piazza del popolo in Rome

Fig. 367
Piazza del popolo in Rome

Fig. 368
Bahnhofplatz in Straßburg
by arcades. The areas themselves are partly covered with buildings.

The Paris market-halls, illustrated in figures 386 & 387, are built to a certain extent in the inside of a complex of houses, though the halls are surrounded on all sides by streets. Fig. 388 shows the central market-hall in Cologne, built on a site formerly occupied by an old quarter of the town, with its railway connection on the east side.

Excellent in effect is the old, long and narrow Piazza Navona in Rome ornamented with three magnificent fountains (fig. 389). As a market-place it is thoroughly practical, and, when illuminated, as the scene of folk-dances on Italian evenings, it is charmingly beautiful.

It was also intended in planning the expansion of Cologne to make the Königsplatz (fig. 390) a suitable and appropriate place for festivals but this unfortunately was not carried out. In size (27,000 sq.m), situation and form it would have been admirably adapted to public festivals, military tournaments and especially to the organization of the annual Shrove Tuesday procession.

A special sort of useful areas that we have not yet mentioned are cab-stands. In the absence of proper spaces designed for this purpose, cabs are allowed to stand along the edges of markets, in the spaces in front of public buildings, in unusually wide parts of the streets or at the beginnings of side streets close to the principle arteries of traffic. In London the stands are usually in the corners of the circuses and along the middle of broad road-ways such as Farringdon Street (Fig. 391) and Haymarket Street. Fig. 392 represent two cab-stands that are particularly suited to this purpose. The vehicles stand so that they do not interfere
with the traffic and the “islands” or resting-places afford convenient spots from which to treat with the drivers and enter the cabs.
Fig. 375
Cavourplatz in Florence

Fig. 376
Hopfenmarkt zu Wismar.
(Unregelmäßiger Verkehrsplatz.)
Hopfenmarkt in Wismar
irregular traffic place

Fig. 377
traffic place of the city expansion of Posen
c. Garden Areas.

Garden areas, also called squares, are of service in the first place to public health and recreation but at the same time they are the most pleasing means of adorning our cities. They offer opportunity for rest on shady seats and in attractive surroundings; their fresh foliage, flowers and green grass are a delight to the eye. For the inhabitants of the city in conjunction with the promenades and parks they supply the place of the natural beauties of the country. They are a check on roughness and with careful cultivation exert an educational influence on young people; they refresh body and mind. It is a well-known fact that the narrower and dingier the quarter of the city, the denser and more unattractive the dwellings, the more remote from bright sunshine and the freshness of nature, the rougher and coarser are the people, the wilder the boys and girls, the more neglected the children. Just as important as the demands of traffic, building and beauty are the fundamental principles of public physical and moral health. This consideration makes it the duty of whoever plans a city to see to it that the city of the future be provided with green resting places and playgrounds sufficient in size and number, conveniently situated and carefully arranged. Especially is this his duty to the middle and lower classes of the population who generally live in cramped dwellings without gardens or other green about them.

The fatherland of squares is England. Especially in London and Edinburgh they are found in rich variety and agreeable grouping. The great West End district of London, from Holborn Viaduct to Regent’s Park is an excellent example; a characteristic group of this district is that sketched in fig. 393 showing Russel, Torrington, Woburn, Gordon, Tavistock, and Euston Squares. Not less charmingly provided with garden areas is the new (and very artificial) district of Edinburgh extending from Princess Street to the St. Stephen’s Church of which some idea is given in the sketch of the city plan in fig. 397. The love of nature and the nearness to it, so generally regarded as necessary, and the suggestions of the country so carefully placed among the dense blocks of masonry in the cities are a most delightful phase of English life. The garden areas seem to a certain extent to be the point of departure for the plotting out of building estates to which the conditions of property holding in England are most favorable. Large connecting pieces of ground belong to some private individual who cuts them up into building lots and leases them for 99 years.

The square in England is moreover usually an intermediate thing between the public square and the private garden. It is indeed surrounded by streets but is generally not open to the public. As a rule it is fenced in and cannot be used except by those families – usually those living about it – who have keys to the gate. It ceases entirely to be public of the common garden if the common garden is enclosed by the backs of the houses, that is, if it lies in the inside of a building complex, which arrangement is also sometimes found in England. Figs. 394 & 396 show two favorite arrangements in the network of streets; the oval, or otherwise
rounded-off, shape of the garden area is very popular. The inner divisions of these squares are not given in our illustrations because of their small scale; playgrounds, arbors, fountains, bowers for birds and so on are used for recreation and ornament.

Garden areas were not introduced into France and Belgium until later; the French are more inclined to outward display and show than to natural ease. In France the enclosed square serves either merely to beautify the street, without being entered at all, or it is open to the general public. An example of the latter sort is shown in fig. 398.

The Piazza Carlo Felice in Turin (fig. 395) is also a pretty square, adorned with fountains and works of art, surrounded by colonnades, a pleasant welcome to the traveller entering the city at the central station.

In Germany and Austria the place of squares was formerly generally taken by long rows of trees in the streets or by the walks which were justly so popular along what had once been fortified walls (Frankfurt a.M., Aachen, Leipzig, Braunschweig, Bremen, Breslau, Krakau, etc.) The former only too often lead a sad life amid the traffic of only moderately wide streets and are detrimental to the effect of the architecture; the latter with all their charm can do but little good to the centre of the city or the outlying districts.
Lately refreshing efforts have been made in German cities to bring green grass and foliage into all quarters of the city, entirely changing the aspect of old markets or graveled spaces, surrounding public buildings with lawns and vegetation and, where new plans are concerned, providing from the beginning for garden areas.

In this respect the capital has accomplished much. The Wilhelm-Platz (fig. 399), the Dönhoffs-Platz (fig. 401) and the Königsplatz (fig. 405) are laid out on a really metropolitan scale. These areas are not enclosed but are divided by foot-paths running straight and diagonally across them into symmetrical hedged plots. Besides the foot-paths the Königplatz has a system of broad drive-ways which cuts up this otherwise so magnificent square more than is desirable and decidedly detracts from its effect. Monuments ornament all three
of these Berlin squares. The mighty triumphal column in the centre is the dominating feature of the Königsplatz. For some time now it has been recognized that a driveway through the Wilhem-Platz would also be most desirable. To meet this need Goecke has designed the plan in fig. 400 showing remarkable alterations. He also planned the alteration of the Dönhoff-Platz(fig. 402). Both plans provide for an inside space to surround the monuments which would thus gain in effect. A stately square is the Schlossplatz in Stuttgart (fig. 406). Adorned by a monumental column, two fountains and statuary, traversed by foot-paths and most carefully kept, it is one of the finest existing spaces before a royal palace.

As an example of a small garden area which has no thoroughfare but is closed and serves solely to beautify the city, the Friesenplatz in Cologne(fig.403) should be mentioned. At its broad end, between the “islands” the different streams of traffic are provided for without cutting through the planted area.

An unfortunate situation is that of the Georgs-Platz in Hannover(fig. 404) which is divided diagonally by the principal driveway into two triangles one of which is still further cut up by other drives. The Albert-Platz in Dresden(fig.407) is divided as little as possible and may therefore claim to be treated as a garden area whereas the similar areas discussed under a in this chapter bear rather the character of traffic centres.

In contrast to traffic centres and market-places garden areas should lie away from the main traffic, secluded and removed from the noise and dust of the streets; at most the stream of traffic should touch these areas only on one side(fig 409). Cutting up the area by one or more driveways is to be avoided and is permissible only if the sections still remain large enough to form independent plots.

Planted squares, as indeed all garden areas, are better situated in a valley or depression than on a height, partly because they are more protected and vegetation grows better there and partly because the view of the lawns, shrubbery and flower beds is more beautiful and enjoyable if seen slightly from above. Examples of larger areas are the Botanical Garden beside the Ring Street in Brussels, the park in Laeken, the new Volksgarten in Cologne, further the Karlsaue in Cassel, the park “Nizza” on the banks of the Main at Frankfurt, the Giardini publici in Milan
the view of which from the neighboring streets above is particularly picturesque.

The vegetation of a garden area must not resemble that of a wood, a
grove or a park; but in order to suit the urban character of its surroundings and
not to detract from the architecture it should in general be low and subdued,
particularly where its green is intended to form the foreground of some building.
Single groups of high trees are nevertheless by no means undesirable and in some
places are even necessary to hide some ugly view or to frame an artistic scene and
to allow of the comparison of the heights of buildings. In small spaces it is most
practical to make the plots geometrical in shape taking care that the lawns are
slightly sunk below the level of the paths. Enclosed areas intended to be entered
are on the contrary often very successfully treated like small park landscapes in
English fashion (figs 408 & 409). This subject is more fully discussed in Part VI
which treats of city gardens, parks and parkways.

Public playgrounds are another kind of garden areas that still remain to
be discussed. They are the real recreation grounds of the city youth and therefore
of eminent value. Figs. 410 and 411 give two examples taken from the city
expansion of Cologne.

The Beethoven-Platz is planted in such a way as to leave the entrances
open (fig. 410); the equipment consists of benches and a table with sand. A
combination of open and closed playgrounds is shown in a part of the
Sachsenring (fig. 411); the upper playground is open at two entrances: the lower
one, situated on a part of the old town moat and protected by a bit of the old
town wall, is on the contrary only open periodically, when it is very popular.

Fig. 412 shows the combination of a playground with a garden area which
is traversed by paths and furnished with seats.

Such playgrounds are not so generally found in Germany as in England
where the municipal authorities and clubs actively favor their establishment in the
interest of public health. As long ago as in 1889 London possessed 28, Manchester
11, Birmingham 9, Bradford 7 public playgrounds which were and are used by
school children under the supervision of a teacher. But also in Germany and
Austria interest in public playgrounds for athletic sports is constantly increasing.

Several playgrounds or ornamental areas of medium or small size are
obviously more practical than one large one because the health-giving advantages
of several areas affect a larger number of people and the distance from business
houses and work-shops to a place of recreation, a green spot, is thus lessened.
The man who is planning a city always bears this consideration in mind will have
at his disposal a large number of opportunities to benefit the future inhabitants
without losing his way among projects which cannot be carried out. But even
in the central districts of old cities much may often be accomplished at small
expense for the comfort and health of the population, by turning the unused
ground about public buildings, disused fair grounds, former convent yards, old
cemeteries and the like into garden areas or spaces planted with trees.

d) Architectural Areas

In the beginning of this work, in part I, chapter 3, the subject is discussed how public buildings must be grouped in the city plan and particular attention is paid to their location in its relation to the neighboring streets. We are now concerned with the arrangement of the spaces themselves on or bordering on which public buildings are erected. A space on which a monumental building standing alone, or nearly so, is erected may be called a covered public space in distinction to an uncovered open space which lies in front of such a building or surrounded by several of them.

As two particular groups we should like further to mention especially city gate squares which have been laid out in numerous city expansion plans in order to save existing gates and gate towers from being torn down; and monumental areas the form and arrangement of which are dependent chiefly or partly on the erection of a statue or one or more monuments.

1) Spaces in front of buildings

The site of a public building should be such that the building may be easily viewed from nearby as a whole the details of which are sufficiently recognizable, yet, from an appropriate distance it should appear in advantageous perspective and so as to invite nearer inspection. Both these conditions however should be fulfilled without disturbing the course of traffic.

For this reason it is obviously
Fig. 389
Piazza Navonna in Rome

Fig. 390
Königsplaz in Cologne

Fig. 391
Johannisplätzchen in Cologne

Fig. 392
Karls Platz in Munich
inadmissible to place prominent edifices in between other buildings in the ordinary building line. It is a sign of an inadequate city plan if it is found necessary to resort to such an inartistic arrangement. A good expedient is to place the principal building back from the street line and to conceal the neighboring buildings by side wings extending forward to the building line, (for instance, the spaces in front of Palazzo Pitti in Florence and San Carlo in Milan fig. 413). In building gentlemen’s residences this device is frequently employed in such a way, especially in France, that the space between the wings is suitably shut off from the street thus forming a cour d’honneur. Similar arrangements are shown in figs. 414&415 and in fig. 416, the space in front from which the church is viewed is cut out of the opposite side of the street.

A building however appears to much greater advantage when it stands on or behind an appropriate open space and at the same time in proper relation to the streets that run into the space. Only under such conditions can a satisfactory view of the edifice be obtained both from nearby and from a distance.

Such open spaces are only adapted to set off the front of a building to the best advantage; their size should be determined with this end in view. As a general rule the depth
of the space should be at least equal to the height of the building and is better to be one and a half times or twice as great.\textsuperscript{18}

As examples the spaces, already mentioned, in front of the railway stations in Kortryk, Hannover, and Strassburg may serve (figs. 363, 366, and 368) also the Appellhofplatz in Cologne (fig. 421) and the St. Moritz-Platz in Lille(fig.420); the two latter are decidedly too small to allow of a proper view of the massive edifices behind them. More favorable in their dimensions are the Piazza Colonna in Rome, ornamented with the column of Marcus Aurelius (fig. 418) and the Piazza Santa Croce in Florence (fig. 419). The Luisenplatz in Wiesbaden (fig. 417) would be amply large for the Hoffmann church if it were not divided by the Waterloo Obelisk and planted with shrubbery. The great square on which the Milan Cathedral stands (fig 107) impresses one as very extensive in spite of the Victor Emanuel monument and the vegetation with which it has subsequently been decorated, and is altogether too large. The cathedral square in Palermo with its statuary and balustrades is certainly more beautiful and attractive. The square in front of Trinity Church in Paris (fig. 422) is one of the finest in existence; the driveway which surrounds the square and by which the church is approached is raised several yards above the street level; proudly the edifice rises forming at the same time the head of the Chausée

\textsuperscript{18} compare the following chapter under c
d’Antin. The most majestic square of this kind if indisputably the space before St. Peter’s in Rome(fig.423) including the Piazza Rusticucci and the colonnades are 340 meters long and 240 wide! The proportions are tremendous but can scarcely be called exaggerated.

The square consists of three parts; the above-mentioned Piazza Rusticucci surrounded by restaurants and shops, the great oval with its embracing Bernini colonnades, and the real square in front of the church which widens before the church portals and is bordered on either side by closed halls. The floor of the oval slopes gently down towards the centre where the famous obelisk rises from its pedestal with four candelabra about it. At the sides, to a certain extent in the focal points, more correctly in the chords of the colonnades, the two-basined iron fountains throw their mighty jets of water. The ground slopes up from the centre of the oval to the flight of steps which leads first to a wide landing and then to the vestibule of the cathedral. The horizontal cornices of the bordering halls rise gradually like the ground so that the eye of the spectator is everywhere guided upward to the portals of the first temple of Christendom.

Both Trinity Church in Paris and St. Peter’s Cathedral in Rome are instructive examples of the aesthetic demand that the ground on which a monumental edifice stands shall rise above the surrounding level. In addition the cathedral and the Severikirche in Erfurt, the Acropolis in Athens, the Villa d’Este in Tivoli, the Churches Santa Maria Maggiore and Santa Trinità de’Monti in Rome, the Votive church on Montmartre, the Trocadéro palace in Paris, the
pilgrim churches on the heights near Lyons and Marseille, the Palace of Justice in Brussels, the Bundespalast in Bern and the Hofburg in Buda should at least be called to mind here. Massive buildings belong on the heights, public gardens in the valleys or on the lower slopes of the city!

2) Covered spaces

In laying out a square in front of a building the sides and back of the latter are generally entirely neglected (if they are built in among other properties) or at best they receive only secondary consideration (if they are surrounded by narrow streets or alleys). The endeavor to leave enough open space about a building so that the architecture can be viewed from all sides results in the creation of those areas that we have designated above as covered spaces. Space enough to allow of a near view should as far as possible be provided on all the free sides of the structure; but the demand for space from which to obtain an effective distant view and the requirement that the site be raised will have to be limited to the principal angles from which the building is seen. The buildings concerned are generally churches, theatres or museums for which a position that leaves the building free on three or four sides is more or less necessary or desirable and which, in consequence of their architectural importance, may well claim prominent locations. As it is extraordinarily difficult and often impossible to create such sites in a city that is already laid out - in which respect Berlin should serve as a warning - it is a duty of prime importance, as was mentioned in part I, chapter 3, in making a city plan to provide suitable sites for public buildings on open spaces.

Figs. 426 & 430 show to what expedients it was necessary to resort in order to obtain open sites for the Lessing Theater in Berlin and the Reformes Church in Barmen. That these buildings had to be erected in a part of the town where the plan of the streets made no provision for such needs is the only excuse for such makeshifts, as the gable walls and buildings at the back of the adjoining properties can scarcely fail to disfigure the whole
In a similar manner but with better success St. Johns Church in Kopenhagen has been placed on the corner of a block apparently after the streets were laid out (fig. 427). In this case the neighboring boundary that form the background has been hidden by foliage. A more appropriate treatment would have been a group of buildings, connected with the church or at least belonging to it in place of the shrubbery.

It is not sufficient to appropriate any spaces that may happen to be left uncoverd in the network of streets to sites for public buildings as has been done with the Bethlehem Church and with Trinity Church in Berlin(fig. 431) which are placed without axial relations or other considerations of beauty. The triangels which are frequently formed at the ends of the blocks where the intersections of the streets is at acute angles may however be most successfully used for monumental buildings if their position and form is not left to chance, as is shown in fig.432. The church of St. Augustin in Paris not only stands free on all sides but is also in line with and on the level of the Boulevard Malesherbes and the Square Delaborde forms a beautiful foreground from which to obtain a near view.

An equally effective arrangement of a site for a monumental building has already been given in the Paris Opera House( fig 70). Awkward building sites that interfere with the traffic have been illustrates in fig 73, the Karolinen-Platz in Vienna and fig.67, the city hall square in Philadelphia. Even the Piazza di Castello in Turin, in spite of its large dimensions must be criticised in this respect because it lays too much restraint on the directions of traffic. This defect is also felt, though to a lesser degree, in the square that interrupts the course of the Landshuterstrasse in Schöneberg (fig.428). Christ Church in
Cologne (fig. 499) on the contrary and the church square in Kiel illustrated in fig. 429, have been placed in such positions that they do not interfere with the traffic.

The space around monumental buildings should be neither too narrow nor too broad. Examples of both sorts are not rare. In order to correct a cramped appearance buildings that stand too near the main edifice are frequently demolished such “clearings” are risky and easily lead to exaggerations (compare chapter 8 of this part) so that the evil lying at the other extrem takes the place of the first one and the emptiness of the surroundings makes the building appear small. In such cases efforts are made to remove the bleak wastelike appearance by planting shrubbery, dividing the open spaces, setting up statuary and ornamental structures. An example of this is seen in the Belle-Alliance-Platz in Berlin (fig. 471). The disproportion between the thin column and the wide open space was formerly very striking but has been greatly relieved by the transformation the area has undergone. Perhaps the Feuersee-Platz in Stuttgart also suffers in its relation to the Johanniskirche by being of such large dimensions. The space about the Votivkirche in Vienna may safely be said to overstep the boundaries of what is permissible (compare fig. 491).

It is naturally difficult in making a city plan to avoid errors between the measurements of open spaces and of the buildings to be erected on them if the latter are not yet known. It is possible however greatly to reduce the number of errors if the designer will only bring the measurements of the space into harmony with the size of the building as he imagines it; as a rule he will have to leave the rest to the good sense of others in the future.

Finally, as examples of what covered spaces should be the following may be mentioned: the Madeleine in Paris the cathedral square in Orléans, the Münsterplatz in Reims, Thomas-Kirchplatz and Michaels-Kirchplatz in Berlin, all with axial relations and sufficient open spaces around them, in addition the Münsterplatz in Ulm and Freiburg i. B. (figs. 424 & 425). In Freiburg the view from the Kaiserstrasse, through the short Münstergasse, of the mighty tower is wonderful and that of the Münster in Strassburg is similar. The Domplatz in Cologne has indeed been brought into proper relation to the gigantic edifice by the demolition of surrounding buildings but artistic treatment of the open space thus created is lacking.

Among covered spaces the Gendarmenmarkt in Berlin (fig. 433) holds a peculiar position being the site not of a single building but of three. In general the formation of a square by leaving free three rectangular building blocks in a row cannot be recommended. Also the designer of a city plan must give way to the temptation to create a square on
which only two buildings of equal merit or a group of buildings can be placed only when the rare need is already present. In the Gendarmenmarkt in Berlin however it must be acknowledged with appreciation that its measurements suit the three buildings admirably.

Buildings situated on squares and that are free or three or four sides are those that most govern the appearance of the city for they more than others are apt to determine the directions of the streets and to form the terminal points of the lines of view. It is well known that in this respect the metropolis on the Seine far surpasses all other cities. The Arc de Triomphe, the Opera House, the above mentioned churches St. Augustin and St. Trinité, the churches Notre Dame de Lorette, St. Vincent de Paul, de la Madeleine, the Strassburg railway station, the Central Halls, the Trocadéro-Palace, the Cathedral Des Invalides, the Luxemburg Palace, the Odeon, the Pantheon, the Belvedere of the Buttes Chaumont and many other celebrated edifices form the terminations of one or several larger or smaller streets. Some other streets are so charmingly planned that they possess architectural termination an architectural termination not directly but over the tops of intervening groups of houses; fine examples of this sort are the Boulevard St. Michel, which seen from the south towards the north looks beyond the Seine over the group of court buildings towards the turret of St. Chapelle and the Avenue de Friedland the view from which is indirectly of the dome of St. Augustin. This makes the city extraordinarily rich in architectural views the effect of which is frequently enhanced by placing the buildings on raised sites and bringing them into relation with lower lying garden areas. (Madeleine, St. Trinité, St. Vincent de Paul, St. Sulpice, Ste. Clotilde, Trocadéro, Sacre- Coeur etc).

\[\text{Fig.402}\]

Göcke’s draft for remodeling the place in Fig.401

Other examples of beautiful indirect street perspectives are Whitehall Street in London which looks across the buildings lying between to the Houses of Parliament, the view from the main railway station in Elberfeld across the Wupper bridge to the town, above which, in the line of the street, The Herz- Jesu- Kirche towers from the height on which it stands, the view of the Elisabeth- Kirche from the Steinentor in Basel, and so on. In such charming and picturesque views, the result more of fortunate chance than of intention, our fine German mediaeval towns are particularly rich, for instance, Nürnberg, Braunschweig, Hildesheim and Lübeck.
At the same time in planning street views wise moderation is necessary. Long and wide traffic streets cannot terminate in ornamental buildings or monuments without detracting from the effect of the latter. A warning example is the wide Bahnhofstrasse in Löwen which has been extended through to the town hall and thus lays bare the graceful edifice in a really unpleasant manner. Mediaeval buildings especially should not have too wide a setting; in focusing the streets upon them and demolishing the buildings about them it is easy to go too far, as has actually been done in the case of Milan Cathedral and Notre Dame in Paris. (Compare also chapter 8, marginal heading 282)

3) Areas surrounded by Buildings

Areas surrounded by buildings may be called the festive halls of the city, just as the streets may be linked to the passages in the plan of a building, the gates and traffic centres to the entrances and vestibules, the market places to the business localities the garden areas to the living rooms. These surrounded architectural spaces do not need the long perspective of streets, they carry the certainty of artistic effect in themselves if proper attention is paid to their shape, to the height and grouping of the buildings about them and to their dimensions.

Regularity of shape is not a necessity, as well-known imposing areas prove. Irregularity however should not be created with intention; but must be the result of historical growth or be based on local building conditions. When this is the case an irregular space may be particularly fine and picturesque.

The level is of great importance. A space that has a decided rise in the direction from which the principal view of it is obtained, or that is noticeably uneven, is not adapted to the erection of monumental buildings. As the latter require a raised position it is indeed permissible to chose the upper side of a sloping space for a site and to use the slanting ground for a terraced or planted garden of approach; but the other three sides are more or
less unsuitable for monumental buildings. A slight rise is scarcely noticeable or is easily concealed. An instance of the intentional sinking of the center of a space was given in fig. 423, in the description of St. Peter’s in Rome. Even if the desirability of such an artificial sinking be doubtful, the principle that underlies it will always prevent our raising the center of a square artificially, which, it is to be regretted, is frequently and unnecessarily done.

A space surrounded by buildings, like a picture, requires a closed frame around it. A space that opens into streets in several directions and that is arranged so that one can look far into the streets does not give the impression of a stately architectural area but only of a noisy extension of the streets themselves. Even artistic walls or foliage are insufficient frames for these areas. Buildings standing close together between which the intersection of the streets is kept very subordinate, or at least arcades and open halls must enclose the space and they must be so grouped that balance is preserved in the distribution of masses and variety in the unity is assured.

Correct dimensions can scarcely be expressed in universally applicable figures. If therefore the rules laid down by Maertens¹ some of which are given in the next chapter (marginal heading 259) cannot claim unconditional correctness, yet they give the city planner a series of important points of view. The space must be large enough to afford a view of all the buildings that surround it from the most desirable distance. Too large spaces detract from the importance and effect of the buildings (Friedrich-Platz in Kassel, Rathausplatz in Vienna, Szechenyi-Platz in Szegedin, also Königsplatz in Munich,  

¹ Maertens, H der optische Massstab etc. 2nd ed. Berlin 1884
Augustus-Platz in Leipzig, Kaiserplatz in Strassburg). Too small spaces do not afford the desired points of view.

Figs 434 to 446 show a number of spaces surrounded by buildings. We see first in fig. 435, the Grande Place in the old Flemish town of Veurne (fr. Furnes), which though little known is highly remarkable on account of its fine old buildings.

The principal buildings, the town hall and the court house, with a narrow carriage thoroughfare between them stand in a corner of the square without axial relations. The cathedral stands near-by, rising above the little gabled houses that surround the open space. The latter slopes downward towards the center. The whole presents a picturesque scene of unusual charm.

The market place in Lübeck shows a closely related arrangement.

In one corner stands the town hall together with the stock exchange. Here too an archway leads through to the neighboring streets. The post office stands on the long side opposite, while St. Mary’s church towers above the little houses about the market. A fountain, which unfortunately is lacking in Veurne, ornaments the square.

The Alte Markt in Stralsund (fig. 436) also shows besides the quaint old town hall, the Nikolai-Kirche rising behind the row of houses.

Similar arrangements are found in the mediaeval market-places of many other towns, for instance, Cologne (fig. 381), Bremen (fig. 438) where, though numerous streets run into the space, it is impossible to see far into them; Breslau, Kiel, Krakau and others, a detailed account of which would take us too far. A very frequent arrangement is to build the town hall on the square but the church in a somewhat more retired position near-by (Aachen, Schwerin, Stralsund, Lübeck, Kiel, Neuss, Geldern, Veurne, Krakau, etc.)

Fig. 439 (Marketplace in Potsdam) shows another solution. The church does indeed stand out in the center of an open space but also, together with the town hall and two palaces, forms the frame of the main part of the square.

One of the most widely known and celebrated squares is St. Mark’s in Venice (fig. 441) which with a length of 175 meters increases in width from 58 to 90 meters.

It is enclosed by the two procurators residences, St. Mark’s Church and a part of the palace of the Dódes. The principal view, looking down the length of the square, is of St. Mark’s which however does not stand in the axis of the space. Its uneven position is concealed by the Campanile which stands on the broad side of the square, and the three well known flag-poles. The Piazzetta, which is sharply separated from the Piazza by the Campanile is in reality merely the street leading from the lagoons to the square but the
Fig. 408
Garden place situated offside from traffic.

Fig. 409
Garden place situated alone on one side of a street.

Fig. 410
Beethoven Platz in Cologne.

Fig. 411
Double playground on Sachsenring in Cologne.

Fig. 412
Playground in connection with a gardenlike recreational place.

Fig. 413
Forecourt of San Carlo in Maillard.
buildings that border it and the two ornamental columns on the strand give it the effect of an independent square. The reconstruction of the collapsed Campanile should be hailed with joy because it restores not only the historic scene but also the division of the square.

Modest in size but very charming is the Piazza dell’Annunziata in Florence (fig. 442). It is bordered by the Annunciata Church and the colonnades of two other imposing buildings and is ornamented with a equestrian statue of Ferdinand I and two pretty fountains. In Verona there is the very beautiful little Piazza d’Signori and the more extensive Piazza Brà. But the finest square of the kind under discussion is undoubtedly that in front of the Capitol in Rome. It was planned by Michel Angelo himself in such a way that it grows wider as it slopes downward, thus drawing the frame, as it were, closer about the picture and making the square itself appear larger than it is(fig. 437)

Pedestrians mount the steep approach and step between the Dioskuri that crown the ascent into the axis of the square which is surrounded on three sides by venerable palaces and bears in the center the famous iron equestrian Statue of Marcus Aurelius. On the right side of the approach a driveway winds to the top of the ascent, on the left a wide flight of steps leads to the church Sta. Maria in Aracoeli.

Among the finest squares in Europe must be reckoned the Stanislaus Square in Nancy (fig. 440)

The principal side is formed by the magnificent town hall; at the two ends are palace facades of equal heights; the fourth side is bordered by low cafés which form the foreground of a fine triumphal arch, the entrance to the way leading to the Place de la Carrière. The four corners and the Rue Ste-Cathérine, which leads down from the place, are closed by gilded iron railings in three of which there are gates whereas the other two stand behind beautiful fountains. Only the main approach Stanislaus Street, opens directly on the square the center of which is occupied by the statue of Stanislaus Lesczynski.

The Place Vendôme in Paris (fig. 446) cannot compete with the Stanislaus Square although it is surrounded by equally high palaces and ornamented with the famous column. The corners of the square are cut off and the centres of the long sides are emphasized by being somewhat built out into the square. One disadvantage of this area and also of the Stanislaus Square is that vehicles that drive across its full length.

This is also the case with the Amalieborg Square in Copenhagen (fig.443) which
is otherwise almost unique of its kind being enclosed by four similar state buildings and adorned with a triumphal arch at the entrance to the Amalienstrasse and an equestrian statue in the center. Opportunities to build squares like it offer themselves very rarely. In the first place the crossing of two streets is suited to such a space only if the traffic is insignificant and will remain so and in the second the possibility of grouping four similar monumental edifices together is quite exceptional.

The proportion of the Amlieborg Square are good whereas those of the Königsplatz in Munich, illustrated in fig. 444 are exaggerated. The three structures, the Glyptothek, the Art Exhibition Building and the Propyläen would appear much more significant if the square were about a third smaller. The Rathausplatz in Vienna suffers still more from exaggerated dimensions. Even such imposing buildings as the new city hall, the university, the parliament building and the new imperial theatre are not able effectively to enclose a space 200 x 400 m in size. It was necessary to cover the area with two small parks; the consequence of which is that one can overlook the great space, as it was intended in the plan, only from the upper stories of the buildings. In this respect the Lustgarten in Berlin is incomparably more beautiful. It is scarcely half as large and therefore affords a much better view of the buildings in relation to one another. The Schlossplatz in Stuttgart, which is exceedingly beautiful as a garden area is too large to be effective as an architectural square.

A modification of “built-about” architectural aereas are the spaces sometimes found in the interior of large buildings which yet are open to public traffic. Such “inside squares” occur only as exceptions and then generally in royal palaces. It will suffice to mention as examples the Franzens-Platz in the Imperial Palace in Vienna, the Zwinger in Dresden, the courtyard of the Palace of the Doges in Venice, the Place du Carroussel in the Tuileries and the inside square in the Palais Royal in Paris which is decorated with gardens and surrounded by colonnades and shops.

In fig. 445 the Zwinger in Dresden is sketched
Fig. 419
Piazza Santa Croce in Florence

Fig. 420
St. Moritz Platz in Lille

Fig. 421
Appellhofplatz in Cologne

Fig. 422
forecourt of the Dreifaltigkeitskirche in Paris

Fig. 423
St. Petersplatz in Rome
without its inside decorations, in the form that Semper proposed for it. What is today the transverse axis was to have been the major axis and to have extended to the Elbe. The inside square which is concave in form is a little gem of city building.

These inside squares lead on to the courtyards of German castles and Italian palaces, which are not treated of here.²

From inside squares and courtyards the endeavor to create a unified architectural border has extended to open city spaces and even to streets. In addition to the above mentioned squares unified palace facades are found most frequently in Italian squares (for instance, Piazza alla Croce, and Piazza Cavour in Florence, Piazza Vittorio Emanuele in Rom). This endeavor can only be approved where really monumental buildings are concerned and even then balanced masses of different styles of architecture are to be preferred to monotony of form. The forced grouping of ordinary dwelling houses behind long uniform facades is an objectionable mochery and at the same time far from beautiful. Regent’s Quadrant in London is a warning example of such uniformity.

² see part IV of this handbook, chapter 3, courts
Fig. 427
St. Johannis Place in Copenhagen

Fig. 428
Churchplace in Berlin-Schöneberg

Fig. 429
Churchplace in Kiel

Fig. 430
Construction site of the new reform church in Barmen

Fig. 431
Dreifaltigkeits Church in Berlin
The fact that monumental areas are treated of here as a special kind of square does not mean that a particular sort of space must be made for the erection of statues, memorial columns etc. On the contrary, as we have seen and the examples cited have shown, monuments may be suitably erected on street expansions, traffic centres, market places, garden areas, squares in front of public buildings and architectural squares. Many areas however are entirely unsuitable while others are especially adapted to the erection of monuments. Greater care is necessary if a monument forms the principal object in an area, that is, when it is a monumental square in the narrow sense.

It is inadmissable to place a monument in one or more lines of vision, needless as to whether or not it intercepts the view or interferes with the traffic and without taking care that the street view is in proper relation to the statue. Thus the Piazza Savoia in Turin (fig.447) apart from the akward arrangement of the square itself, is an entirely unsuitable place for the monument. The same fault may be found with the Piazza Carlo Emanuele in Turin (fig. 448) although it does not interfere with traffic to such an extent. Even on the Luisen-Platz in Darmstaadt the column with its massive pedestal that forms such a stately termination to the Rheinstrasse makes itself felt to a certain extent as a hindrance to traffic (fig. 449). This is not so noticeable in the Bahnofplatz in Löwen(fig. 453) where the traffic to and from the station passes quite naturally round the Van-de-Weyer monument. The Thiers monument in the station square in Nancy (fig. 452) also interferes as little with traffic as does the Ernst August monument of the Bahnofplatz in Hannover (fig. 366). The Boduognatus monument in Antwerp (fig.454) standing as it does out of the way of traffic, is better placed than the Max monument in the Maximilianstrasse in Munich (fig. 455) though in the former case the traffic connection between the Avenue Charlotte and the Avenue des Nerviens suffers considerably.
Fig. 434
market place in Lübeck

Fig. 435
Groote Plaats in Veurne

Fig. 436
Alter Markt in Stralsund

Fig. 437
Piazza del Campidoglio in Rome

Fig. 438
Marketplace in Bremen
The Piazza dello Statuto in Turin (fig.450) is an exceptionally fine monumental square. The pyramid of rock out of which water trickles and which bears marble figures representing successful work, rises, crowned by the allegorical figure of an angel, as the terminal point of the long Via di Dora Grossa. The space between the end of this street and the monument, which commemorates the closer connection of the peoples brought about by the tunneling of Mont Cenis, is planted with flower beds.

Still finer is the Place de la Concorde in Paris (fig. 451), in size and arrangement the richest monumental area in Europe. It is surrounded by a massive stone parapet, the eight corners of which are occupied by the huge symbolic figures of eight French towns that guard, so to speak, the entrances which are decorated with magnificent candelabra. The famous Obelisk of Luxor and two fountains with several basins stand on a long shaped field in the centre of the place thus enclosed. From the centre looking down the streets that open onto the square four magnificent distant views are obtained of prominent buildings in the city. A great defect of the square is that the surroundings are too open to be artistic. The effect of the whole would be quite different and incomparably more beautiful if the surroundings, which consist of the Tuileries garden on three sides, the Champs Elysée and the Seine, formed a closer boundary. The latter is an advantage possessed by Trafalgar Square in London (fig. 456) which, although the space within its parapets is scarcely more than 100 x100 m, makes a greater impression on the visitor. Both squares, being free from planted areas, are entirely open to the people and serve for public meetings and festivals. A terrace runs along the side of Trafalgar Square facing the National Gallery and the surface of the square which it overlooks is ornamented with Nelson’s column, which rises to a great height, statues of Napier and Havelock and two fountain basins. The equestrian statue of Charles I which stands on the street crossing at Charing Cross looks very insignificant opposite to the other statuary.

We shall devote chapter 7 in part V to a more thorough consideration of the manner in which monuments should be erected on squares and streets.
Fig. 441
St. Markus Place in Venice

Fig. 442
Piazza dell'Annunziata in Florence

Fig. 443
Amaliegard Place in Copenhagen
5) City Gate Areas

If among architectural areas we lay special emphasize on “city gate areas” it is because in planning the expansion of cities today we are so often confronted with the problem of meeting the demands of increased traffic without destroying valuable entrance structures either of mediaeval or more modern origin. Many of our German towns have been robbed of their mediaeval gate towers owing partly to their being considered a hindrance to traffic, and partly to a lack of artistic understanding. Only a few and of those not in all cases even the finest have been preserved. But everywhere where such town gates have been saved from destruction and their surroundings adapted to meet the new demands of traffic, these old structures stand not only as venerable witnesses of history but serve also in great measure to beautify the town. Figs. 457 to 464 present a number of examples. Fig. 459 shows how a path for pedestrians was made beside the old Martins-Tor in Freiburg i. B. as there was not space for one beneath the arch through which vehicles pass. If the need should arise a second sidewalk might be cut through on the other side of the street without destroying the connection between the archway and the street wall. (Has since been done). In Eisenach (fig. 457) the entrance to the town leads past the Nikolaitor or Bahnhofstor which has been successfully restored by Stier after a struggle with levelling difficulties, while the old gate tower is used only as an exit. Thoroughfares have been opened on both sides of the Eschenheimer Turm in Frankfurt a. M. (fig. 458) so that traffic through the gateway is relieved as far as possible. Similar arrangements are found in Nürnberg (figs 519 to 521), Heidelberg, Stendal, Basel (Spalentor fig. 460), Schaffhausen and other places.

Temple Bar, the old gateway between the city and the Westend in London, has had indeed to give way to the tremendous traffic; but the Temple Bar Memorial, a pillared structure on the sides of which stand statues of Queen Victoria and the Prince of Wales, has been erected in the middle of the street to commemorate the historic spot, though it too noticeably affects traffic.

While no real squares have been laid out about any of the gateways just mentioned, the Isartor in Munich (fig. 462) which, together with the Zwinger, is preserved as a thoroughfare, is surrounded by a regular square which is intersected by six streets. The old Hahnenorturburg in Cologne (fig. 464) is connected with the Rudolfplatz an open garden area in such a manner that the gateway is used only by pedestrians, vehicles being obliged to drive round, in this case the main traffic does not enter the Hahnenstrasse which lies behind the gate, but is along the Mittelstrasse which was cut through for this purpose.

More parklike in character are the surroundings of the Hal’sche Tor in Brussels which no longer serves its original purpose but stands in a garden area beside the Boulevard and is arranged as a museum of weapons.

The Berliner Tor in Wesel and the Holstentor in Lübeck (fig. 461) like the Cologne Hahnenortor are used only by foot passengers while carriage thoroughfares lead around them. Although the effect of the planted area in Lübeck is very bright and cheerful the arch unfortunately looks as if it had sunk into the ground, the surroundings also might well be more in keeping.
Fig. 444
Königsplatz in Munich

Fig. 445
Zwinger in Dresden

Fig. 446
Place Vendôme in Paris

Fig. 447
Piazza Savoia in Turin

Fig. 448
Piazza Carlo Emanuele in Turin
The Ponttor in Aachen (fig. 466) acts as a boundary to the park areas of the Ludwigsallee on the one side and forms the wall about an enclosed section of a square on the other.

The Paris gate in Lille (fig. 467) stands like a triumphal arch on a rounded out street crossing. The Porte de St. Denis in Paris (fig. 463) is so placed that the Boulevard driveway passes it without hindrance whereas it interferes to a certain extent with the traffic turning into the Foubourg St. Denis. Two Florentine town gate areas have already been discussed in figs. 373 and 375.

In conclusion mention should be made of a modern city gate with its adjoining square, the Brandenburger Tor in Berlin (fig. 465).

It contains one main carriage thoroughfare and four side driveways while the contiguous colonades serve for foot travel. An open square, the Pariser Platz, adjoins the gate and forms the beautiful starting point of the magnificent street, Unter den Linden. The square is open to traffic the whole breadth of the street while the extensions on the sides are decorated with ornamental planted areas. Together with its surroundings the Pariser Platz forms a worthy vestibule for the capital of the German Empire as does the Piazza del Popolo (fig. 367) for Rome.

Under the marginal heading 187 the fact was mentioned that one and the same area often serves various purposes. It is not always possible therefore to classify the existing open spaces of a town as belonging to any one of the different kinds of areas already discussed. In planning city expansion also the need is often felt of making one space serve several purposes, for instance, as a market place and architectural area, or as a garden area and monumental square. In such cases it is the more necessary to consider carefully and meet as far as possible the increased number of requirements. Traffic squares and centres are least suited to be used for other purposes. It is therefore often found necessary, if the need of another kind of area is felt at the spot where a traffic center lies, to

6) Double Squares

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make adjoining it a second square of the desired kind. In this way twin or double squares are formed.

The distinct natures of the two areas in such a double square are clearly seen in figs. 468 & 471, the Potsdamer Platz and Hallesches Tor in Berlin. Outside of the real entrance to the city the streets which come together at this point are united in a decided traffic square while on the inside of the former gates in both cases a spacious garden area has been laid out. For the regulation and safety of the enormous traffic the Potsdamer Platz is differently divided
today from what is shown in fig.468. But no arrangement can be really adequate for, owing to various conditions, the inhabitants of an outlying city district who number perhaps half a million, are obliged to enter the centre of the city just at this point, which has resulted in a tremendous increase in the traffic.

In front of the principal railway station in Milan (fig. 472) a large open space serves as a public traffic square; the streets leading down from it to the Porta di Venezia enclose a spacious garden area above which rises the traffic square, on a high supporting wall - a double square of unusually large dimensions and favorable effect.

Equally attractive is the arrangement of the Piazza Acquaverde in Genoa (fig.470). The lower half of the area lying in front of the tower and the descent to the railway station, is divided by different levels into foot and carriage ways and serves as a traffic square. The upper portion of the area, surrounded by the parkway like streets that lead from the Via Balbi up to the hillside, is the site of the Christopher Columbus monument and is laid out in lawns planted with flowers and shrubbery.

The Piazza Grande in Triest (fig. 469) is an example of the frequently occurring combination of an enclosed garden area, which is in this case traversed by foot paths and open to the public and an architectural square. The latter lies in front of the city hall and is ornamented with a fountain and two stately candelabra decorated with figures.

Finally in fig. 473 we give an illustration of another frequent combination: an architectural space before a large building and a traffic centre. Above the Place de la Fayette rises the church St. Vincent de Paul from a terrace laid out in lawns and flower beds, which ascends in a gently concave line from the Boulevard Bonne-Nouvelle.
Fig. 456  Trafalgar Square in London

Fig. 457  gate at the station in Eisenach

Fig. 458  Eschenheimer gate in Frankfurt a. M.

Fig. 459  Martins gate in Freiburg i. B.

Fig. 460  Spalentor in Basel
Fig. 461
Holstentor in Lübeck

Fig. 462
Hör Tor zu München.

Fig. 463
Porte St. Denis in Paris

Fig. 464
Rudolphsplatz in Cologne

Fig. 465
Brandenburger Tor and Pariser Platz in Berlin
Fig. 466
surrounding of the Ponttor in Aachen

Fig. 467
Paris gate in Lille
Fig. 468
Leipziger and Potsdamer Platz in Berlin

Fig. 469
Piazza Granda in Triest

Fig. 470
Piazza Acquaverde in Genua

Fig. 471
Belle Alliance Platz and Hallerscher Torplatz in Berlin
Abb. 472
Place in front of the railway station in Milano
In making a city plan open spaces are the best means of embellishments at the architect’s command. Once laid out, alteration and improvement is the more difficult and telling the closer their connection is with the directions of the streets and with groups of buildings. The situation, the form and the adornment of these areas is therefore one of the most important tasks in planning a city. The lack of understanding of these matters that is unfortunately so often met with in finished city plans is the author’s justification for treating the subject at such length.

f) Comparison of the Dimensions of different areas

As it was unfortunately impossible to use the same scale in all our illustrations the reader may compare the dimensions of well known city squares by the following table in which the areas are arranged according to their approximate measurements

In these measurements the streets that border the squares are always included so that the last column gives the size of the open space between the buildings. The table shows clearly that the beauty of an area by no means increases with its size. The charming squares in Lübeck, Bremen, and on the Capitol in Rome have a surface area of only from 4300 to 5000 square meters; the celebrated squares in Nancy and Venice only between 10000 and 15000, the Piazza del Popolo and Trafalgar Square about 20000. The enormous dimensions of the Gendarmenmarkt in Berlin and St. Peter’s Square in Rome do not detract from their fine appearance only because in one case several majestic buildings divide the space and in the other the mobile outline, the grand setting and the effective arrangement of elevations are all calculated to direct the gaze to St. Peter’s church. Yet it is open to doubt whether the effect of the latter would not have been enhanced by making the square just a little smaller. The four largest areas and several others suffer decidedly from the exaggerated scale on which they are laid out.
<table>
<thead>
<tr>
<th>Place Name</th>
<th>Broadth (meter)</th>
<th>Length (meter)</th>
<th>Area in sq m (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Königsplatz, Berlin</td>
<td>230</td>
<td>460</td>
<td>105000</td>
</tr>
<tr>
<td>same, including the little Kö̈nigsplatz</td>
<td>-</td>
<td>-</td>
<td>134000</td>
</tr>
<tr>
<td>Rathausplatz, Vienna</td>
<td>200</td>
<td>400</td>
<td>80000</td>
</tr>
<tr>
<td>Place de la Concorde</td>
<td>220</td>
<td>360</td>
<td>79000</td>
</tr>
<tr>
<td>Place de l’Etoile</td>
<td>275</td>
<td>diameter</td>
<td>59000</td>
</tr>
<tr>
<td>St. Peter’s Square</td>
<td>240</td>
<td>340</td>
<td>57000</td>
</tr>
<tr>
<td>Frirdrichs Platz, Kassel</td>
<td>165</td>
<td>340</td>
<td>56000</td>
</tr>
<tr>
<td>Place des Nations, Paris</td>
<td>262</td>
<td>diameter</td>
<td>54000</td>
</tr>
<tr>
<td>Gendarmenmarkt</td>
<td>155</td>
<td>340</td>
<td>53000</td>
</tr>
<tr>
<td>Piazza Vittorio Emanuele, Rom</td>
<td>165</td>
<td>315</td>
<td>52000</td>
</tr>
<tr>
<td>Szchenyi Square, Szegedin</td>
<td>170</td>
<td>300</td>
<td>51000</td>
</tr>
<tr>
<td>Station Square, Milan</td>
<td>200</td>
<td>210</td>
<td>42000</td>
</tr>
<tr>
<td>Lustgarten, Berlin</td>
<td>180</td>
<td>230</td>
<td>41000</td>
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<tr>
<td>Schlossplatz, Stuttgart</td>
<td>180</td>
<td>210</td>
<td>38000</td>
</tr>
<tr>
<td>Piazza Cavour, Florence</td>
<td>180</td>
<td>180</td>
<td>32000</td>
</tr>
<tr>
<td>Kaiserplatz, Strassburg</td>
<td>170</td>
<td>185</td>
<td>31000</td>
</tr>
<tr>
<td>Köningsplatz, Cologne</td>
<td>120</td>
<td>232</td>
<td>26000</td>
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</table>

Note: Width shown in meter, Length shown in meter, Area shown in squaremeter.
<table>
<thead>
<tr>
<th>Location</th>
<th>Broadth (meters)</th>
<th>Length (meters)</th>
<th>Area in sq. meter (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neumarkt, Cologne</td>
<td>113</td>
<td>240</td>
<td>27000</td>
</tr>
<tr>
<td>Trafalgar-Square, London</td>
<td>145</td>
<td>155</td>
<td>22000</td>
</tr>
<tr>
<td>Königsplatz, Munich</td>
<td>120</td>
<td>185</td>
<td>22000</td>
</tr>
<tr>
<td>Dönhoff-Platz, Berlin</td>
<td>120</td>
<td>180</td>
<td>22000</td>
</tr>
<tr>
<td>Piazza del Popolo, Rom</td>
<td>150</td>
<td>180</td>
<td>20000</td>
</tr>
<tr>
<td>Piazza Grande</td>
<td>100</td>
<td>190</td>
<td>19000</td>
</tr>
<tr>
<td>Albert-Platz, Dresden</td>
<td>155</td>
<td>diameter</td>
<td>19000</td>
</tr>
<tr>
<td>Bahnhofsplatz, Hannover</td>
<td>100</td>
<td>200</td>
<td>18000</td>
</tr>
<tr>
<td>Wilhelms-Platz, Berlin</td>
<td>98</td>
<td>176</td>
<td>17000</td>
</tr>
<tr>
<td>Königsplatz, Kassel</td>
<td>140</td>
<td>diameter</td>
<td>15400</td>
</tr>
<tr>
<td>St. Mark's Square, Venice</td>
<td>58+90/2</td>
<td>175</td>
<td>13000</td>
</tr>
<tr>
<td>Stanislaus Square, Nancy</td>
<td>100</td>
<td>120</td>
<td>12000</td>
</tr>
<tr>
<td>Altermarkt, Cologne</td>
<td>48</td>
<td>145</td>
<td>7000</td>
</tr>
<tr>
<td>Marktplatz, Lübeck</td>
<td>60</td>
<td>85</td>
<td>5000</td>
</tr>
<tr>
<td>Capitol, Square, Rome</td>
<td>48+68/2</td>
<td>79</td>
<td>4500</td>
</tr>
<tr>
<td>Marktplatz, Bremen</td>
<td>63</td>
<td>68</td>
<td>4300</td>
</tr>
</tbody>
</table>

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The table above lists the dimensions and areas of various squares and plazas in different cities, including Neumarkt, Cologne; Trafalgar-Square, London; Königsplatz, Munich; Dönhoff-Platz, Berlin; Piazza del Popolo, Rom; Piazza Grande; Albert-Platz, Dresden; Bahnhofsplatz, Hannover; Wilhelms-Platz, Berlin; Königsplatz, Kassel; St. Mark's Square, Venice; Stanislaus Square, Nancy; Altermarkt, Cologne; Marktplatz, Lübeck; Capitol, Square, Rome; and Marktplatz, Bremen. The data is presented in meters for breadth and length, and square meters for area. The table is constructed with a clear layout, ensuring readability and comprehension.
Place de la Fayette an forcourt of the church St. Vincent de PAul in Paris
PART II

CHAPTER 7: The Artistic Side of Open Spaces

The arrangement and laying out of public squares is the most important artistic task in city building. Its successful accomplishment is one of the fundamental conditions for the satisfactory appearance of the town. It is therefore advisable to collect here and properly arrange the artistic requirements of public squares that are scattered through the foregoing chapter, to discuss them connectedly and further to supplement them from an artistic point of view. There follows a short historical review, after which we shall take up in order the surroundings or settings of squares, their proportions and dimensions, their relation to monumental structures, their grouping, equipment, division and arrangement, and their levels.

a) Historical Review.

Among the ancients the building of the city in general and the laying out of public squares in particular was more often considered as a work of art that it is today. Pausanias and Aristoteles spoke of the possession of public squares and public buildings as necessary to the conception of the city, and Aristoteles laid down the wise principles for guidance in building artistic and beautiful cities. The ancient city squares took the place of modern public halls for public gatherings and festivals.

The Greek name for these areas is therefore Agora (meaning originally “people’s meeting”). It was square or rectangular in shape usually enclosed by colonnades with an open gallery on top, surrounded by temples and other public buildings, ornamented with statues of gods and heroes and other art treasures; a gate with columns formed the entrance. That was the Greek council place. A second square not so richly appointed served as a market; but of still greater artistic importance were the places of worship. The temple areas of Acropolis, in Pergamon, in Eleusis, in Olympia and elsewhere were noble creations of the art of city building, public squares and festival squares of the first rank.

The Roman public square was the Forum. The former arrangement of the Roman forum in Arles, in southern France., is shown in fig.474. What has been preserved of the forum in Rome, in Pompei, (see illustration in part 5, chapter 7) and in other places give us an idea of the former magnificence of these ancient “festival halls” of the city. Vitruv has described to us the construction of the Roman forums and other writers have pictured the life that went on there.
There too we find columned structures, temples and other imposing edifices as surroundings, as well as statues, altars and even whole temples on the squares themselves. A distinction must be made between the Forum civile, the real place of council, justice, elections etc., and the Fora venalia, the markets. The Fora were also used for shows, gladiatorial struggles, and so on, although the theaters, palestras, and thermas, served the same and similar purposes. Many public squares and Italian towns (for instance Piazza Navona and Piazza di Termini in Rome) are the remains of such ancient areas, whose fundamental characteristics - free, uncovered surfaces and closely built surroundings or “frames” - are reflected in the courtyards of old Roman dwellings and in their descendents, the courtyards surrounded by galleries in southern European town houses.

In the Middle Ages in Italy there were three distinct squares: the Signoria, the worldly square, usually serving as the approach to the finest palace, surrounded by other public buildings and often adorned with a loggia, or pillared hall used as a platform and as a main-guard room; the cathedral or church square on and about which were assembled the church, the special baptistry, the Campanile and the bishop’s palace; finally the mercato, that is, the market-place with fountains and weighing scales and municipal government buildings. Signoria and mercato have their predecessors in the ancient squares but the church squares has not. The church was usually built on it connected on one or more sides with cloisters, schools and similar structures. Sometimes the cathedral square with its various buildings became the finest spot in the city, comparable to the Greek temple areas; this is the case in Pisa for instance, where even today cathedral and baptistry, bell-tower and Campo Santo display their marble eloquence in majestic harmony.

The German towns of the Middle Ages used the market-place for public gatherings and festivals. It was also the town hall and square and fountains and monuments stood there. In the preceding chapter we gave numerous examples and also pointed out the fact that the church buildings in contrast to the town hall which stood on or facing the market, generally stood in more retired and frequently quite cramped surroundings. They were often attached to cloisters,
convents or seminaries but sometimes stood alone in church-yards or squares of their own. Whichever way they were erected they have provided our modern cities with many beautiful church squares, for the church-yards later ceased to be burial grounds and the many small buildings that crowded about embraced cathedrals and churches like a circle of parasites after the Middle Ages, were afterwards torn down. This clearing away of surrounding structures may however be carried to too great length as will be shown in chapter 8 of this part.

The squares laid out during the Renaissance were copied from the old Roman models, from the fora but also from the thermae, the theater and circus squares. Particularly in Italy they were frequently enclosed by pillared halls, either standing separate or connected with the houses, and were either straight or curved in outline. They were decorated with oblisks, statues and fountains, and reached the height of their development during the Baroque period. Under heading 231 we have already discussed St. Mark's Square with its straight surroundings after the manner of the fora and the Piazza del Popolo and St. Peter's Square with their curved outline-structures were described under heading 217. Besides the squares that are entirely enclosed we find also some that, like stages, are shut in on three sides and open on the fourth, the spectators' side; among them are square in the front of the Palazzo Pitti and the Piazza dell' Annunziata in Florence (fig. 442), the Piazza Colonna in Rome (fig. 418) and especially the Capitol Square (fig. 437). With the rise of the new style of art the Italian squares were imitated all over Europe. Particularly in Spain, France and Germany the later Renaissance and the Baroque period created many remarkable works of this kind. The Plaza Mayores in Madrid, Salamanca, Bilboa and elsewhere are closed and surrounded by buildings and halls. We owe to that time that was especially
successful and enterprising in its arrangement of masses, the Stanislaus Square in Nancy (fig. 440), the Tuileries and the Place des Vosges in Paris, the squares before the palace and the Brandenburger Tor in Berlin, the Residenz squares in Vienna, Versailles, Stuttgart, Karlsruhe, Würzburg, Koblenz, Braunschweig and Gotha; also numerous squares in front of public buildings, the front and two sides of which are usually formed by the building with its two wings. In fig. 475 we have an illustration of a square such as is found in very many places.

In spite of Schinkel and Semper the nineteenth century accomplished little that was artistic in the way of city-building notwithstanding that in the second half the growth of city life and city expansion was greater than perhaps ever before. Even today the work of geometrist and the activity of the land speculator frequently take the place of the plan of the architect. The work of a surveyor and the enterprise of the business man are certainly indispensable; but only the penetration of the whole by the idea of artistic building will be able to raise city-building from its present low status and place it beside the accomplishments of earlier artistic periods. Unless all signs fail we, in Germany, are on the way to a healthy development, the artistic part of which we owe especially to Sitte’s endeavors. Artistic activity seems to be weakest in North American city-building. There the striving after uniformity, quickness and money making seems so far to have prevented artistic considerations from even entering into the technical task.
b) Surroundings

It is the surroundings that make of the open, uncovered space a square. As long as the surroundings consist merely of a line on the plan, a fence, a hedge, that is, as long as they do not possess the character of an architectural wall, the square lacks the corporeal, architectural quality.

Thus, also from an artistic point of view, the street crossings, expansions and connections discussed in chapter 5, do not belong among the city squares and the “traffic centers “, described under a in chapter 6, which must necessarily be open on many sides to provide thoroughfares for traffic, bear the architectural character of a square only as an exception when, in spite of the traffic that crosses them, the surroundings are kept as closed as possible. This is the case in fig. 363, 366, and 368 where station walls form the long side, in fig. 375 and particularly in fig. 364 where arcades embrace the open area, and finally in fig. 367 where the space is enclosed by the gate and buildings on one long side and by the ramp structures at the ends. In general the traffic center, open on many sides and crossed in all directions by streams of traffic and pedestrians, is artistically unsatisfying and has something this disquieting and uncomfortable about it; the warning against a too liberal use of the spaces - which may be the cause of modern disease “fear of open spaces” - particularly of radial spaces, may therefore be repeated.

The surroundings of squares cannot of course be entirely closed as streets opening into the latter are indispensable. We saw however in figs. 364, 367,395 and 470 how colonnades can be continued across the street openings or how a city gate may form the connection. The streets may also enter the square in such a way that the setting appears as a little cut up as possible, the gaze being directed more towards the buildings than towards the gaps made by the streets (fig. 376 and 380).

Colonnades either lie along the front of the houses, that is are built into the lower stories and continued across the street openings by arches, or they may be independent structures the purpose of which is to give the square an ornamental setting. In both cases they usually serve as covered sidewalks. The most magnificent example of the second sort is seen in fig. 423, St. Peter’s Square in Rome.

Gates and gateways also either form a part of the houses that surround the square, as in the Joseph-Platz in Vienna, the Kerkboog in Nymwegen, the thoroughfares for vehicles and pedestrians under the town halls of the Middle Ages and the Renaissance. (Munich, Lübeck, Emden etc.), also in the Piazza Grande in Triest (fig. 469) and the Place Des Vosges in Paris (see where mentioned elsewhere,) or they are independent structures: triumphal arches, city gates etc.
Examples of the latter are seen in the Stanislaus Square in Nancy (fig. 440), the Amalieborg Square in Copenhagen (fig. 443), the Karls-Platz and Königsplatz in Munich (figs. 392 and 444) and the Pariserplatz in Berlin (fig. 465). Surroundings of a peculiar sort are the wrought iron railings at the corners and across the street opening of the Stanislaus Square, the parapet railings in the Place de la Concorde in Paris (fig. 451), the parapets at the ends and the terrace along the side of Trafalgar Square in London (fig. 456). The destruction of many medieval town gates was an error not only from the standpoint of preservation of historic relics but also because gaps were thus formed at points where closed surroundings were needed to frame the street view, or squares either already in existence or yet to be laid out.

If the lines of the streets are continued across or along the length of a square it loses a great deal of its effect. This is not so when the views from the streets as they enter the square are of the opposite wall, so that the square appears closed. The simplest arrangement of this sort is that of the turbine or windmill squares discussed under heading 185 (fig. 476). Various applications of this design are shown in fig. 477, from Ravenna, fig. 478 from Mantua, fig. 479, from the suburbs of Brünn, fig. 480 from the plan for city expansion in Marienburg. Somewhat similar is the way in which lines of the streets face the walls of the squares in...
An odd method of making the gaps in the surroundings of the square as small as possible is that employed, as has already been mentioned (marginal heading 202), in a great number of those towns that were founded in the thirteenth and fourteenth centuries, as German settlements in the countries lying to the east, for instance, in Pilsen, Waldenburg in Silesia, Glogau and Posen.

This method, as shown again in fig. 484 consists in combining two streets at the corner where they enter the square in such a way that the opening is only about half their breadth. Thus the corner houses a and b are visible in the street lines A and B, and the wall of the square a c gains in length. As the narrowed street areas that thus arose might be inconvenient for traffic and as medieval town builders can scarcely have made aesthetic considerations of first importance in laying out new streets and squares, we may suppose that the object of this arrangement was to gain longer fronts facing the square, for business purposes. Be that as it may, the plan, for artistic reasons, is worthy of imitation where the traffic allows of it. Under certain conditions it is admissible in order to relieve traffic to slant off the lower stories of the houses at the corners a and b, the upper stores being built out as usual. The arrangement shown in fig. 485 which consists in building the corners a ,a back far enough so that, although the gap continues to be partly concealed, the traffic gains a sufficiently wide entrance into the square, may also be used. More modern examples are given in figs. 486 to 488 , taken from Posen and Gelsenkirchen.

The buildings surrounding squares should present a harmonious appearance which is often obtained by uniform are symmetrical arrangement (Amalieborg Square, Place Vendôme, St. Mark’s Square, the Capitol Square, etc.); it can however be produced as well by providing for artistic balance in the placing of different single buildings as is shown in many of the picturesque medieval market-places ( Lübeck, Bremen, Stralsund, Breslau, Kracow, Brussels, Veurne,
Brügge etc.). Generally the surroundings of the square consist of the town hall, a court house or a church, as the principal edifice, which the other buildings adjoin thus forming a graceful setting for the whole. The erection of two main buildings of different styles, standing opposite of each other, on the principle sides of the square, is also not difficult to carry out as they do not present themselves to the eye as a pair.

Far less pleasing on the other hand is the arrangement frequently seen in new city plans whereby two buildings are placed on either side of the principal axis of vision, for instance, or standing side-by-side form one wall of the square. The need for two such buildings of equal merit is rarely felt, as we stated under the marginal heading 224; it certainly should not be artificially created in the city plan.

The well-considered artistic setting of open spaces is indispensable if, in spite of the changes in the conditions of society and travel, modern city squares are again to reach the artistic height of the antique forum and medieval marketplace or to equal the creations of the Renaissance. In the setting the idea of the square is traced back to its source; it emphasizes the relation between the atrium of the antique house and the forum of the antique city, between the courtyard of the medieval or Renaissance castle and the city square of today. The clearer this relation is shown the greater will be the artistic effect.

C) Shape and Size.

If there is to be the suggestion of the room about the city square, as the foregoing sentence implies, its outline must be such that the whole appears as a unified space enclosed by the walls of the buildings about it. Broken outlines like those, for instance, of the Luisenplatz in Darmstadt (fig. 449) and of the square-like expansions in the Karl Friedrich Strasse in Karlsruhe (see illustration in part five, chapter 7, under a) , with many jutting out corners, destroy the room like
impression. As the building line of a street so too it is desirable to have the outline
des of a square concave and to avoid making it convex; this does not mean that the
designer should make all the lines of a square more or less circular but rather that
he should bear in mind the manner in which a photographer groups a large party
so as to get a good photograph of the whole. He arranges most of the people
in an irregular concave line and places only a few, perhaps the most
important members of the group, somewhat more towards the front. This
consideration

underlies the successful effect of squares like the Leipziger Platz in Berlin, the
Place Vendôme in Paris, the colonnades in front of St. Peter’s in Rome etc. Indeed
even many traffic centers that are open on all sides make an excellent impression
because of the concave grouping of the buildings surrounding them.

Regularity of form, in the geometrical sense, is not necessary for
a square; neither does it need to be symmetrical. Aesthetic balance however is
required and distortions and “freaks” are to be avoided. The irregular forms of
medieval squares, which only seem to be intentional and have really arisen in
the course of centuries for special reasons, charming though they are, cannot be imitated intentionally. But in modern suburbs and plans for city expansion irregularity is justified wherever it grows out of local causes and fulfills artistic purposes. We cannot call down on the squares we create the picturesqueness of former times; in a few years or decades the squares that we lay out will be surrounded by the dwellings and buildings of modern people. Thence follows for us the authority, not of the ruler and compass, but of the creative mind that uses the ruler and compasses as well as the freehand line to obtain artistic and practical results without losing itself among intentional irregularities for which there is no reason.

In spite of the radical difference between modern and former times we learn from the lawlessness of old squares that after we have planned the whole in harmony with the ideas of our time we should not allow ourselves to be too closely bound to regularity and symmetry in the execution of details. The beautiful form of the Piazza delle Erbe in Verona (see illustration in part 5, chapter 7, under A.), is very striking although the lines of both sides are not exactly symmetrical nor the details perfectly regular. By the use of such irregularities, recesses and projections, even spaces of an unfavorable form, as, for instance, the triangles that are so common in modern city plans, may be made nearable, or even picturesque, whereas in a regular triangle the lines of the buildings clash harshly and unpleasantly against one another.

The size and open space should be in accordance with the purpose to which it is to be put and with the size of the buildings that are to be erected on or behind it. The amount of business transacted on the marketplace, the amount of traffic, the desirability of garden
areas and other practical considerations will determine the size of the open space; but artistic considerations will prevent extremely large or extremely small dimensions and end will establish the limit of permissible measurements. H. Maertens’ excellent work: “’the Optical Scale etc.” (Der optische Masstab etc. 2nd ed Berlin, 1884) and the comparative study of well-known city squares afford us the necessary data.19

Maerten’s theories, which so far have remained undisputed all their essential points, include the following:

1) a distance equal to the determinative height of the building, requiring that the eyes be raised at an angle of about 45°, is the most suitable from which to obtain a view of the details of a building.

2) a distance equal to double the height of the building (requiring that the eyes be raised 27°) is the normal one from which to obtain a view of the whole building alone, while.

3) a distance equal to three times the height of the building (requiring that the eyes be raised about 18°) unites the view of the building with its surroundings and blurs the details; finally

4) a distance equal to 4 or 5 times the height of the building affords only a picturesque view of the whole, in which the outline of the building is most effective.

In judging the “determinative height” towers and such like, also high roofs etc. are usually not included. The greatest side angle at which a distinct view is still obtainable is about 70°.

According to these rules the breadth of a street or square, on or behind which a prominent building is to be erected, should be at least equal to the height of the latter.

If this be so it appears that many building regulations allow the houses to be built somewhat too high (compare marginal heading 120). On the other hand our warning against too broad streets (see marginal headings 114 and 123) is also justified. Thus too it seems that a number of medieval church squares are too small whereas many modern squares are exaggerated in size. For it is clear from Maerten’s rules that a square which is greater than double or three times the height of the building detracts from the view and effect of the structure. At certain points of the square however the distance may be greater, up to about 4 times the height, so as to afford a view of the picturesque, architectural union of the edifice and its surroundings. Then can also be no objection to streets which from a greater distance guide the eye to the edifice as the termination of the view. But also in such street views moderation must be observed for if the distance

19 compare also:Maertens, H. Optical measure for city-building, Bonn 1890
from which the building is seen is greater than 6 times its height is apt to appear insignificant unless a direct comparison with smaller buildings is afforded.

According to Maertens the old Procurazia is seen from the center of St. Mark's Square by raising the eyes on the 29°, the new one and St. Mark's Church by raising them 33° and 28°, while measured from the long side of the square the two first are seen at angles of 16° and 18°. The average breadth of the square is about three times the height of the buildings.

Our remarks on the least permissible size of spaces in front of public buildings (marginal heading 216) are supported by Maerten’s principles. The height of the courthouse on the Appellhofplatz in Cologne is about 30 m, the breadth of the square only 32 so that it is necessary to go down the slope into the Komödienstrase to obtain a good view of the whole building. On the Piazza della Colonna in Rome, on the contrary, the palace facing the Corso is seen from that thoroughfare at a distance of 2 ½ to 3 times its height and the Marcus Aurelius Column, which is 29 m high, from a distance of about 40 m.

The depth of the square in front of Milan Cathedral is 169 meters, the height of the church is 56, thus the proportion is about 3:1. The effect of the whole is also marred by the fact that the facade of the cathedral does not sufficiently exceed in height the lofty buildings that surround the square; it has however been somewhat improved by gardens and a monument. The cathedral in Palermo, on the contrary, is seen from the side of the square at a distance of somewhat less than double its height; the effect is therefore much grander. The first view of St. Peter’s from the Piazza Rusticucci is not as impressive as we might expect; this is because, although the dome may rise 143 meters above the point from which it is seen, the distance from the visitor to the vestibule is 340 meters, that is 2 ½ times the height, and to the intersection of the nave and transepts 480 meters, nearly 3 ½ times the height. For this reason the view of the cathedral is rather a picturesque than a majestic one; it appears as a part of a magnificent architectural scene.

The beautiful proportion of about 1:2 or 2 ½ between the breadth of the square and the height of the building is shown, for instance, in the Capitol Square in Rome, the Piazza dell' Annunziata in Florence and the market place in Brussels. The proportion of the breadth of the Kaiserplatz in Strassburg to the new Kaiserpalast is greater than 1:4; it is therefore not to be wondered at that from most points of view the palace does not make the desired impression. The proportion on the Königsplatz and Friedrichs-Platz in Kassel, on the Rathausplatz in Vienna and on the Szechenyi-Platz in Szegedin increases to 1:8 and more. On the Rathausplatz in Cologne, as well as on the sides of the minsters in Regenburg and Strassburg (North front), on the contrary, it sinks below 1:1.

Turning again from the size of the squares to their form it is clear, after the foregoing, that fronts with towers and domed structures require spaces of a form that will allow of a proper view of the high parts of the building; the spaces
must possess great “depth” (compare figs. 417, 419, 478, and 489.) Sitte designates this kind of squares as “deep squares”. Wide buildings whose height is not so marked, like town halls, museums, also the sides of churches, on the other hand, require long spaces of slight depth, called “broad” or “side” squares (compare figs. 366, 368 and 481, 490). The outline of St. Mark’s Square in Venice takes into account the cupolas of the church as well as the low wide forms of the Procuratie.

It would be toil spent in vain to try to establish artistic rules for the proportion between the length and the breadth of a square. Spaces that approach the perfect square in form, like figs. 434 to 437, 440, 442 etc., may in reality be as satisfactory aesthetically as long spaces, for example, figs. 381 and 389. The main point to be considered is the perspective view and that is dependent on where the visitor stands, on the buildings around and on the manner in which the space is ornamented. It is true, the longer a “square” is the more it looks like a street, perhaps the proportions of the Piazza Navona in Rome (1:4) may therefore be considered the limit between squares and streets. The so-called Friedrich Wilhelms-Platz in Aachen (proportion 1:6) and the Ständeplatz in Kassel (1:7)

really do appear like streets.

The endeavor to enlarge too narrow spaces, to clear a space around monumental buildings that are too shut in, is praiseworthy in itself but is attended by risks. The fact that errors have been made on the side of exaggeration has called forth warnings against extending squares and against “clearings” altogether. Efforts have even been made to reduce the size of too extensive open spaces. Sitte, in his various works, has presented plans for reducing the open spaces about the court buildings, the Imperial Theatre, the City Hall and the Votive Church in Vienna by adding new groups of buildings. Even though from the standpoint of traffic these plans are partly impracticable and also arouse certain aesthetic misgivings, still they
contain artistic truths that have already been of great service in the development of city building. In fig. 491 we give a sketch, that is well worth consideration, of the alterations proposed by Sitte for the surrounds of the Votive church in Vienna.

The extensive space between the Ringstrasse and the church and the smaller space behind the choir should be partly built up with the blocks A, B, and C. A deep square of limited extent would still remain as an atrium in front and a space from which to obtain a side view on the Währingerstrasse. The choir and transept could still be viewed obliquely from the space remaining behind the choir. The ends of the block fronting on the Ringstrasse would be ornamented with two monumental fountains and an appropriate site for a monument “of the first rank” would be gained at D. which would be well set off by the closed architectural background.

d) Position of Prominent Buildings on or Facing Open Spaces.

The view according to which, in the preceding chapter, spaces in front of buildings, spaces surrounded by buildings and covered spaces were distinguished from one another, may also be expressed, if we make the buildings and not the spaces out starting-point, by distinguishing between a building (or buildings) that is detached on one, on
Buildings that are detached on one side only, have more the appearance of a front, a wall, than of an architectural body. Numerous examples were given in the foregoing chapter in connection with spaces in front of buildings and those surrounded by buildings as well as under b in the present chapter. The Greek agora and the Roman forum also generally show us only the fronts of the buildings. It must be admitted that this arrangement is less satisfactory for the building itself; but the spaces in front of such buildings and to an even greater extent those that are surrounded by majestic structures, may be so magnificently and effectively developed that it is not rare for the square to appear to be the main object and the buildings only a part of it.

Buildings detached on two adjoining sides, that is one end and one side, are comparatively rare. Such an arrangement often has a forced appearance in a regularly built city as one corner of the building projects into the square (see fig. 449). In other cases, for instance, in Catania, (fig. 492) the effect is excellent because the square is divided into two independent parts, each of which is suited to the side of the building facing it. The imitation of such picturesque arrangements is by no means out of the question. Similar ones are found in the Cathedral Square in Sienna, in connection with Notre Dame in Rouen and several churches in Cologne, as well as in Würzburg where the choir of the Cathedral is on the Paradeplatz, the long north side on the Münsterplatz which is connected with it.

A different arrangement is when the building is so placed that the front and the back, or better, two parallel sides are free. This results in the formation of two separate open spaces, like those about the Palace in Berlin, the Cologne City Hall and many medieval churches.

But even in the Middle Ages prominent buildings were usually given a more isolated position. Three sides were generally left free and the fourth adjoined structures belonging to the church, palace, or whatever the main edifices might be. Several of the numerous examples that have been preserved are shown in figs. 493 to 496. In Padua one side originally adjoined other buildings whereas those on the other side were added later and are by no means organic. The cathedrals in Regensburg and Münster i. W., the Church of the Apostles in Cologne etc. are also connected on one side – in Strassburg the choir side – with buildings belonging to them. The back of the City Hall on the Market in Wismar adjoins a group of buildings standing on another property. That churches today are usually built completely isolated from other buildings is partly due to the fact that their direct connection with schools, cloisters, etc. is no longer as necessary as formerly and partly to a custom that has been carried to extremes. This custom may safely be broken away from and indeed such a course is to be advised wherever for practical reasons and out of artistic considerations it appears desirable (compare f. i. fig. 481). The proposals of Sitte and others however, who
set themselves against the isolation of buildings altogether, overshot the mark.

Ancient and modern churches and other edifices that are isolated on all sides have already been illustrated in great number in figs. 424 to 433. Other examples, such as very frequent in medieval towns, are given in figs. 497, 498 and 505. It is in keeping with the artistic interior construction of some buildings that all sides of the exterior should also be visible; but one or two sides can just as well face a garden as a public square. As regards an isolated position the following buildings, besides churches, come under consideration: city halls, concert halls, parliament buildings, market halls, exhibition buildings, stock exchanges etc. On account of the danger from fire isolation is even more important for libraries, archives, museums and theaters. Barracks, higher schools, and hospitals should indeed be in independent blocks and separated from all other structures but they do not require public open spaces about them as they should be provided with grounds of their own for recreation and other purposes as well as for outbuildings.

A building that is detached on all sides need not therefore need not stand in the center of the open space; figs. 417, 422, 424, 432, 439, 466, 498, 499 and 505 show the contrary. The principle view and perhaps also a second one has naturally to be considered and both these require a certain amount of space. Thus figs. 498 and 499 show a larger space in front and sufficient to afford a view of the choir at the side.
The division of the space about buildings of greater extent results in the formation of several (two, three or four) squares on the different sides of the building. Thus, for instance, the Domhof lies on the south side of Cologne Cathedral, the Domkloster on the west side and the Bahnhofplatz on the north side—all open spaces of considerable size. The choir side of Santa Maria Maggiore in Rome lies on the Piazza dell’Esquilino, the front on the Piazza Santa Maria Maggiore. Smaller buildings too are sometimes surrounded by different squares, among others the theatre in Mainz (fig. 500), three sides of which face three independent squares; Gutenberg-Platz, Tritonplatz and the Krempelmarkt; also the Mairie in the twentieth district of Paris, on one side of which lies the Places des Pyrenées, the junction of six streets, while the other faces the Square Tenon (fig. 501). The Church of St. Augustin in Paris (fig. 432), the Cathedral in Palermo (fig. 490), Sitte’s proposed alterations of the surroundings of the Votive Church in Vienna (fig. 491), the cathedrals in Amiens and Orleans and many other edifices show similar arrangements. A particularly charming group of squares is found about the Cathedral in Salzburg (fig. 502), consisting of Residenzplatz, the Kapitelplatz and the Domplatz which are separated from one another by open pillared passages.

It is clear that by means of such a distribution of the open space the single parts of which are treated as separate squares, the surroundings of an edifice may be made very rich in variety and picturesque, and the effect of the building itself also greatly enhanced. The surroundings of
Salzburg Cathedral, in which the Mozart-Platz should also be included, might be cited as a perfect example – as the individual squares are closely framed as far as possible and ornamented with fountains and monuments – if the Domplatz were not a little small and the buildings on one side of the Kapitelplatz did not stand quite so near the choir.

The opposite method, that is, the division of an open space by the erection of several large buildings is more difficult and not so frequent. Among examples belonging to former times we have already mentioned the Acropolis in Athens and the Cathedral square in Pisa; more modern examples are the Theaterplatz in Dresden and the Gendarmenmarket in Berlin (fig. 433). In such cases the difficulties of determining the dimensions and “framing” the square are materially increased; their solution is a peculiar and risky task in each separate case, a task that, on the whole, has been very successfully accomplished in the examples mentioned above.

e) Groups of Squares

We have hitherto considered the division and grouping of a space surrounding one building (or in exceptional cases a group of buildings). The next step is to examine those groups of different squares that have no common artistic relation to any one particular edifice.

One sort of such squares was discussed in the preceding chapter (under e): double squares which owe their origin to the different practical demands that the square is intended to satisfy.
Another way of grouping different squares is according to artistic considerations with reference to different buildings. The Piazetta and St. Mark’s Square in Venice are not distinguishable from each other by differences in their usefulness but are widely distinct in their artistic arrangement. They are clearly divided from each other by the Campanile; the Piazzetta serves as a “front” square before the library and the palace of the Doges, St. Mark’s Square as a space from which to view the church and as a majestic public square; their union results in a most beautiful city scene. Smaller, but equally characteristic is the group consisting of the Piazza di San Domenico and Piazza Reale in Modena (fig. 504), one of which is the square in front of the church of the same name while the other lies in front of the massive Palazzo Ducale or Reale. The group shown in fig. 503, in Parma, is similar. There too a church and a palace have caused the formation of a double square. One of the finest examples in Germany is a group in Braunschweig, of which only a sketch is given in fig. 505; consisting of the Alstadtmarkt with its fountain, surrounded by the city hall, the Martini Church and the Gewandhaus; and a second square that lies at the side of the church. Similar examples are found in Bremen, Lübeck, Stettin, Magdeburg, Cologne and other German cities; under the marginal heading 231 attentions was also called to the favorite grouping of the town hall and the church in the Middle
Ages, of which the market-place and the Marienkirche in Rostock (fig. 506) are an excellent example. French groups of squares are those about the Hôtel-de-Ville and St. Gervais in Paris, the Cathedral and the Court House in Reims, the City Hall and the Cathedral in Orleans. These attractive arrangements of squares and the picturesque scenes and groups which they produce show us how the close and careful grouping of open spaces in modern city plans too may contribute to the artistic embellishment of the city if the arrangement is based on a genuine need, is well thought out and properly executed. Examples of modern groups in Kiel and Marienberg are shown in figs 507 and 508. Arbitrary inventions for which there is no real basis are, of course, of little value; here too then it is clear that the city plan must not be regarded merely as an arrangement for traffic and buildings, but that the needs and aims of the future must first be carefully studied and the plan then adapted to them with due respect to artistic considerations.

The well thought out city plan should also aim to group the public squares artistically in the wider sense. Aristotle advocated that all public buildings should be grouped together in the city and this may well be demanded today in our smaller towns and newly founded cities. With the growth of the city however the prominent buildings naturally become scattered and it is one of the most important tasks in making plans for city expansion to arrange their distribution not only from a practical point of view but also artistically, grouping public buildings and public squares so that they best fulfill the purposes for which they were designed and at the same time stand in artistic relation to one another. In this way arises the richness of design, the pleasing variety that we admire not only in the old cities where art has been especially cultivated (for instance Rome, Florence, Nürnberg, Braunschweig), but in thoroughly modern cities like Paris and Brussels. Groups like the Madeleine and Palais Bourbon, the Tuileries and the Triumphal Arch, the Palais Luxembourg and the Observatory; squares distributed as are the Place de
la Concord, Rond-Point and Place de l’Etoile, the Place d’Eylan, the Jena and Trocadéro Squares; distant and indirect views like those from the Boulevards of the churches Trinité, Loretto and St. Vincent de Paul – such artistic grouping in the same wider sense, which was also the aim of the author in his plans for the expansion of Cologne, offers not only an attractive scene on paper but is in reality most inspiring and, in the best sense, entertaining. The difference between city laid out in this way and one that is merely an unattractive rectangular system of network streets, entirely lacking the artistic wielding together of thoroughfares, structures and squares, is very striking and must make clear to everyone to how great an extent the building of a city may claim to be a work of art

f) Equipment, Arrangement and Level of Open Spaces

Under marginal heading 226 the streets of a city were likened to the passages, the squares to the rooms of a dwelling. This comparison map be followed still further in the equipment of the streets and squares. Just as the decoration of corridors is kept subordinate, occurring only where they widen or contain alcoves or niches etc. so too streets are embellished only at such points. The square however as a bare space space is nothing but an empty room, a room without furniture or ornament. The candelabra, placard–pillars, newspaper kiosks and such like may be compared to the household furniture, the fountains, ornamental flagstaffs, statues etc. to the art objects in a house; plants and flowers increase the atmosphere of
comfort both within and without. Thus the equipment of the square must be added to its surroundings. In parts 5 & 6 of this half-volume the different objects used to adorn a square and their arrangement will be discussed in detail; at this point only a few general principals are emphasized.

The way in which such furnishings as lamppost, notice-boards, booths, railings, curbstones etc. are used should be much more artistic than has hitherto been customery in most cities; for the effect of the interior architecture of public buildings on the taste and mind of the people is small compared with the effect of the “little architecture” – if it may be so called – of the streets and squares. The kind of works of art to be used and the manner in which they are placed should be the subject of most careful consideration. What a difference there is, in this respect, between the majority of our modern cities – not only our manufacturing and commercial centres – and the ancient cities of Greece and Rome! Today there is indeed a wealth of statuary and other works of art in the museums and the houses of the rich, but an emptiness of all art in the squares; in Greece and Rome we find agora and forum magnificently adorned with works of architecture and plastic art speaking in monumental eloquence to the living generation, of gods and heroes, of the great deeds of their ancestors and of love of their country! The
average citizen visits the museum several times a year or – even less frequently. He crosses and sees the public squares weekly or daily. The artistic fountains of mediaeval towns and the statuary so generally seen in Italy should serve as models in our provincial towns to a far greater extent, always of course with due consideration of modern demands.

Useful structures and works of art should not interfere with views and lines of traffic. Only a work of importance can form the chief adornment of a square or the terminal point of a long line of vision. The arrangement of monuments like an army in a long straight line, is seldom desirable; grouping and picturesque distribution is more attractive.

The division and arrangement of the square is of great importance. Throughfares, footpaths, resting-places, flower beds and shrubbery, places for fountains and monuments, for booths and notice boards, seats etc. must be carefully considered and separately arranged for, just as in a room, carpets and rugs, chairs and tables, corner seats and ornaments are not distributed haphazard nor yet according to ruler and compass. The principal thoroughfares may indeed be curved according to necessity but must be blocked. The spaces that are free from traffic – with the exception of the resting-places, discussed under heading 191 – should be arranged as connectedly as possible for they are the only parts that can be decorated and offer the only opportunity to stand still and observe. It is advisable to divide extensive areas lying beside the paths into plots and borders.
These may be inlaid with geometrical and architectural designs in different kinds of paving, for instance, flagging and mosaic work (compare part 5, chapter 4). As examples may be mentioned the Capitol and St. Peter’s Squares in Rome, the Cathedral Square in Milan and the Amalieborg Square in Copenhagen.

The lines of the edges of the walks and the railings or hedges, of the street car tracks, foliage, etc. of a square should be practical and pleasing, regular, but not forced in appearance. Geometry, art and nature should be united in a harmonious whole. Architecture and shrubbery, monuments and foliage, the green of plants, and water – all these, each by its peculiar character heightening the impression of the others, are the best means of obtaining artistic effects in public squares.

Finally, the level of a square is of the utmost importance. To an even greater extent than in streets it is necessary to avoid convex, and incline to concave forms. If we classify squares as horizontal, that is, approximately horizontal, and sloping, we may say that the former are generally better suited to be surrounded by, or to surround, eminent buildings and for artistic decoration than the latter without however excluding the sloping squares altogether. It is the reverse of beautiful to see a square that is naturally horizontal raised in the centre to provide better drainage, so that it appears to the eye, which sees horizontal dimensions much foreshortened, like a mound or top of a tent. If in addition a lawn or ornamental space is laid out in the centre it affords almost no pleasure to the passerby at the side of the square; only people in the upper stories of the buildings surrounding it can see the beautiful design as it was planned.

Among the ancients, during the Middle Ages and Renaissance, the opposite process was frequently employed, that is, sinking the square in the centre, thus affording a more complete and beautiful view of its surface, as many remaining samples show. Noteworthy examples of ancient squares are the forums in Rome and Pompeji, of mediaeval squares the market-place in Fournes (fig.435) and the Römerberg (square in front of the Römer) in Frankfurt a. M., and of a later period, the Residenzplatz in Salzburg, Zwinger and Theaterplatz in Dresden,
Piazza del Popolo and St. Peter’s Square in Rome. We have already mentioned that the last-named square slopes downward towards the centre in fig. 423; many models of it however take no notice of this fact, as, for instance, that in the Crystal Palace in London. Particularly if the square is to be ornamented with lawns, flower beds or fountain basins it becomes almost necessary to sink the centre. In modern times, since the subterranean drainage of cities has become indispensable, there is no longer any difficulty in making the form of the surface concave.

Where festival squares (public meeting places etc.) are concerned it is of still greater importance, from an artistic point of view, to sink the whole surface of the square inside a “frame” of a higher level. In the last chapter we pointed out the advantage of being able to overlook such squares from the margin; a raised walk all round with steps leading down from it, colonnades and archways as surroundings, flat roofs above the colonnades from which to overlook the scene – such an arrangement of the whole would bring back to us a tinge of antique grandeur.

Sloping squares cannot be avoided where the city itself is built on a slope. Their formation and artistic treatment is indeed more difficult than those of horizontal squares; nevertheless they can be made charming spots in the city. A majestic building on the upper side of the square, or even a large monument with terraced foundations, is most effectively placed. One of the finest examples of the sort is the Trocadéro Palace in Paris, which, seen from Seine or the Champs de Mars, rises majestically behind an ascending square. The church of

Fig. 507.

Platzgruppe in Stübben’s Bebauungsplan für Kiel.

Fig. 507

group of plazas from Stübben’s construction plan for Kiel
Santa Maria Maggiore in Rome may also be mentioned again in this connection. Its choir rests on a foundation of thirty steps on the upper edge of the sloping Piazza dell’Esquilino. Another example in Rome is the church Trinità de’Monti, the narrow space in front of which is reached by ascending 125 steps from the Piazza di Spagna (fig. 509).

The ascending sides of a sloping square are little adapted to the erection of prominent buildings, still less so the lower side, on which building, seen from the upper side, looks as if it had sunk into the ground. Statues and fountains, on the contrary, can often be advantageously placed on the lower side or on the sloping surface, the background being formed by foliage. This is only possible however if a horizontal effect cutting into the sloping surface be avoided. The “Herrenacker” in Schaffhausen shows how unfortunate the attempt is to interrupt the slope of a square with the horizontal basin of a fountain. In this particular case the discord of the lines is all the more striking because the basin is set in the centre of the square. The surface of the water cannot be seen except from the upper half of the square. If water was to be used at all for decoration just at this point a cascade would have been suitable, certainly not a fountain basin intended for horizontal square or garden area.

The slope of the square may be either straight, concave or convex. A slightly hollow slope affords the prettiest view, particularly if the square is decorated with shrubbery and flowers. A convex surface, that is, one in which the upper part of the space has a gentler slope than the lower part, or worse, where a flat space adjoins a ramp-like ascent, is ugly. The ground floors of the buildings standing along the upper margin of the square are hidden from below...
the ridge. In such cases there are indeed methods by which the bulge can be concealed (compare heading 141) but their application is difficult and expensive. Generally the result is accomplished by separating the planes of the square by a parapet, terraces, dense shrubbery and such like. It is better in new city plans to avoid such ridged squares. The spaces about some imposing buildings, for instance, even Cologne Cathederal, are unfortunately not free from this evil.

A sloping square may be rendered uncommonly charming by allowing the streets at the sides to ascend but, according to the concave principle, keeping the surface of the square proper horizontal or, better still, only slightly inclined, which arrangement results in its being enclosed on the sides and along the upper margin by a terraced or graded setting. If these steps, breast-walls and terraces are architecturally developed, perhaps also ornamented with figures, artistic squares of the first rank may be produced. Examples are Trafalgar Square in London with steps at the sides and terraces above, and the Petit Sablon Square in Brussels, the surroundings of which are graded and richly ornamented with figures. For squares in front of public buildings the following arrangement is particularly advisable: a garden-like foreground above which the building rises by means of steps and ramps; examples in Paris were given in figs. 422 and 473.
PART II

CHAPTER 8:
Flush Lines in Old City Districts

When the extension of a fortified town is suddenly undertaken or when an unwalled city grows rapidly beyond its original limits, this development has a most decided influence on the traffic, business and property values of the central city districts. Sometimes the centre of the city moves in such a way that unfavorable changes in the value of land are brought about but, as a rule, traffic increases, business is stimulated and land value rise. The activity in building at the edge of the city is reflected in its centre; capital that is made in the outlying districts is invested in the inner city. The impetus thus given to the life of the city was clearly shown when Magdeburg, Cologne and Antwerp were extended and the same result has been produced by the growth of unwalled cities like Berlin, Frankfurt a. M., Hannover, Kiel and many others. The old city grows young again; the augmented traffic, the increased needs of many kinds feel themselves hampered and limited on all sides. Medieval city plans are not equal to the requirements of increased traffic, nor, usually, to those of public sanitation. Traffic and hygiene, as we understand them, are modern terms, little known to the Middle Ages. It thus appears that the outward growth of the city generally involves inner changes. Some alterations in the old network of streets are unavoidable. For the sake of traffic and public health narrow streets have to be widened; deviations in the street directions that hamper the traffic have to be altered, the levels of some streets or whole parts of the city have to be improved on account of the traffic, the drainage and to escape high water; new radial and diagonal thoroughfares have to be laid out; different street directions have to be connected with one another; it is sometimes even necessary to tear down whole portions of the city that bid defiance to health or traffic and to replace them with others. All these measures however must not be taken with a view merely to satisfying the demands of the modern city; they must also aim at preserving the old, at keeping intact historic monuments in the wide sense of the word.

An alteration should be made only if it is actually needed. In old towns and cities of slow growth changes in the streets and squares should not be brought about by establishing generally new flush-lines. It is sufficient in each case when a new building is to be erected to require it to conform to a new or the old building line as may be necessary. From an artistic point of view such quiet places are to be counted fortunate; but the citizens are more benefitted by industrial progress. In view of the civic improvements which the latter has brought about, the congress for the preservation of monuments, held in Erfurt in 1903, formulated the following rules:

1) Old structures of artistic and historic significance, among which especially characteristic private houses are reckoned, should be indicated as such on the flush-line
plans.

This is intended to prevent unintentional damage. It puts clearly before the man who lays out the new flush-lines to task of protecting these points.

2) A new building line that runs either in front of or behind that of such old structures, is to be established only if unavoidable demands of traffic and health require it. At the same time the question must be considered whether and how neighboring buildings are to be adapted to the new flush-line. Special attention must be given in this connection to the building over of footpaths.

When new building conforming to the new building line are erected on either side of an old structure, the latter is placed in an unfavorable position, either in a hole, as it were, or jutting out into the street. If this is unavoidable it is sometimes possible to overcome the difficulty either by building a hall of approach, by cutting a hall through the front of the old building or, as a last resort, by taking down the old façade and putting it up again on the new building line. The carrying through of the footway under the old Town Hall in Oberlahnstein has been accomplished in a model manner.

(3) The level of a street at the point where some building of historic or artistic value stands should never be changed unless difficulties connected with traffic, high water, etc. cannot be solved in any other way. In such a case careful consideration must be given beforehand to the way in which the old structure can be adapted to the new level.

Much damage has been done by laying bare the foundation walls of old buildings as well as, especially, raising the street in front of them so that they look as if they had sunk into the ground. Sometimes it has been partly remedied by laying out a sunken court all around the structure (Holztor in Mainz, Berliner Tor in Wesel, Pariser Tor in Lille); this expedient is to be recommended in case of necessity (fig. 467), in Lille).

(4) New flush-lines are, as far as possible, to be so established that not only certain structures are protected but also so that the individual character of old streets is preserved. If it seems likely that this will be destroyed by the carrying out of straight flush and level lines their establishment should be given up. Curved streets and characteristic variations in the levels up. Curved streets and characteristic variations in the levels of old highways should be retained if possible when new flush-lines, intended to widen and improve the streets, are established.

In the plan of the streets in nearly all cities we are able to trace the irregularities of a former village ground-plan, or of the surroundings of a castle that have gradually grown into a town, or of an ecclesiastical settlement. In the centuries in which art flourished and towns reached their finest development, in the late Middle Ages and during the Renaissance, these irregularities were used as a basis and, by building and forming, tearing down and constructing, altering and developing, those beautiful and picturesque city, square and street scenes were produced, whose loss should ever be guarded against by the modern city builder. Some old curved streets are found in which the curves in the line of the street do not correspond to those in the building lines. We must not seek to improve these by straightening the line of the street and that of the houses, by filling out the side hollows and
cutting sway all the projections. Neither must we think ourselves obliged, for the sake of traffic to level all rises and raise all hollows in the ground. The demands of traffic must be satisfied as far as possible it is true; but traffic does not require any mathematically straight lines. It does absolutely require widened streets, where necessary, the graduation of ascents, and, above all things, it must be easily surveyed. This is most important, and traffic is more easily surveyed on a slightly curved street with a slight concave slope than on one which is perfectly straight and level. In the latter case the near objects conceal the more distant ones far more than when the street curves gradually so that the objects come into view one after another as the street is traveled, thus not only affording much greater variety in the scene but also bringing the traffic into sight in a way that makes it easier to survey (compare marginal heading 139). It is often absolutely necessary to widen a thoroughfare and to graduate ascents, but it is never essential to straighten the line of the street, its walls, or its level.

Fig. 510 shows an old street widened to 13m. The old houses 1, 7, 9, 11, 21, 4, 6, and 18 have been left unmolested and as far as possible the original outline has been retained. Where the street was wider than 13m it has been allowed to remain so.

Fig. 511 carries out somewhat the same idea; a width of not less than 12m has been obtained without sacrificing any valuable buildings. Fig. 512 shows the same street improperly straightened. It is wrong from three points of view. First because the old historic houses 3, 5, 23, 25, 12 and 14 are sacrificed; second, because the new buildings could not be set forward to the building line unless the opposite side of the street were torn down, and third, because the rectification is unnecessary.

The solution in fig. 513 does indeed produce a slightly curved street that is easily surveyed; but it would only be admissible if the first step in the alteration were to tear down the houses 16 to 26 at the same time, and if the houses 3, 5, 14, 23 and 25 were not considered worth preserving.

As a rule it is inadmissible to replace a concave curve in the wall of a street with a straight building line because the beauty of the view is affected and the street is made narrower.

In widening old streets and lanes the following purely practical points have to be considered: the depth of the building lots, the probable time that will elapse before the buildings are renewed, the value of the properties for which indemnity will have to be paid and the proportions of altitude. If the building lots are much deeper on one side of the street than on the other it follows as a matter of course that it is better to widen the street on that side. If the lots are not deep on either side the street should not be widened to the same extent as otherwise, so that the yard area is not too much reduced; this applies especially if the street is widened not so much to meet the demands of traffic as to obtain light and air for the houses, for light and air in the yards is just as important as in the street. It is also preferable to cut into those properties first that are of less value on which the buildings will probably be replaced by new ones before long and to protect as far as possible properties of high value and new houses. On very uneven ground it is usually easier to widen the street on the valley side than on the side next the upward slope; steep streets that
branch off may make the problem more difficult and influence its solution.

Cases are comparatively rare in which projecting buildings are acquired by appropriation or purchase when it is proposed to widen the street. The usual method is to establish a new flush line to which buildings must conform in the near, but indefinite future, in the expectation that the old structures will soon be replaced with new ones. Thus in thriving cities many improvements have been brought about in the course of a few years whereas in quiet places it is useless and sometimes detrimental to draw flush-lines in advance, as has already been pointed out.

5) As far as possible the closed effect in the sides of old streets and squares is to be protected even when the traffic necessitates widening thoroughfares, improving their directions and cutting through new streets.

In observing this requirement much forethought is necessary and even then insurmountable difficulties are sometimes encountered. Traffic demands a clear view of the line of travel and of the surface on which it moves. The more rapid the travel the farther must this clear view extends; otherwise it is difficult to avoid collisions. On the other hand the observer with artistic appreciation requires the closed setting. Fine distant views are characteristic of modern cities, like Paris, with long streets and open traffic spaces; it would be foolish to deny the element of beauty in such city schemes. But the individuality and artistic charm of the old cities and parts of cities that we are discussing lie in the closed,
varying, intimate character of their streets and squares. To open them up for modern traffic without sacrificing their quaint individuality is a difficult problem, one, in fact, that cannot be wholly solved because the aims are at variance with one another. The most we can do is to compromise and our compromises may be especially attractive if artistic power dominates the practical task. Several examples may serve to make this clear.

Bringing a side street into a curved thoroughfare at a point where the side of the latter is concave may ruin the effect; a hole is formed (fig.514). By bringing the street in at a convex point this difficulty is avoided.

Along the course of an old street we often find points at which two other streets enter almost but not quite opposite each other so that the view from each entering street is of the closed side of the old street. It would be a mistake to require the increasing traffic to take the two turns round the corners, or worse, to believe that such a course is advantageous to traffic. For through traffic an offset is always a hindrance and sometimes, for instance for street railways, it is absolutely impracticable. A method that is frequently employed, in order to meet the demands of the traffic, is slanting off the two block corners (fig. 516); but this destroys the closed view form both streets. If instead, the crossing is widened, at the

![Fig. 512](image1)

Incoorect straightening of an old street

![Fig. 513](image2)

crokked flushline of anold lane, only admissable under conditions mentioned in the text above
point where it leads from one direction into the other, as shown in fig. 517, the traffic is aided without detracting from the street views.

An old city gate in the encircling city wall forms a picturesque terminal point of a street, but blocks the line of traffic. The latter can be aided by tearing down the gate; as a rule such treatment is barbaric. It is little better to tear down the wall on either side, so that the traffic can pass not only through the narrow gate but on both sides of it, for the gate thus loses a part of its character and the gaps on both sides detract from the street view. These considerations led to the solution shown in fig. 518, the Severins-Tor in Cologne.

The unpleasant effect is still more striking if the gate is built into a group of buildings and it is to be detached on both sides, as was at first intended with the Weisser Turm in Nürnberg, for example. There the solution illustrated in figs. 519 to 521 was finally decided on, according to which the gate tower was allowed to remain in the wall of the buildings while the adjoining buildings were reconstructed and provided with throughfares for foot and carriage traffic as was required.

The closed settings or “frames” of old squares suffer most when street openings are introduced into them. In Brussels the house “l’Etoile” adjoining the city hall was torn down in order to widen a narrow street that entered the market-place at that point; the gap thus produced in the beautiful surroundings of the famous square was so unbearable that the Burgomaster Buls had the house reconstructed with a thoroughfare through its lowest story. The street now bears his name (compare fig. 383, in which unfortunately the reconstructed house is somewhat too small). In Rome a broad traffic street was planned from the new Court House to the Piazza Navona which would have made a most unsightly breach in the surroundings of that square (compare fig. 389). During a visit to Rome Buls succeeded in having the plan so changed that the new artery of traffic was distributed in the network of streets before it reached the Piazza Navona. When traffic requires that a new street be cut through it should not lead into a square but go round it: an old architectural square should not be turned into a traffic centre.

A street in Frankfurt a. M. that has been cut through with great care and artistic understanding is shown in fig. 522. The flush-lines of the new street, leading from the Wedelgasse to the Fahrgasse have been drawn with several curves and varying width so that all along a breadth of at least 18m has been obtained, the open space “Römerberg” has been closed as far as possible, the Domplatz extended towards the west and the curious old court “Im Rebstock” preserved. In order to secure appropriately artistic facades various measures have been taken, among others prize competitions have been advertised.

6) So-called “clearings” about a building, or rather the establishment of flush-lines preparatory to such clearings, are made either to meet traffic requirements or for aesthetic reasons. In either case special consideration must first be given to the question whether the whole view of the building will gain or lose by the proposed clearing. If the latter is to be feared and the proposed alteration is intended to relieve traffic, the latter should, as far as possible, be diverted into another channel. If the clearing is to be undertaken for aesthetic reasons it is clear that it should not be carried out if it will detract from the view; an effort should be made to improve the surroundings and the building in some other way.
The distant effect of a building about which a clearing is to be made must not be impaired by opening up too long lines of vision. Under marginal heading 259 and 260 the question of the distance necessary from which to obtain a proper view of a building was fully discussed. An example of how it should not be done is seen in the clearing about the graceful town hall in Lowen towards which the Bahnhofstrasse, which runs straight for a kilometer or more, is directed.

The points from which to obtain a near view of a building must not be lost, nor the smaller buildings near it which enhance its effect and serve as a basis of comparison. Finally, the dimensions of the open space, as well as those of the surrounding buildings, (compare chapter 7, under c) must not exceed the scale of the main edifice.

These points must be especially observed when the clearing is made for artistic reasons. It may be, when a fine building is wedged in among, and partly concealed by, worthless or unsightly structures, that a clearing is necessary or desirable. But it may also be that the chief artistic and historic charm lies just in the intimate connection of the building with the quaint old houses about it: in such cases clearing is a mistake that has

![Fig. 514.](image)

![Fig. 515.](image)

*Abzweigung eines Straßendurchbruches in konkaver Straßenwandung.*

![Fig. 516.](image)

![Fig. 517.](image)

*Unrichtige Abknickungen an der Verfertigung eines alten Straßenzuges.*

*Richtige Erweiterung der Kreuzungsfelle eines verfechten*
hitherto not always been avoided.

In order to create space about the PetersKirche in Löwen it was first proposed to tear down the blocks 1, 2, 3, 4, and 5, but later the much superior treatment shown in fig. 523 was adopted. The writer was in favor of the plan shown in fig. 524.

In Darmstadt the old Kirchstrasse was very narrow and the so-called Stadtkirche unpleasantly hemmed in by surrounding structures; the street was therefore widened and a clearing made but at the same time some new and suitable structures were put up thus preventing the creation of a bare looking waste space about the church (fig. 525).

We have so far been occupied with buildings, streets and city districts which, n spite of the m o d e r n demands of traffic and hy g i e n e, were to be p r e s e r v e d as far as p o s s i b l e. But there are as well numerous o l d structures, narrow little streets and d i s t r i c t s that, a menace to health and h i n d r a n c e
to traffic, not only deserve no protection but should be torn down in order that they may be replaced by new streets and blocks with plenty of light and air and improved traffic conditions. If a new radial or diagonal street is to be cut through such a district, misgivings as to the destruction of old properties are out of place. And if it is decided to do away entirely with such building blocks, the new network of streets should be laid out in accordance with the same rules that apply to altogether new city districts. We shall return to this subject in part IV, chapter 3.
Fig. 521
Weisser Turm in Nürnberg after realised traffic correction
Fig. 522
street cut in Frankfurt a. M.
Fig. 523-524
exposure of the Peters church in Löwen
proposal Vingerodt proposal J. Stübben
Fig. 525
widening of the churchstreet and partly exposure of the citychurch in Darmstadt
Besides their industrial use two points of view are determinative in the treatment of the city water courses and basins of water, canals both useful and ornamental, navigable and unnavigable rivers, lakes and seashores; the possiblility of using these bodies of water to beautify the city, and their protection against disfigurement and pollution by the industrial establishments of the city. Both points of view demand that all bodies of water shall, as far as possible, be kept visible and accessible, hence that they shall not be built over or around in the inside of the blocks and that construction directly beside or over the water shall be allowed only when it is necessary for industrial purposes.

As a matter of course the city frontage on the sea, on lakes and navigable rivers, must in general be kept free for traffic. Special parts of the waterfront however, especially on the harbor will have to be reserved for the harbor and commercial traffic and for warehouses, docks, etc. In all cases it is well to separate the waterfront shipping traffic from the ordinary city traffic (compare marginal headings 161 and 162) either by laying out two roadways side by side on the same level (Hamburg, Cologne, Zürich) or by making a double street consisting of a city highway above and a quay street on a lower level convenient to the wharves (Paris, Lyon, Budapest, Mainz).

If the street along the bank is not used for waterfront traffic, or if the body of water is not navigable, the shores or embankments offer excellent opportunities for promenades and garden areas such as are seen in Hamburg’s Alsterbecken, Breslau’s Ringstrasse, the Dreisamstrasse in Freiburg and the Rheinanlagen in Koblenz. In cities where a considerable portion of the waterfront has to be reserved for shipping it is doubly necessary to beautify those streets along the water that are open for general traffic and recreation. In cities on the seacoast (not only in seaside resorts) as well as in cities on rivers, the open streets along the strand are generally the pleasantest and the most popular walks. The attractive treatment of the Alster banks in Hamburg, where lawns and ornamental shrubbery lie between the water and the paths, is a model of its kind.

In the centre of the city parking along the banks has generally to be dispersed with; along the seashore it is seldom possible because of the tide. Florence and Pisa have their famous Lungarno; at great expense Rome has created its Lungo Tevere; Naples, Venice and Trieste each have a Riva. Marseilles has laid out an extensive drive along its rocky coast. In that city and in Trieste there are rocks or cliffs in place of the parking seen in Hamburg which border and support the roads and fling back the surf that dashes against them. For the sake of its trade Antwerp was obliged to build up the banks of the Schelde with wharves and sheds; but the city has laid out an open driveway over the roofs of the sheds to which
expensive approaches for vehicles and foot passengers ascend. London built the Victoria Embankment at an enormous cost. There, as in many other places, (Bremen, Berlin, Breslau, Cologne, Deutz, Mainz, Rome etc.) former generations had failed to recognize the value of the open river banks for driving and walking, for recreation and as a means of beautifying the city. Later generations in Mainz, Cologne and Düsseldorf succeeded in once more setting free and improving the river banks.

Happy the city whose early inhabitants kept the river banks free and rendered them attractive by laying out garden areas or even planted a whole park along part of the course of a river or brook thus making the latter the chief charm of the area. The Englische Garten in Munich, the Hofgarten in Düsseldorf, and Karls-Aue in Kassel and the Bois de Boulounge in Paris are examples of this foresight.

In planning the expansion of Düsseldorf, Kiel, Flensburg, Rostock etc. special attention was paid to this point. Brooks and ponds surrounded by streets and vegetation should be used in new districts as a permanent means of beautifying the city.

In many cities experience has shown that a watercourse lying in private property or directly bordering on human habitations, gradually changes from a clear stream into a dirty ditch (Paubach in Aschen, Berne in Essen, Pegnitz in Nürnberg, Birsig in Basel, Dyle in Löwen, Grüner Graben in Berlin etc.) In view of this fact the “Verbande Deutscher Architkten –und Ingenieurvereine” in 1878, adopted the following resolution:

“In designing city building plans streets and squares are to be so disposed that they embrace the brooks and other navigable watercourses that run through the territory. Only in exceptional cases, especially for industrial purposes, is it admissible to place a watercourse in the inside of the building blocks; when this is done proper provision must be made for inspection of the watercourses by public authorities.”

In streets of ordinary width watercourses must be arched over and be so equipped that they can be easily cleaned and inspected. If a stream is to be left uncovered wider streets
are necessary which are “then especially suitable for promenades (compare figs. 241 & 263, also the building plan of Freiburg in fig. 587). A partly covered, partly open watercourse in a wide street is shown in fig. 526, the Boulevard Richard Lenoir in Paris; the St. Martins Canal has openings at intervals into the street above which are surrounded with grass and flower-beds.

When a watercourse runs through the inside of the blocks and has become filthy and polluted by refuse, etc. it must be either diverted from its course into the public street or a new street must be cut through the blocks along the brook or stream. This has been done in Brussels where the dirty Senne was cleaned and made into a double canal along which the well-known beautiful Boulevards Anspach and de la Senne were laid out; similar changes have been carried out in Vienna, Breslau, Aachen, Basel, Marseilles and other cities. As however such subsequent regulation of watercourses is often combined with difficulties as regards property rights, and great cost, it is better in planning city extensions to provide against the development of such unsanitary conditions.

Watercourses used for industrial purposes and millstreams cannot of course be kept free from buildings but they are always an evil in densely populated city districts and their use in such should be limited as far as possible. If water rights are held by industrial plants that cause the water to be polluted (tanneries, dyeing establishments, etc.) an effort should be made to buy out the rights or terminate the lease. Unauthorized use of the water for such purposes should be energetically repressed; new plants should depend on steam for their power and should be drained (after the waste water has been cleared) into the city sewers. Such watercourses used by industries as must remain in the city blocks should be subject to constant, rigid inspection.

The rule requiring that river banks and streams should, as far as possible, be kept out of private ownership, also applies in a greater degree to ornamental bodies of water (ponds, bays, coves) on the borders of which public gardens or promenades should be laid out. Ornamental ponds many also, in exceptional cases, supply the place of public squares, as was seen in the Feuersee in Stuttgart. How difficult it is to keep such bodies of water clean if they are surrounded by private properties is exemplified in many old city ditches which, formerly used for boating and other pleasures, have gradually become evil-smelling pools. As an example the “Beutel” in Schwerin may be mentioned. On the other hand it cannot be denied that an easily accessible public basin of water with adequate protection may be one of the great beauties of the city if it is surrounded by private gardens and villas. Charming examples are found around the lakes in the Grunewald Colony near Berlin and about a little, almost land-locked bay of the Aussenalster in Uhlendorf near Hamburg. The Schlossteich in Königsberg i. Pr., surrounded by pleasant gardens, is also one of the ornaments of that city. In the above mentioned building plan of Freiburg a small lake was provided for to be bordered partly by public streets and walks, partly by the gardens of villa properties.

Just as ornamental ponds may take the place of public squares so too canals may be used as highways, that is, serve for city traffic and for building. The classic example of a water-city is Venice where the place of cabs and street railways is supplied by gondolas and
“tramway” boats. The Venetian canals, called Rii, generally lie directly in front of the houses and palaces; sometimes a narrow street runs along one, seldom along both sides. Somewhat similar are the “Fleete” in Hamburg, the “Delfte” and “Grachten” in Emden, Groningen, Amsterdam, Vlissingen and many other Dutch towns. The Hamburg Fleete usually lie in the rear of properties that front on the street; they are not used for passenger travel but for cargo boats that discharge their cargoes into the warehouses that border the Fleet. In Dutch cities, particularly in Amsterdam, the Crachten which are usually combined with streets, carry both passengers and goods although, in contrast to Venice where there are no cabs, a complete system of streets for vehicles exists. 

20 See also: Wochenblatt für Architekten u. Ing. 1880, P. 366.
PART II

CHAPTER 10: Railways

All means of transportation, particularly those that we group under the general name of “railways”, are of eminent importance in the development of cities, an importance that constantly increases with the growth of the city on the one side and with its industrial advance on the other. Travel is a stimulating factor in city life and well-being, not only long distance travel but ordinary urban and suburban traffic. The main railway lines take care of the traffic to distant points. Suburban traffic is served by local railways (which may at the same time be main lines) on tracks that are quite separate from the city streets, or by street railways. Traffic in the city itself is served both by street and city railways. Hence we must distinguish between three kinds of railways, main railways, local(city) railways and street railways, in their relation to the city plan and to city building.

a) Main Railways

In part I, chapters 2 and 3 brief mention was made of the relation between the city plan and the main railways that terminate in the city or pass through it. We are concerned here with the points to which special attention must be paid in the establishment and distribution of passenger and freight stations both in the interest of city development and urban traffic.

Under marginal heading 78 railway stations are included under outlying establishments and in larger cities under the establishments to be distributed in different parts of the city, that is, they are grouped with those structures that would naturally be placed on the edge of small and medium-sized towns but that in large cities are to be distributed in the central and outlying districts.

To the outlying establishments must be reckoned in the first place all shunting yards, car works etc. with which the inhabitants of the city have little to do. The farther these establishments are removed from the built-over part of the city the better it is for the city building-plan. If they are too near the city the building plan of the latter is always unfavorably affected owing to the fact that the railway yards are very extensive and seriously interfere with the crossing of streets etc.

This also applies in a limited degree only to freight stations, as too great a distance between the city and the freight station, to which of course there is a great deal of traffic, is not desirable. Express freight stations should be situated near the city, best of all, next to the passenger stations; stations for general freight may be somewhat farther away and stations where the freight is handled in carloads and large quantities may be still more distant, and, in fact, it is an advantage to the city building plan to have them so.
In order that the growth of the city should not be too much hampered by extensive railway yards, it is well, in large cities, to divide the freight stations into two kinds: the shunting yards, engine sheds, turn tables etc. in one group, the real freight stations in the narrow sense (freight sheds, platforms for loading and unloading etc.) in the other. Only the latter need to be near the city. The first group may be situated a little way out, where the trains can be made up, come in and go out, while the freight stations that are to be distributed as needed in the inner districts should be quite limited in size and be connected with the outlying yard by a branch line. Instructive examples of this method are seen in London and Berlin where small freight stations have been established at different points along the main lines. It may be assumed that the increased cost in such cases is more than made up for by the advantages to traffic and the lower cost of property and construction.

While in the city or on its outskirts tracks must be elevated or put underground, outside the town yards may be laid out on the surface with ordinary grade crossings.

The establishment in the built-over portion of the city of large passenger stations, particularly terminal stations, which must be equipped with many switches and sidings, is connected with great disadvantages, for the railway as well as for the city. The railway is put to great expense in the purchase of property and the cost of construction and even then it is cramped and unable to develop freely as the need arises. The city suffers by having its traffic streets either interrupted or undermined with tunnels; in many places the railways stick like a wedge in the flesh of the city (for instance, Berlin), separating whole city districts from one another and necessitating widely circuitous routes. Nevertheless the railway administration, particularly if it has to compete with other transportation companies, as in England, or if as in Germany, the railway owner in the shape of the state is able to sacrifice large sums of money for the general welfare, will strive to bring passengers as near as possible to their destination, that is, to the heart of the city. This has led to the establishment of stations in the central districts either in the form of terminal stations, most convenient for passengers, but disadvantageous for the technical reasons mentioned above, or wayside (through) stations. The latter arrangement makes it doubly difficult for the railway to reach the centre of the city but requires much less station and yard space.

This effort of the railways to get into the heart of the city corresponds of course to the desire of the city population to have railway facilities leading in all directions, within a short distance. But for the railways as well as for the cities both the advantages and disadvantages of such centrally situated stations are so great that local conditions must be depended upon to turn the decision one way or the other. In the following cities for example the question was thus decided: Hannover (through stations), Dresden and Cologne (connected through and terminal stations) have centrally situated stations; Düsseldorf (through stations) and Frankfurt a. M. (terminal stations) have outlying stations.

What has been said of freight stations in regard to the making up of trains, engine and car sheds etc. applies even more strictly to passenger stations. In addition, these should be as limited in size as is feasible, the space in the interior should be used as economically as possible and they should be distributed in different districts of the city.

The state railway administration or a company owning several railway lines will
naturally endeavor, in its own interest and in that of through traffic, to make one point the changing place for the traffic of the different lines. This has led in Germany and to a lesser extent in England and France to the establishment of central, main or union stations in many large cities. This is not always as desirable in the interest of the cities as in that of the railways. Frequently it leads to congestion of the traffic in the district where the central station is situated and a corresponding lack of traffic in other districts. The larger a city becomes however the more impossible it is to concentrate all the different lines of travel in one large central station; the more necessary too it becomes, in the interest of the city as well as of the railways, to decentralize the stations so that instead of congested traffic at one point we have a more equal distribution in different districts. London, Paris, Berlin, Vienna, Budapest and Brussels offer examples of such distributed stations though in most of these cases the distribution is not the result of planning but of the system of private railway ownership. As a rule these different stations are terminals grouped around the centre of the city. London, Berlin and Vienna also show how the disadvantages of terminal stations – failure of the railways to reach the traffic centre of the city and lack of through traffic lines – may be overcome by the establishment of “city railways” (Stadtbahnen) which will be discussed under b.

The open tracks of the main railway lines still lie to a great extent on the same level as the streets which is the cause of any evils and much danger to the railway traffic and especially to the street traffic. Within the last few decades enormous sums have been spent and must continue to be spent in order to get rid of these evils. In the construction of new railways or the reconstruction of old, level(grade) crossings in cities are now always avoided. In hilly cities the crossings are made by means of viaducts and tunnels. In flat cities the railway has to be raised. The credit due to the railway administrations for their work in this direction in large cities does not unfortunately extend to their efforts in smaller and medium-sized town or in the suburbs of great traffic centres. In these suburbs too, which experience tells us grow rapidly, and in medium-sized cities which are developing with the advance of industry, the separation of the railway level from that of the street should be undertaken as speedily as possible, for delay only increases the ultimate cost; especially however new construction and reconstruction should not go on on the street level.

Separating the railway from the street level facilitates the penetration of the passenger traffic into the heart of the city and at the same time tends to keep the freight trains off the railway line that cuts through the city. In large cities it is usually cheaper and more practical to lead the freight traffic, in as far as it does not concern the city, round the latter outside, than to burden the tracks intended for passenger traffic in the city with freight trains or to lay special tracks for freight.

In existing city districts a new main railway line is seldom to be placed
on a dam or viaduct in the middle of the street; as a rule the railway line is to be laid across through the building blocks and to be carried over street crossings on bridges. Unfortunately this method produces many unsightly views. Foot passengers in the streets are confronted by bare house walls where the railway line cuts through and passengers in the trains look out on unattractive back yards and rear buildings receiving unpleasant impressions of metropolitan life and housing conditions before they even set foot in the magnificent streets of the great city. The Berlin city railway (Stadtbahn) affords a hideous yet by no means the worst example. These evils are unavoidable if the railway is carried through or into the city after the latter is built. It is possible however to relieve the ugly views somewhat if this side of the matter is borne in mind when the plan for the railway line is made. By purchasing remnants of blocks that are unfit for building on along the line and planting them with grass, shrubbery etc. and by proper treatment of the windows and house corners next the railway much improvement may be accomplished.

Also in new city building-plans which have been designed at the same time as the railway system, or when railway lines are laid out in districts for which the building plans have been made but not yet carried
out, tracks are often placed unnecessarily in the inside of the blocks. In such cases, it is true, property owners are able to build their houses with some regard for the position of the railway and to consider the view of their houses from the trains. Thus the worst errors can be avoided; in cities where the houses are built detached and in villa districts the view from the railway of the gardens may even be very attractive. But as a rule, even under such conditions, much ugliness is seen, for by no means all property owners consider the impression made on railway passengers. The backs of the city flat-houses seldom lose their ugliness and at the street crossings where the railway cuts through the rows of houses an unpleasant effect is always produced unless, as in England, the sunk or elevated railway is built over the houses or portals fronting on the street.

The reason why railways are run through city building blocks is usually because of financial considerations. If a street were laid out on either side of a railway dam or excavation the city would be responsible for two half streets as the abutters are only obliged to care for half the street, that is from their houses to the middle of the roadway, unless indeed it were possible to reckon each of the streets as a half street. Naturally the city seeks to avoid this expense. But not only cost should be considered. The beautiful appearance of the city for the citizen and for visitors is also worth some sacrifice. Thus though it would be going too far to require that all passenger lines should be laid out along the streets and in such a way that travelers would see the fronts of the houses, yet in planning railways in the city the effort should be made to combine the railway lines with those of the streets and
with gardens, bodies of water, etc. so that, in short, the ugly method of cutting through the blocks would be avoided.

We must guard still more carefully against a railway line that is bordered by a street along one side and by the backs of properties facing another street on the other. In such a case not only the view from the train is unpleasant but also that from the houses fronting on the street beside the railway track.

An example of a railway lying in an excavation between two streets was given in fig. 261. Viaducts may be built either with open construction so that city traffic may pass beneath them (see figs. 527 & 528 in Rotterdam) or the arches that support them may be used for shops, restaurants etc. (for instance in the Berlin Stadtbahn, and the Vienna Verbindungs­bahn). Examples of railway lines in or along parks are found in Mannheim, Hamburg, Cologne, Berlin (Tiergarten), Paris (Buttes Chaumont); for travelers they are undoubtedly the most beautiful way of approaching a city by rail and if the country is at all undulating the lines can be combined with the park landscape in a perfectly acceptable manner. In other places the banks on either side of the track are planted with vegetation affording a pleasant view for the traveler as well as the passer-by in the street (Elberfeld, Amiens).

**b) City Railways (Stadtbahnen)**

The term “city railway” is used for several kinds of railways that are absolutely different from one another in purpose. The least important, for us, of these railways are the connecting or girdle lines that connect the outlying stations with one another in wide circular form; as a rule they are used principally for freight, transporting troops etc. and at present have little influence on the city building plan. In the more distant future they may be of importance for local and suburban traffic.

The second sort of city railway connects the outlying stations with one another by means of one or more diameter lines, thus carrying the traffic from outside (long distance traffic) into the centre of the city and at the same time facilitating through traffic. (Stadtbahn in Berlin and Vienna). If it is sufficiently long this kind of city railway may also serve city traffic though that is not its first purpose. The Berlin Stadtbahn gains its real importance as a means of local conveyance from the fact that besides the long distance traffic it has extra tracks that are connected with the “Ringbahn” which encircles the whole city, touching in its course the outlying districts and suburbs.

The third kind of city railway, the Stadtbahn proper, is intended to be used for city traffic over greater distances in the city thus affording rapid transit facilities between city districts that lie far apart (London underground, New York and Liverpool elevated, Paris Metropolitain railway, Berlin electric elevated and underground Railway, Budapest
Stadtbahm, suspension railway in Elberfeld-Barmen). The connection of this kind of railway with the outlying stations and long distance traffic is convenient but entirely of secondary importance. It should form an independent system or network adapted to the traffic needs of the city but separate from the street and long distance traffic. Electric trains of not too great length following each other at short intervals and stopping at stations from 0.70 to 1.00 km apart best serve the bulk of the traffic. Such a city railway is only necessary for thickly populated cities where the distances are great; smaller cities are adequately served by the main railways and the street railways.

If we compare our cities with those of England and America we must come to the conclusion that here on the Continent we are only at the beginning of the development of city railways; hence it behooves us in planning cities and transportation systems in large cities to prepare the way for future city railway traffic more than we have hitherto done. This is the more important as experience has shown that the traffic increases much faster than does the population of a city. In London in the ten years from 1864 to 1874 the population decreased 40%, during another period of twenty years it increased 64% whereas the amount of traffic on the city and street railways and omnibuses during these periods increased three and sixfold. In New York the population increased 59%, the traffic 262%, in twenty years. Also in smaller cities in which the population is reckoned not by millions but by hundreds of thousands some consideration should be given, in planning streets and city extensions, to the probable requirements of the city railway in the future; in some cases it is possible to arrange the outlying connections between the different stations and the mail lines that penetrate into the city in such a way that with the growth of the city in the future they may be used as city railways.

In planning a city railway one of the first questions to claim attention is whether it is to be underground or elevated, for such railways on the level of the streets yet entirely separate from them are quite exceptional. An underground railway may run in a double-track tunnel or in two single-track tunnels, either so deep that the city water, gas, sewerage systems etc, are not affected (London underground railway, and “tube” between Southwark and the City the latter consisting of two tubes 3.16 m in diameter) or directly under the surface of the street so that in or beside the tunnel the city conduits also find a suitable place. The former method, which presupposes a hilly territory, also allows of the railways being diverted from the course of the streets (as in the London underground) and of tunneling across the building blocks under the house cellars, or even under the bed of a river (as in the London “tube” between the City and Southwark). The latter method involves the use of the street system but this also keeps the railway in close connection with the existing lines of traffic and makes the stations more easily accessible. The elevated train is also pleasanter for passengers, lighter and airier, but it cannot be developed to the same width as the underground, and is more or less unsightly and noisy when seen from the streets, squares and upper stories of the houses which it passes. An elevated railway that forsakes

the streets and crosses over the roofs of the houses comes under consideration only as a very rare exception. In order to reduce the loss of light involved in a city elevated railway to a minimum and to make sharp curves possible, the Lartigue one-rail track was recommended. It consists of a single rail on forged iron trestles and two guide rails on the sides, without any ties or flooring.\textsuperscript{22} It has been superseded by the Langen suspension railway.

At present electricity is used almost exclusively. For city and street railways it is most practical to conduct the electricity, that is produced in one or several power house, to the cars and thus to set in motion the electric motors under the cars. The manner in which the electric current is conducted differs according to whether the track lies on a separate road, such as is necessary for city railways, or is laid on the ordinary street roadway, which will be discussed under street railways (see c.). The rails serve to return the current.

Cable railways may also serve for city railways. In this case the cars travel by taking hold with grippers of a never-ending cable that is moved by fixed machines. Especially in America this kind of railway is used.

Funicular railways on an inclined plane are used in Budapest to ascend to the Burg, in Lyon to the Croix-rousse, in Pittsburg to connect the lower part of the city with the districts on the higher level,\textsuperscript{23} also in Dresden, Turin, between Ouchy and Lausanne and in many other places. Water power is frequently used.

c) Street Railways

As we have seen, the main railways serve the outgoing traffic, the city railways the traffic between distant parts of the city and suburbs. Both these kinds of railways in consequence of the rapidity with which they travel and for other reasons cannot find a place on the city streets. The street railways are laid directly on the roadways of the city streets and serve the traffic over shorter distances where speed is not so much an object, both from one district to another, and from the city to the suburbs; they also serve to relieve and facilitate the ordinary street traffic. Street railways, according to the power used may be divided into, horse, electric, cable railways etc. and according to the width of the tracks, into normal and narrow gauge roads, but though the ascents and curves of such railways are affected by these factors, they have little influence on the way the railways are laid in the streets.

Where the street traffic is very dense, as in the central districts of Paris and London, street railways cannot be used, nor in a network of narrow and intricate streets like that of the inner city in Vienna. In such cases passengers must

\textsuperscript{22} see: Centralblatt der Bauverwaltung, 1889. S. 216
\textsuperscript{23} see: American Engineer, 1887, 10. April
depend on omnibuses, in traveling over prescribed routes, or on cabs, handsomes and other such conveyances. It is true that on wide streets where the traffic is light street railways “regulate” such traffic, but this does not apply to streets that are already fully occupied with city traffic of all kinds. In such streets the presence of street cars that cannot turn out themselves and thus hamper all other vehicles in traveling and produce stoppages in standing still, by no means regulates and aids traffic but, on the contrary, is a decided hindrance. Hence the street railway system which had its rise in North America must stop short of the heart of all cities.

The second limitation in the use of street railways applies to their speed. On a busy street it must not be much faster than of a vehicle drawn by a trotting horse; in cities therefore it is usually about 180m a minute, while on country roads, under certain conditions also on wide city streets where there is little traffic, a speed of from 200 to 300m a minute, that is 12 to 18km an hour is considered admissible. Thus it follows that the need of rapid transit by means of city railways is felt in the inner city even for comparatively short distances whereas as regards traffic between the city and suburbs it is felt only when the distances are greater.

Nevertheless inside those limitations as regards dense traffic and low speed street railways have a wide sphere of usefulness that continues to develop daily. In the environs of Italian and Belgian cities steam street railways have been found
serviceable for distances up to 30km and more.

The perfecting of street railway systems goes hand in hand with their more extensive use and development. It includes the system and construction of the line as well as its management and working.

As the street railway is intended to carry a part of the street traffic, it is necessary that it should keep to the main lines of travel – radial, peripheral and diagonal – or if the traffic on some of the main streets is too dense to allow of street cars running there, to follow lines that are as nearly as possible parallel. It is used only for travel in one district or between two districts where the distance is great enough (at least about 1.50 km) to outweigh in the passenger’s mind the time lost in waiting for the car or in walking to reach it and the money spent for fare. If the distances are too short the street railway does not pay.

As the main radial streets are the busiest lines of traffic it follow that they are the first directions chosen for the street railway lines; their importance grows with their length. Thus the busiest street car lines run from the suburbs into the city and the heart of the city, in some cases through it and out into a suburb on the opposite side. In some places these radial streets, on which the cars runs and which extend into the country, have been used as sites at greater intervals for new settlements of private houses, summer houses, or factories, which very gradually, as the land between them and
the city is built up, become a part of the latter.

In contrast to the radial system of street railways lines (fig. 529) stands the ring line (fig. 530 or 531) which either receives the radial lines or exists

Fig. 534.

Straßenbahnnetz zu Mailand. — ca. 1/50000 w. Gr.
independent of them. The latter sort of ring line is only of importance for large cities and for thickly populated cities of medium size with much traffic and at least 150 to 200 thousand inhabitants, for in smaller places the peripheral traffic is very slight. The Berlin Ringbahn is about 4, the Hamburg Rundbahn about 2, the Vienna and Cologne ring lines about 1 ¾ km in diameter; it would not be worthwhile to build a line round a much smaller circle because the distance from one point in the circle to another would not be great enough to warrant the circuitous route in the car. On the other hand a ring line that receives the radial line (fig. 530) – a necessity in a city where the inner districts do not admit of street railway lines – may be very desirable even in cities of fewer inhabitants and where the diameter of the circle is smaller. If the ring has double tracks the cars that come in from outside can easily turn into it, carry the passengers to their destination, and then either return or continue their way on another radial street. There is also no reason, if the ring is sufficiently large, why cars should not travel round it without turning out into the radial streets. A combination of through radial lines and others that are received into the ring line is shown in fig. 532. Of course in every case local traffic and street conditions are determinative in planning a street railway system, giving rise in some cases to very curious forms. The scheme of the Cologne street railway system is shown in fig. 533. It consists of a belt line, cross line, ring lines, a diametrical line from Marienburg to Ehrenfeld and several outside radial lines, and has recently been considerably extended. The street railway system in Milan (fig. 534) is composed of a considerable number of inner radial and side lines, of which the former centre at the cathedral square, a ring line and numerous outer radial lines of from 4 to 32 km in length.

For the intricate traffic conditions of very large cities the simple radial and ring lines do not suffice, as the two last named cities show; all kinds of diagonal lines have to be introduced. These are intended to make the shortest and most convenient connections between the central points and the points of gravity in the city traffic. The stations for the main and city railways, the markets, business streets, place of amusement, the harbors and landing places, stock exchanges, post offices, etc. are the natural central points of the street railway system in which the ring lines and the long suburban lines are indeed essential but by no means exclusively determinative factors. Rules cannot be formulated for the construction of such systems.

Where, as in America and Russia, the whole city is laid out on a rectangular scheme the natural traffic lines: radial, peripheral and diagonal, cannot be fully developed in the street railway system; the latter is rather limited to long and cross lines which involve roundabout ways and lose of time and power. In long narrow cities double cities and as a means of connection between two neighboring cities, the railway system of ten consists merely of one main line.

The most common method of treating the terminal points of single lines is to make a loop at the end of the track. In this way the turning about to start in the other direction, which requires both time and space, is avoided. In Paris the star and circular open spaces have proved especially suitable for such loops.

Whether a street railway is to be laid out with single or double tracks is first of all
a question of capital but to an even greater extent a question of management. A single track street railway is always very unwelcome, because the cars cannot pass each other except at a switch which greatly limits the time table and any mishap to a car, that may so easily occur in the street traffic, affects all the cars on the line. Consequently the line is not popular; it does not attract traffic and therefore cannot develop itself. Only for longer distances where the traffic is light, for instance, on lines running to more distant suburbs, is the single track railway serviceable. The distance between the switches depends on the speed of the cars and the intervals at which they follow one another. When the cars travel at an average speed of 180m a minute and follow one another in both directions at intervals of 10 and 5 minutes the distance between the switches is \(1800/2 = 900\) and \(900/2 = 450\)m respectively. The shorter the intervals at which the cars follow one another the less is the amount of capital saved in the construction of a single track road because the sidings are of considerable length and the switches themselves cost more.

In old cities narrow streets and sharp corners often make a second track beside the first impossible; sometimes it is even necessary to tear down houses in order to lay a single track with switches. In such close quarters it is advisable, as soon as a second track becomes necessary, to divide the tracks, that is to lay the second one in another street as nearly parallel to the first as possible. In this way the advantage of double tracks is gained which consists in the independence of the cars from one another particularly from those running in the opposite direction (for example, Elberfeld, Hundsturmer Linie in Vienna, Querbahn in Cologne in fig. 533). Traffic on double tracks that are undivided however is clearer and passengers find them more convenient.

A single track stretch may sometimes, under certain conditions, be used like a double track one by making the distance between the switches so short that the driver or motorman is able to see from one switch to the next and thus to stop his car only when he sees another. Short stretches of single tracks are often necessary on an otherwise double track line. In order to avoid switches they may run round a loop.

Sharp curves in street railways are undesirable not only because of the increased demand they make on the power and the danger of the cars running off the track, but also because of the loss of time and the inconvenience suffered by other vehicles the wheels of which can easily cross the track at right angles or follow it in the long direction by begin to skid and slip as soon as they strike a slightly raised rail at an acute angle in passing over it. The least admissible semi-diameter of a curve depends on the distance of the wheels from one another and on the gauge, unless cars with wheels that can be turned are used. For this reason the wheels are placed as close together as possible (on small cars at a distance of from 1.40 to 1.60m from each other) and the front and rear platforms project as far as is compatible with safety. As a rule the street railway tracks have the same
gauge as the main railways, 1.435m, the cars are thus able to round curves of 20m semi-diameter with ease and with some difficulty those of 13m semi-diameter.

The ordinary street car should not be more than two meters wide, so that, allowing a space for safety on either side, it occupies at least 2.50m (better 3.00,m) of the street width; hence a double trunk street railway of ordinary gauge takes up form 5 to 6 meters of the street width. For every other larger vehicle a strip 2.5m wide has also to be reckoned. Thus for normal gauge street railways the following are the least admissible widths:

1) For a single track, allowing room for an ordinary vehicle to turn out: 5m. A vehicle may step at the curb only on the side of the street that is free from rails; there is not space for another vehicle to pass the car beside a vehicle standing at the curb. The edge of the sidewalk is 0.50m from the nearest rail (fig. 535).

2) Width required for a double-truck street railway without space for other vehicles: 5m. As no side of the street is free from rails a vehicle can stop at the curb only in the interval between the passings of the cars. The occupants of the houses are thus such inconvenienced and, although the trucks regulate the movements of the traffic, hitches often occur (fig. 536).

3) Width for a double-track street railway with space for other vehicles on one side (fig. 537) or for a single track with space on both sides, 7.50m (fig. 538). In the former case the ordinary traffic is at a disadvantage as vehicles can stop only on one side of the street; in the latter case the street railway service is incomplete.

4) Width for a double track road with space on both sides: 10m (fig. 539).

5) Width for a double-track road with space on each side for vehicles to meet and pass each other: 15m (fig. 540).

6) Width for a double-track road with space in the middle of the street for two vehicles to meet and pass, and space for a single vehicle on either side: 15m (fig. 541).

Of these widths number 4 is the first that is really suitable for busy street and street railway traffic; with sidewalks 3m in width such a street would measure 16m across. To meet greater traffic demands this width may be increased to 18m (10m roadway, sidewalks each 4m); 20m (11 to 12m roadway, sidewalks each 4 to 4.50m) or 20m (11 to 12m roadway, sidewalks each 4 to 4.50m) or 22m (11 to 13m roadway, sidewalks each 4.50 to 5.50m).

The best position for the track or tracks is generally the middle of the roadway, for this interferes least with the drainage of the street and enables vehicles to stop at the sidewalks; the disadvantage of this arrangement is the
Eingeleitige Straßenbahn auf 5 m breitem Fahrdamm.

Zweigleitige Straßenbahn auf 5 m breitem Fahrdamm.

Zweigleitige Straßenbahn auf 7,5 m breitem Fahrdamm.

Eingeleitige Straßenbahn auf 7,5 m breitem Fahrdamm.

Zweigleitige Straßenbahn auf 10 m breitem Fahrdamm.

Zweigleitige Straßenbahn auf 15 m breitem Fahrdamm.

Zweigleitige Straßenbahn auf 15 m breitem Fahrdamm.

Straßenbahn an einer Mittelalle.

Straßenbahn am Park.

Zweigleitige Straßenbahn auf 18 m breitem Fahrdamm.
danger of passengers being run over or injured getting in or out of the cars. In narrow streets (see 1, 2 & 3 above) however this arrangement is not possible and even in wide streets it is better to place the tracks at the side of the roadway if it is not necessary for ordinary vehicles to stop at one of the footways, for instance, where there is a walk in the middle of the street, or along garden areas. Hence in figs. 542 and 543 the position of the tracks at the side, as indicated, is generally to be preferred, because ordinary street traffic is thus enabled to use the free side of the roadway with greater freedom and the danger of being run over does not exist on one side at least. Another symmetrical arrangement with the tracks at the sides is shown in fig. 544 (Hohenzollernring in Cologne). On the axis of the roadway, which is 18m wide, there is a row of candelabra, the middle strip of 8m in width serves for carriages and riders, while the side strips (5m wide) are each divided into a horse-car track and a space for general traffic, the latter next the footway. This treatment is very desirable for broad roadways; ordinary vehicles can stop at the curb and the danger of being run over is lessened, as rapid vehicles usually keep in the middle of the street.

Improvements have continually been made in the surface construction of street railways, usually in the direction of greater durability, perfecting of the joint-fastenings and closer connection with the pavement. From the standpoint of road maintenance cross sleepers and wooden long sleepers should not be used. Flat iron ties in the crevices of the pavement should hold the rails together. Iron or steel for the whole surface construction is becoming more and more general. The system most in use in Germany is the grooved “Phönixschiene”.

The ability to travel up steep ascents, the cost of working the line, the speed and capacity of the cars, are determined by the motor power. We find in use mainly, horse power, steam, compressed air and electricity.

Horses are no longer much used in larger and medium-sized cities. Even on ascents of 1:40 a car drawn by one horse is cruel; a pair of horses – with an extra one in front – can draw a car up an ascent of 1:15. But speed and our capacity are both always low.

Cars drawn by steam engines are not usually suitable in the central districts of a city both because the density of the street traffic does not admit of greater speed than that of a fast horse, and because in spite of smoke consuming and protective devices the engines cause much annoyance to the occupants of the houses they pass. Steam may however be used on an outer street where the traffic is light and the steam railway line long, because it insures greater speed and capacity and the noise and smoke are not so objectionable there. Its use to supplement horse power on occasions when the traffic is greater than usual (Sunday traffic) is also admissible.

Cable systems with underground cables are quite common in American and English cities, in the plains as well as in hilly countries (New York, Chicago, Philadelphia, San Francisco etc. also Birmingham and Edinburgh). The cable system is especially useful on steep ascents, on which other kinds of cars cannot be used (for instance Highgate Hill near London).

In place of steam compressed air or various gases may be used. But during recent decades electricity has triumphed over all other kinds of motor power.
The explanation of the construction and use of the electric street railway does not lie within the province of this book. It will suffice to point out the principal systems used: the overhead current, the underground current and the storage battery. Everywhere the rails, which are connected with each other by metal, serve to return the current to the place where it is produced. The longer the storage battery system has been tried the less economical it has proved. The subterranean current is far more expensive and less reliable than the overhead system; it is used wherever it is particularly important to avoid disfiguring the street with poles, wires etc. especially in the neighborhood of monumental buildings. But the system used everywhere with success is the overhead current. Whether it is cause for rejoicing or not, practical advantages for the traffic have triumphed over considerations of beauty.
PART III

THE COMPLETE PLAN
PART III

CHAPTER 1. Historical Review

A history of city building has not yet been written. This historical review is not of course intended to supply this deficiency in our literature. Its purpose is rather merely to give an approximate idea of the development of city building in historical times and it should also form a certain basis for the consideration of modern problems of city building in connection and comparison with earlier creations.

Pre-Grecian Antiquity

In the antique world before the Greek era the cities were principally settlements founded by individual despots who had their residence there. Of vast extent, encircled by walls they contained the royal castle which was also strongly fortified and nearby, the temple and public buildings, while round about were the dwellings of the warlike fellow tribesmen. These cities took no part in the production of goods but were simply the centers where the booty of war and tribute were consumed.

So it was with the Egyptians, Assyrians, Babylonians and Persians. A new ruler often built himself a new city and the old one decayed rapidly for, in Egypt at least, bricks of clay were the chief building material. Only one of the Egyptian royal cities was preserved for a long time, Memphis; and Thebes as the place where sacred objects were kept. Our knowledge of the ground-plan of these ancient cities is quite incomplete.

Babylon and Ninive, Sufa and Ecbatana were the seats of the rulers of the races that succeeded one another in the government of Anterior Asia; the Assyrians, Babylonians, Meder and Persians. Of these great cities only Ninive, which according to the prophet Jonah was so extensive that it took three days to travel through it, has been completely destroyed. According to Herodotus Babylon formed a tremendous quadrangle surrounded by a double wall, each side of which 22 km long. Thus it must have obtained 484 sqkm, that is, it covered an area seven times as large as the city of Berlin. The rectangular streets were laid out according to the points of the compass; they terminated at the traditional 100 gates and are said to have been lined with three and four-story houses. It is probable however that no connected construction existed and that the houses were built in loose groups with extensive fields, gardens and pastures about them which in time of war would accommodate the whole surrounding population with their cattle, while the size of the city would make it difficult for the enemy to
besiege it. The royal palace and the chief sanctuary, the Tower, stood on artificial hills.

But inspite of their rich color these gigantic cities lacked a higher value as complete plans. Jerusalem and the Phoenician settlements, adapted to the natural formation of the ground affording protection and opening themselves to traffic, seem to be the first cities that lead up to artistic Greek city building.

b) Greek City Building.

The Greek state formations were city-states. Perhaps the greatest achievement that the Greek mind ever produced was the law and arrangement of the “Polis”, the city-state. Only a number of small peasants, tenants and slaves lived in the country; property owners and well-to-do people found life in the city indispensable. The citizen of the city-state was a landowner and agriculturist; trades were generally left to foreigners and slaves. Later however in the cities on the coast, whose harbors were included in the city fortifications, commerce played an important part.

The strong power of expansion of the Greek races was not expressed by constantly enlarging their own city – only Athens with the Pireaus can to a certain extent be called a metropolis – but by the founding of towns on all the coasts of the Mediterranean. And from outside the forces poured back, stronger than before, to advance culture at home.

In the construction of Greek cities we can distinguish four periods; in the first cities were built mainly as a protection against attacks; in the second their object was the cultivation of traffic; artistic perfection reached its climax in the third and the fourth was that of decay.

The oldest Greek cities were built on the slopes of mountains and tops of hills where they could be easily defended. They were irregular but conformed to the formation of the land; many places in the interior of Greece, lower Italy and Sicily still show this choice of site and manner of building.

During this period the striving for traffic and commerce caused cities to be built in the river valleys and on the seacoast, both at home and abroad. Colonial cities in particular, like Syracuse, Acragas and the later Selinunt, bear witness in their ruined states to the industrial prosperity of that time and , as Strabo has pointed out with admiration, show how gifted the Greeks were in choosing the sites and forms of their cities. If they ground-plan of the old cities in the mother country, like Athens and Corinth, showed the central portion to be a confused mass of narrow streets the colonial activity required and furthered the laying out of cities according to most carefully thought out plans. Since the fifty century this new style of city building has come into universal use. Aristoteles understood under cities of thhis kind those that were easily surveyed and laid out according to a regular plan, if possible only of medium size, with a healthy situation and good water, well placed with regard to the sea and the land and
equipped with open spaces and public buildings. The latter in particular he considered as indispensable part of a city.

In the time of Pericles this development reached its greatest artistic height. After the plan of Hippodamus of Milet the port of Piraeus was built, celebrated in antiquity because of its beauty. An idea of its ground-plan, restored by Hirschfeld\(^1\), is given in fig. 545. Between harbor basins on both sides the Agora, surrounded by colonnades, formed the centre of the rectangular system of streets, with streets of varying widths up to 30m, theatres and temples forming

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the terminal points of the lines of vision. The temples were placed corner wise to the streets so that two fronts were visible from a distance – a favorite arrangement of the Greeks. The Doric coast town in Asia Minor, Knidos, is a great contrast, nestling closely to the hilly country and overlooked by the fortified height on which stood the temples of the patron gods of the town; at the foot of the mountain slope was the theatre cut out of the rock and affording a view of the sea and of the protective structures on the height. The inland city of Priene in Asia Minor also shows the Greek type clearly2), the streets of which, laid out on a rectangular system (fig. 546), had many of them to be cut out of the rock, supported by walls or to be built as steps; they are narrow, 4 to 7m and the blocks and building plots small; but the market, the scene of public life, is very large, 75 x 100m in a town of only 20ha extent.

The antique city squares, as places for public meetings and festivals, took the place of the public halls of today (compare part II, chapter 7, under a).

Under Alexander the Great and the Diadochi the construction of new cities was a frequent task; but gradually the monumental contents disappeared while the regular lines remained. To the beginning of this fourth period belongs Alexandria the scheme of whose city plan, (fig. 547) was the work of the master builder Deinocrates. According to Strabo the two main streets that crossed each other at right angles were 30m broad and decorated along their whole length

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2 Jahrbuch des Kaiserlichen Archäologischen Instituts, Bd. 12, Archaologischer Anzeiger, p.178
with colonnades; one of these main streets, the Canopic road, still exists, while otherwise little of the old city has been preserved.

Fig. 547
Alexandria 1. and 2nd century B.C.

c) Roman City Building

The Romans also proved themselves to be clever engineers in the choice of the sites for their settlements: traffic facilities, safety and healthiness, water supply and drainage were always carefully considered. Artistic feeling on the other hand was expressed more in the magnificent public buildings and squares than in the usual scheme of the city 3).

This scheme was developed from the building plan of the square Castra in which the Cardo and Decumanus ran at right angles to correspond to the four gates. In numerous places that were formerly old Roman cities, for instance in the centre of Turin, Verona, Florence, Cologne, Strassburg etc. the Roman street system is still more or less clearly recognizable, particularly in the city of Aosta, the former and present ground plans of which are shown in figs. 548 and 549. But the regularity of the plan appears only in those cities that were designed all at once, not in the older cities that grew slowly; they were not laid out according to rule either by the Greeks or by the Romans. There is a very considerable

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difference between the irregular, charming plan of the old centre of Pompei (fig. 550) and the rectangular scheme of the Colonia Augusta Taurinorum, now Turin (fig. 551), which has only lately been adapted to modern traffic requirements by the cutting through of diagonal streets.

Our knowledge of the former city plan of Rome is incomplete; yet in spite of frequent destructions and changes the lines of many old streets are still be found and some of them are still preserved in the street system of today. They lay more or less like rays from the centre of the city towards the outside, through the forums or past them and beyond the gates they were often continued in straight lines over hills and valleys for long distances. Cross streets, generally very narrow, divided the areas between the main lines into so-called insulae, many of the characteristics of which, unpleasant ones for the most part, are known to us, but no general ground-plan.

The real public square of the Roman cities was the forum (compare fig. 474 in Arles and fig. 828 in Pompeii). The ruins that remain of the forums in
Rome, Pompeii and elsewhere give us an idea of the former magnificence of these festival halls of the city. More than with us these squares, which in more modest form also served as...
markets, determined the ground-plan of the city. We recognize their influence in much that was produced in Roman cities during the Renaissance and Baroque period, of which we shall speak later.

Fig. 550
Pompeji
A. Forum B. Street of graves
d) Medieval Cities

In the social order of the Middle Ages the cities played a different part from what they did in antiquity. Of course in the Middle Ages they were in the first place intended as fortified places and were therefore all surrounded by walls and ramparts to the protection of which the country population was also entitled in time of war. But these country people were not absorbed into the cities as in the Greek states and the old Roman Empire; they formed communities of their own under special landlords⁴). The country people as peasants were sharply distinct from the “citizens”. The country produced the raw material; in the city lived the tradesmen and merchants who worked up the raw material and by exporting and importing built up commerce. The city market served for the exchange of the products. The antique cities were founded by command of the rulers. In the early Middle Ages (under Henry the first as well as under Guelph’s and Zähringern) this was very rarely the case; most German cities on the contrary grew up gradually from country communities and remained small towns. Recent investigations have shown that no mediaeval German city had

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more than 25,000 inhabitants.

The surplus strength of the people found its outlet in the late Middle Ages in the colonization of the east, which went hand in hand with a busy period of city building. This is the reason that the mediaeval towns that grew up gradually are found in the southwest part of our country, those that were founded or laid out, on the contrary, mainly in the northeast half.

Of course even the first named cities were not the result of chance but the gradual production of thinking men. Close to a castle, a church, a monastery, the kernel of the city, surrounding a market-place, was formed and spread in circular form; the ways that led out from it through the fields were bordered by rows of houses and closed by gates in the surrounding wall. There was no geometrical plan on which the streets and lines of the buildings were drawn in beforehand, to be later translated into reality; the lines of the streets and the sites of the houses were determined on the spot according to the dictates of need and choice. The
result was that the acute-angled forks of the field paths were retained but the side roads branched off as far as possible at right angles to correspond to the form of the houses; curves and irregularities of all kinds were produced, offsets, blind lanes and streets of varying widths.

Fig. 553
Dortmund
The work of the individual citizens who built with little guidance is seen in Germany as in Italy principally in the old Roman settlements whose original regularity, as in Strasburg, Cologne, Verona, Aosta, has been not indeed obliterated, but very much modified. Traffic, in the modern sense, was not known in the Middle Ages; Roman roads and bridges fell into decay or were destroyed, only to be renewed, as in Cologne, after long centuries had passed. Yet there were of course certain through main roads, old and new; they often formed the backbone of the city, like the Hochstrasse in Cologne, the Maximilianstrasse in Augsburg, the Kaiserstrasse in Freiburg and the Anger in Erfurt. In many places the

Fig. 555
Moscow with main streets
later expansion of the city, following the line of the wall, produced distinct ring streets, as in Aachen, Antwerp, Basel and Braunschweig.

This was the condition of the cities when, in the late Middle Ages, they entered into the period of their economic and artistic flower, when, by the erection of new churches and town halls, market halls and guild halls, the appearance of the streets and squares was beautified and changed, when the squares were widened and decorated with artistic fountains, when a consciousness of prosperity took possession of the citizens and the
practice of art became general, causing people and guilds to vie with one another in the development of the city. The charm of these mediaeval cities lies in the individuality that everywhere predominates and in the room-like closed effect that is found in the streets and squares; and the city scenes became the more quaint and picturesque the more passing centuries left their various stamps on the crooked streets and irregular squares of a city scheme that was conceived in the early Middle Ages without any unified plan. Indeed, the majority of the buildings that make up the picturesque “mediaeval” city views belong to the period of the Renaissance. Riehl calls Augsburg the Pompei of the Renaissance. In Augsburg and Nürnberg, Hildesheim and Brügge, we see not the creation of one period, the result of a planned city, but the work of centuries.

The cities Lennep, Dortmund, Braunschweig and Moscow in figs. 552 to 555 show the round, irregular outlines common in the early Middle Ages. Lennep shows a double, Dortmund a single ring line; in the Braunschweig plan it seems to be possible to distinguish between the older western and the later eastern part. In Moscow we see a second ring formation round the centre of the city, the Kremlin, dividing it into two zones, the inner “white city” surrounded by a wall and the newer “earth city” surrounded by suburbs which have grown until they now form part of it.

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Fig.557
Tangermünde

Nürnberg is also circular in form but with clear indentations at the points where the Pegnitz is crossed. The town which was not founded, but grew was built up gradually round the imperial palace that was erected in the eleventh century and soon so outgrew its first belt of wall that towards the middle of the thirteenth century a new one was built to include all the new settlements. The double ring is fairly recognizable in fig. 556.

Another way in which mediaeval cities expanded was by doubling (or lengthening) as shown in fig 557 (Tangermunde), 558 (Rostock) and 559 (Bern). This produced, in spite of all irregularity, a scheme akin to the rectangular and in Bern a long drawn out form which is divided across into four parts and is favorable to a marked prominence of the main streets.

Fig. 558
Rostock
The beautiful scene found in the “old town” in Landshut (fig 560) shows, seen from either direction, the artistic effect of slightly concave street sides and the “closed views from the streets of the towering churches at their terminal points are very fine.

Viterbo (fig 561) is remarkable for its particularly confused and intricate network of street; but the traffic streets are clearly distinguished from the badly developed scheme of the side streets, and the numerous, generally very irregular squares and street expansions, ornamented with beautiful fountains, afford
charming views.

Essenwein is of the opinion that the mediaeval architects looked upon the irregularities of their cities as the unwelcome result of compelling circumstances. Perhaps this is putting it too strongly; but it is undoubtedly true that there was no general conscious artistic pleasure taken in these irregularities. This is shown by the fact that the scheme of city districts that we know to have been laid out during the late Middle Ages is regular (for instanced in Braunschweig, Hildeseim, Göttingen, Gotha) and not only of such districts but of whole cities that were founded then in France, Germany and especially east of the Elbe where hundreds of colonial cities were laid out on a rectangular plan. To be sure we rarely find even there the perfectly straight lines of today; and a certain freedom in the way the lines are carried out, intentional or unintentional, combined with moderate variation in the street width contributes in some places, for instance Krakow, Breslau, Danzig, to the intimate effect produced in spite of the regularity.

Figs 562 to 570 illustrate such cities in Southern France (Aigues Mortes), Dalmatia (Ragusa), Western Germany (Hülchrath and Zons and the Slavish colonial district of eastern Germany (Liegnitz, Köslin, Posen, Breslau, Krakow).

Aigues Mortes (fig. 562) on the coast of the Mediterranean, dates from the time of the Crusades. The city wall and the gates, erected in the thirteenth century, have been preserved almost untouched and are exceedingly

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6 In part II vol.4 section 1 (Mittelalterliche Kriegsbaukunst) of this "Handbuch", p. 30.

picturesque; but in the city itself the pattern-like street system offers little that is attractive. It is very different with Ragusa (fig. 563) where not only the outside appearance of the city with its surrounding wall, its towers and lovely landscape offers an abundance of picturesque views, but also the main street (Stradone)
and the three open spaces (Signoria, Mercato and del Duomo) indeed even the network of narrow little streets.

The two small fortified towns Hülchrath (fig. 564) and Zons (fig. 565) probably belonging to the fourteenth century, are gathered about their old castles. Attractive views are found not so much in their straight streets as in their towers and walls.

In Liegnitz although the street system is in itself regular it has been adapted to the oval outline of the city thus producing pleasing curves (fig. 566), which enrich the street views; the castle, the market-place (compare marginal heading 202) and the adjoining church square are all remnants of the old city. Also the old city in Leipzig (see accompanying plate) shows several curved streets besides the straight sides of the square, while in Köslin (fig. 567) and Breslau (fig. 568) the rectangular street system, bounded by a circular line, is very marked. Posen (fig. 569), dating from the fourteenth century, shows the same regularity in its inner town to which, after the oldest wall was taken down, new city districts without any system have been joined. The set mediaeval plan together with the old wall has been very well preserved in Kracow which in spite of its regularity is rich in fine street views. (fig. 570)

e) Cities of the Renaissance and Baroque Period.

During the Renaissance the regularity and symmetry of the buildings

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was extended to the streets and squares. The Italian cities vied with one another in the sixteenth century in the rectification and widening of streets, in making their squares regular and in cutting new streets through the confused network of old lanes. The theory of Leone Battista Alberti who declared that, for aesthetic reason, serpentine lines were to be preferred if not for the main highways at least for the side streets because they gave variety to the city, made it look larger, broke the force of the wind and provided shade, aroused but little attention.

From Julius II to Sixtus V, from Michelangelo to Domenice Fontana, the city of Rome experienced a complete artistic rejuvenation: The Piazza del Popolo, the Via Sistina, the Scala di Spagna, the Capitol, the Lateran Square ad St. Peter’s Square bear witness to the brilliant activity in city building that existed at that time.

The Baroque Period, like that of Pericles, created an art that regarded the building of a city as a whole. It spread from Italy, where, besides Rome, Florence and Palermo in particular where built over and beautified, to Spain (Madrid, Salamanca, Bilboa), France and Germany. In France, besides Paris, particular mention should be made of Nancy, the city of Stanislaus Lesczynski (fig. 571). The part of the city that is built according to the regular Baroque plan with its straight streets and its squares, some of which are very extensive (Place Stanislas, see fig. 440, Place de la Carrière, Cours Léopold), triumphal arches, monuments, and gardens, is easily distinguished from the irregular mediaeval part.

After Germany had recovered from the suffering of the Thirty Years War many princes there became active in founding new city districts and cities, generally in connection with the erection of castles or palaces. Berlin, Cassel, Hanau, Darmstadt, Würzburg, Mannheim, Ludwigsburg, Düsseldorf, Koblenz (see fig. 475) are well-known examples.

But artistic achievement did not remain at its height; artificiality and set patterns soon gained the upper hand. The checkerboard (Mannheim) or at best the fan-like plan became the general city scheme; in its most precise form it was introduced into America at this time where it has remained paramount ever since.
Another curious form should be mentioned here; it may be likened to a nest of squares with broken lines but closed at the corners, placed one inside the other and is found, for instance, in the so-called new Newtown near Magdeburg and in Freudenstadt in the Black Forest.

The plan of Mannheim (fig. 572) is not such a complete checkerboard as is generally supposed. There are streets of greater and varying breadth whose changing flush-lines produce many a pleasant street scene; the palace too is effective in this way. An almost circular ring street has been laid out on the site of the former wall but open at the palace garden; the plans of the new parts of the city lying outside are not rectangular. Also in Karleruhe (fig. 573) the fan-like street system which radiates from the palace and is traversed by the “Lange Strasse” (now Kaiserstrasse) has not been continued towards the outside; there rectangular and other blocks adjoin that have no organic connection with the “fan town”.

As an example of American city building fig. 574, illustrating the city plan of New York, may serve. Characteristic of New York, as of other cities in America, is the direct way in which different street systems are placed together, the unconsidered manner in which the checkerboard plan is continued across the serpentine line of Broadway and the formless termination of the building blocks at the river banks. It is no wonder that, seen from the water side, the city is impressive by ugly and that in its central districts it appears busy but cheerless.

The city plan that resembles a nest of squares one inside the other is found in its most pronounced from in the little Württemberg town of Freudenstadt in the Black Forest (fig.575). The middle is occupied by a very extensive open space, originally intended for the site of a palace, one corner of which serves as a market while the rest is taken up by gardens, paths and subordinate buildings. The depth of the building blocks is so slight that there is only limited room for a house with its belongings and the backs of the houses with farming tools and manure heaps are turned towards the rear street. The corners of the squares are generally closed so that the buildings in the angles adjoin one another. Even the church which occupies a corner of the innermost square consists of two naves.
placed together at right angles while the pulpit is situated in the corner (fig. 576). A certain resemblance to the Freudenstadt plan is found in the outlines of the so-called new Neustadt near Magdeburg (fig. 577), which was laid out at a later date. There too the right angles of the streets are placed one inside another and the corners are closed. The reason for this arrangement is said to be the easiness with which such a town could be defended, as it would be necessary to hold only the two main through streets.
Fig. 567 Köslin

Fig. 568 Old-Breslau
Fig. 569
Posen
Fig. 370.

Krakau.

1:3000 w. Gr.
1. Stanislaus Place with monument  A. Porte de la Craffe
2. Dombaste Monument          B. Porte Desilles
3. Carnot Monument             C. Porte Stanislas
4. Drouot Monument             D. Porte Royale
5. Herzog René Monument        E. Porte St. Georges

Fig. 571
Nancy
Fig. 572
Mannheim
Old Town and expansion
A. Water Tower  B. Festival Hall (Rose garden)
f) City Building in the XIX Century.

Following the great collapse towards the end of the eighteenth century came the poverty and impotence of the first half and then the unequaled rapid development of the second half of the nineteenth century in city building. The population and area of many cities has increased three and four fold. Municipal authorities and architects alike were unprepared for the tremendous demands that were produced by this development. Hence we cannot wonder that the city building of the nineteenth century bears the marks of unfinished work, often even of the apprentice’s hand and that experiments of all kinds were made until gradually a certain practical and artistic aim was recognized.

The energetic building over and systematic expansion of the French capital (fig 578) seems first to have acted in France and Belgium as an inspiring example. Probably the principal characteristics of the Paris city plan are decided radial, diagonal and ring streets, long straight distant views, rich horticultural decoration, clear traffic lines and their convergence at certain points that were frequently developed into radial open spaces. Its relation to the extension of Strassburg (see accompanying plate) and to the new parts of

Fig. 575
Freudenstadt i. Westfalen

Fig. 576
Church in Freudenstadt
Brussels, Lüttich and Antwerp (figs. 579 to 581) cannot fail to be noticed. The south quarter of Antwerp planned by *de Keyser* slows the diagonal street lines in their most pronounced form.

Though the plans for the expansion of Strasburg, made originally by the French architect *Conrath*, were directly influenced by Paris, the effect of the woot is less pronounced but still clearly to be seen in the plans of Cologne (see accompanying plate; also figs. 582 & 583) by *Stübben*, Szegedin (fig. 584, by *Lechner*), Tokio (fig. 585, by *Boeckmann*), the City extensions of Mannheim (see fig. 572), of Wesel (see accompanying plate: designer *Stübben*), of Schöneberg near Berlin (fig 586°), Designer: *Berlach*, also in the new railway station district of Rostock (see fig. 558), in which unfortunately several greenspots have not been indicated; designer: *Baumeister*) and in a freer form in the plan of the Hölderletal in Freiburg i.. Br.

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9 From: Zentralblatt der Bauverwaltung. 1903, p 450.
(fig. 587; designer: Stübben). More approaching the rectangular form are the city extensions in Vienna (see accompanying plate), the new districts in Leipzig (see plate opposite page 278), the new town in Mains (fig 588; designer Kreyssig), the city extensions in Olmütz (fig 589; designer: Sitte).

Fig. 578
Paris with its main streets
Fig. 579
District Pré St.-Denis in Lüttich

Fig. 580
District Quartier du Sud in Antwerp

Fig. 581
District Ste.-Marie aux Neiges in Brussels
Characteristic of all these plans which are by no means to be despised are geometrical lines and a decided variation from the irregularity of the old city districts, also, in Olmütz, less pronounced traffic lines. We find geometry strongly predominant in the suburbs Friedenau (fig 590) and Dahlem (fig 591) near Berlin, as well as in the new parts of Dortmund (see fig 553), Karlsruhe (see fig 573), Tangermünde (see fig 557) and nearly all German medium-sized and small towns, of which Tangermünde is a sad example.

Fig. 582
Cologne
It is to be regretted that this sober geometrical fashion is still strongly in evidence in the city building that has been done since the beginning of the twentieth century. It is true, many prominent experts, artists and economists, wide-awake city governments and state authorities have in recent decades taken active steps to further the perfecting of city building; and their efforts have been attended with a measure of success. But we have still a long way to go before we reach a universal, modern applied art in city building.
Fig. 585
District in Tokio
CHAPTER 2
The General Construction of Cities

The manner in which cities are constructed is generally the result of the geographical and topographical position and of their history. The site of most great cities corresponds to the natural convergence of the traffic lines at the time they were founded or when they began to prosper. Important changes in the lines of travel have been the cause of the decay of some cities and the advance of others. In both large and small cities in the past and in the present the examples of this process are innumerable. Happy the city that is so situated that whatever changes may take place it will still remain a centre of traffic.

Favorable places from this point of view are river valleys where they join the plains (Turin, Toulouse, Vienna, Basel, Cologne, Leipzig, Dresden): also the confluence of two rivers (St. Louis, Lyon, Paris, Lüttich, Koblenz, Mainz, Mannheim, Belgrad), the mouths of rivers where they enter the sea or a short distance away from it (Marseilles, Le Havre, Antwerp, London, Rotterdam, Hamburg, Stettin, Alexandria, New Orleans, Buenos Aires) and the most inland points of bays (Genoa, Trieste, Christiania, St. Petersburg, Odessa, Kalkutta):
Fig. 587
construction plan of the district of Hölderle
in Freiburg i. Breisgau
and finally the central points of fertile strips of country and industrial districts (Brussels, Dortmund, Budapest, Moscow, Milan.

The geographical position, on which depend the climate and character of the settlement and the character and occupation of its inhabitants sets the first stamp of the construction of the city but the topographical nature of the ground is not less important in determining its appearance. The development of the city is governed and characterized by whether it stretches along the seashore (Fiume), or a natural harbor (Marseilles), along one or both river banks (Lyon), extends over a hillside (Stuttgart), is spread out in a long valley (Barmen-Elberfeld) or in an unlimited plain (Milan), lies on hills and table-lands (Brussels, Paris, Zürich), and by other peculiarities of the country. When a city is built along the seashore and up the adjacent height amphitheatrical construction results, such as we admire so much for instance in Constantinople, Trieste and especially in Genoa. On broad rivers one bank serves as a site for the city; on the opposite side a ferry, the end of a bridge, a fort or a railway station generally causes a small settlement to be built (Bonn, Mainz, Strassburg, Turin, Antwerp). In rarer cases a complete though smaller town is laid out on the other bank (Cologne, Basel, Mannheim, Frankfurt a. M., Dresden, Budapest). Always however the broad river forms a distinct barrier which may be greatly reduced by one or more bridges but cannot be entirely done away with. Not so with smaller rivers in large cities, as in Rome, Florence, Berlin, Paris, and even in London. In such cases the river in consequence of numerous bridges loses its character as a separating agent more and more and as a water highway it enters into the service of the community.

Mountain sides divide and limit cities still more effectually than do rivers; Edinburgh and Zürich are examples. In Stuttgart and Le Havre, Barmen and Geneva, the city climbs slowly up the mountains. Brussels and Pittsburg, Trieste and Helsingborg are divided into an upper and a lower city. A mountain ridge was the original division between the cities of Aachen and Burtscheid which have now grown together. Heights and water basins form the attractive decorations of the city scene; what the hills in and about the city are to Rome and Paris, the Alsterbecken and the lakes are to Hamburg and Schwerin.

As the third basis for the manner in which the city is built we named its history. Not only its political but also its artistic and economic history exert a great influence on the kind and extent of the city’s development. Its character varies according to whether it is or was the residence of a royal patron of art, the centre of a powerful state or province, the seat of a high culture or prosperous industry. What a difference there is between our cities of the early Middle Ages, the Italian cities created by the Renaissance and the modern cities in America.

b) Influence of the Systems.

As we have seen the early Middle Ages generally produced cities whose streets ran in a more or less radial direction towards a point of convergence (
Fig. 588
Mainz
the “market”, the “square”, the ring”) and were connected by a circular or semicircular line, and were divided by side streets, for instance, Aachen, Münster i. W., Braunschweig, Munich, Lennep, Lüdenscheid, etc.; usually resulting in a picturesque, crooked-lined settlement. The “central” cities grew and added one ring after another, not always clearly pronounced but still recognizable (for instance, Mainz, Koblenz, Cologne, Aachen, Antwerp, Würzburg, Vienna, Basel, Milan, Paris, Moscow).

The radial is also often called the natural system because it passes most easily into the country roads and paths; yet without some alteration and supplementation of the existing system of roads and field paths a practical and serviceable radial system cannot be carried out; this alteration is difficult at times but it is so much the less to be avoided if the necessary changes in the level obliges the owners to build artificial roads before city building can be carried out.
Cases are very rare in which a city can be developed naturally without disadvantages simply by the gradual building up of the country roads and lanes which can then be absorbed into the city without misgivings for the future. They represent in the sense in which the term is used above the natural system of building. This should not be understood as a recommendation of the planlessness that still unfortunately often rules in medium sized and small towns which may be regarded as a modification of the natural system.

Fig. 590
Suburb Friedenau near Berlin

The opposite of the natural, the artificial system proper, is the rectangular, which strikes a stranger as monotonous and wearisome and is indifferent in its effect on the citizens themselves. It is particularly ugly when it is laid out regardless of hills and valleys as is Darmstadt, Wiesbaden, the Flemish town of Nieuwpoort, San Francisco etc. It also inadequately fulfills the requirements of traffic for to pass from a point in one street to a point in a different one two sides of a right angle triangle must always be traversed. Hence a purely rectangular system would
seem to be suitable only for a small city district and for the subdivisions of a city laid out on a radial system.

Americans however seem to be entirely satisfied with this system; their aesthetic desires are apparently not modest and in general they seem to find that the traffic disadvantages are sufficiently overcome by their city and street railway systems. American streets are very wide: from 40 to 50m for main streets, 20 to 30m for side streets; diagonal streets are rare. If a river or similar obstacle divides the city into several quarters or even if an old traffic street cuts through it in a direction that does not fit in with the general scheme, each quarter is laid out on its own checkerboard plan which may be absolutely different in direction and block division from the neighboring one. Thus, as Baumeister fittingly remarks, “the city plan of Philadelphia looks as if several sheets of checked paper had been pasted together without any regards to the ruling”. While we seek to individualize our streets and to give them names of their own people in America are satisfied to use numbers and letters; in addition a distinction is made in New York and other cities between streets running in the long direction, called avenues, and cross streets, called streets, everywhere we find a pattern, never individuality.

The third so-called city building system is the diagonal or triangular system (compare for example fig. 580: south quarter of Antwerp). A number of traffic centres either already existing or proposed to be established of suitable points are connected with one another by direct street lines. Thus a net of main streets is formed the meshes of which will be triangles with some few squares. If the centres are well arranged the traffic is thus admirably served; but if the system is thoroughly developed all the streets become in reality traffic streets; the almost exclusively acute-angled blocks make construction difficult as well as the choice of sites for public buildings, and the formation of closed architectural squares is almost entirely frustrated.

Thus we see that if all justifiable demands are to be met there can be no idea of carrying out a system that is all together radial, or natural, rectangular, or diagonal. The word system alone is out of place. City building does not require either in the practical or artistic sense any system or scheme. The natural topographical conditions, ways and boundaries are the given points of departure for the city building plan, they should be

Fig. 591
Suburb Dahlem near Berlin
disregarded only when they stand in contradiction to the requirements of traffic, of industry, of construction and art. The more closely the city plan is adapted to what is provided by nature the more individual and attractive it will be. Rectangular divisions should be used in supplementing the existing ways so as to make the street scheme complete because the rectangular is the best shape for the blocks and for the real needs of traffic diagonal streets are at our command. Streets that radiate like the ribs of a fan are especially suitable for use at city gates, railway station squares, the end of bridges and similar points. But all such artificial component parts of a city building plan that are to be added to what naturally exists are not in themselves obliged to conform to the law of the straight line or the regulation of parallel street and square walls. As a rule curved lines are better than straight ones in a hilly country; on a wide plain, in order to afford distant views or impressive ones and for simple block divisions straight lines are best adapted. The final decision rests in each case with a practical conception of the task combined with artistic feeling. If we may speak of the use of definite systems at all, these should not play a dominant but a subordinate part.

Traffic needs broad free streets and open spaces but it is not hindered by residential streets of moderate width intended only as approaches to the houses. Neither is it inconvenienced by closed architectural squares and garden areas that, situated in appropriate spots are more or less remote from the bulk of traffic. By making the streets and squares individual in character according to the purpose they serve, modern cities may become richer in variety than those of earlier centuries. An abundance of designs and ideas are at the disposal of the architect whose projects rest on a practical basis open traffic centres, closed, framed architectural squares, varying street widths, projecting, retreating and curved street walls; effective placing of monumental buildings on the concave side of the street, as the terminal point of a street, as the dominant element in a square, or on a height; horticultural decoration, fountains and statues; distant views and intimate, homelike street scenes etc. For what has been said of the requirements of traffic applies also to sanitary, social and economic demands: they do not hamper the artist in city building but provide him with the material which it is his task to mould and form. The more this is done with individuality and variety the better. It is clear that a certain variety must exist in the different quarters of the city: business district and residential section, manufacturing quarters and workmens’ colonies, flat-house and villa districts differ from one another in their appearance as well as in their requirements. By arranging the parts in a well-proportioned whole the constructive development of the city is furthered and it is easy to find one’s way about in.

c) Garden Cities

The idea which originated in England and has been transferred to the continent, of aiding the decentralization of the industry and the population by
founding so-called garden cities, deserves widespread recognition and application. The essential points of the idea are as follows: “garden-like settlements on cheap land separate from the city, the price of the land not to exceed or to exceed by very little its agricultural value; common possession of the land; methodical planning out of the new settlement which is listed in size; its hygienic and aesthetic treatment; self-reliance. The final aim is the eventual division of the country into garden cities, thus actual decentralization of the large cities.”

It cannot be overlooked that the success of these endeavors is made difficult by several of the above-mentioned points, especially by the unconditional demand of common possession of the land, by the complete separation from the city and by the general principle of garden-like construction. A city consisting entirely of houses with real gardens, or to be an even greater extent of single houses with gardens, is scarcely possible under continental conditions. Building in closed rows and houses for several families cannot be avoided.

The model plans for garden city settlements which have so far been published suffer under geometrical monotony and hardly correspond to the needs of different kinds of construction on and of practical life. Nevertheless there is no reason why better plans should not be made than these that have been produced in England. With the changes in its programme which we have mentioned the garden city movement will in all probability attain its object, a result that can only be desired by all who care for the improvement of housing conditions.
A) **Causes of City Extension**

The principal causes which lead to the extension of cities are the increase in the population, the growth of industry, prosperity, improved public sanitation, social betterment, and, finally, a decrease in the population in the centre of the city. These causes are not independent of one another.

The increase in the population is due to the excess of births over deaths and to an excess in the number of people moving into the city over those moving out of it. The excess in the number of births varies greatly in different nations; it is larger among Slavs than among Germans and among the latter than in Latin countries. The annual excess in the number of births in the German Empire is about 1% of the number of inhabitants, that is, about 600,000; in France it is only about 1/6 %, that is about 60,000 souls. But this increase in the population is not equally distributed in the cities and villages. More people move into the cities than away from them and the reverse is true of the villages. Thus it follows that the population of the German cities increases annually by more than 1% on an average while the country population remains about the same. Whereas about the middle of the last century of 35 millions Germans about 26 millions lived in the country and 9 millions in cities, today 60 millions Germans about 26 millions live in the country and 34 millions in cities. Thus the number of city dwellers has increased almost fourfold and in consequence the amount of city extensions is now about three times the amount of the cities that existed in 1850! In France too the increase in the population flocks into the cities but it is both absolutely and relatively considerably less; in the French plain country, in some districts the population has decreased a conduction which is also observable in a less degree in certain parts of the country in Germany.

The population in the large cities has increased to a greater extent than that in the medium sized and smaller ones; in the latter, in some cases there has been a decrease. The annual growth of most of the large cities may be placed at from 2 to 5%, thus, assuming an equal development, it doubles in from 35 to 14 years. Large German cities have usually doubled in 25 years; some, for instance, Berlin, Düsseldorf, Essen, Gelsenkirchen grow still faster. Easier conditions of employment and increased opportunity for recreation are the attractions that draw people to the city; mutual competition is expressed in the strengthening of these two factors.

The growth of industry constantly requires more land for building and a
larger number of workers; the extensive plots of ground needed for manufacturing purposes extend the city the more it is thought necessary to place factories at a considerable distance from the residential quarters. Thus for instance the country community of Gelsenkirchen in Westphalia has become almost a connected city.

The increase in prosperity raises the standard of living so that more space is required for dwellings, just a stagnation in industry results in a decreased demand for houses.

Public sanitation and the movement for social betterment result in the condemnation of bad and inadequate dwellings in existing city districts and their replacing by new ones in other quarters. We often find far out in the suburbs new settlements founded by benevolent societies or in the interest of the employer.

Finally the increased number of business houses in the centre of the city and the growing noise of street traffic drives the inhabitants towards the outside. When whole houses, even gigantic buildings and whole streets contain only places of business, shops and offices, the centre of the city becomes depopulated. The number of people who live in the city of London has decreased by nearly a third; a similar condition, in a lesser degree, may be observed in Berlin, Leipzig and Cologne. This results in an increased demand for dwellings in the newer parts of the city and in the growth of suburbs and villa districts.

If owing to these causes the expansion of the city becomes necessary the extent to which the city must expand varies of course in different places. The first task with which city building confronts the authorities is to ascertain to what extent the expansion is necessary and therefore how much land will be required. Just as it is foolish to plan extensive new city districts for cities that are standing still or developing slowly so too it would be a mistake not to make comprehensive plans for the growth of a city that in all probability will double itself in the course of twenty years. The time when such plans should be made and their extent thus depend on local conditions.

b) The Time to make Plans

Every city expansion whether it takes place gradually or goes forward suddenly after certain obstacles have been removed (destruction of fortifications, changes in the course of a river etc.) and not less the building up again of a city or part of a city after it has been destroyed by some natural event, begins along the radial lines that lead from the old centre of the city out into the country because these are the main arteries of traffic and, as the first streets to be finished, they are naturally the first to be built up. In consequence of this unwalled cities in particular stretch out long rays into the country (Frankfurt, Aachen, Leipzig). Even where a river or fortification presents an obstacle the ray-like formation, of the city extension beyond the obstacle is easily observable (Strassburg, Cologne, Antwerp). Thus building plots are often found miles away from the city on a country road while the sections lying between the radial streets are still given over
to agriculture. A few gardens and villas are not able to lend another character to such a farming community.

This condition is a normal one and need give rise to no misgivings up to the point when the distance from the city to the unbuilt on plots on the radial lines is so great that building speculation seeks to gain possession of the fields and gardens lying between the radial lines either by laying out plots for factories etc. or whole streets and street districts. Both may produce undesirable results: one because planless construction is thus begun, the other because the interest of speculation and that of the community at large are seldom one. City or state supervision is not enough in such cases; the authorities themselves must provide plans and see that they are adhered to.

Often enough the time when such plans should be made is missed owing either to a lack of technical knowledge or to hesitancy in assuming responsibility and costs. If later the community sees its mistakes it also sees that in the meantime obstacles have arisen which present extreme difficulties. These difficulties are that the gaps on this built up radial lines that would be suitable points at which to bring in peripheral and diagonal streets no longer exist and that the plans that provide for the most practical position of the city streets, their levels and drainage, can no longer be carried out because they cannot be brought into harmony with the structures that have since been erected on certain parts of the former country roads. Hence delay in making city building plans is not only productive of considerable expense that might have been avoided if the work had been done earlier, but the plans themselves must necessarily be defective.

On the other hand if the plan is made too early incompleteness may result because the future needs of the city cannot yet be sufficiently known. Changes in the plans can however always be made and are certainly easier than changes in structures already erected.

According to this the choice of the time when the plans should be made is an important duty of the authorities. It would be used less and harmful to establish a building plan before the city shows signs of developing, yet not as harmful as it would be to delay making plans after the development has already begun.

What is true in the field of city expansion also applies, in a limited degree, to improvements undertaken in old cities. It would be foolish to make comprehensive flush-line plans, traffic improvements and new street lines for an old city in which little new construction is going on; but it is a mistake in an old city where the old structures are constantly being rebuilt simply to look on aimlessly at the new aspect it is acquiring or now and then to require that some new building be set back. In such a city systematic revision and establishment of the building lines should be undertaken in the centre of the city as well as in the outlying districts.

“Every growing city”, says the German Society for Public Sanitation,
“requires a harmonious, comprehensive city plan for its development towards the outside and its improvement in the centre.” (See appendix).

c) Extent of the plan

In the above-mentioned rule the city building plan is required to be comprehensive. This corresponds to the first of the city extension theses that were advanced in 1874 by the “Verband deutscher Architekten- und Ingenieurvereine” at Baumeister’s suggestion. It reads: “The projection of city extensions consists mainly (better probably, first) in establishing the chief lines of all the means of traffic: streets, horse car lines, steam railway lines, canals, which should be treated systematically and therefore for a considerable distance.” The reason for this sentence is contained in the sentence itself. No harmonious, carefully thought out plan can be produced that does not embrace an area that is considerable in proportion to the city as it now exists. How this requirement is to be applied to the individual city depends on technical reasons based on local needs as was pointed out under a.

The mere consideration of immediate needs will by no means produce a serviceable plan. The carefully chosen expression used in the Prussian flush-line law of July 2, 1875, that the building plans are to be made “according to the probable needs of the near future” is certainly to be approved if under the “near future” we understand not several years but perhaps two decades, or under some conditions an even longer period.

As far as possible the development of the city in the future must be ascertained by considering its growth in the past and the influence which new traffic systems and industrial plants will have on it. The annual percentage by which the population has increased hitherto, the construction, or proposed construction of new railways, railway stations, harbors and navigable canals, the destruction of fortifications and such like are all of importance in deciding the question.

The connection of the city building plan with the above-mentioned public works is a necessity. The general plan of a city extension which shall suffice for twenty years to come, thus, when the population increases by 4%, for an area which is more than double, or when the increase is by 2%, for an area that is about 1 1/2 times the present city area, is certainly not extreme. Neither should it be forgotten that the new land is not so closely built up as the old city.

Of course no one can look into the future with certainty and particularly the development of railways and waterways is apt to differ from what is foreseen. Hence the best city extension plan will show imperfections and errors before the period is over during which it was intended to be carried out. This should not be

10 Of the seven largest German cities in the course of the last century the population in Berlin increased ninefold, in Hamburg sixfold, in Munish eightfold, in Dresden sevenfold, in Leipzig tenfold, in Breslau sixfold, in Cologne ninefold, this includes the suburbs.
interpreted as meaning that an extensive plan can be dispensed with; alterations in parts of the plan that have not yet been carried out are always possible at any time. City extension without a comprehensive plan would, on the contrary produce an unserviceable whole.

The first step, as was mentioned above, is the establishment of the building flush-lines on the outer radial streets at a time when building is just beginning. That done the next step is to establish the real plan of construction: the positions and levels of the ring streets that connect the outer radial lines, the introduction of new radial streets, the arrangement of the diagonal streets so as to distribute the traffic of the outer radial streets in the different districts of the inner city. This work of planning is controlled by the traffic lines of the steam railways and waterways, in as far as they exist, are designed, or are planned to be carried out at the same time as city extension (Mainz, Frankfurt, Cologne, Metz); the whole city building plan is changed and sometimes thrown entirely out of kilter if such traffic arrangements are designed and introduced later (Berlin, Hamburg, Düsseldorf).

The outside limit up to which the plan shall extend is generally set — with consideration of the causes of extension mentioned under a — by the nature of the locality. Parks, railways, watercourses, lakes, heights, the boundary line of a township form natural barriers. When development progresses farther parks, railway stations, harbors are embraced by the city construction. Railway lines are changed, re-laid or crossed by new sunken or raised streets. Small watercourses are arched over or deflected, larger ones bridged over; even on big rivers like the Rhine and Danube, Rhone and Po, the growing city continues its construction on the other bank. Dykes give way to municipal river embankments; mountain slopes and heights are eventually built on in spite of the attendant difficulties (for instance Stuttgart, Zürich, Havre). Yet it must be admitted that broad rivers and steep cliffs limit or change the course of construction and traffic.

Township boundaries are in so far a barrier as they hinder the establishment and carrying out of the city building plan in a uniform manner; to prevent this hindrance it is best early to incorporate the smaller townships in the large city. The cities of Vienna, Munich, Dresden, Leipzig, Cologne, Magdeburg and Posen have incorporated most of their suburbs. Where the city fails to do this at the proper time the difficulties in the way of a union later sometimes become insurmountable to the detriment of all involved. In London, Brussels and Berlin for instance it seems useless to hope for the incorporation of the adjoining places.

The immediate, absolute establishment of the network of streets between the main radial lines and the limit of the plans is not necessary and sometimes undesirable because it is easy in this way to anticipate a development the fundamental principles of which are not yet fully known. Mistakes may be made by cutting up the land into too small plots for some large future undertaking, or in the choice of the kinds of construction, size of the blocks etc. This early
settlement of details is especially hampering if the plan aims rather at adapting itself to some generally practical pattern than to the given local conditions.

A rule of the “Deutscher Verein für öffentliche Gesundheitspflege” reads: “The plan should be established and carried out, as a rule, only for the main streets and, according to the need, for those sub-divisions which are expected to be built on in the near future”. This is particularly important for spread-out open cities which are frequently built up in a scattered way; in such cases it is better simply to plan the sub-divisions but not to establish them publicly. Only when construction is about to be undertaken the building lines should be actually established after the original plan has been once more examined and the changed conditions taken into account that have meanwhile arisen. In smaller cities on the contrary, and in those larger ones that are limited in area, as, for instance, inside fortifications, it is often necessary to settle the plan at the outset down to the smallest details.

d) General Requirements

The traffic systems and directions form the basis of the plan of construction; hence it is the first task of whoever makes a plan for a city extension to study them in their present form and their probable development. If railway lines are to be changed or new railways constructed it is often necessary to establish their routes before the lines of the street traffic can be brought into harmony with them; this is sometimes difficult to accomplish because the work of designing is in the hands of different authorities with different interests. Cooperation is indispensable in many cases if the result is to be satisfactory.

Not all streets should be traffic streets. Areas of greater or less extent remain between the main highways which should be divided by streets of a second rank, so-called residential streets. While the main streets must be of considerable width which is to be graduated according to the amount of traffic they are expected to accommodate, (approximately from 15 to 40m and more), residential streets need only be wide enough to insure light in the lower stories of the houses, that is the street width must equal the height of the houses. The whole width however, (for instance 20 to 12m) need not be devoted to traffic; part of it may be laid out in front garden plots or independent garden areas. Thus the actual traffic width may be reduced to from 12m (roadway 7m, sidewalks 2.50m) to 7m (roadway 4.80m, sidewalks 1.10m).

Careful attention must then be given to the treatment of the open spaces; their practical purpose and artistic arrangement (according to part II, chapters 6 and 7) must be kept in view by the planner from the beginning: traffic centres at the convergence of traffic directions; architectural squares and garden areas beside the main streets or in the residential sections, but always so that the square is not cut up by traffic lines; double squares and group squares according to the needs of the locality.
Sites for public buildings are not to be left to chance but should as far as possible be established when the plan of the streets is made. Hence it is wise to ascertain beforehand, if possible what the demand for such structures will probably be. What churches will be needed can be fairly accurately determined, which is the more important as they, in particular, claim special attention in planning the appearance and treatment of the streets and squares. And the city should not be content with merely determining such sites but should early take steps to purchase them before advanced construction has raised the prices.

In the creation and disposition of the building lots for the purpose of private construction, thus in the measurement and division of the building blocks, the method of building in local use, or intended to be used, is determinative. According to whether large or small flat houses are built, or single houses, closed rows or detached buildings, workmen’s dwellings or factories the subdivision of the land lying between the arteries of traffic will vary. The course of the traffic streets too is not entirely independent of the shape and the size of the blocks. But while they are governed primarily by the needs of traffic the side or residential streets are influenced mainly by the requirements of construction. It is their task to divide the building land into blocks so that they can again be divided into building lots.

For sanitary reasons the ground and the water must be kept clean by establishing and preparing the best possible drainage of the new parts of the city; in addition there must be protection from floods and sufficient provision for light and air by arranging for suitable street widths, open spaces, front garden plots, garden areas and parks; finally, in filling in the streets and the blocks care must be taken that nothing is used that may later become decomposed. Some exponents of hygiene demand that the street directions shall be such that sun in the buildings is assured. If the houses are built detached this consideration may be overlooked as each house may be so placed as to receive the sun. For building in closed rows **Vögt** advocates a north and south direction for the streets; from west to east is less desirable and most unfavorable of all are streets running diagonally to the points of the compass. On the other hand **F. v. Gruber**’s¹¹ thorough investigation has shown that streets running from east to west and particularly houses fronting the north are to be avoided and streets running from southwest to northeast and southeast to northwest preferred. These considerations can of course have little influence on the directions of traffic streets proper; but they are important for residential and other side streets.

Social demands receive due consideration if the sanitary requirements are met, the construction of small and medium-sized houses on blocks of suitable dimensions in proper situations facilitated, and if playgrounds and places of recreation, also promenades, parks and gardens are provided.

The demands of beauty are not independent of all others. More than in other fields in city building beauty is perfect serviceableness. Variety based on technical understanding, the individualization of every street and every square, the contrast between the open and the closed, the combination of distance views and picturesque intimate street scenes, the avoidance of the convex in building line and street level, the successful choice of sites for monumental buildings, moderation in all the proportions, statuary and horticultural decoration and everywhere a certain harmonious, artistic conception – all this is offered in the beautiful modern city. A new city must look different from an old one; for conditions are different. Nevertheless the cities of the Middle Ages and the Baroque period offer us a wealth of ideas and models.

e) Different Kinds of City Sections

A metropolis consists as a rule of the following parts:

1) The inner city or old town, the middle of which is usually of a city called the heart of the city;
2) The newer quarters of the city also called the new city;
3) The adjoining outer city districts, still in process of construction, also called the outlying city or city extension;
4) The suburbs, consisting partly of old villages, partly of new residential and industrial settlements, the former being made up of villa districts and workmen’s colonies.

In medium-sized and small cities sometimes one sometimes another of these parts are lacking or are fragmentary; they are formed or supplemented as the population increases. And also within the four principal sections of the city there are different groups according to prosperity or occupation. As regards the latter special divisions may be made into: aa) wholesale trade and commerce, bb) the working population, cc) shops, dd) the manual trades, ee) that portion of the inhabitants that carry no special occupation at home (people of independent means, manufacturers, merchants, officials etc.).

Difficult and uncertain as it is to try to foresee the way in which a city will develop and the future grouping of its inhabitants, it is yet essential in making plans for city extensions to bear in mind that the different parts of the extended area will in the future be used for various purposes and to keep more or less definite purposes in view. If this were not done the city plan would be in danger of becoming merely an arbitrary network of lines with no real basis. In this respect the “Verbande Deutscher Architekten- und Ingeniurvereine” holds the following principle: “The grouping of different kinds of city districts should be brought about by a proper choice of their situation and other characteristics; it should not
be forced except where sanitary trade regulations make that necessary.” Instead of “choice of their situation” it would be better to say “consideration of their situation”; for in reality in making the plan of construction the question is not usually so much where certain classes of the population are to be accommodated in the future, as for what kind of buildings a certain area is suitable according to its position and other characteristics.

The vicinity of railways and waterways, where land is low in value (owing to its remoteness and the unattractive surroundings) and extensive plots that are little cut up – such places are suitable for the construction of factories and warehouses. Wholesale merchants and tradesmen are not obliged, as are those engaged in retail trade, to combine their dwellings with their shops, stores and factories.

The houses of the working population are generally grouped together in the vicinity of industrial plants and wholesale houses and like them should be built on cheap land. Though the formation of small workmen’s districts or workmen’s streets seems to be natural yet the herding together of workmen’s families at one point and their separation from the more prosperous portions of the community are by no means desirable. For sociological as well as for sanitary and economic reasons the mingling of the various classes of the populating is to be encouraged. In this way the more detached method used in building the houses of the well-to-do benefits the poorer people at least indirectly and it is a great advantage to a working family to live in a neighborhood where the different members of the family can find various occupations near-by.

The main traffic streets, that is the radial streets running out into the country and still more the inner radial lines, are the most suitable sites for shops. Busy and varying traffic is one of the first conditions necessary for shops. Nearest to the city gates are found the best sites for shops that have to do mainly with the country people; more towards the centre are situated the shops for more particular customers. The heart of the city is usually taken up by shops in all directions which sometimes occupy whole business districts.

In the Middle Ages whole streets or quarters of the city were frequently devoted to the trades and it was customary for men working at a certain trade to group themselves together. Old street names like “Löhergraben”, “Kupfergasse”, “Unter Hutmacher” etc. remind us of this segregation of the trades and classes that is no longer customary today. In modern places tradesmen are scattered all over the city among the other inhabitants. The best situation for them is indeed in the radial traffic streets; but they follow other classes of the population for whom they work, from whom they gain their living, into more remote parts of the city, into the manufacturing and workmen’s districts as well as into the finer residential sections. Although promenade and “luxury” streets are too expensive to afford suitable dwellings for tradesmen it is not uncommon to find craftsmen living on the ground floor or in the basement of a large flat-house the upper
stories of which are occupied by people of wealth. Not less frequently we find in cities with smaller houses that fine residential streets alternate with subordinate parallel and side streets where tradesmen find suitable dwellings.

For the last group of the population that seeks dwellings in which no occupation is carried on, and for artists, scholars etc., those areas of land divided by residential streets, lying between the traffic streets are suitable, as well as districts on the edge of the city that are distinguished by pleasant surroundings, freedom from unwelcome industrial plants, nearness to places of recreation and walks, and good connections with the inner city.

After what has been said it is clear that the groups are not and should not be kept sharply distinct from one another; there will always be a certain intermingling of the groups of the population and a mingling of these groups in the different sections of the city. The busiest outer radial streets for instance in all districts will always attract the shops and restaurants; the main ring lines will as a rule be the best and finest residential streets; factories and villas will be found in the suburban districts according to the situation of the latter.

The city plan not only can, it must take into consideration the peculiarities of these different groups. Factory districts must not be cut up into small blocks; the street system must be regular and the streets themselves must not be luxuriously treated or too wide. Workmen’s districts need small blocks, modest streets, special equipment with everything conducive to public health, particularly public playgrounds and trees. The business district requires carefully planned, moderately large building lots and numerous direct lines of traffic, especially diagonal streets. Quiet residential sections should have walks with trees, front garden plots, public garden areas of all kinds and, where single houses are the rule, the building blocks should allow plenty of space for private gardens.

According, to this it is essential that the architect that designs the city building plan should as far as possible obtain, from the given conditions, an idea of the kind of construction for which the projected streets are intended; it is not so bad if individual unavoidable mistakes occur, which can sometimes be corrected, as if the lack of necessary consideration revenges itself in numerous difficulties that might have been avoided, when construction is really in process.

A very attractive proposal for the grouping of the different sections of the city and of the classes of the population has been put forward and explained by Ludwig Hercher in his pamphlet “Grossstadterweiterungen” (Göttingen 1904). According to Hercher our inner cities cannot “in their present changed condition, fulfill either the justified demand for the preservation of what is old, or form suitable places for the development of thoroughly modern cities”; traffic, modes of living and business life cannot be served in them as is desirable and the mounting of the price of land to dizzy heights in the heart of the city hampers development.

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12 See: Deutsche Bauzeitung. 1905, p. 103.
and progress.” Even the newer quarters of the city and “the outlying districts of the large cities that have been built up in recent decades do not correspond to the demands that the present day rightly makes and must make as regards adequate, healthful dwellings for all the classes of the population, and the development of public and business life”. Finally, the suburbs, because of their remoteness from employment and pleasure and of the loud through traffic that traverses them, fulfill only a single one-sided need of life “and that in insufficient measure and not as perfectly as is desirable”. Hercher therefore proposes an ideal metropolitan city extension as shown in fig. 592, which possesses the following characteristics:

1) the establishment of many groups of squares connected at a few points, with numerous public buildings facing them, so called “city centres”;

2) the connection of these centres with one another by a few slightly curved, uninterrupted “remarkably wide main streets”;

3) large districts between these main streets which are subdivided by numerous short narrow side streets whose course is unforced and natural.

Fig. 592
Metropolitan City extension according to Hercher

These three parts of the city extension are intended to correspond approximately to those in the inner city which contain the public buildings, the new and outlying city districts that are traversed by wide streets and the suburbs that are used for quiet dwellings or for industrial purposes. At the same time they present a strong contrast in their position and development to these districts of the modern metropolis. The illustration shows how the areas between the main traffic streets are to be used for dwelling houses, villas, workmen's dwellings, also for parks and industrial structures, how even an old village can continue its existence on such a section and how the advantages of comfortable, healthy and quiet living can be combined with nearness to the place of employment, opportunity to shop, traffic facilities and all metropolitan achievements.

There are serious practical difficulties in the way of the realization of Hercher’s proposals; but they are in themselves so well thought out and attractive and the idea as a whole on which they are based is so sensible that they deserve not only approval on principle, but also application within the limits of actual conditions and possibilities.

The various parts of a city extension are prepared by the plan of construction and the building acts. These naturally exert a certain compulsion that may be useful but may also be harmful. The latter is especially the case if the foresight of the planner and the authorities later proves to have been erroneous. Thus we see, on the one hand, with what extreme caution the plan is to be definitely established and how on the other, the compulsion should as far as possible be replaced with a certain freedom. The building laws in this relation will be discussed in part IV, chapter 7; as regards the building plan we have already mentioned that it is indeed advisable to design certain parts of the plan but to postpone its legal establishment until the desire to build makes it necessary and then once more to examine the plan in the light of the later changes. But the owner of the land and builder may also be allowed a certain freedom without disadvantage, although the municipality is the lawful bearer of all the flush-lines. This freedom is not so much in place in determining the lines of the main streets but can well be permitted in the subdivision of the areas between them. If a municipality gives a land society, a building society, or a corporation or private individual owning property, the possibility and freedom to make building plans themselves, even to suggest building regulations, it may be that the whole city will gain in individuality and variety according to the artistic or technical power of the persons who make the plans.

It is clear that the general outlines are to be determined only by the municipal authorities and the state authorities to whom they are responsible. An important point of this kind is the question whether a certain area is to be built on at all or whether it is to be kept free for the public good, to be used either to drain off high water or as a park, meadow and woods. Legislation generally provides for the keeping free of high water profiles; for other purposes the land in question must
pass into the possession of the community or state by purchase or expropriation. The more the city expands the more important do the free areas in and about it become. Those communities are to be praised\textsuperscript{14} that have therefore made a point of buying up the woods in their environs, arranging them as places of recreation for their inhabitants and keeping them free from construction. And is to be hoped that other large cities will be moved to follow in the footsteps of Vienna that, at a cost of fifty million crowns is engaged in laying out a “woods and meadow” belt of 4400ha in extent all round the suburbs, at the same time preserving and improving such parts as already exist\textsuperscript{15}. The belt consists of woods, meadows and parks that are connected by wide garden streets. Within the belt a “Höhenstrasse” is to be built that will afford magnificent views of the city and the Danube valley.

\textbf{f) Building Over the Old City.}

With the increase in the population and the city traffic grows unceasingly. The cities of the late Middle Ages and particularly those of the Baroque period are partly so well thought out and so extensive that they are even equal to the demands of modern traffic or at least require but few improvements. It is different with the cities of the early Middle Ages and the industrial villages and newer small cities that have gradually grown onto large cities or at least tend in that direction. In them it is necessary to widen streets and cut through new ones, and to improve levels.

For this reason plans for city extensions generally include the plan of building lines for the old city. But just as no larger city extension plan is necessary for a little city that is standing still or developing but slowly, so too in such a place the establishment of a general building line plan for the old streets is dispensable, in fact, disadvantageous. It is better in the rare cases where new structures are to be erected to examine this question of the building lines and to determine them, being careful to preserve the individuality of the place.

This method is no longer possible or practical however if the demands of traffic increase and now city sections are constantly being built up outside. Then, the whole old city must be examined in regard to the needs of the future and the establishment of a uniform, general building line plan so that they many new and reconstructed buildings on the old streets can conform to it and the opportunity to make necessary improvements in levels and to cut through new streets be not missed. But as with the plans for city extensions, so too the building line plan of the old city need only be designed for those parts where re-construction is not pressing and its legal establishment put off until it is necessary to use it when it should again be carefully examined.

Scarcely one of the larger cities of Germany has been able to avoid widening its old streets – at least where new structures were erected – and improving them, also cutting traffic streets through old parts of the city. In this process, as experience has shown, many

\textsuperscript{14} For example, Elberfeld, Barmen, Duisburg.
\textsuperscript{15} See: Techn. Gemeindebl. 1906, Nr. 19.
Fig. 593
Street tunneling through Palais Royal

Fig. 594
Street cut throughs from west to east and south to north
Hénards proposals for street cut throughs in Paris
sins have been committed both in a practical and in an artistic sense. The principles that are generally acknowledged today for the alteration of old streets, squares, and city districts, have already been discussed in chapter 8, of the last part.

Most has been accomplished in the way of cutting through streets in the cities of Paris, London, Brussels, Budapest, Naples, and Rome, though not always in an exemplary way. The greatest activity in this direction was exhibited in Paris, that, after the comprehensive changes that it had undergone under Napoleon III and under the second republic, is now apparently about to enter on a third period of reconstruction, not because the former alterations have not proved satisfactory but because they are still inadequate to fulfill the demands of the growing traffic in the metropolis on the Seine. The plan of the architect E. Henard for a cross made up of new main streets of 35 and 40m in width, to be cut through the heart of the city, is shown in figs. 593 and 595\textsuperscript{16}. The convergence of the traffic lines at certain points that is also noticeable in these illustrations as well as the lack of effort to avoid acute-angled and very small building blocks, is, as we have already emphasized, a peculiarity of modern French city building.

\textsuperscript{16} From: Deutsche Bauz. 1904, p. 596,
sanitation. If a confused network of narrow, dark lanes densely lined with old structures lies outside the sphere of traffic, if therefore there is no reason that would impel owners voluntarily to erect new and improved buildings in it, such miserable and permanent housing evils grow up that only energetic interferences is able to remedy matters. The case is similar when an old part of the city is exposed repeatedly to floods and only a general raising of the land is able to remove the cause and prevent its evil results. We shall discuss such cases more fully in part IV, chapter 3.
PART III

CHAPTER 4: Modern Examples of New City Sections

The discussion of several modern plans and designs, some of which have been carried out, will illustrate for us the present-day development of city building. At first some new city sections are given which are followed by more extensive plans of construction. The city sections may be divided into:

a) Construction on the site formerly occupied by fortified walls;
b) City sections which are built up mainly in closed rows and blocks
c) Villa districts; and
d) Factory districts.

a) City Walls.

The land formerly occupied by city walls is today so frequently used for building when alterations are made that the landscape architect is no longer able, as formerly, to turn it to account. For economic reasons nearly the whole of such land is required for building purposed so that its treatment as a landscape is not indeed to be neglected but still must become of secondary importance.

Examples of the manner in which the sites of walls were formerly turned into city promenades are shown in figs. 596 and 597 in Frankfurt a. M.
The destruction of the walls always affords an opportunity to lay out one or two ring streets. A single ring street, on the site of the former Glacisweg on the outer side of the walls, is found in Frankfurt a. M. On the side towards the old city the public park girdle bounds the gardens of private properties, the use of which for construction is limited, the houses on these properties face another, approximately parallel street.

The most common treatment is to add a new (outer) ring street to the old (inner) wall street, thus forming a double ring line. In Bremen the double line consists of the Wallstrasse and the Glacisstrasse (Kontereskarpe), between which extensive hilly gardens and broad ornamental bodies of water remind one of the former walls and ditches; on the outer side of the Kontereskarpe stand pleasant residential blocks occupied by private houses. This landscape treatment of the wall promenades affords beautiful sites for monuments and public buildings as Frankfurt a. M. and Bremen show. In both places for instance, the theatres have found places on those beautiful ring lines. Similar arrangements are found in Leipzig, Braunschweig, Posen, Glogau and elsewhere.

For the landscape treatment of the zone in which the walls formerly stood Frankfurt a. M. and Bremen are still models; therefore the illustrations given here have been included among the “modern” examples. The new part of the outer ring promenade in Frankfurt, called Hohenzollernplatz and Viktoriaallee, and illustrated in fig. 599 is really thoroughly modern. The

Fig. 598
part of the ring promenade in Bremen
form of the beautiful garden area was partly determined by the desire to keep a free view of the Taunus in the given directions. A considerable number of monumental buildings have been combined here with stately effect. Admirable as the park is,

Fig. 599.

the long convex building line still remains undesirable.

From the site of the fortified walls in Glogau we give in fig. 600 the sketch of a park block partly surrounded by buildings which was laid out because of the desire to preserve the two old allees. The private gardens are to have gates into the park which will thus become a sort of inside park. (Compare part VI.)

Fig 601 illustrates the city extension plan of Metz which is now being carried out. To the old Wallstrasse is added in the usualy way the ring street that is decorated with vegetation; the street system has many good points though a reduction in the number of diagonal streets and a better arrangement of the traffic centre in front of the new main railway station would be desirable.

In a similar way the Wallstrasse and the Ringstrasse supplement each other in the city extension plan of Posen, of which fig. 602 presents a section. Attention may be called to the squares about the old Carmelite church, to the Eichwaldtor which is to be preserved and to the termination of the new bridge across the Warthe.

The plan of the construction of the encircling belt in Königsberg (fig. 603)

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Fig. 600
from the construction plan of the remodeling of Glogau
shows lines that are mobile and full of variety caused mainly by the desire to preserve existing garden areas and to avoid using certain water ditches for construction. An ornamental stream flows though the new Ringstrasse. The old Wallstrasse on which runs a small railway has been done away with at the eastern end so as to gain space for the extension of the barrack ground. Suitable sites were also obtained for a court-house, a group of church buildings and an administration building.

Finally fig. 604 shows the plan for connecting the parts of the Ringstrasse which follows the line of the old city wall and adjoining building blocks in Aachen. These parts were formerly separated by the railway station to Templerband. The street beside the new railway line is bridged over by the Ringstrasse.

Fig. 601
from the city expansion of Metz

Fig. 602
from the construction plan for walling in Posen
Fig. 603
from the construction plan for the northwest front in Königsberg
Fig. 604
New connecting link on the ring in Aachen
b) Closed City Sections.

Modern sections of the cities that are to be built up entirely or chiefly in closed rows are illustrated in figs. 605 to 611.

In the new section of Munich (fig. 605\textsuperscript{18}) we see how, though the blocks are almost regular in form, well thought out irregularities in the lines of the streets and squares have produced a pleasing richness in city views. Especially worthy of notice are the views of the concave sides of the Sanatorium and Longobarden streets and the terminal views of the walls of the Anthari and the Theodolinden squares. The plan of the new part of Munich in fig. 606 shows, in the position of the St. Josefskirche, in the beautiful arrangement of the Josefplatz in the lines of the streets A B C and C D, altogether in the distribution of space, the most remarkable contrast to the adjoining geometrical district dating from an earlier period.

In fig. 607\textsuperscript{19}, illustrating a new city section in the outlying portion of Breslau, notice should be taken of the great (perhaps too great) irregularity of the lines of several streets, the attractive subdivision of the building blocks and the inside park which may be entered from three streets.

\textsuperscript{18} From: Zentralbl. D. Bauverw. 1903, p. 434.
\textsuperscript{19} From: Zentralbl. d. Bauverw. 1903, p. 434.
The new part of the city about the electoral palace in Mainz (fig. 608), which was carried out according to the design by F. Pützer that won the prize in a competition that was instituted for this purpose, is distinguished especially by the monumental, beautifully enclosed Ernst-Ludwig-Platz, the picturesque lines of the broad street that leads from there to the Christuskirche and the indirect introduction of the diagonal street across from the Realgymnasium.

In the plan of a part of Flensburg (fig. 609) the way in which the system of streets is joined onto the diagonal country road (Kupfermühlenweg), and the arrangement and connection of the two squares should be observed.

Fig. 610 shows how the land formerly occupied by a railway station in Wiesbaden is to be built up. The Wilhelmatrasse runs in a curved, the Nikolasstrasse in a straight line to the new railway building; an irregular city district is to be introduced between the villa district on the one side and the rectangular section on the other.

A new outlying district in Waldenburg (in Silesia) is illustrated in fig. 611. Attention is called to the way in which the side streets enter the market-place and the garden area, also the slightly curved lines of the streets and their convergence at the two traffic centres.

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A main street that is very rich in variety is the distinguishing feature of a new city section in Södertelje (in Sweden) (see plate opposite page 278); the squares are also worthy of notice.

c)Villa Districts

In almost all the modern villa districts we find freer lines and more curved forms than in sections that are built in closed rows. The blocks do not need to be so regular in form because the buildings are detached; as a rule squares and the creation of space become of secondary consideration; landscape treatment on the other hand becomes of great importance.

Fig. 612\textsuperscript{21} shows a better residential section adjoining an older geometrical district in Kiel.

The outlying district of Darmstadt shown in fig. 613, designed by Pützer, is rich in beautiful views of streets and squares.

The same striving for variety in appearance underlies the plan of construction of the Kämmereiwiesen in Wismer fig. 614; the closed framing of the squares and the concave building lines that result from the given position of the buildings back from the street fishlines should be noticed.

Very winding lines characterize the villa districts Hungerberg in Vienna (fig. 615\textsuperscript{22}) where it was necessary to use extremely hilly territory for dwelling houses (also a school and park). Conditions are similar in the district about the “Grossen Mühlenteich” in Flensburg where a residential section is planned (see accompanying plate). We have to do in this case, as Gurlitt writes in the book mentioned below\textsuperscript{23} with the dividing up of a valley at the bottom of which a lake lies. The view from the city across the lake of a recreation building standing on a hill was of importance and a straight line leading to it has rightly been introduced instead of a curved one. It is not to be expected that much traffic will pass

\textsuperscript{21} From: Zentralbl. D. Bauverw. 1903, p. 434.

\textsuperscript{22} From: Goldemund, II. Die bauliche Entwicklung und Stadtregulierung von Wien. Leipzig 1902.

\textsuperscript{23} In: Wuttke. Die desutschen Städte etc. Leipzig 1904.
through the valley itself; the main streets run along the side past the valley which is to serve as a quiet residential section.

d) Factory Districts

A modern factory district is also included among our examples. For this purpose we have chosen Landau (fig. 616) because the industrial district there shows the different kinds and positions of the connecting railway tracks: the position in the inside of the blocks and on the open street, service by means of switches and turn-tables. Though the inside position of the tracks and the connection by switches is a necessity for large plants, the tracks on the street are by no means rare; in the hands of the municipal authorities such a position has the advantage of being more easily established because the streets are public property or are obtained by expropriation and can without difficulty be laid out of the proper width for tracks. The connection of the factory tracks by means of turn-tables makes it more difficult to deliver and receive the cars but requires a minimum of space and can be carried out almost anywhere.
Fig. 609
from the construction plan of the northern part of Flensburg

Fig. 610
construction plan for the former area of the railway station of Wiesbaden
Fig. 611
Construction plan for the new suburb of Waldenburg

Fig. 612
connection of an old quarter to a new residential area in Kiel

Anschluss eines besseren Wohnviertels an einen älteren Stadtteil zu Kiel[44].
Also more extensive building plans need to be divided into those that are intended mainly for building in closed rows, and those that are designed for villa-like settlements.
construction plan for a suburban quarter in Wismar
Fig. 615
Villa district Hungerberg in Vienna
a) Plans for building in closed rows.

If we begin with the extension plans of Altona and Dessau, illustrated in figs. 617 and 618, it is because they, dating from the nineties of the last century, belong to the first period of development of modern city building: fig. 617 with strong accentuation of the traffic lines with rich formations of the streets themselves and of their distant views; fig 618 on the contrary with less pronounced traffic lines, fine groups of squares and intimate street views – a difference that is based partly on the difference between a metropolis and a medium-sized town and partly on the varied conceptions of different persons.

A mingling of the two conceptions confronts us in the extension plans of Diedenhofen and Marienberg. In Diedenhofen (see accompanying plate) in spite of the pronounced traffic lines we find also smaller street views and squares. (The two cross streets that are extended outside by dotted lines have a purely military significance.) In Marienberg (fig. 619) we find several long straight traffic streets among them a decided diagonal line, but many modest picturesque side streets as well, a beautiful group of squares about the church (compare fig. 508) and a stately square in front of the Rathaus. A peculiarity is the preference shown for hook-shaped residential streets and for very extensive blocks the insides of which are intended for public uses. The building line at the southern end of the diagonal street is set back without affecting the traffic thus gaining fine terminal views for the street looking in both directions.

Fig. 616 factory quarter in Landau

24 From: Deutsche Bauz. 1891, p. 321.
In fig. 620, a portion of the city extension in Brünn, attention is called, among the main traffic streets to the one that runs in the long direction near the middle of the plan with a concave south wall and a retreating north wall, also to the surroundings of the church, the position of the other public buildings, the traffic centres at A and B and the manner in which, at C and D, the streets that have been introduced to divide the land in the long direction, branch off from the country road.

Most attractive and rich in beautiful forms and in the terminations of streets and squares are the building plans of Friedberg and Pfersee near Augsburg of which sketches are given in figs. 621 and 622. If these places were large cities a somewhat more pronounced development of the traffic lines would be desirable. The formation of the blocks is practical, the placing of the schools and similar buildings in the inside of the blocks has the advantage that such sites are cheap but is disadvantageous in that they cannot be used to
Fig. 619
city extension of Marienberg
  (draft by C. Sitte.)
1,2. Inner parks 3. Inner marketplace 4,4,4. reserved inner areas for public and commercial purposes
  The old quarters are more hatched
heighten the effect of the streets and squares.

The building plan of Kufstein (fig. 623) is distinguished by a similar richness in forms. Particularly worth of notice are the three neighboring city squares, the treatment of the corners of the squares and streets, the graduated offsetting of the building line in curves. The southeastern part of the city extension is intended for detached building; the course of the brook inside the building blocks is therefore permissible.

Finally in figs. 624 and 625 two foreign modern city building plans in Belgium and South America are sketched. The plan of Zeebrugge, although not free from geometrical lines, shows German influence, whereas the Americans, for the present at least, seem to be entirely governed by patterns.

b) Plans for Detached Buildings

Settlements in which the houses are built detached or semidetached are usually erected as bathing or health resorts, suburbs of large cities or as colonies for the officials of large industrial plants. The English idea of building independent
garden cities which are to combine the most modern ideas in factory building and dwelling houses has indeed found much favor on the Continent. But though such cities would be most desirable for social and sanitary reasons the idea has not yet been successfully carried out. The reasons for this may probably be found in the fact that such cities are built on principle away from the large cities thus involving the lack of certain intellectual and material advantages, in the principle of community of ownership, and in the intention to build all the houses detached, a method that,
for some needs, is not as practical as building in closed rows.

Fig. 627 shows the outline of the resort on the coast of the East Sea, Travemünde. A distinction must be made between the original settlement consisting of the Kurpark and everything belonging to it with the broad Kaiserallee that runs in a straight line parallel to the shore, and the extension that adjoins this portion and stretches inland in winding lines.

Fig. 622
construction plan Pfersee near Augsburg
1. churches 2. schools 3. Castle 4. community houses
The colony of country houses in Cobenzl near Vienna, interspersed with parks and vineyards, shows still more attractive and varying lines in the street system (see accompanying plate). The deep curves are necessitated by the mountainous character of the country the horizontal lines of which could not unfortunately be indicated owing to the small scale on which the plan is drawn.

On the accompanying plate, the villa colony Buchschlag near Frankfurt a. M. the building flush lines should be especially observed (compare fig. 614 in Wismar); they do not run parallel to the lines of the streets and are concavely curved in many places; also the squares which in spite of the fact that the houses are built detached, are framed in an attractive way and more or less closed to the lines of vision.

The great charm of the building plan of the settlement for officials and workmen in Streiffeld near Aachen (fig. 626) consists in the careful disposition of the streets, the difference between wide and narrow streets and the interesting squares. Highly remarkable and picturesque in effect is the peculiar manner in which the buildings are set back at the block corners and the stairway-like deviation of the building flushlines from the lines of the streets; unfortunately the breadth of the building blocks between the country road and the next
Fig. 624
Zeebrugg
Draft Nyssens
Fig. 625
district of Montevideo
1. central station 2. university 3. government building 4. theatre

Fig. 626
construction plan for Streiffeld near Aachen
Fig. 627
Sea resort Travemünde
draft G. Schaumann
parallel street is only great enough for single, not for double, building lots.

Finally, Port Sunlight near Liverpool, a section of which lying nearest to the factories is illustrated in fig. 628, is remarkable for the great area it covers and for the charming landscape groups it contains. The houses are built in groups adjoining one another; the inside of the blocks is planted with vegetation and serves at the approach to stables and yards. Extensive plots are used for parks and playgrounds or are divided into kitchen garden which are let to the occupants of the houses.

Fig. 628
worker's colony Port Sunlight
PART IV

THE EXECUTION OF THE CITY PLAN
PART IV

CHAPTER 1
Duties of the State, the Municipality, and of Private Individuals

If in making the design alone of a city plan or city extension plan a considerable number of things have to be considered that do not belong either to the province of architecture nor indeed to any branch of building technique, a far greater number of questions and interests arise when the plan is to be executed, which have to be weighed one against the other, brought into harmony with one another or rejected. These interests arise in the main out of the rights of property owners, or they have to do with the preservation of public order, with traffic and with public sanitation. Hence the carrying out of the city plan is by no means the sole affair of the engineer; he is however the natural guide because the study and practices of his profession gives him a better knowledge and command of the subject than any one else. The expert engineer will not find the solution of the problem difficult if he is sided by competent men in the intricate legal and economic questions that arise, as is generally the case in undertakings conducted by the state or the city. It will therefore be practical to examine these questions involved in carrying out the plan more closely, for the instruction of the engineer.

The city is primarily responsible for the measures taken to carry out the city extension; but there are important duties to be delegated to the state on the one side and private individuals on the other.

With the state rests legislation which can certainly not be regarded as finished as concerns city building, further the recognition of police, watercourse and fortification interests, the reduction or extension of the city limits and finally the legally authorized supervision of the municipality’s activity. In addition the state is the landlord of numerous public buildings and may sometimes appear as the promoter of traffic schemes (railways, waterways, bridges etc.), in his role of landowner, as the authority that undertakes a city extension or as an employer who put up dwellings for his employees.

In the last named capacities the state plays the part of the private individual and has to observe the same duties and rights as one.

The municipality has the right to make ordinances of all kinds1, it is also responsible for the design and establishment of the city building plan, for the water supply, drainage and lighting of the city, for the construction of streets

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1 The exceptional cases in which some of these functions rest with the state are here overlooked.
or at least their supervision, for the practical shaping of the building lots, for public order, traffic and health, for the construction at the proper time of public buildings and the laying out of garden areas. Sometimes the city itself undertakes the city extension, especially is this the case in fortified towns (Magdeburg, Strassburg, Mainaz Cologne, Wesel, Ulm), or erects dwellings for employees or finally promotes traffic undertakings (city and street railways, harbors, bridges and ferries.).

Private persons as landowners and builders are in the widest sense participants in city extension, whether it be by using only single building lots or on a large scale by laying out and developing whole street districts. In the latter case they may also take a determinative part in the designing of the city plan and in carrying out street construction. Their principal activity is of course confined to the erection of dwelling houses.

About half the inhabitants of the German Empire live in cities and the percentage of the urban population is apparently constantly increasing. For this reason and because of its legal right of supervision over the measures of the city government the state must be actively interested in the questions of city building. Its legislation has to determine the principles and forms of law according to which the city building plan is designed and carried out.

In some countries the establishment of the building flush-lines is regarded as the affair of the state, especially of the state police, or ordinances regarding the city building plans are entirely lacking. In France and especially in Prussia (through the law of July 2 1875, see appendix) this duty is given into the hands of the municipal authorities. The right to make suggestions or to raise objections is accorded to the police authorities with the provision that such suggestions are to be followed or objections recognized if they do not conflict with the decisions of higher state authorities. Other boards too should be given the opportunity to express their views if they are interested in the plan of construction, for instance the board of fortifications, railway administrations and the management of state and provincial highways. Sometimes the number of boards and authorities who put forward their interests results in delaying the establishment of the plan for years, without its being possible to prevent planless construction being continued in the meantime. Mixed commissions (as in Straussburg) or the appointment of a special central board (as in Vienna and London) have been found successful in such cases. Once the various authorities have come to an agreement the plan is made public for the benefit of the landowners; objections of the latter are to be heard and decided either by the special commission or by the permanent authorities. Not till then can the plan be legally established.

State legislation has to determine the questions of limiting construction for the sake of insuring the established plan (see next chapter), the preliminary conditions and the procedure of expropriation (see chapter 3), the regulation of the boundaries (see chapter 4), the basis on which money is to be raised for the
construction and maintenance of the highways (see chapter 5), finally the general principles of the building laws (see chapter 7).

The state, in the shape of national police, protects the city construction when the area is cut through by railways, canals and similar works; it also protects public bodies of water and all defensive works. Numerous legal points are constantly being disputed which are brought about mainly by the limitation of construction, expropriation and the building laws.

It is also the affair of the state to extend the city limits as soon as the latter has so developed that no adequate plan for extension can be made without exceeding them. Many cities are hampered in their development or develop in an irregular way because this is not done. Outside of the city limits, for instance, new suburbs grow up that have not the means to construct proper water and drainage systems and the building plans of which are not in harmony with the mother city. The condition is still more deplorable if several suburbs generally develop into towns without taking consideration of one another or of the suitable plan of extension of the main city because the suburban authorities have neither the capability, the foresight or the money necessary. The unified practical arrangement of the traffic systems (street railways etc.) or the consistent carrying out of general sanitary measures is still less likely to be achieved. Moreover the cities, as soon as the area that is built over approaches too near the city limits, find that they have no the necessary space for their municipal institutions, hence they are obliged to put their slaughter houses, gas or electric light works, parks, cemeteries etc. outside the limits which results in all kinds of disagreeable features.

Mainly for these reasons as well as for the other economic considerations the suburbs of larger cities have in many cases recently been incorporated in them, for instance, Vienna, Dresden, Munich, Magdeburg, Altona, Leipzig, Cologne, Frankfurt a. M. Posen, Stuttgart. The difficulties encountered are usually connected with taxation and city funds, also objections by political parties and fear on the part of small places of losing their independence. The city of Cologne which is now in a position to control its whole surroundings, owes this largely to the instigation of the national government which recognized the undesirability of having the city districts divided into eight communities, as they were, and advised all the places involved to unite with the larger city; unfortunately there still remain two important suburbs outside that the city failed to embrace.

Berlin missed the opportunity of incorporating its suburbs; the evils of divided government for the large city and the small places are so pronounced there that the national government, it is reported, is planning a more intimate binding together of Greater Berlin without actually extending the limits of Berlin proper.

Other cities, like Brussels and London, consist of an unwieldy group of communities. The clumsiness and inefficiency of such an arrangement would be even more noticeable in these cities (especially as regards traffic systems, sanitary
measures and city extension plans) and might have most disastrous results if the central power of the state did not sometimes interfere, as, for instance, in Brussels where the king himself was instrumental in bringing about the extended comprehensive city plan, and in London where whole branches of the public administration are in the hands of the state authorities.

This brings us to another important task of the state’s, the supervision of the municipal administrations, not arbitrarily or as a city guardian but simply in accordance with the laws. The national supervision is a necessary and when properly exercised, a highly beneficial institution particularly when city extensions are to be undertaken. It is able to prod lazy communities, it can lend its aid when their activity is lamed by quarrels or private interests, it can cut away excrescences of municipal life and insure practical enforcement of legal measures.

When with the extension of the city certain public government buildings become necessary (administration and court buildings, prisons, railways stations, barracks, institutions of learning etc.) the state should secure the proper building sites betimes so that it need not later be obliged to pay higher prices or to choose subordinate and not thoroughly suitable sites. As the promoter of traffic enterprises the state must follow closely the trend of conditions and the needs of the growing city and early take them into account. Inactivity in this direction revenges itself later and it is difficult to make up for omissions. The tremendous changes that are being made at present in the railway stations and railway lines of nearly all the large cities show the great importance of this task which has been too long postponed in many places.

If in its capacity as landowner the state itself undertakes a city extension the danger of a conflict of duties is present. As the state supervises the municipality and at the same time, in undertaking the extension, stands under the municipal administration, a practical compromise of interests is difficult. The state should therefore, as far as possible, abstain from entering this field of enterprise; it is devoting itself, on the other hand more and more to the erection of dwellings for its officials and workmen. Not dwellings that go with certain positions are meant, but ordinary houses and apartments to be rented. We have come almost to expect the large manufacturer with insight into social problems to provide suitable houses in which at least a part of his employees, if they desire, can find sanitary, reasonably priced dwellings. Is it asking too much of the city to expect it to provide for its hundreds of workmen and subordinate officials? And ought not the state in particular to take measures for housing the thousands and thousands that are directly dependent upon it? In all justice it must be acknowledged that Prussia and other German states, also several cities, have within the last decade become keenly conscious of this social duty and energetically taken up this question of providing dwellings for their employees.

In the city the local statutes apply to the local development of the regulations regarding the limitation of construction, the regulation of boundaries,
raising the money for street construction and maintenance, the use of municipal institutions and municipal property etc. Local police regulation applies to all these things as well as to the street traffic and especially to the building regulations proper (see chapter 7). The part of the municipality in establishing the street and building flush-lines has already been explained. The construction of streets with all that belongs to it is also, as a rule best left in the hands of the municipal authorities because it will be better carried out from a technical point of view. It would however be a mistake to exclude private activity altogether; sometimes the work of a large co-operative society, under the guidance of practical engineers, is to be preferred to that of the municipality which is at times inadequate and clumsy.

As regards the laying out of the building lots the municipality should not rest content merely with issuing ordinances; it should itself take care that the boundaries are rightly adjusted and the lots properly parceled out; as the construction of streets progresses it must see to it that public order is maintained and public traffic not obstructed. It is the natural guardian of public health as regards the supply of drinking water, the removal of garbage, the drainage, the material used for filling up streets and squares, the cleanliness of public watercourses, the planning of vegetation and the prevention of too dense construction.

The necessity of early providing proper sites for public buildings is as great for the municipality as for the state, and this applies especially to those structures that, for architectural or economic reasons, were not assigned sites when the plan was made. The sooner the municipality begins to carry out the intended garden areas, the ornamental squares and municipal structures the more effective and beneficial will it be to the regular progress and the cheerful appearance of the new parts of the city.

Finally when the municipality undertakes the extension of the city it fulfills one of its most important duties. By covering land of its own or purchased government or private land with a practical, sanitary and artistic plan of construction that has been carefully thought out, by building or laying out the streets; squares and planted areas, by itself laying out the building lots and selling them, with certain building regulations, the city is able to create a unified and beautiful whole and at the same time to afford an example when building is to be undertaken on private property, to limit speculation and to moderate the price of dwellings.

Moreover it can promote construction by making easier conditions for the payment of building land and for the erection of small dwellings, by early establishing public means of traffic and public buildings and garden areas, also by lightened taxation for a certain period following new construction and by supporting building enterprises undertaken by churches or benevolent societies.

The municipality can be still more successful in solving the housing problems by providing moderate priced dwellings for its employees, as was
recommended above for the state. The city Frankfurt a. M. has led the way in this direction and many other cities have followed. And just as the state has become the owner of large traffic systems the municipality can contribute to the general welfare by laying out and operating traffic lines within its limits. Municipal docks, bridges and ferries are not rare. As far as we know there are no city railways operated by the municipality; but Frankfurt is again in the lead by taking over the street railways. Whoever knows the great difficulties that almost regularly arise between the city and the private transit company when parts of the street are given over to the latter, difficulties, the results of which are most keenly felt by the citizen, will agree with the writer that although universal municipal ownership of street railways cannot be expected, the city authorities should yet, when the present concessions expire or when new lines are laid out, most carefully consider the desirability of taking over the operation of the lines themselves. This careful consideration in Berlin has resulted indeed in the renewal of the concession to the Greater Berlin Street Railway Company; but the city has bought other lines and is planning to operate its own street and city railway systems. Other cities that are in whole or part possession of the street railways – generally with success – are Darmstadt, Düsseldorf, Oberhausen, Cologne, Königsberg, Munic, Münster i. W., M.-Gladbach etc.

But if the activity of the municipality embraces so much what remains for private enterprise in which after all the strength of the city, province and state is rooted? This question does not seem entirely unjustified in view of the situation. On the other side the industrial activity of private persons has tremendously increased in the last few decades, and as regards transit facilities, the writer is by no means of the opinion that private enterprise is to be altogether excluded. The operation of city and street railways will always it is hoped be accessible to efficient companies and the operation of rural lines, which are constantly increasing in importance, will probably remain chiefly in their hands.

Within the province of actual city building private enterprise has still a wide field. The purchase and sale of building lots has unfortunately become a business and indeed a most lucrative one in rapidly growing cities. We say “unfortunately” because sometimes the greatest evils have been produced. The artificial profits of speculation and in a still greater degree the holding on to land, have forced up the price of building lots in an undesirable manner, thus giving rise to dense construction, high rents and contributing in many ways to making the housing problem a difficult one.

In order to develop real activity in extending the city the possession of single properties it not enough; an area large enough to contain a street or at least a stretch of street between two crossings is necessary before the enterprise can be begun. The owner of such an area, or if ownership is divided, the majority of the owners, can “open” the street, that is, clear the street land according to the publicly established city plan of construction and make it over to the city. A contract must
be made with the city and construction of the street carried out according to the local regulations either by the owner himself or by the municipality for payment.

If the area is of still greater extent the owner can himself design its subdivision by side streets, always of course observing the main street lines determined by the city, and after the plan has been examined and approved, can carry it out.

In both cases, in the interest of the owner and of the community as soon as the new streets serve public traffic to any considerable extent and a fair number of houses have been built on them, it is advisable that the city should take them over, that is, they are to be owned and maintained by the city.

These streets are thus to be public highways, built by private persons and partly designed by them with the help of the city which must approve the plan and except in rare cases lay the water pipes and sewers.

It is different with streets that are planned and constructed by private persons and are not intended to be taken over by the city. These are not public but private streets to be permanently maintained by their owners and moreover they can at any time be closed. The Prussian flush-line act contains nothing that applies to such streets and the laws of other states are little concerned with them. Streets that are necessary parts of the street system for general traffic are not suitable for private streets; but the latter are of service in dividing very large building blocks, in opening up large plots lying inside building blocks, or when they run through valuable properties in the centre of the old city. Paris and London have many such private Cités, Inns, Terraces, etc. (compare figs. 99 to 102, 332 and 333); but especially to this class belong the “passages” figs. 103 to 107 and many so-called “courts”, that is street areas that extend into the inside of properties where independent houses are built on them. In many cases these latter are contrary to the requirements of health and safety; hence the city and the police should as far as possible prevent new ones being made.

In addition there are, especially in undeveloped or inadequately managed cities, a number of so-called “private streets”, which have not been properly constructed but have simply been made when irregular additions to buildings were put up without the city’s consent and under other irregular conditions. Such places of which no one takes any particular care or which are maintained at the order of the police are frequently a public nuisance. In well governed cities they should not occur. Eventually the city cannot avoid taking them over.

A most important part of city building which is carried out by private enterprise is the erection of dwelling and business houses and factories. Usually these buildings are erected for the use of the owners, not to be sold or let. Single industrial buildings are generally built by capitalists while companies or associations often erect whole groups or parts of cities. House prices are determined by whether building activity corresponds to the demand, is greater than or not equal to it. Usually the demand for lower class dwelling houses is
greater than the supply so that a constant dearth of such dwellings exists. The reason for this is the difficulty with which such buildings are sold and the unpleasant features involved in managing them if they are rented. The remedy, which is far from being sufficient, consists in the erection by benevolent societies of workingmen’s houses and in the activity of the city and the state in providing dwellings for their employees. It must be admitted that to workingmen’s families are generally inclined to save in the matter of rent and therefore put up with rooms that are scarcely fit for human habitation. Hence unscrupulous property owners often draw large profits from their houses though the rents seem low to the individual tenants, thus making the erection of suitable dwellings difficult and numbing the activity of benevolent societies. Good may be done by the enacting of adequate building laws and the strict enforcement by the police of building regulations and ordinance.
PART IV

CHAPTER 2

Limiting Freedom of Construction

Whether or not the right to build naturally accompanies the right of ownership, as some say, or whether this right must first be granted to the landowner, as others teach, one thing is certain, - for the successful completion of a city extension and for city building altogether, legislation limiting the right to build is an absolute necessity. Complete freedom of construction does not exist in any highly civilized land; everyone is subject to certain limitations in the way in which he builds on his own land, in the shape of building police regulations; this is universally taken for granted. In the process of city building however such regulations must apply not only to how construction is to be limited, but also to whether and when it may begin.

Construction on land lying in the first, second and third rayon of a fortress is forbidden or greatly limited by legislation; when new fortresses are constructed the military fiscal authorities must pay the owners of such land a suitable indemnity. Construction on land that lies near a river and is apt to be inundated when the river rises is also regulated, or must be regulated, by law as it is obviously inadmissible to erect structures that hinder the flowing off of high water. It is equally necessary to keep free the areas that are intended in the legally established building plan for streets and own spaces, including the areas to be used for front garden plots.

In this connection the “Verband Deutscher Architekten – und Ingenieurvereine” says: (see appendix): “The conditions of the property holding which arises when a city extension plan is established, as well as the obligations of the abutters on the one hand and of the city on the other require legal regulation. On areas that are to be used for streets and squares, after once the plan is legally established, no construction must be allowed or, if at all, only temporarily. The owner is not to be indemnified for this limitation, but he has the right to demand that property to be used for squares shall be purchased as soon as the surrounding streets are built. For this accessibility and drainage of scattered new structures the owner must at first provide. But the city should undertake to build and maintain a new street as soon as it is certain that houses will be built on a considerable number of the properties that front on it”.

In this respect legislation and practice varies greatly in different countries, it is partly incomplete and sometimes arbitrary.

In Prussia the prohibition of construction as regards street land is unconditional. But according to paragraph 13 of the flush line law indemnification
is granted in three cases, namely: 1) as soon as a city itself decides to take
possession of the land intended for a street; 2) when existing structures have to
be torn down, the site of which can no longer be used for construction; 3) if the
owner of a building lot lying on a finished street is prevented from building on
it by the establishment of a new cross street and erects the building on the lot to
conform to the flush-line of this new street. These regulations are supplemented
by decisions of the highest courts so that indemnification must also be paid in the
following cases: 4) if building lots lying on a finished street also include pieces
of land fronting on a newly established cross street, on which construction is
entirely or in part impossible; 5) for land lying within the area of a public square,
as soon as the surrounding streets are constructed.

Hence, according to the recommendation of the “Verband Deutscher
Architekten – und Ingenieurvereine”, all the land that the establishment of a city
extension plan on unbuit on ground claims for streets and squares, is subject
to the prohibition of construction, and this, in most cases, without the owners
being able to demand indemnification. The Prussia law rightly maintains that the
increase in value of the remaining building land as a rule more than makes up for
the limitations as regards street land and that in the use of a plot for building it
must be taken for granted that it is necessary to leave street land free.

On the other hand the Württemberg law which allows the city to decide
that the properties along one side of the street may be built on but that those
on the other side of the street must be kept entirely free from construction and
that without providing that the owners shall be indemnified probably goes too
far. There are of course cases where construction is admissible only on one side
of the street, for instance, on streets on a mountain slope; but an appropriate
indemnification should be made the owners unless the use of their land for
buildings fronting on another street is made possible.

Permanent prohibition could apply only to the street land and front garden
plots; the building lots could only be made subject to conditions pertaining to the
questions how and when, that is, as regards the time and manner of construction.

According to paragraph 12 of the Prussian flush-line law every city or
town may require that no dwelling houses be erected on a street until the latter is
finished according to the plan and to the police regulations. Most of the Prussian
cities have such a statute (compare city statutes of Berlin and Cologne in the
appendix) but few enforce them. Usually the city allows an owner to pay a certain
sum for the cost of street construction, and to make over to the city without
compensation the street land, after which no objection is raised to construction on
unfinished ways. By this process the difficulty is not overcome although it is one
of the pronounced aims of the flush-line law to protect the cities from the large
cost of street construction occasioned by unhampered building in all directions;
rather conditions are allowed to grow up that are deplorable from the standpoint
of traffic and hygiene and for the removal of which the city will eventually have
to make fresh financial sacrifices. The Prussian cities, taking advantage of their legal privileges, should in general see that the streets are finished and the water supply, drainage and lighting provided for before construction on the houses is begun and their building police regulations should not ask too much of streets that are considered ready to be built on.

Also in Bavaria, Hessen and Saxony construction may not as a rule begin before the sewers are laid. In most other states and cities there is no such law; thus in Baden and Hamburg, also in Strassburg everyone may build on the unfinished streets of the city extension but the first story must be on the level provided for in the plan and the house must stand parallel to the flush-line. In Mainz and Vienna permission to build is dependent on several conditions, among others the practical division of the whole block must not be prevented by the erection of single structures. Desirable as this regulation is, it is unfortunately found scarcely anywhere else; we shall return to this subject in chapter four of this part.

The Hessian building law (see appendix) is practical in that it empowers cities to forbid all construction outside of the area covered by the city plan of construction, a privilege that must be used with caution. In Prussia, on the contrary, it is not possible to forbid construction until the flush-line plan has been established.

As regards the kind of construction and manner of building conditions may be imposed either in the contract (entered in the register) especially in the sale of building lots, or by city statutes and police regulations. The conditions agreed to in the contract refer, for instance, to the exclusion of industrial plants, to the height, style and materials of the buildings, to detached or semi-detached method of construction and other details.

The city statutes can legally forbid the erection of objectionable factories and the carrying on of undesirable trades in certain sections of the city. The German trade regulations have provided for this case in section 3, paragraph 23: “The legislature reserves the right to determine in how far city ordinances may set apart certain sections for the erection and use of plants of the kind specified in §16, and exclude them altogether or under certain conditions from other parts of the city.” §16 enumerates those trades to which the permission to build is granted only after they have been investigated by the city authorities. In accordance with §23 the kingdom of Saxony and Württemberg, the grand duchies of Baden and Hessen and the duchies of Anhalt and Braunschweig have given their cities the possibility of laying out city sections to be kept free from factories. In the other German states the matter has not yet regulated by legislation; the “German Society for Public Sanitation”, cooperating with other societies and numerous cities, has been very active in trying to obtain the general regulation of the question. The subject has however lost much of its importance owing to

2 see: Örtliche Lage der Fabriken in Städten. Deutsche Vierteljahresschrift für öffentliche Gesundheitspflege.1899, p.42
the practical progress made in many cities by means of the “graduation of the building police regulations”. The “zone building ordinances” now make it possible to exclude not only those trades enumerated in §16 of the trade regulations, but all objectionable or undesirable trades from quiet residential sections of the city and in addition as regards manner of building and density of construction to impose all those conditions that have been recognized as necessary, for sanitary or social reasons, in the different districts. This subject is more fully treated in chapter 7 of this part.
PART IV

CHAPTER 3
Expropriation

In nearly all civilized lands cities have the right to expropriate land for streets on the basis of a legally established flush-line plan, that is, to compel the owner to relinquish it for an indemnity. But the formalities that lead to this end and the measures taken to determine the amount of the indemnity vary greatly in different countries. Exceptions, to our knowledge, are Mecklenburg where the right of expropriation for purposes of city extension does not exist, and Bavaria where the right applies to state streets but not to municipal streets, a condition that must make the carrying out of city extensions extremely difficult.

In paragraph 11 of the Prussian flush-line act it is briefly stated that on the day on which the established plan is made public the right of the city to forbid the owner to erect new or additional structures that extend beyond the flush-line comes into force and at the same time the city receives the right to expropriate the area that is determined by the street flush-lines in the plan, for streets and squares. The expropriation is made in accordance with the expropriation law of June 11, 1874.

In settling the amount of the indemnity two questions are determinative: the value of the land on a certain date and whether it is to be valued as a “Building site”.

The first question is of great importance in cities or parts of cities where the price of land is rising rapidly in consequence of rapid growth or of railway or other structures that influence its value. Three different dates come under consideration, first, the day on which the street plan was established and made public; second the day on which the expropriation claim was put forward and third, the day on which the property was transferred. All three dates have a certain justification; the first because it does not seem fair to require the city treasury to pay speculative values and the value of the land does not generally change till after the building limitations, based perhaps on the street plan, are established; the second because not until this day does the city make actual use of its right of expropriation, and the third because it is the day on which the owner is relieved of his rights and duties as regards the property and, by the payment of the indemnity is enabled to seek an equivalent elsewhere. Judicial decisions which formally in the majority of cases favored the day on which the plan was established as the proper date of valuation, at least in Prussia, have in recent cases named the day on which the expropriation claim was put forward as the determinative one.
The second question, whether the area is to be regarded as a building site or as land which cannot be built on (garden land, fields, etc.) is still more incisive. In as far as regulations in regard to it exist they are contradictory. According to Baumeister the law in Leipzig provides that the land is to be valued as a building site. In Vienna, on the contrary, the land is to be regarded as a building site only if it has already been built on, or if it might have been built on according to the former building line, or if it has been entered in the public books as a building site. If it is not a building site it is to be valued according to the use to which it is put, taking into consideration the time and place. In the Hessian law for the extension of Mainz it is stated that land which, according to the plan of construction of the new part of the city, is to be used only for canals, streets or squares, cannot be valued as high as land that is suitable for building sites, but only according to the use to which it is possible to put it, as a field, garden etc. Prussia has no express regulations as regards this matter and therefore there is a great variation in the amounts awarded both by the courts and by the expropriation authorities (district committees).

That land on which a building has stood or that, according to a former building line, might have been built on, is to be valued as a building site can scarcely be disputed. But for other street land it is, as a rule, just that only its value according to its actual use be paid, not its value as a building site because the remaining property does not really become a building lot until the area that has been expropriated is used for a street so that the owner is compensated by the increased value of the land that he still possesses. But this is true only if the owners of the land that is to be expropriated for a street are also the owners of the adjacent building land (who have to pay the cost of the street construction when the street is built up). If this is not the case the owners of the adjacent building land receive an undeserved advantage if too low an indemnity is paid to the owners of the land expropriated. To avoid such injustice indemnity is often paid for the street land, not indeed as a building site, but taking into consideration the average value of the land in that section and the accessibility, shape and depth of the particular piece of property in question. An example – not cited as a model – will serve to make this clear.

In a certain part of the city at the time that the land is expropriated the price of the building lots may be fifty marks a square meter. Let us assume that the properties have each to relinquish on an average one third of their area for street land and to pay at the rate of five marks per square meter of building land towards the cost of street construction. Thus we find the average value of the land to be (50 -5) 2/3 – 30 marks per square meter while the value of the same unit to be used as a garden or place of storage might only amount to from 5 to 10 marks. This average valuation cannot of course be applied when plots of very slight depth or of unusual depth are only partly expropriated; in the former case the indemnity would be higher, in the latter considerably lower as the loss to the
owner always exists only in the difference between the value of the original plot and the value of what remains after the expropriation has been made. Only in a few states, for instance, in Württemburg, Saxony, Hamburg, France and North America, do the expropriation laws allow the increasing value of the remaining plots to be included in the calculation of the indemnity for the expropriated area. In most countries this is expressly rejected.; in addition the owner is entitled not only to compensation for the full value of the expropriated area but also for certain disadvantages that may thus accrue to his business and for the decrease in value of the remaining property if such exists. The latter point may be of great importance in the laying out of a new street particularly if it cuts though the properties diagonally and may easily lead to injustice.

According to the Prussian law the owner may demand that the city take over the whole property if it is so cut up by the new flush-line that the building regulations forbid the use of the remaining piece for construction. But
the city itself has not the right to expropriate such a remnant; on the contrary the owner may keep it or not as he pleases, and if he does he can claim from the city compensation for the damage, to the shape of the plot and for its having been rendered unsuitable for construction. This is obviously unjust and should be remedied, especially as these remnants not only remain unbuilt on and ugly spots in the neighborhood but also because they hamper construction and adjoining building lots often lead to the erection of buildings that are unsatisfactory in economic and sanitary respects. These remnants are sometimes called “annoyance strips” or “fleece strips” because an unscrupulous owner sometimes keeps such a piece simply to annoy his neighbor and with the intention or forcing the latter to pay exorbitant price for it.

The expropriation laws in Switzerland, Baden and Braunschweig are somewhat better for they at least give the city the right to expropriate such remnants in such cases when the decrease in value exceeds a quarter of the total value. But as far as we know the legal right to expropriate such remnants just because they are unfit for building does not exist in any German state. Belgium, France, England and Hungary are ahead of us in this respect. The “Deutsche
Verein für Öffentliche Gesundheitspflege”, in the resolutions of its annual meeting in Freiburg i.Br. expressly demanded that the cities be given the right to expropriate all the property necessary to carry out the plan of construction including those plots that were unfit for building. To be sure, the remnant still remains unfit for building on after it has been transferred to the city unless it may chance to be possible to combine it with other remnants or pieces of land belonging to the city, or the owner of adjoining property is ready to buy it at once. Hence, in order to be really effectual, the regulations should require that the city be obliged to relinquish the remnant without increasing the price if it is to be used to form part of another building plot, and they should also provide for a proper combining and changing the position of the building lots, which will be discussed in chapter 4.

The countries mentioned above, Belgium, France, England and Hungary, also Italy and Switzerland possess still more extensive expropriation laws which are designed to enable cities to expropriate whole city districts or complexes of buildings which are a menace to health or an obstacle to traffic, in order to lay out in their place a sanitary city section.

Fig. 631
Street cut throughs in Brussels
with practical traffic streets. To this end the whole zone is expropriated, new street courses are laid out and properly constructed and the land divided into practical building lots and sold. In Belgium, according to the acts of July, 1 1858 and November 15, 1867, this also applies to the creation of new city districts on land that has hitherto been unbuilt on. As regards the improvement of old city

Fig.632
Restructuring of the district near the Schwurplacebridge in Budapest
districts this process has been carried out in Paris (decrees of March 26, 1852 and December 27, 1858), Lyons, Marseilles, Brussels, Antwerp, London, Manchester, Agram, Budapest, Rome, Naples, Florence and Zürich in a greater or less degree with very beneficial results. It is true that such improvements cost the city large sums; but a large part of the expense is covered by the profit on the building lots which increase in value and practical, harmonious construction is made possible – without any loss to the former owners who are fully compensated for their possessions.

The accompanying plate and figs. 629 to 636 show a number of examples.

In order to cut through a street from the Rue de la Cuiller to the Porte de Flandre in Brussels those plots were expropriated that are outlined in fig. 629. The re-division of the land for the purpose of reconstruction is shown in fig. 630. A zone expropriation of great extent, also in the old city in Brussels, is illustrated in fig. 631; the problem was to form two main traffic lines between the lower and upper city, from A via B to C on one side to D on the other; also to gain two building sites (with front squares) for the extension of the Royal Museums and for the central station of the city railway; and finally to improve the sanitary conditions of the unhealthy old quarter about the university. The streets were curved not only for artistic reasons but also to moderate the ascent. The small size of the blocks is noteworthy (except the block that is occupied by the central station and the site of the produce exchange); it is explained by the small dimensions of the building lots in Belgium where great barrack like flat-houses are unknown; also worthy of note is the number of triangular and acute-angled blocks which are very popular in Brussels for the erection of business houses.

An example in London of the cutting through of streets and changing of levels is shown on the accompanying plate, the Holborn Valley Improvements. The properties which the city of London was enabled by the act of parliament to expropriate for the purpose of laying out the new streets Holborn Viaduct, Holborn Circus, Snow Hill, Charterhouse Street, Shoe Lane, St. Andrew Street and St Bride Street, and bridging over Farringdon street, are marked by diagonal lining.

In fig. 632 we give an illustration of the alterations made in the approach to the new Schwurplatzbrücke with the expropriation zone marked. Figs. 633 to 635 show alterations in Florence and Naples. In Florence the undertaking was to create a healthy quarter in the heart of the city under the name of Risanamento.

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4 from the pamphlet mentioned in footnote 8
5 from: Deutsche Bauzeitung.1904.p. 333
Fig. 633

Restucturing of the city center of Florence
del centro in place a number of dark, unhealthy, densely populated structures. The buildings marked in black were preserved because of their historic and artistic value; those properties marked with diagonal lining were laid bare; the new blocks that were obtained were built up again leaving free a space of 82 x 90 m in size. A somewhat more artistic treatment might well be desired for the old art city.

Fig. 634
Reconstruction of the city center of Florence (new state)
Fig 635 gives an incomplete illustration of the alterations in the old parts of Naples where the cholera epidemic of 1884 gave rise to thorough sanitary investigations. The dark, ruled areas were expropriated.
Among the streets that were newly laid out the most important are the broad Corso Re d'Italia that leads from the main railway station into the city and its fork leading to the Via Medina and the Piazza Municipio; at the same time new quarters with suitable dwellings were built on the edge of the city to accommodate the poor population that was obliged to vacate the expropriated district.

The alteration of the Zähringer quarter in Zürich with the expropriation zone marked in dark ruling is shown in Fig. 636.

Fig. 636
Alteration of the Zähriger quarter in Zürich

The alteration of the Zähringer quarter in Zürich with the expropriation zone marked in dark ruling is shown in fig. 636.
In Austria there is no general legal regulation of zone expropriations but by the special act of February 11, 1893 the city of Prague was enabled to expropriate extensive areas in old city districts with the object of making sanitary the over populated and unhealthy quarter known as the Josefstadt.

Similarly in Hamburg a special law has made possible the sanitary improvement of the old part called the southern new town which has been partly accomplished and is still being carried out. The expropriation zone is marked by ruling in fig. 6376; the parts that are in process of being carried out are indicated by dotted lines. These extensive alterations due to the cholera of 1892 are to extend over a term of nine years; a number of new and suitable dwellings were erected before the work on the different sections was begun. It would have been better to have avoided cutting into the walls of the Schaarmarkt to such an extent.

Sanierung der südlichen "Neustadt" zu Hamburg\(^6\).

fig. 637
renovation of the southern "new city" of Hamburg

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6 from Zentralblatt für allgemeine Gesundheitspflege.1904 p. 389
In the rest of Germany - with the exception of Saxony where the laws are more favorable – owing to the difficult conditions of expropriation and the large sums required to obtain the necessary land, extensive improvements and the regulation of inner city districts are rare, although the need of them is felt in many places. The cutting through of a street that is now in process in the inner city in Frankfurt a. M. was illustrated in chapter 8 of the last part (fig. 522).

At its annual meeting in Freiburg 1885 the “Deutsche Verein für öffentliche Gesundheitspflege” demanded that all cities be given extensive expropriation rights so as to enable them to alter or rebuild unhealthy parts of the city without incurring exorbitant costs. And at the meeting in Strassburg the demand was repeated in this form: “If whole groups of houses or city districts are condemned as unfit for use the city has the right to undertake or to cause to be undertaken their complete reconstruction; for this purpose it may expropriate all the landed property and buildings lying within the district in question.” The international congress in Paris 1889 recommended similar legislation with the object of obtaining sanitary workmen’s dwellings.

The same demand may under certain circumstances be based on the needs of traffic. The question may be left open whether it is advisable to transfer to German conditions the zone expropriation rights in outlying, unbuilt on territory after the example set by Belgium. It may be pointed out to those who fear the possible abuse of such rights by the cities that the supervision of the national government as well as the cities’ own financial cares would prevent excesses in this direction also that the latter could easily be regulated by law and that in any case all owners of expropriated property would have to be fully compensated.

7 Deutsche Vierteljahresschrift für öffentliche Gesundheitspflege 1890, p. 60
PART IV

CHAPTER 4
Regulation of Building Lots
(Changing the position of the lots, combining and redistributing them)

In part II, chapter 3, the principles were mentioned that should be applied in dividing up the building blocks into lots. It is easy to do this if the block belongs to a single owner but becomes difficult and - if legislation is inadequate - impossible if the block consists of a number of plots which because of their shape and position are more or less unsuitable for building and belonging to different owners.

If the difficulty consists merely of the fact that the plots are indeed regular in form but stand at acute angles to the street, construction may if necessary be so carried out that the fronts of the buildings conform to the flush-line and the acute angles are, as far as possible, overcome in the outline of the rooms, or in such a way that rectangular buildings are erected standing “en échelon” to the street. The former method is required in most building regulations; the latter has sometimes been carried out in a charming fashion in old cities (for instance, Nürnberg) with alcoves and bay windows, (compare also fig. 638 in Aachen).

If the en échelon formation is in general little adapted to modern cities because of the dirty corners and dark recesses that are often formed, yet there is not sufficient ground for police prohibition of this method if a good connection of every house with the projecting adjoining house is assured. With the close method of building if this connection does not exist the bare walls are very ugly even if the fences or railings enclosing the lots are placed in the flush-line. For detached construction the acute angled position of the lots in itself is less hampering but is also undesirable and gives rise to difficulties in the use and subdivision.
of the block.

The difficulty is much greater when the course of the boundaries of the lots in the block is without any regularity whatever and the flush-lines because of other requirements of the city building plan cannot be adapted to the property lines. An irregular block is given as an example in fig. 639 which does not contain a single lot on which a building could be erected without disadvantage to itself and detriment to the neighbors. If for example the owner of plot M - perhaps after a long and fruitless bargaining with his neighbors - should finally decide to make the best of his plot as it stood and should erect the structures indicated not only he and his successors as well as tenants would have to suffer from inconvenience, unsightliness and economic disadvantages but the regulation of the block by changing the position of the lots would be made difficult, partly impossible, and for centuries the inhabitants of the block would have to complain of the unpractical arrangement of their dwelling and business localities. Fig. 640 shows the form and position that might be given to the single lots either with the consent of all or by legally enforcing such an arrangement.

It would be to the advantage of every owner and also of all the future occupants; at the same time the whole position and the size of the new lots are almost exactly like the old. We might be led to believe that the advantage to all concerned is so clear that the change need only be suggested to gain their enthusiastic consent. But that is not unfortunately human nature. Only with a great deal of trouble and not always then is it possible to reach an agreement among all the owners if an impartial expert takes the matter in hand, works out practical projects and makes them clear to those concerned by much explanation and persuasion.

A capital example of this is shown in figs. 641 and 642, illustrating a part of the Cologne city extension in which the position of the blocks was changed.
Fig. 641

position of plots between Lothringer- and Volksgartenstrasse in Cologne before the restructuring

Grundstückslage zwischen der Lothringer und Volksgarten-Straße zu Köln vor der Umlegung.
Fig. 642

Position of plots between Lothringer- and Volksgartenstreet in Cologne after the restructuring.
Figs. 643 and 644 show the plan of another part of the same city extension where the attempt to change the position of the blocks was unsuccessful. In the year 1885 the plan was proposed and explained to the 31 owners of whom 29 accepted it; the other two, the owners of the properties 11 and 16 felt that their rights were being encroached upon and could not be prevailed upon to give their consent. As a result the whole territory lay idle for twelve years although its general situation was favorable as possible for construction. 

In the meantime the Venloerstrasse was built up as shown in fig. 645, making the regulation even more difficult; it was finally brought about but not until most of the owners had been bought out by the others so that only 5 remained.

There have been many similar failures in Cologne and other cities where the effort has been made to carry out extensive block regulations by obtaining the voluntary consent of the different owners. It often results in crooked, irregular and unpractical construction of whole blocks or city districts. And the reasons that prevent several owners from agreeing to a plan that is clearly to the advantage of all are always devotion to their own interests, the hope that by holding back they will gain an arrangement still most advantageous to themselves, or envy of the advantage of others. In almost every instance consent is refused on the ground that someone else has been more favorably treated! Cases are not rare in which the owner brings the plan to naught because his interests elsewhere make it undesirable.

Fig. 643
plan of plots of the Neustadt in Cologne near Bismarck-, Kamecke- and Werderstreet in 1885
for him to have the lot touched just at that time, or he purposely creates an obstacle so that the others concerned will eventually be obliged to buy his property at a high price in order to gain their end. In the lack of a legal regulation of the subject it is often this despicable self interest that hinders the progress of city building. The good citizen is at the mercy of his grasping neighbor; and if finally money and determination overcome the obstacles or if one owner is finally in possession of the whole by paying high prices for the others’ land, the effect is to raise the prices of the building lots above what they would naturally be and this in turn means high rents.

Sometimes however the consent of those concerned to the changing of the boundaries is not enough, especially if the property belongs
to minors, missing persons, and bankrupts, or if the sale of the property is legally limited. Hence in order that building lots may be practically arranged, legal regulation of this matter is urgently needed.

In order to make this need still clearer attention is called to fig.646 (position in strips), 647 (massed position), 648 (irregular position on a finished country road) and 649 (construction on irregular plots on a finished street).

The strips of from 2 to 3m in width and more than 200m in length in fig. 646 can only be made fit for construction - however the blocks are formed - either by combining adjoining plots or by redistributing their area in wider and shorter lots.

No plan of construction could be made for the mass of plots in fig. 647 in which it would be possible to use all the plots for building without some alteration. Insufficient width or a slanting position will always form obstacles that can only be overcome by changing the boundaries. We see the necessity for this particularly clearly if for traffic or other reasons the existing ways must be kept in the plan of the streets.

An example of irregular plots, all of which are unsuitable for building, lying on a finished street, is shown in fig. 648. Apart from their slanting position, the plots I, II, III, IV and VII are too narrow; the plots IV and VIII are not deep enough; the plots V, IX, X, XI and XII lack street frontage. If alterations are necessary in such cases fig. 649 shows that they would also be highly desirable where, in spite of the irregular position, construction has been found possible and has been carried out - after a fashion! Irregular lots are not so objectionable for detached houses, provided, as in fig. 650, they are large enough. But it is clear that even in such a case it would have been better to have regulated the boundaries beforehand.

Examples of what has been accomplished in Hannover, Hamburg, Frankfurt a. M. and Zürich are given in figs. 651 to 658. Most of them are taken from “Die Umlegung städtischer Grundstücke und die Zonenenteignung”,

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published by the Verbande Deutscher Architekten-und Ingenieurvereine, in
which it is stated on page 23 that no opinion should be given of the excellence of
the building plane in themselves.

In the examples in Hannover (figs. 651 & 652) the gain to all concerned
in particularly clear. Owner number 1, for instance, receives instead of 12 cut
up and irregular pieces 4 regular building lots; No. 2 found his property well
regulated and in almost the same position as before, as did number 3. Instead
of his former acute angled plot, number 4 received two excellent, rectangular
lots with frontage on four streets, in the former but improved position; the case
of numbers 5 and 6 was similar. The enclosed plot number 7 became a valuable
corner building site.

Figs. 653 and 654 in Hamburg show a frequent
formation in which all the
lots stand at acute angles
to the street. The process of
turning the lots so that they
lie at right angles, though
simple in itself can, in the
absence of legal regulation,
only be carried out if none
if the owners objects.
Experience has taught us
that one of them frequently
does. If after a great deal
of waiting and trouble one
owner finally decides to
build on his lot as it stands,
re-distribution is generally
made impossible and the
whole street is condemned
to build as the first man has.

A redistribution
that was carried out in the
much cut up territory called
the Kiesheide in Frankfurt a. M. is the illustrated in figs. 655 and 656. A re-
distribution in Zürich, according to what is there called the “quarter plan”, is
shown in figs. 657 and 658. Owner 1 loses on the north and gains on the south of
the Mattengasse. Owners 4, 5, and 6 each receive three building lots of practical
form and in good positions. Owner 7 obtains from owner 6 a supplementary
piece on the Mattengasse; number 8 becomes a serviceable corner lot, number 9
is made into two corner lots in its original position.
Even if in the cases illustrated the flush-line plans appear capable of improvement, yet the advantage of redistribution is indisputably proved. Lots that lie in the inside of blocks without touching the building flush-lines cannot be used for construction at all unless they are re-distributed or combined. It may be mentioned here that combination plays a much smaller part in city properties than with farming lands. Whereas in the country it is usual to combine scattered pieces of land belonging to the same owner so that they can be worked to better advantage, in the city where land is cut up into small plots in any case combination is not employed unless a serviceable building lot cannot be formed out of the different plots even by re-distribution of the area. The object is attained by combining two or more such small plots to the advantage of the owner and also of the neighbors for small unused plots lying between the houses are neither attractive nor safe.

Fig. 647

mixture of plots in Cologne
Combination is especially necessary in order to make separate useless remnants of plots or old ways and water courses fit for use. These remnants are either combined to make one useful building lot or they are added to and included in a neighboring plot or, finally a number of properties are re-divided. Thus land belonging to different owners is combined into one piece of property, a process that was called “Eineignung” (incorporation, inclusion) in the Freiburg recommendations (see appendix). Those remnants especially should be included in other properties that were expropriated as unfit for construction when the street was built. Figs. 639 and 640 show the inclusion of the remnants L, N, J, and R. How small a remnant must be in order to be declared unfit for construction should be legally settled according to the custom of the city and such areas should be subject to expropriation and inclusion.

To those who think that it is monstrous to oblige an owner to add to his property we would point out that it is a much milder proceeding slightly to increase his possessions at a low cost and on easy terms of payment than, in the public interest, to expropriate his property and under some circumstances drive him from house and home. As a matter of fact in many places the process of inclusion takes place without difficulty when the building flush-lines in old streets and city districts are regulated. In order to advance a new structure into the flush-line the owner must obtain the necessary part of what has up till then been street land, with the consent of the city. As in such cases, so too in including remnants of plots payment can as a rule be put off until the piece of land is actually about to be used.

Laws pertaining to the re-distribution and combination of land were enacted in Hungary at the time that the city of Szegedin was rebuilt after being destroyed by floods, in Hessen when the Mainz city extension was undertaken, in Prussia for the rebuilding of the burnt town of Brotterode and for the benefit of the expansion of Frankfurt a. M. They have been issued for general use in Baden, Saxony, Hamburg and in the Canton of Zürich. Extracts from the laws of Baden, Saxony, Hamburg, and Frankfurt are given in the appendix.
The following are the most important principles of the Frankfurt re-distribution law for which we have to thank the untiring efforts of the Oberbürgermeister Adickes.

Redistribution should be undertaken in the interest of public welfare. Market gardens, forestry schools and parks may be excepted. Land shall be re-distributed at the request of the municipal authorities or more than half of the owners, provided the latter possess more than half of the area. The land for streets and squares is first separated and transferred to the city; the remaining territory is divided into proper building lots and distributed among the owners, each of whom receives the same proportion that he contributed. As far as is feasible the lots shall remain in their original situation in the group. The owners shall receive monetary compensation for the land necessary for streets and squares in as far as this land exceeds 30% of the area contributed by the owners; in this case however the re-distribution can only take place with the consent of the magistrate. Compensation is also to be paid if structures, market gardens, forestry schools etc. are expropriated. “Dwarf” pieces of land are, if it is desired, to be combined into building site and transferred into the common possession of those concerned; otherwise they are to be expropriated and either included in the adjoining plots and paid for or included in the distribution of the whole area. The process of redistribution is to be carried out by a commission consisting of at least one building expert, one lawyer, one surveyor and one more technical expert. The commission sets the term within which the streets and squares are

Fig. 649
construction of irregular plots on uncompleted street
to be finished and ready for traffic and construction; if the re-distribution is undertaken at the request of the city authorities the term may not exceed four years. During the process of re-distribution the building police may forbid the erection of structures on the territory in question in as far as they would make the re-distribution difficult.

These principles are much the same as those of the law in Baden; but there is a remarkable difference in the method of setting aside the land for streets and squares.

Whereas according to the Frankfurt law this land is first separated from the whole area and transferred to the city which does not have to pay for it unless it exceeds 30% of the area, in Baden it must be purchased by the city before the re-distribution is begun and bought back again when the houses are built. Limiting the street land that must be made over to the city free of 30% is not entirely unobjectionable. In many cases this percentage is too much; in others too little especially if the area is traversed by broad traffic streets and an open space is made. In cases of the first sort the city may be tempted to lay out unnecessarily wide streets while in those of the second sort the streets and squares may be too limited or the re-distribution may not be undertaken at all. In some of the re-distributions in Frankfurt the city received more than 30% of the area free, the owners voluntarily renouncing their claim indemnification.

The advantages of re-distribution are set forth in the pamphlet issued by the Frankfurt city building department as follows: “construction that is neither
economic nor sanitary from a practical point of view is prevented. The property of every one involved is improved; misshaped streets are avoided; traffic difficulties of many years standing are overcome; a certain steadiness in the development of the city is made possible; the supply of building lots ready for construction is increased and disastrous speculation checked. Hence the re-distribution of city landed property with its tendency to improve the conditions of land ownership deserves to be included with the other means for solving the housing problem which is at bottom a land problem.”

It can only be a question of time till all the Prussian states have similar re-distribution laws. It is a question whether it would be better to extend the Frankfurt law with the alterations suggested by experience or to take entirely different legislative steps. Küster, de Weldige and Fahrenhorst have recently suggested that the regulation of the re-distribution problem in the Prussian cities should take the following form: the existing agricultural “combination” laws should be supplemented and made applicable to city territory and the process should be entrusted to the agricultural “Generalkommissionsen”. Adickes has opposed this on the ground that city and country conditions of property holding are so different.

The most beneficial result of a re-distribution law would perhaps be that it would seldom have to be applied because obstinate owners, knowing that in the end they would be compelled to give their consent to re-distribution, would be far readier to agree voluntarily, and this latter method is always to be preferred. It cannot unfortunately be denied that, misunderstanding the nature of re-distribution, certain technical writers have also opposed its compulsory use, believing that the lines of a plan of construction could always be so drawn that re-distribution would be unnecessary. That this is not the case is easily proved by a glance of figs. 646 and 647. Even if apart from the property boundaries other factors were not determinative for the plan of construction, if the seeking for suitable ascents on mountain slopes did not involve slanting streets, if bridges, railways, stations and city gates did not determine the directions of traffic streets; yet the narrow strips of property from 2 to 3m wide that are so often found in the west of Germany, the still more frequent massed position of the plots and finally the many plots that are entirely enclosed without means of approach or street frontage would necessitate re-distribution. Hence in all cities that are efficiently managed it is undertaken whether it be by general consent or legal compulsion.

By projecting an altered plan of construction Sitte attempted to do away with the necessity for redistribution in figs. 643 and 651 with the result not only that his plans were found to be impracticable but it was also proved that, even had they been accepted, re-distribution would still have been necessary.

The place of a proper re-distribution law is imperfectly supplied in Basel by § 52 of the act pertaining to superstructures of June 27, 1895 (see appendix), according to which if the boundary between two lots does not lie at right angles
to the building flush-line it may be made so up to a depth of 15m, if necessary by compulsion, and under certain circumstances compensation must be paid by the one owner to the other.
In Vienna, where, in spite of the repeated efforts of those who understand the matter, a re-distribution law is lacking, re-distribution is sometimes brought about by enforcing §§ 3 and 5 of the building ordinance of January 17, 1883 according to which before the request for a permit to build is made a plan of
the area divided into proper building sites must be submitted to the authorities for their approval. This presupposes that all the owners involved have previously arrive at an agreement or that one has bought out the rest.

It is to be hoped that more general legislation pertaining to this matter will soon be brought about. Until then cities or building police departments should at least have the right to refuse to allow buildings to be erected on irregular lots - as in Vienna - because if construction is once begun, as was pointed out in connection with figs. 643 and 653, later regulation may become impossible.

It would take us too far to give here in detail the geometrical process employed in the re-distribution of land. There is as yet no general practice in this matter. It may be of service to give a few of the main principles and for further information again to call attention to the “Denkschrift des Verbandes Deutscher Architekten und Ingenieurvereine” and to the excellent works of Abendroth.

The size and boundaries of the area to be re-distributed are to be determined entirely by local conditions. The area may consist of a single block or even of part of a block; it may however comprise several blocks or large parcels of building land. Re-distribution in a single block or part of a block is especially advisable for building land that lies along regulated, more or less finished, streets. But if it is a matter of opening up new territory, for which the streets are only designed, it is practical to make the re-distribution of greater extent (as in figs. 643 and 653).
44

641, 643, 651, 655 and 657); the area is bounded by existing property boundaries, the middle lines of streets to be laid out and the boundary lines of existing streets. As far as possible each owner should receive his lot or lots in the same situation as that in which his original property lay.

Different methods are employed in the treatment of the street land. According to Baumeister:

a) The city can obtain the street land before redistribution,

b) During the process of redistribution the city receives the street land free (or in Baden in return for temporary payment), or

c) The city puts off the purchase of the land until a later date, convenient to itself, and then buys the already prepared strips of the regulated plots.

If the streets are soon to be finished justice favors the method described under b that was employed in Frankfurt. If, on the other hand, it is not necessary or intended to build the streets immediately the method c may be found practical if the purchase price is properly settled beforehand. Still better is the method advised by Abendroth and employed in recent redistributions (for instance in Dortmund): “the street land is to be set apart for the city at the beginning without payment. If however construction is to be expected only after some time has elapsed the street land may for the present be left to the use of the abuttors with

Fig. 654
relocated plots in Hamburg
the exception of a certain width, to be determined in each case, that is reserved for ways. The surface of the ways, according to the need, should be temporarily paved.”

Fig. 655
restructuring of plots in Frankfurt a. Main
The redistribution in figs. 639 and 640 rests on the supposition that the method a was used; the re-distribution assumes the form given in figs. 659 and 660 if the method b is used and the middle lines of the streets surrounding the block serve as the boundaries of the re-distribution area. The change inequalities of the
portions that the streets claim from the different plots and their valuation for the purpose of selling them to the city or for mutual compensation, are thus avoided.

Fig. 657
restructuring of plots in Zürich
plan of plots before restructuring
Fig. 658
restructuring of plots in Zürich
plan of plots after the restructure

The plots L, N and R, that in fig. 639 were expropriated and included, are large enough in fig. 659 to be replaced by whole building lots.
But other pieces, A, D and V, that do not extend into the block, have to be expropriated and included. Whereas the area inside the middle lines of the streets contains 15 048 qm, the actual block contains only 10 500 qm, thus 4548 qm or 30.2% or the whole area have to be sacrificed to the street. This results in the following shrinkage of all the plots:

<table>
<thead>
<tr>
<th>Plot</th>
<th>Original Area</th>
<th>Sacrifice</th>
<th>Remaining Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+B</td>
<td>645 qm</td>
<td>195 qm</td>
<td>450 qm</td>
</tr>
<tr>
<td>C</td>
<td>828</td>
<td>578</td>
<td>250</td>
</tr>
<tr>
<td>D+E</td>
<td>660</td>
<td>461</td>
<td>199</td>
</tr>
<tr>
<td>F+J</td>
<td>669</td>
<td>467</td>
<td>202</td>
</tr>
<tr>
<td>G</td>
<td>266</td>
<td>185</td>
<td>71</td>
</tr>
<tr>
<td>H</td>
<td>470</td>
<td>328</td>
<td>142</td>
</tr>
<tr>
<td>K</td>
<td>2002</td>
<td>1396</td>
<td>606</td>
</tr>
<tr>
<td>L</td>
<td>338</td>
<td>236</td>
<td>92</td>
</tr>
<tr>
<td>M</td>
<td>1140</td>
<td>796</td>
<td>344</td>
</tr>
<tr>
<td></td>
<td>7018 qm</td>
<td>4897 qm</td>
<td>2121 qm</td>
</tr>
</tbody>
</table>

This example is by no means indisputable. For instance, the owners of the lots on the narrower streets might complain that they were obliged to contribute the same proportion of street land as those whose properties fronted on the wider streets who alone were benefited by this breadth. It may therefore appear fairer to divide the block into four triangles by a diagonal cross and to determine for each triangle the proportion of street land to the entire area. The lots and parts of lots lying in the different triangles would have to be made smaller according to these proportions in the distribution. Both in fig. 640 and fig. 660 the old way C has been made over into building land; it is more proper and fairer to include such parts of public ways in the whole mass of land and to distribute it among the owners for the new streets supply the place of such paths. The same is true of the remnants A, D, J and V which cannot be turned into building lots because of their small size and which are included in the foregoing example in the adjoining properties.

Special treatment is due, as Abendroth rightly explain, to the re-distribution of building land on finished streets. In such cases it is advisable to value the different plots separately, especially front and rear properties or in strips lying parallel to the flushline. The value of the different plots must then be taken into consideration when the new building lots are laid out. Such re-distributions in blocks surrounded by finished or nearly finished streets are undertaken as a rule at the instigation of the owners not because of legal compulsion.
Fig. 659
construction block and streets in unstructured state

Fig. 660
relocation of plots of Fig. 659 under integrating street area until the middle
PART IV

CHAPTER 5

Raising the Money for City Extension

The expenses that have to be raised when a city extension is carried out may be divided into two groups: one group comprises all the payments that must be made in order to make the territory fit for city construction, for instance, the cost of deflecting rivers, bridges, dams, main drainage canals, moving fortifications, securing the annulment of rayon limitations; the second group consists of all those expenses that are necessary in constructing the highways with everything belonging to them.

The first group of costs is, as a rule borne entirely or mainly by the city, often on the basis of special laws, it is borne in part at least by a group of the inhabitants or owners who will be especially benefitted by the extension. The second kind of costs, those necessary for the construction of streets including the purchase of the land, are usually met by the abuttors or paid by them to the city when buildings are erected.

It is the city’s task to expend money in the public interest and to extend its boundaries so that its possibilities of development may be maintained or increased. It often receives contributions from private persons who are interested in the extension, from the state or from an enterprising company. Sometimes the state or such a company fulfills all the obligations of the city. But if the latter is able it is better not to leave these obligations to others for failure to meet them may mean the renunciation of certain rights and privileges.

As regards the second group of costs most countries have laws pertaining to the obligations of the landowners. As has already been stated the cost of the ordinary streets with everything belonging to them is usually met by the abuttors; the city becomes responsible when a certain street width is exceeded and also for open spaces, public gardens, improvements and for the interest that has to be paid until the abuttors actually fulfill their obligations. The sixth city extension recommendation of the Verband Deutscher Architekten- und Ingenieurvereine reads: “The city shall have the privilege of assessing the abuttors for the coast of new streets. As regards the financial forms to be used it is advisable to exact an average sum per meter of the street frontage of each property, especially if regulation (re-distribution) has been carried out.” In § 15 of the Prussian flush-line law provision is made for the assessment of abuttors for the cost of street construction but it is stated that property owners cannot be assessed for more than half of the street width and if the street width exceeds 26m they can still be assessed only for 13m. There are similar regulations in the other German states. In
Saxony however owners cannot be assessed for more than 12 meters of the street width, in Alsace and Lorraine not for more than 10m and in Hessen only for 8m; if there are houses only on one side of the street these figures are increased in Saxony to 15m (24m on open spaces). In Hessen- Darmstadt the abuttors have only to pay that part of the cost of the land that exceeds the price of 70 Pfennig per square meter.

The assessment according to street frontage presses heavily on owners of corner properties. As such properties are more valuable this is not entirely unfair but it sometimes exceeds the limit of what is reasonable and not seldom causes difficulties which are in some cases removed by a peaceful compromise among the persons involved.

It cannot be denied however that it is wrong in principle to assess owners according to the street frontage without considering the depth and height of the structures and the area of the building lots. But as the assessment is generally made as soon as the first building is erected on a street and at that time neither the kind of structures that will be erected nor sometimes even the measurements of the lots are known, it must be acknowledged that it is difficult to find any other practical standard of assessment. Yet in a few places, for instance in Gotha, the area is also taken into consideration.

How the Prussian cities have settled the other questions that arise in connection with raising the money for city extension is shown in the municipal statutes of Berlin and Cologne that are given in the appendix as examples. The law and the city statutes distinguish between the laying out of new streets on the one side and construction on existing but hitherto unbuilt on streets, on the other.

As to the nature of the latter opinions vary greatly. The cities, in order to be able to cover the cost, stretch this term to its very broadest meaning whereas abuttors, for the opposite reason, take it in its narrowest sense. If in the sense of the law the way is not recognized as an “existing, hitherto unbuilt on street” the abuttors not only do not have to contribute to its cost but may also claim from the city compensation for giving up land etc. The lawmaker certainly did not mean old city streets that have long been used for construction, though perhaps only in parts, (so-called “historic” streets) but it is going too far to affirm that he meant only “newly planned, still unfinished streets”. A path, a gravel walk or a country road which are intended by the city plan of construction to be made into wider city streets with improved directions and levels are certainly to be regarded as the streets to which § 15 of the Prussian law applies. In judging this matter and in the question of cost it is indifferent whether the street is laid out through the middle of a section or whether it consists partly of an old unbuilt on way. Legal questions cannot however be exhaustively discussed here.

In setting the amount that the abuttors are to be assessed the cost of a section of the street is calculated and distributed; parts of street crossings and of
streets that branch off belonging to this section are included. In this way, if the formation of the ground is at all even, average amounts are obtained for earth works, paving and footways, per linear meter of frontage, in some cases also per cubic meter or according to other measurements as well as according to the street width. In some city extensions the city has gone a step further as regards the sewer system and illuminating works, by assessing abuttors an equal amount for these works whether a main sewer ran through the street or only a pipe of small diameter, a main gas pip of 60cm or one of only 10cm. The sewer and the lighting systems are of equal value to all abuttors whether their main channels lie in this street or in that.

For this reason the city of Cologne has set the contribution for sewer construction (including the cost of connection with the house which is done by the city) at 40 marks, that for the construction of the gas system at 12 marks per linear meter of property frontage, so that it would now be possible to assess certain average amounts for street construction (without the cost of the land) which would vary according to the width of the street from 100 to 180 marks per meter of frontage.

This question is most easily dealt with if the city itself owns the building land and has opened it up by making new streets. In that case the question resolves itself into one of policy in selling, whether by the terms of sale it is better to exact high, low, or no contributions. For the building lots belonging to the city in the Cologne city extension the amount was set at about one third of what was usual, an arrangement that has a certain power of attraction for the average man.

If a flush-line has been formally established for the widening of an old street, new structure, alterations and additions extending beyond the flush-line may be forbidden according to the Prussian law without the owners having a right to claim indemnity. Repairs on the other hand are allowed and these include new construction that may become necessary to preserve the house when a neighboring structure is torn down. The new structures, which are more often erected in cities in order to make the most use of the building lots than because they are needed, retreat one by one as they are put into the flush-line and thus, during the frequently lengthy period of transition, that ragged side line of the street is produced that we have ample opportunity of observing in old cities. In order to improve the appearance and to do away with the collection of dirt in corners it is permitted to build out temporary ground floor extensions or show windows which have to be removed when the neighboring houses are re-built. This is particularly common in French cities. We are unfortunately obliged to put up with such temporary makeshifts, though they may last for decades, if the widening of a narrow street is necessary; as a rule we must be content gradually to attain our end for the cost of widening a street all at once would be excessive.
<table>
<thead>
<tr>
<th>Class of Structure</th>
<th>Is Closed Construction Allowed or Open Construction Prescribed</th>
<th>Approx. Portion of the Whole Building Area</th>
<th>Admissible Number of Stories Not Including Basement + Attic</th>
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<tr>
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<td>17</td>
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<td>3</td>
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<td>Closed</td>
<td>23</td>
<td>Frontb.3</td>
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<tr>
<td>IIIb</td>
<td>Open</td>
<td>23</td>
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<td>IIIc</td>
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</tr>
<tr>
<td>Ib</td>
<td>Closed</td>
<td>7</td>
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</tr>
<tr>
<td>II</td>
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<td>III*</td>
<td>Closed</td>
<td>57</td>
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</tr>
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<td>Open</td>
<td>17.50</td>
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<td>-</td>
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</tr>
<tr>
<td></td>
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## In Recent Building Regulations

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<th>minimum yard space</th>
<th>maximum height of buildings (to roof gutter)</th>
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<td>0.75*</td>
<td>30</td>
<td>18  *in addition 0.05</td>
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<tr>
<td>0.75*</td>
<td>30</td>
<td>18  one story</td>
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<td>0.50 **</td>
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<td>0.40 **</td>
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<td>0.40 **</td>
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<td>0.75</td>
<td>2.50 min. width</td>
<td>20  *ClassIII include for the present all areas lying outside the building plan</td>
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<td>0.65</td>
<td>3 m &quot; &quot;</td>
<td>20  ** 0.65 with structures up to 9 m height</td>
</tr>
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<td>0.50 **</td>
<td>3 m &quot; &quot;</td>
<td>15  **</td>
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<tr>
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<td>3 m &quot; &quot;</td>
<td>15  **</td>
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<td>0.40</td>
<td>3 m &quot; &quot;</td>
<td>15  **</td>
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<td>5 m yield</td>
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<td>50</td>
<td>18</td>
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<td>0.67*</td>
<td>-</td>
<td>frontb. 22  *on old properties rearb. 22 0.75 to 0.80</td>
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<td>-</td>
<td>frontb. 18</td>
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<td>rearb. 18</td>
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<td>frontb. 18</td>
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## Comparative Table Of The Principle

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<tr>
<th>class of structure</th>
<th>is closed construction allowed or open construction prescribed?</th>
<th>approx. portion of the whole building area</th>
<th>admissible number of stories not including basement+ attic</th>
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<tr>
<td>Munich</td>
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<td>IV</td>
<td>closed</td>
<td>-</td>
<td>frontb.3</td>
</tr>
<tr>
<td>V</td>
<td>closed</td>
<td>-</td>
<td>rearb. 2</td>
</tr>
<tr>
<td>VI</td>
<td>open</td>
<td>-</td>
<td>frontb.4</td>
</tr>
<tr>
<td>VII</td>
<td>open</td>
<td>-</td>
<td>frontb.4</td>
</tr>
<tr>
<td>VIII</td>
<td>open</td>
<td>-</td>
<td>rearb. 2</td>
</tr>
<tr>
<td>IX</td>
<td>open</td>
<td>-</td>
<td>frontb.2</td>
</tr>
<tr>
<td>Posen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>closed</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>IIa</td>
<td>closed with factory privilege</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>IIb</td>
<td>closed without fac.priv.</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>IIIa</td>
<td>open or half-open**</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>IIIb</td>
<td>closed</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>IVa</td>
<td>open or half-open**</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>IVb</td>
<td>closed</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>largest part of surface to be built over in usual cases</td>
<td>minimum yard space</td>
<td>maximum height of buildings (to roof gutter)</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>--------------------</td>
<td>---------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>0.67</td>
<td>-</td>
<td>frontb.15 **with detached</td>
<td></td>
</tr>
<tr>
<td>0.67</td>
<td>-</td>
<td>rearb. 12 construction</td>
<td></td>
</tr>
<tr>
<td>0.67</td>
<td>-</td>
<td>frontb.12 neither front</td>
<td></td>
</tr>
<tr>
<td>0.67</td>
<td>-</td>
<td>rearb. 9 gardens nor</td>
<td></td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>frontb.20 side yields</td>
<td></td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>rearb. 20 are reckoned</td>
<td></td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>frontb.18</td>
<td></td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>rearb. 12</td>
<td></td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>frontb.15</td>
<td></td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>rearb. 12</td>
<td></td>
</tr>
<tr>
<td>0.50**</td>
<td>-</td>
<td>frontb.12</td>
<td></td>
</tr>
<tr>
<td>0.50**</td>
<td>-</td>
<td>rearb. 9</td>
<td></td>
</tr>
<tr>
<td>0.70*</td>
<td>33</td>
<td>20 **covered yards sometimes admissible</td>
<td></td>
</tr>
<tr>
<td>0.67</td>
<td>-</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>0.67</td>
<td>33</td>
<td>17.50 ** in the classes 3a/4a owners may choose</td>
<td></td>
</tr>
<tr>
<td>0.60</td>
<td>24</td>
<td>15 between open, group or semi-detached con-</td>
<td></td>
</tr>
<tr>
<td>0.60</td>
<td>24</td>
<td>15 construction</td>
<td></td>
</tr>
<tr>
<td>0.55</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>0.55</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### Comparative Table Of The Principle

<table>
<thead>
<tr>
<th>class of structure</th>
<th>is closed construction allowed or open construction prescribed?</th>
<th>approx. portion of the whole building area</th>
<th>admissible number of stories not including basement+ attic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vienna</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>closed</td>
<td>2</td>
<td>5 to 6</td>
</tr>
<tr>
<td>II</td>
<td>closed</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>III</td>
<td>closed</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>IVa</td>
<td>open</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>IVb</td>
<td>closed</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>V</td>
<td>factory district</td>
<td>24</td>
<td>-</td>
</tr>
</tbody>
</table>

| Wiesbaden          |                                                 |                                          |                                                         |
| I                  | closed                                          | 3.60%                                   | frontb.4 rearb. 3                                       |
| II                 | closed                                          | 15.40%                                  | frontb.4 rearb. 3                                       |
| III                | closed                                          | 7%                                      | 3                                                       |
| IV                 | group                                           | 7%                                      | 3                                                       |
| V                  | open                                            | 9.50%                                   | 3                                                       |
| VI                 | open                                            | 14%                                     | 3                                                       |
| VII*               | open                                            | 43.30%                                  | 3                                                       |
| VIII               | semi detached                                   | 0.20%                                   | frontb.4 rearb. 3                                       |
### In Recent Building Regulations

<table>
<thead>
<tr>
<th>largest part of surface to be built over in usual cases</th>
<th>minimum yard space</th>
<th>maximum height of buildings (to roof gutter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.85</td>
<td>12</td>
<td>25 about 26% of the territory consisting of parks, woods, meadows, Danube river and canal, is not included in any building class</td>
</tr>
<tr>
<td>0.85</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>0.85</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0.85</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>1. strip 1.00</td>
<td>80sqm</td>
<td>19m * a large area will not</td>
</tr>
<tr>
<td>2. strip 0.60</td>
<td>or</td>
<td>19m be built on at present</td>
</tr>
<tr>
<td>3. strip 0.50</td>
<td>60sqm</td>
<td>19m a part of it may later</td>
</tr>
<tr>
<td>1. strip 1.00</td>
<td>or</td>
<td>19m be opened for denser construction</td>
</tr>
<tr>
<td>2. strip 0.35</td>
<td>or</td>
<td>19m</td>
</tr>
<tr>
<td>3. strip 0.30</td>
<td>40sqm*</td>
<td>15m ** 1. strip extends</td>
</tr>
<tr>
<td>0.40</td>
<td></td>
<td>15m from building line to</td>
</tr>
<tr>
<td>0.33</td>
<td></td>
<td>15m a depth of 6m</td>
</tr>
<tr>
<td>0.25</td>
<td></td>
<td>19m</td>
</tr>
<tr>
<td>0.20*</td>
<td></td>
<td>19m</td>
</tr>
<tr>
<td>0.50</td>
<td></td>
<td>19m</td>
</tr>
<tr>
<td>0.50</td>
<td></td>
<td>19m</td>
</tr>
</tbody>
</table>

2. strip from there to depth of 32 m
PART IV

Chapter 6
Use of the Streets by Householders for Private Purposes

Owing partly to practical reasons and partly to economic necessity the boundary between private property and the public street cannot be as sharply defined nor as protected from use as that between private lots.

The boundary of the public property of the city is indeed clearly marked by the street flush-line, if the street conditions are properly regulated. But this is not always the case and even where it is the street flush-line is not always easily recognizable as the boundary.

There are old streets the sidewalks of which are regarded as belonging in a measure to the adjoining properties and steps are put up on them, cellar entrances and other private possessions belonging to the householder. And even on new streets that were formerly bordered particularly in England, by openings that let the light into the cellars or by garden plots, the boundaries are often indistinctly defined after the openings have been filled up or the front gardens done away with. It is clear that when new parts of the city are built every effort should be made to avoid these indistinct boundaries. This is most easily accomplished by requiring that some permanent means of enclosing the private properties should be used even in those cases where the front of the house is not set forward in the street flush-line; justifiable exceptions will be discussed in the next chapter. Also in older parts of the city the effort should be made to induce owners voluntarily to remove projecting structures and, failing this, they should, in some cases be expropriated; when new structures are erected the city should not allow them to project.

But even when clear property and street boundaries exist the use of public ground, or of the space above it, for projecting parts of buildings is not usually absolutely forbidden. The foundation walls of new buildings are everywhere allowed to project slightly into the ground of the street though the front wall of the house is not allowed to extend out into the street. Thus as a rule the front wall of the buildings forms the street boundary but it would obviously be going too far to forbid any and every projection from this wall. Cornices, over hanging roofs etc. are therefore everywhere regarded as permissible within certain limitations. Such a limitation which is directed towards the protection of traffic applies to the lower part of the building to a height of 2 to 3m above the street. Yet to allow no projections at all on this part of the wall would also be going too far. Building
regulations generally require that such projections shall not claim more than about 1% of the street width or that they shall not extend more than from 25 to 40cm from the wall. The Berlin regulations allow the basements to extend 13cm in all the streets and in very wide ones they also permit of steps that project 20cm. In general, up to a height of 2.50m, parts of buildings that extend still farther into the street such as outside steps, window shutters, fixed or movable awnings, should be regarded as inadmissible, but, apart from this, in the interest of artistic appearance, all possible freedom should be allowed that is not hampering to order and the traffic.

Above the height of 2.50m and below the level of the sidewalk projecting parts of buildings may be given more room. On the upper part of the building these parts include overhanging roofs, signs, lanterns, commercial signs (such as shoes, gloves, watches, etc), windows and window shutters, balconies, bay windows etc.; below the level of the sidewalk there may be cellar passages, light shafts, cellar entrances and cellars under the sidewalks.

As regards the latter group three different policies are pursued by different cities. Some entirely forbid any kind of construction in or under the sidewalk, which is entirely justified when the streets are narrow and busy. Some cities forbid cellar entrances with movable doors in the surface of the street but allow “coal holes” or light shafts on the conditions that they are not farther than from 15 to 30cm from the building flush-line and are covered in the level of the sidewalk by strong glass, flag stones, corrugated cast iron or iron lattice work, or are otherwise properly enclosed, a custom that cannot be objectionable if the streets are wide. Other cities, particularly in Belgium, Holland and England, go so far as to allow cellars to be built under the sidewalks, covered with thick glass. In America considerable parts of the surface of the sidewalk are also used for outside steps, show cases etc. For European conditions such freedom in the use of public property would not be suitable; many cities however rent space on particularly wide sidewalks to cafes and restaurants for tables and chairs.

As regards projections on the upper parts of buildings, business signs, lamps etc. are generally allowed either without payment or for a small amount; by reserving the right to order their removal at any time the city is able to prevent excesses. Window shutters that open outward are now seldom used on city streets; windows that open outward are forbidden in some places, permitted in others; for the safety of passers-by it is better not to allow them. Various regulations apply to balconies and bay windows. The Berlin regulations allow them only in streets of more than 15m in width and limit their projection to 1.30m. In Rome balconies that do not project more than 80cm are allowed even in streets of less than 7m in width; and the projections may increase with the width of the street. In Brussels projections of 70cm are allowed in streets of less than 12m in width, in wider streets the number is increased to 90cm. The balconies must be at least 3.50m above the sidewalk. In Cologne the figures range from 30cm in streets 7m wide
to 120 cm in those of 20 m in width; bay windows are not admissible in streets that are less than 7 m wide; the maximum extent of projections is 1.20 m. In both Cologne and Berlin balconies and bay windows must be at least one and a half times their width from the neighboring boundary. The regulation the projecting parts of the buildings may occupy only a certain fraction of the entire width of the building (in Berlin 1/3, in Cologne 2/5) projections that extend across the whole front, formerly so popular and customary, are prevented; exceptions within certain limitations may however be made with the consent of the neighbor. Some cities also have regulations pertaining to projecting or overhanging roofs.

The very general regulation that the front wall of the buildings must form the plane of the side of the street, certainly may not project beyond it, makes it difficult to develop the corporeal appearance of the buildings. It is indeed possible to build houses with front projections if the owner places the main façade back from the building flush-line the depth of the projection. But as the desire to use the land to the best advantage usually restrains owners from making this sacrifice, those wearisome, flat streets walls are formed that distinguish so many modern streets from those in older parts of the city. The city can remedy this monotony to a certain extent by allowing, at least in wide streets projections in front of the street flush-line, that is, by sacrificing the land that the owner is not willing to sacrifice. In the new Ringstrasse and in public squares in Cologne projections of 25 cm occupying 2/5 of the front width were permitted, resulting in pleasing variety in the street walls. This cannot be attained merely by permitting owners to set their houses as far back as they may wish (thus more than 25 cm) from the street flush-line because, on the one hand the owner, who is anxious to use all of his lot, is slow to take advantage of the permission and, on the other, the city should not further the creation of corners for dirt to collect in and the laying bare of the side walls of the adjoining houses. But Baumeister’s proposal to establish a double street flush-line with a distance of from 0.50 cm to 1.50 cm deserves to be carefully considered and employed. The object of this distance is that the main fronts of the buildings may be built on the back line and portals, verandahs, steps, cellar entrances etc. may extend from it out to the inner line. Mannheim and Posen have such building regulations though they are still incomplete. Of course no fence or railing is required along the front street flush-line but it is necessary that the building should be suitably connected with the adjoining one if both are not set back the same distance. In order to add still more life to the street scene Tittrich recommends that the front street line and the back line should diverge.

Still greater freedom is admissible and desirable if enclosed front garden plots lie between the street flush-line and the building flush-line. Under certain circumstances in such cases low front buildings (not exceeding 1.00 or 1.25 m in height) may well be permitted to extend out to the line of the street, while high

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9 In: Wege und Ziele moderner Städtebaukunst. München 1903
projections that do not cover more than about from 1/3 to 2/5 of the front of the building, may take up a considerable part, from about 1/4 to 1/2, of the front garden width. If there is no closed building flush-line behind the front gardens but only a row of detached houses (villas), it is not only not necessary to maintain a straight building line but on the contrary it is desirable to allow owners full freedom in placing their houses.

A contrast to front garden plots are colonades, found particularly in Italian cities, which border the street on either side under the upper stories of the houses. Whereas with front garden plots the streets are in a measure separated from the houses, with colonades they penetrate from 4 to 7m into the houses. For the portici along the new street (Lungo Tevere, fig. 257) in Rome the following requirements were made: a width of 6m, a distance between the columns or pillars of at least 3.50m, an open height at the entrance of at least 7.50m if arched, 7m if straight (art. 18 of the Regolamento edilizio per il commune di Roma). In German cities too the use of colonades, which were formerly so popular, would be highly desirable in appropriate places, especially on open spaces and to interrupt along straight street fronts; at the same time the individual houses might be allowed greater freedom in the development of the colonades than is permitted by the Italian regulations. In the old English city of Chester such covered ways exist even in the second stories along whole streets and are used when new houses are erected.

In the same way it appears advisable to introduce again arches and similar structures across street openings — quite frequent in Italy — in places where property conditions and the requirements of traffic would permit their use. They are a great aid to closed views in streets and squares and bring variety into an otherwise monotonous city scene.

If we return to the use of the public street by abutters for private purposes we find still another group of uses that rests on practical or economic necessity.

During construction the building must use a part of the street land for the erection of scaffolds. Whether the drainage be surface or underground the owner must use the street and it must also be used when the house is connected with public water, light, heat or power systems. These uses are generally regulated by city statutes or police ordinances.

As regards scaffolds and enclosures during construction or when buildings are torn down, everyone will admit that the owner has a right to use a certain necessary part of the street surface (80 to 100cm in width). If the builder needs more space in order to put up wider scaffolds or to keep building material he should be allowed, if traffic admits of it, to rent a wider strip of the street. In some places (Aachen, Cologne) the rent is reckoned according to the amount of space required, in others according to the length of the street frontage of the building plot (Brussels).

Towns usually tax householders a small annual amount for the permission
to drain water from the houses into the street gutters, either by means of pipes under the surface of the sidewalk or by means of covered gutters or again by using cast iron in the surface of the sidewalk.

After the sewer system has been established these surface drains are abolished and the city then connects the house with the public system either at its own expense or at the expense of the householder; but the householder is obliged to conduct the house drains into this connecting pipe and has generally to pay an annual tax for the use of the city sewer system. The amount of this tax is determined either according to the rent of the house, the number of waste pipes it contains or at the rate of so much per meter of street frontage. The last method is not perhaps the fairest but it is the simplest and surest; in different cities it is approximately from 1 to 3 marks per meter with certain concessions to corner lots and fronts that are not built on.

The sewer tax, which should be determined according to the amount of service the sewer system gives, amounts to less in those cities in which the lavatories do no empty into the sewers than in those in which the sewers can be flushed and where flush closets are installed in the houses. It must also be taken into consideration whether the city is obliged at great expense to clarify the water from the sewers before it is conducted into a river. But the principle should never be lost sight of that all these costs should be borne not by the householders alone but that half of the expense should be met by the city, that is, by all the taxpayers, for all the inhabitants profit by such improvements; the householders are spared the cost of disposing otherwise of the waste material and people in general enjoy well-drained streets, squares and public places and improved sanitary conditions. Moreover the builders of new streets who have already paid for the construction of the sewers should not be overburdened with these other costs and this may be avoided by dividing them among all the taxpayers.

Similar taxes have to be paid for water, light, heat and power; the amount is generally determined by meters that register the quantity used (water meters, gas meters etc.), though a minimum charge is usually established. Other methods are to reckon the amount according to the rent of the house, the size of the property, the number of flames etc. but these have not in general been found as practical.

A water tax especially that is not based on the amount used has indeed advantages from a sanitary point of view but it encourages the waste of water, thus increasing the cost of operation and results, in spite of the apparent low price of the cubic meter, in an increase in the annual tax. The owner of the water, gas, and electric light works, that is usually the city, undertakes the connection of the houses with these conveniences at the expense of the householder.
PART IV

CHAPTER 7

Building Laws

Since several important branches of building legislation have been discussed in chapters 2 to 6 of this part the subject to which we must now turn our attention is the regulation pertaining to the method and kind of construction within the established block boundaries. These regulations lie within the province of the board of works (Baupolizei) – usually a municipal body, sometimes however appointed by the state. The ordinary task of this board is not so much a positive as a preventative one. As far as possible it must prevent offences against the building regulations and to this end, before any building plans are carried out it should examine them in the light of the building regulations and if necessary cause them to be altered; it has also to examine the buildings at certain intervals and finally declare them fit for use. Examination of buildings at other times than these stated intervals is also necessary in order to see that the ordinances are carried out and as far as possible to prevent accidents connected with the construction. Real safety from accidents does not depend on this superintendence it is true but rather on the knowledge and conscientiousness of the persons who carry out the work.

An important positive duty of the Board however is the improvement of existing and the issuance of new building ordinances and regulations. This duty is the more important as the building regulations and the housing problem are closely related. The responsibility for the building ordinances and regulations is borne partly by the national legislature, partly by the national and municipal police authorities and partly (for instance in Southern Germany) by the city administration.

Hence the building regulations particularly in the German Empire are a great conglomeration in which differences of place and race are more than necessarily pronounced. Efforts of the “Deutschen Architekten- und Ingenieur-Vereine” directed in a measure at the formation of harmonious building laws for the whole of Germany, led to Baumeister’s meritorious work: “Normale Bauordnung nebst Erläuterungen(Wiesbaden 1880), not itself the framing of an act but a scientific starting point for the establishment and alteration of local building regulations. At the same time Baumeister’s work proves that certain ordinances can be made applicable all over the country while their further supplementation must be left to the city authorities and country communities.

Shortly afterwards the members of the Reichstag Kalle, Miquel and Jäger urged the enactment of building laws, particularly those pertaining to sanitary housing conditions; these and other efforts finally culminated in the formation of the society “Reichswohnungsgesetz”. Owing to Miguel’s and Baumeister’s activity in the German Society for Public Sanitation the draught of the “Reichsgesetzliche Vorschriften zum Schutz des gesunden Wohnens”, which is reprinted in the appendix of this book, was made and sent to the Reichskanzleramt.

Since then the national legislatures and the technical societies in Germany and Austria have been much occupied with the question of building laws. The most perfect is probably the “Allgemeine Baugesetz” of the Kingdom of Saxony dating from 1900; and very useful have been the meetings and recommendations of the German Society for Public Sanitation, the resolutions of which, passed at the meeting of the society in Stuttgart, are given in the appendix.

The same scheme, as regards buildings, cannot be used in all the cities and country districts of Germany; not even in the same municipality should the ordinance be the same for all parts. In the old city they should aim at protecting certain economic and financial interests; in the new city at encouraging more open and healthy construction; in suburban districts they should be such that still further development of the city is not made difficult and so as to facilitate the erection of industrial plants in suitable places. Hence in many German cities the “zone” regulations were introduced. 11“The ordinances are graduated in regard to extent, number of stories, height of the buildings, construction of the buildings and industrial establishments according to local land, traffic and value conditions and economic possibilities on the one side and the social needs of the inhabitants on the other.”

First of all it is necessary that a building law should state clear principles and leave as little as possible to individual interpretation; neither the responsible official nor the man who is desirous of building is aided by uncertainties that way become ground for disagreements.

The building laws should pertain to the process of building, to the protection of traffic and health, to protection against fire and to the relation between adjoining pieces of property. They must also take social points of view into account by opposing the barrack like flat-house and encouraging the erection of single houses, houses for two or three families, those containing a moderate number of small dwellings and, in fact, of all small houses. Finally the building laws must also aim to keep the city beautiful by preventing streets and squares being made unsightly. This is especially urgent in old cities and in the neighborhood of monumental structures and forms an important branch of the preservation of “historic monuments”.

The formalities connected with the process of building will always be

11 see: Stübben, J. Zur Frage der Stuttgarter Bauordnung Deutsche Vierteljahrschrift für öffentliche Gesundheitspflege.1903.p.344
irksome to those who desire to build; people do not want to have even benefits forced upon them. Hence in many places the authorities are trying to simplify and reduce the number of formalities as far as possible, unfortunately often with opposite results to those hoped for, just as the movement for simplified spelling sometimes results in greater confusion on the part of the writer. In some cities those desiring to build have gone so far as to demand that the beginning of construction should not depend on a “building permit” but that it shall be sufficient to submit the plan and that after the latter has been examined and approved a “building certificate” shall be issued. In the light of the necessary limitations to construction mentioned in chapter 2, this is going too far; it might however be possible to issue a building permit immediately on application, that is the simple permission to build, but to hold back the “building certificate”, that is the explanation how the building must be erected until after the plans had been examined; in this way some time might perhaps be saved. Changes in the plans, if examination should show that any would have to be made, would, of course, in all cases, be the affair of the man who was about to build. The formalities connected with the erection of industrial plants must of necessity be more extensive and undesirable factories (see chapter 2) must be subject to special regulations.

Local inspection is usually made at three stages in the process of construction: inspection of the basement (as regards flush-line and level), inspection of the raw structure (as regards the safety of the construction and the carrying out of the building regulations) and inspection of the finished structure (in order to be able to declare it fit for use from a sanitary point of view). Inspection at other times if the builder is not reliable or for some special reason is not exceptional. Private activity is thus subject to generally necessary, though in some cases dispensable, interference which requires special tact and mature judgment on the part of the officials concerned. Government and municipal buildings are sometimes exempt from this control and in some cases are not subject to the usual building ordinances. In our opinion this is a Privilegium odiosum, incompatible with the position of the board of works whose right to exist is not based on mistrust of certain individuals but on the protection of all.

In as far as traffic regulations refer to the traffic in the public street they have been discussed already, particularly in chapter 6. In addition we are concerned with traffic in the house and on the lot, that is, with regulations regarding stairs and passages, entrances, approaches and courts, particularly courts that serve as entrances to other houses (very common in Hamburg) and with regulations regarding traffic during construction.

The most important regulations are those that aim at the protection of health. Just as considerations of public health play an important, often the most important part in city building as a whole, so too they should dominate the building regulations to a much greater extent than is the case in many places. Miquel’s uniform legal regulation of the housing problem was aimed first of all at
the protection of health. We have already mentioned the work of the “German Society for Public Sanitation” (ace appendix). The bill drafted by this society which has been partly superseded by later development contains only minimum requirements and is not intended to prevent farther reaching national, provincial and municipal laws.

The first section concerns streets and building sites. The second paragraph of this section contains only a general suggestion because it seems inadvisable, in view of large private gardens, railway stations and similar unbuilt on areas and of plans of construction that establish only the main traffic directions, not the division of the blocks, to prescribe definitely a certain percentage of the contents of the area (for instance, 25 or 30%) as the least amount. The third paragraph demands that cities be given the right to prescribe open, detached, construction in certain streets and front garden plots and for certain parts of the city, as this method of building not only allows light, air and sunshine free access in the districts where it is used, but also benefits adjoining parts of the city. The fourth paragraph is directed against the custom of filling in streets and squares with debris and garbage.

The second section treats of the new construction of buildings as distinguished from the new construction of single rooms which is treated of in section III. In §§ 2 and 3 the maximum height and minimum width of new buildings on hitherto unbuilt on lots and on those that have already been built on, are regulated and as regards the latter lots so loosely that even cities with old narrow streets and small lots (single house cities) can conform to the requirements which will have to be made stricter for flat-house cities with broad streets and large lots. Above the admissible maximum height the establishment of a roof angle (from 45° to 60° ) in customary and necessary. The size of the yard (court) is made dependent on the height of the building not on the size of the lot because, where the lots are small, this method leads to inadequate requirements and where they are large the requirements are unreasonable. Moreover some corner houses in which the living rooms all front on the street can dispense with a court altogether. § 4 concerns the prohibition to build on sanitary grounds and therefore comes under the limitations of construction already discussed in chapter 2. § 5 states the minimum requirements for lavatories, stables and places of business (industrial localities). The lavatories and drainage of houses in particular, whether the latter is connected with the city sewer system or discharges into ditches, puncheons or street gutters, require very careful sanitary treatment which cannot however be discussed here.  

Section III distinguishes between “living rooms”, that is, the rooms of a dwelling and “rooms in which people congregate for longer periods of time”, by which besides rooms and dwellings also workshops, shops, concert halls and similar localities are to be understood. 2.50m for the height of a story will of course be admitted only in exceptional cases, and 3 to 3.20m be made the usual height. Very incisive is the rule, which agrees with the Berlin building laws, prohibiting dwellings above the fourth story. It would be a blessing if the increase in the number of stories – that goes hand in hand with the speculation in building land – not indeed in cities of medium size but in the great centres like Rome, Paris, Vienna, New York, should be limited by such a law. One of the principal tasks in furthering public sanitation is energetic opposition to the unnatural and harmful crowding of the population in cities. Cellar dwellings, in spite of the doubtful results of city investigations, must also be regarded as objectionable; hence, according to § 8 whole dwellings in basements should no longer be permitted and single living or business rooms only if the floor is at least 1 meter above it.

The fourth section which limits the use of finished rooms on sanitary grounds is new to legislation in its essentials, but of great importance because the sanitary aim of the building laws is frustrated if localities are used as living and particularly as sleeping rooms which were designed in the plans for other purposes, on which understanding the building permit was issued, or if there is insufficient or bad air for the inhabitants owing to overcrowding. $5^{\text{chm}}$ of air for a child and $10^{\text{chm}}$ for an adult is such a minimum that the society must bear the consequences of having the dwellings cleared that, according to this are overcrowded, that is it must provide for an increase in cheap workingmen’s dwellings if, in some cities, families of the poorer classes have actually been obliged by lack of dwellings and high rents, to pack in so closely.

Very low are the requirements in § 10 of 0.10 window surface for a child and $0.20^{\text{qm}}$ for an adult. § 7 establishes a rule for a greater light surface but the exception made there for attic room windows should be limited in § 10 as regards the amount of light necessary for each person.

Now, at least in Germany are the two legal regulations demanded in § 11, the first dealing with single unhealthy dwellings, the second with whole districts that are contrary to sanitation. According to this law all the buildings and lots in the district shall be subject to expropriation for the purpose of complete re-construction. This would mean that the privilege that we demanded in chapter 3 whereby all cities would be enabled to take all the necessary steps and precautionary measures in doing away with unsanitary districts and those

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PridginThale, TLLebensgefahr im eigenen Hause. Für deutsche Verhältnisse bearbeitet von H. Wansleben. Kiel 1886

13 compare Wasserfuhr. Die Gesundheitsschädlichkeiten der Bevölkerungsdichtigkeit in den modernen Mietshäusern. Deutsche Vierteljahrschrift für öffentliche Gesundheitspflege. 1890, p. 20-60
that form obstacles to traffic, would be granted. 14

Schools, public halls and industrial plants require special and extended sanitary regulations as regards their construction and equipment as well as their use, the discussion of which here would take us too far afield.

Even though the Miquel-Baumeister minimum requirements have been to a great extent superseded by later ordinances and regulations, still it seemed to us important to discuss them as the basis of modern developments. The new Prussian bill relative to dwellings (1905) provides for the establishment of similar minimum requirements and in addition for the pacing of the graduation of the building laws in the same city on an indisputable legal basis.

The regulations pertaining to making buildings durable and fireproof aim, as do sanitary regulations, at protecting human life and include also the protection of property. Their purpose is not so much to control the individual builder as effectively to protect the occupants of the house and the neighbors against flimsily or wrongly constructed buildings whether these are due to ignorance or unscrupulousness.

In order to secure solidity and durability older cities and towns often have exhaustive regulations regarding the thickness of the walls, the buttresses, the strength of the beams, main couples etc. whereas later regulations are creditably general in character referring mainly to foundations, specific weights and the admissibility of the building material ordinarily used in that locality. If technical progress is to be made in manufacturing and building material the builder and the owner must be allowed a certain amount of freedom and they are much hampered by definite rules regarding the strength of the walls, the thickness of the wood, or iron construction etc. They are sufficiently controlled if the preliminary and later inspection by the authorities and the unconditional exclusion of all unsuitable building material are conscientiously carried out.

In order to avoid fires cities require massive construction of the outside walls and of those inside walls that serve as supports for the ceiling beams and to shut off the stairway. Wooden construction in the outer walls is usually permitted if the houses are built detached but if they are built in closed rows it is allowed only if that part of the building is a certain distance from the boundary, a distance that varies in different cities from 1 to 10m. In many places instead of pure stone construction woodwork is permitted under certain conditions with a strong covering 13cm deep. Iron framework can scarcely be otherwise treated than wooden framework; experience has shown that it cannot be relied on to take the place of massive construction. The distance from the boundary must be increased if the outer walls have openings (doors and windows) or if they are built entirely of wood. For timber frame houses and wooden structures certain maximum heights, lengths and widths are established, if the buildings are to

14 see also the discussion of this bill in: Deutsche Vierteljahrschrift für öffentliche Gesundheitspflege 1890, p.20-60
exceed which stone or iron construction must be used. The roofs of all buildings in the city should, without exception, be fireproof.

Regulations that aim to make the interior of buildings fireproof refer to stairways, which in larger buildings should be massive, that is inflammable and fireproof, boilers, chimneys, fireplaces and gas pipes, to the construction of the through passages and exits to the street, to the putting in of fireproof dividing walls and the protection of iron beams and supports.

Fireproof walls, that is massive dividing walls that extend above the roof and are provided with tightly closing fireproof doors, are usually required in larger buildings at distances of from 30 to 40m. For iron beams and supports, which are by no means free from danger of fire, fireproof coverings are required. The great differences in the protective regulations in the various cities and countries are not made necessary by the subject itself. Simplification and greater agreement would be desirable. But it is to be hoped that too many obstacles will not be put in the way of timber construction! The latter is of considerable economic and artistic importance. Great fires are not so apt to sweep through villa districts in which the houses are detached even though some of them are timber frame houses as they are in the densely built up inner districts of the city although the construction there may be entirely of stone and iron. Within the first rayon of a fortress, where only wooden structures of 7m in height are admissible, and in the second rayon where only frame structures of 13m are permitted, open, that is, detached construction with considerable distance between the buildings is the best and only protection against fire.

We mentioned above the regulation of the relations between neighbors as lying within the province of the building laws. Freedom in using the building lot for construction is but little limited by the claims of the neighbor. His light and air may be interfered with without his being able to protest. In countries where French law is used enclosure walls may be built half on one property and half on the adjoining one and if the owner wants to construct his outer wall directly at the boundary but on his own property his neighbor can oblige him at any time to sell half the wall. Since the new civil code has been introduced all over Germany this right has been abolished. In many places however the building laws permit the erection of party walls if both owners consent; in other places it is forbidden. It is certainly only just to demand that no niches, closets, chimneys etc. should be built in such party walls as they detract from their solidity and often lead to confusion and mutual annoyance.

Other such questions pertain to drainage and lavatories. Where new structures are to be erected it is inadmissible to drain one plot of land across another if surface drainage is used, as this leads to unavoidable disagreements; and if underground drainage is used, connecting with the sewer system each house should still be drained independently. It is also not sufficient to prohibit common water or earth closets and cesspools; unless flush closets are used they
must be sufficient distance from the boundary (60 to 100cm).

Steam railways have a special influence on adjoining properties; because of the vibration of the ground and the danger from sparks. The first objection can only be overcome by making the buildings very solid and durable; the second by making them fireproof; in addition different countries have different regulations as regards the distance that buildings must be from the railways. Baumeister proposes that the distance should be 3m for closed massive walls, 8m for ordinary fireproof structures, and 30m for buildings built of inflammable material, the measurement to be made in all cases from the centre of the next track.

Social points of view cannot receive proper attention unless the building regulations are graduated for different parts of the city, for in the centre of the city justified economic interests must not be injured and even in new parts of the city the existing value of the land cannot be entirely overlooked. But where the value of the land is still low, especially where new territory is opened up there are no interest that force the consideration of health and well-being into the background. In such places the barrack-line flathouse can be forbidden, the height of the buildings, the number of the stories, the rear buildings etc. can be limited and at the same time the erection of small houses and of flat-houses with a few, airy dwellings can be encouraged by the division of the land and the building regulations.

The graduation of the building regulations must be double: according to the local districts and according to the kind of buildings.

Graduation according to the local districts refers mainly to the following points: admissible height of the buildings, relations between the height of the buildings and the width of the street on the one side, as well as the width of the yard (court) on the other; also the number of stories, whether or not basement and attic dwellings are allowed, the number of dwellings in the house, whether or not rear buildings and rear dwellings are allowed, limitation of the depth of the buildings and keeping open the centre of the block (rear building line), whether or not factories may be built, detached and semidetached construction. (see marginal heading 6)

The graduation of the building regulations according to the kind of buildings refers to the building material (massive construction, iron framework, timber framework), to the minimum strength or thickness of walls and ceilings, to the width, kind and number of stairways, to the driveways or foot passages into the court or yard, to the number and height of the stories, to the admissibility of common fireproof dividing walls etc. We see at once that these points must vary greatly according to whether the building concerned is a large flat or tenement house with courts and rear buildings, a one-family house, a house with a few small dwellings and according to whether the houses are built detached or in a closet row, whether they are factories or dwelling houses.

Thus in new parts of the city the erection of those airy, healthy, pleasant
dwellings should be encouraged, that it is often impossible to build in the older quarters of the city principally because of the high price of land and partly out of consideration for certain business interests.

Finally under certain conditions the board of works is expected to look after the aesthetic side of buildings, to see that the appearance of the buildings is beautiful. Erroneous as it is to believe that this authority can result in the creation of fine facades and beautiful streets and far astray as the authorities went in former times in definitely settling the height of houses, number of stories, the style of architecture to be used, in short, the whole appearance of the houses, according to a pattern, there are nevertheless cases today in which if beauty cannot be created at least ugliness can be avoided. In § 3 of the Prussian flush-line law it is expressly stated that when flush-lines are established care must be taken not to render the streets unsightly.

Three cases may be cited in which the authorities should interfere to prevent unsightliness. If a householder out of miserliness or carelessness neglects his building the authorities should have the right to require him to repair and repaint it; in some places this case occurs oftener than one would imagine. Secondly, it would be desirable to forbid the erection of a structure in a block with irregular lot boundaries that is certain to render the view of a street and probably of the whole block unsightly (compare figs 639, 645 and 649); when legal regulation of the boundaries is established this difficulty will probably be more effectively overcome.

The third case is the justification of the authorities in interfering to preserve monuments and places of historic interest. The heights, materials, forms and colors of new buildings and alterations are subject to certain regulations and limitations in the building laws of some cities (for instance Hildesheim, Frankfurt a. M., Nürnberg, Rotenburg o. T., Lindau, Prague) in order to preserve as far as possible the view in old streets and squares and to prevent unsightliness in the surroundings of architectural monuments. These regulations apply also to the keeping up or alteration of structures of artistic or historic value and sometimes also aim at making the whole views of new streets or squares harmonious. All that has been done in this direction however requires supplementary activity on the part of the state and the city which should take the form of giving technical advice to those who are anxious to build, under certain conditions also additional money and finally by offering model architectural designs as has been done for instance by public competitions in Bremen, Lübeck, Cologne and other places.

The owner of larger areas of land can go somewhat further in encouraging the aesthetic development of buildings than can the city, for he can make certain conditions regarding the buildings to be erected at the time of selling the property. Building societies as well as communities have used this means with much success, for instance, in Berlin, Munich, Cologne and Düsseldorf. But care must be taken not to go too far in these architectural requirements; it is best to limit them to
insuring sanitary conditions (prohibition of too great height, too narrow lots, too dense construction), to preserving the special character of the streets (villas, exclusion of industries) and to requiring the use of genuine material (stone, brick etc.). Moreover under healthy conditions competition among the architect is the best means of procuring beauty and variety. Some cities would do well to follow the example of Brussels and offer a prize for the best dwelling houses erected within a given period.

We wish to close this part with the accompanying extract from an older table (dating from 1889) containing building regulations from various cities and with the group on pages 412 and 413 of the principal requirements embodied in the regulations of some cities in northern, southern and western Germany and Austria (belonging to the year 1905).
PART VI

CITY PLANTED AREAS
PART VI

CHAPTER 1

Planted Streets

The most widespread manner of planting streets consists of rows of trees (also sometimes groups of trees and single trees); rarer are lawns and groups of ornamental shrubbery. When these are used they are nearly always combined with rows of trees. A third way of planting the streets, which may or may not be combined with rows of trees, is to lay out front garden plots between the street flush-line and the building flush-line.

a) Rows of Trees.

There may be single, double or several rows of trees that correspond to the direction of the street, hence run straight or curved, the trees being planted at regular distances from one another. It is true that rows of trees alone do not present an artistic effect especially if the trees do not thrive, if those that die are not replanted and altogether if the greatest care is not exercised in planting and keeping them; neither can it be denied that even the most beautiful rows of trees may interfere with the traffic and hide fine buildings. On the other side rows of trees are, in many cases, the best means of beautifying city streets and bringing life into them; their shade is an advantage, they mitigate the dust and bring a touch of nature into the mass of stone and masonry. City building should therefore aim not to do away with rows of trees but to see that they are planted in suitable places and properly cared for. On wide parts of street groups of trees or single trees are an advisable means of beautifying and enlivening the view.

In streets of less than 20m in width and closely built up on both sides two rows of trees cannot thrive; the distance of the trunk width from the houses must be at least 5m if the tree is to bear healthy foliage. If the street width is between 16 and 21m unless there are front garden plots, one row of trees will have to suffice; this of course involves an unsymmetrical street profile (compare marginal heading 146) Not until reach a street width of 22m is it safe to plant two rows of trees and three rows require a street width of 30m the number of the rows can be increased up to six and more; in this way and by the different distribution of the rows in the streets the various profiles are produced of which a number were given as examples in part II, headings 145 to 165. Trees are much benefited by front garden plots at the side of the streets and gaps between the houses (detached construction). In streets with front garden plots where the traffic area is 15m wide two rows of trees may be planted.

In front of monumental buildings the rows of trees, which interfere
with the view, are usually omitted, sometimes, if desirable the whole arrangement of the street is interrupted, either by laying out an area equipped only with isles of safety, candelabra, flagstaffs and such like (Place de l'Opéra in Paris), or by using lawns with flower beds and low shrubbery instead of the rows of trees (fig. 862). Thus it is quite proper that the rows of trees “Unter den Linden” in Berlin should cease at the point where the more important buildings begin, and on the Ringstrasse in Vienna the rows of trees are interrupted in front of the opera and other monumental buildings. Other examples are seen in the Appellhofplatz in Cologne (fig. 283), the Boulevard de Strasbourg in Le Havre etc.

The distance of the street trees from one another is from 5 to 10m, usually 7.5m. Certain small kinds of trees like locusts and hawthorn, require a distance of only from 5 to 6m, while spreading varieties, like the plane-tree, need at least 10m. The planting of spreading trees at a distance of only 5m from one another is often advocated on the ground that young trees with undeveloped tops reach a certain fullness and provide shade more quickly and moreover that it is easier to make space for the development of the branches by removing every second tree as soon as their growth requires it. If, notwithstanding, it is usual in laying out avenues to plant the trees from 7 to 8m apart at the outset, it is because they are 5m apart the gratings surrounding them are apt to interfere with traffic and later when every second tree has been removed the distance of 10m between the trees is apt to make the street look empty, for a time at least, if not for always; luxurious and regular development of the trees in city streets is seldom to be expected until they have grown very old.

The distance of the rows from one another is generally about the same as that between the trees in the row. For walks and riding paths the customary width is from 6 to 8m (compare figs. 139 to 264). It is very practical where there are three or more rows of trees to plant them en quinconce, that is, so that each tree is on a line with the space between two trees in the next row; this adds variety and the foliage has more space in which to develop (fig. 863 & 864). If this is done the distance between the rows may, under certain conditions, be reduced to 5m,
as the distance must be measured diagonally; walks and riding paths of less than 6m in width are however undesirable.

If the way is to be used a a carriage drive the points discussed under headings 144 and 315 must be taken into consideration and these as a rule require wider, sometimes two or three times as wide, distances between the rows as those just mentioned. Wider distances are also necessary if grass and flowers are to be planted between the row; in this case the minimum space between the rows may be regarded as 10m.

The question what varieties of trees should be chosen for street planting is more often settled according to individual preference than serviceableness. Every variety of tree that is tough and hardy enough to stand wind and frost in an unprotected position, drought and heat, the dust of the street and the constant passage of traffic and whose roots have a certain power of resistance, is suitable, if properly planted and cared for, to be used a a street tree. Although according to this the choice is not very great, yet, when the street is long variety in the trees is just as necessary as variety in the street profile and the architecture, if the whole effect of the street is not to be monotonous and uniform.

The best hardiest street tree is usually conceded to be the common, small leaved elm (Ulmus campestris or Ulmus effusa), which in Belgium is called Reine des avenues and that has also succeeded well in many German streets in spite of poor subsoil. Still more beautiful is the maountain elm (Ulmus scabra), but it likes a somewhat better soil. Another excellent variety, though not quite as hardy, are the lime-trees (Tilia grandifolia, Tilia parvifolia and Tilia americana alba, silver linden). Then there are the plane-trees (Platanus occidentalis), which form stately, shady avenues but are not always proof against frost and therefore not adapted to planting where they will be exposed to north and east winds; the horsechestnuts (Aesculus hippocastanum) both the white blossomed and the red blossomed sorts, especially those that do not bear fruit and hence do not serve as targets for the stones of the boys in the street; the maples (Acer platanoides, Acer pseudoplatanus, Acer dasycarpum, Acer Schwedleri), further the tree of heaven (Ailanthus glandulosa), the white and the red hawthorn (Crataegus oxyacantha fl. albo pleno and fl. rubr. pl.), the oak (Quercus robur and Quercus pedunculata), the
walnut (Juglans nigra) etc. Less available are the acacias (Robinia pseudacacia), unless it be the globular species and they be used for some special purpose (as a setting for a fountain, a bench, etc.)

Of course the climate is of great importance in the choice of varieties; eucalyptus, olive trees, cedars and even poplars (Populus italica) are not suitable for German cities.

One disadvantage of the elms is that they are frequently attacked by beetles; acacias do not give much shade. The chestnuts get their leaves early in the spring but lose them in the autumn before the other sorts of trees. The foliage of lime-trees, elms and especially plane-trees does not come till late; the elms also lose their leaves early, while the two latter remain green somewhat longer. Plane-trees and maples keep their leaves longest of all.

Pleasant variety may be introduced into long streets by planting not only different sorts of trees but choosing those that vary in the time they leaf and bloom. This should only be done in long stretches of street however and different kinds of trees should not be planted in the same row; the experiment has often been tried but seldom with satisfactory results.

Long rows of elms, for instance, were interrupted at the street crossings and at their starting and terminal points with chestnuts, chestnuts with red American oaks, the tree of heaven with the hawthorn; it was found necessary however to do away with the inequality in their appearance by taking out the second sort as soon as the difference in growth became unpleasantly noticeable. In Hamburg mountain-ash was successfully alternated with oaks; the former were removed as soon as the oaks, which were very spreading, were sufficiently grown. Still, in general it is an undertaking of doubtful outcome to alternate trees of different foliage either singly or in pairs, for instance, two dark elms and a light maple; such an arrangement usually looks well only until the stronger of the two sorts begins to crowd out the weaker.

It is of the utmost importance that the young trees that are set out should be perfectly healthy and of sufficient size. Weak saplings and those that are very thin, even if they do not die under the disadvantageous conditions incidental to street traffic and city soil, develop unequally and are not able to produce the pleasant effect of a closed avenue. The least admissible diameter of a sapling to be planted, measured 1m above the ground, is 12cm; it is better to have the 15, best of all 18 to 20cm thick. Price must not be considered for, in view of the much greater cost of planting and cultivating the trees, it cannot be determinative whether a sapling costs 1.50 or 5 marks. It is best to keep a supply of 20 to 25 year old trees ready in a nursery.

The method of planting is also of importance. It will seldom happen that the soil of the street is such that trees can be planted without any preparation. It is usually necessary to dig a pit from 2 to 2.5m across and 1m deep and to fill it up again with rich earth. A mixture of dark garden soil and clay loam is good.
If possible the soil should be allowed to remain for the winter before planting is begun so that it may become better mixed and that the settling of the loose soil does not later interfere with the growth of the roots of the tree. If the soil is very poor, particularly if it is sandy or wet and clinging this process is not sufficient; measures must be taken to insure the roots of the tree sufficient nourishment and the soil must be properly drained. For the first purpose a large pit may be dug, about 3m across; but it is better to make not a single pit but a long ditch of about 2 to 2.5m in breadth and 1.5m in depth and after it has been filled in with good soil and allowed to settle to plant the row of trees in it. Drainage is accomplished by making a slit in the bottom of the ditch and filling it with loose stones; care must be taken to prevent the waters rising at the deepest points in the ditch (by connection with a street drain or in some other way). Where the bed of the street does not let water through the bottom and sides of the ditch must be covered with stones at the time that the good soil is filled in ad connection made with a drain.

The most dangerous, unfortunately also the commonest enemy of street trees is illuminating gas for from 10 to 20% of the gas produced leaks out of the pipes underground and if it reaches the roots of the trees it kills them. The protective measures that are sometimes taken against illuminating gas consist in putting a cover of asphalt round the gas pipes, in putting the pipes themselves in the drainage channels (Paris) or of putting an impenetrable wall of concrete, masonry or something similar between the gas pipes and the roots of the trees (fig. 865). The success of the first and the last named precautions is always doubtful as the gas filters through tiny crevices in the covering of the pipes or the masonry and impregnates the whole soil. It is therefore supplemented by covering the pipe thickly with dry gravel (fig. 865) and a suitable strip of the street surface is left so that it can be permeated by the gas fumes instead of their being especially attracted to the loose surroundings of the tree.
A row of trees or group of plants in the neighborhood of whose roots gas pipes lie must always be regarded as in danger; the small pipes leading to the street lamps may be just as destructive as the main pipes. For this reason the method employed in Paris of laying the pipes in the drainage channels, even if the connections with the houses are also laid in walled channels, does not entirely prevent the danger. In any case on all planted city streets and promenades the first care must be to see that all gas pipes are at least 3, better 5 meters removed from the planted spots. But it is best of all to replace the gas lights with electricity.

It is also necessary to leave a suitable space (at least about 2m) between the trunks of the trees and the openings of all kinds into the sewers, the hydrants and other similar objects in or on the street, because all these things may affect the growth of the tree. A space about 4m (at least 3m) high below the crown of the trees must be kept free for traffic.

Trees must not be planted on the roadway of city streets because there they are always in danger of being thrown down by teams or of gradually withering and dying and they are always injured by having their bark scraped and knocked by passing wheels. The arrangement of trees in figs. 167, 168, and 866, although still much used, is therefore wrong. Placing stones either in an upright or lying position about the trees to protect them (fig. 867) is not sufficient if there is much traffic; moreover such an arrangement is ugly, inconvenient for the traffic; and makes places for the street dirt to collect.

Hence the trees must be planted
on special strips of the street surface reserved from traffic or on the edges of walks and riding paths. A gutter between the last-mentioned ways and the roadway is not sufficient protection for the trees for vehicles often drive over it; raised curbstones are necessary, behind which the trees must be so placed that they are not touched by the hubs of wheels or the loads on teams. As the development of the roots is hindered if the stones are as near as from 20 to 30cm, the least admissible distance of the tree from the edge of the curb is 75cm, better 1.00m (fig. 868); in Paris it varies from 1.25 to 1.50m. If in exceptional cases it should be necessary to put the trees nearer to the edge a gap of from 1 to 1.50m in length may be left in the curbing. (fig. 869).

It is necessary that the soil above the roots of the trees should be kept loose so that air and moisture can penetrate to them. It is therefore practical to lay out a strip of the street without a hard covering and measuring form 1.50 to 2.50m across between the roadway and the footway (fig. 870); in order to take into account even the thinnest of ladies shoes small crossings of stone, asphalt or something similar may be made in the spaces between the trees, connecting the footway with the roadway (fig. 871). Where the sidewalks are narrow a loose space around the trunk of every tree has to suffice (fig. 872). The surface of the earth round the truck should in every case be slightly sunk and so shaped that the water does not trickle down between the trunk and the earth but permeates the soil a little distance from the trunk so that it reaches the roots better (fig. 873).

The uncovered space around the tree should measure at least 3, better from 4 to 5qm; it must always be kept loose and clean. If the pavement of the sidewalk is closer to the tree we can often notice how the roots raise the pavement or the asphalt to free themselves from its burden. If, on account of traffic it is unavoidable to pave the farther surroundings of the trunk in some way, a covering should
be used through which air and water can penetrate; in Berlin,

Fig. 870
Trees on foot and bridle paths: Sand path

Fig. 871
Trees on foot and bridle paths: Concrete sidewalk

Fig. 872
Gaps in the sidewalk cover for trees

Fig. 873
Gaps in the sidewalk cover for trees: Cross section of AB in Figure 742
Breslau, Leipzig, Dresden, Darmstadt and other cities mosaic pavement laid in sand has been very successfully used for this purpose (compare heading 565). The arrangement of the footway in the Neckarstrasse in Darmstadt is shown in fig. 874, that of the Bellevue-Strasse in Berlin in fig. 875. The unusual position of the row of trees in the middle of the sidewalk in the latter case is owing to the subsequent re-construction of the street.

If there is so much traffic that it is impossible to keep the soil loose about the trunks of the trees, there is no alternative but to make a slight depression about each trunk, to enclose it with stones or a little wall and to cover it with a cast iron grating that can be walked on. The gratings may be circular, of from 0.80 to 1.20m in diameter (fig. 876) but it is better to make them oval or rectangular; they weigh from 150 to 300kg. Practical forms that connect closely with the curbstones are shown in figs. 877 and 878. The space under the grating must frequently be cleaned and regularly watered in dry weather.

If the soil is very dry it is advisable to lay a water pipe in the ditch in which the trees are planted through which water trickles either periodically or constantly. Drain pipes are also put in the surrounding of the trunk, closed with little caps and periodically filled with water; in this way the roots are better nourished than by merely watering the surface. Sometimes it suffices to make rain gutters without solid bottoms in the row of trees.\(^1\) In addition to watering it is necessary to stir up the soil. Finally during a long drought the branches and leaves, that are covered with dust, should be sprinkled so that the tree may thrive.

The young tree must be tied to a strong stake, better two or three connected ones of from 6 to 8cm thick and 4m high, driven about 1m into the earth, until it is strong enough to stand strong winds. In addition the trunk must be protected by a strong but airy covering. These coverings are often made of willow wickerwork, sometimes of galvanized iron wire, or consist of four perforated boards (fig. 879). Another, simpler but ugly method is to nail galvanized wire netting to the three posts or stakes that served for the original support. The best looking upright gratings are those made of iron rods which are screwed into wooden blocks at the bottom (fig. 880 & 881); these weigh approximately from 12 to 18kg and cost from 7 to 8 marks.

The trees are benefitted if, in addition to depressing the ground about them as shown in fig. 873, a grass plot is made which holds the moisture longer and keeps the soil loose. In this way little “isles” of grass are made around every tree, as on the Vienna Ringstrasse (fig. 882) or strips of grass underneath the whole row, as in Breslau, Basel, Zürich, Strassburg and on different parts of the Ringstrasse in Cologne (figs. 883 & 884; compare also figs. 190, 246 & 247). If the little isles of grass are enclosed at all it is only with flat iron wire; the stripe of lawn, as they prevent passing across altogether, may be more strongly enclosed, for instance, with iron rods, or cast iron arches (figs. 885 to 888). The single cast iron arches are bound together with wire. Instead of cast iron arches other ornamental cast iron patterns or wrought iron arched forms of strong wire are sometimes used.

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\(^1\) see also: Hampel, K. Stadtbäume. Berlin 1893.p. 45ff
Inside this enclosure the grass is sometimes bordered with ivy or some other creeping plant.

A row of trees on a strip of grass can be rendered very attractive by planting, between every two trees, a climbing plant (gravevine, clematis etc.) which is trained along wires in the form of garlands or festoons from tree to tree. In this way the whole walk is pleasantly bordered with green on either side (fig.889).

Another way of beautifying an avenue that was formerly very popular and is still sometimes employed is to clip or prune the tree-tops. The free
Fig. 876
Four-part tree grate in Paris

Fig. 877
Four-part tree grate in Hamburg

Fig. 878
Four-part tree grate in Leipzig

Fig. 879
Tree protection made out of four wooden boards

Fig. 880
Tree protection from Hamburg

Fig. 881
Iron protection (made out of iron)
development of foliage did not accord with the stiff formal garden style of the seventeenth century and with Lenôtre’s taste. Three styles of clipping are shown in figs. 890 to 893, two hedges in the park in Brussels, the rectangular trees on the Place de la Carrière in Nancy and an Allee in the park St. Germain en Laye in which only the lower part of the treetops is clipped. Lately these artificial tree forms particularly those in geometrically regular shapes, seem to be becoming popular again. This method may also be employed for practical reasons, especially if it is desirable to keep the view of the upper part of the houses free, as may often be observed in health resorts and in many towns on the Rhine.

b) Garden Areas

Lawns with flower beds and groups of ornamental shrubbery combined with rows of trees are the best decoration of wide city streets. They are pleasant to look at and offer the passer-by an opportunity to rest both mind and nerves; grass and shrubbery are necessary to make an allee into a promenade. Examples of such promenade streets in Dortmund, Aachen, Mainz, Mannheim, Munich, Hague, Breda, Lille and Zürich were given in figs. 149, 151, 156, 157, 168, 176, 180, 248, and 249. Such garden areas are laid out either in geometrical patterns or on so-called “natural” lines. The latter are possible only if the space is wide; hence geometrical figures predominate.

These require a level surface which, on account of the improvement in

Anordnung der Rasenbänder in den Baumreihen des Hansa-Ringes zu Köln.

Fig. 883
Ordering of lawn bands between rows of trees on the Hansa Ring in Cologne
appearance, should be slightly (20 to 40cm) sunk below the surrounding street level (figs. 894 to 900). Sometimes slight rises and depressions are made in the lawn itself, as on the Kaiser Wilhelm Strasse in Breslau (fig. 901). Such area involve great care on the part of the gardener and also a certain self restraint, for too much artificiality easily lends to taudriness. The middle plane is the most suitable place for flower beds, groups of plants, marble or bronze figures, vases, fountains and such like, in the arrangement of which it is well to keep the centre free on long stretches because of the better effect obtained. The ascending edge is the place for strips of ivy, moss, architectural patterns in creeping plants and flowers, and similar borders. The upper edge can be planted with real street trees or dwarf varieties, also high growing roses and may be decorated by garlands. The whole requires a firm but not too high architectural fence or edge to enclose it. In this way the ideas of the parterres of the French gardens are adapted to the city streets.

The free, natural lines of the landscape garden in the street require a more undulating surface. It cannot be expected that the beauties of an English park can be produced because of the close and stiff surroundings but the principles of valley and hill formations are easy to follow. Beautiful grassy hollows, planted rises in the ground and lawns the lines of which are easy and natural can be obtained if the space is at all extensive. Unfortunately however we often find high grass banks instead of gentle slopes, thick groups of shrubbery instead of open vistas.
and a hardness in the treatment of the lines that is an offense to artistic feeling.

Whereas the fig. 899 and the Kaiser Wilhelm Ring in Cologne, show geometrical areas, the Sachsen-Ring and the Deutsche Ring in the same city are ornamented by free “English” gardens, bordered by treed walks; the Ubierring, on the contrary, shows informal garden areas on both sides of an avenue. It is planted in the way explained by figs. 899 and 900.

Basel possesses a charming street along the course of the old fortifications, with straight lined and informal planting. The accompanying plate illustrates the
main stretch between the Spalenter and St. Alban-Tor.

The west part of the Schützengraben (33.60m wide) has a broad and a narrow roadway which embrace an enclosed garden area 11.70m wide; the entrances to the latter are open so that walks, benches and playgrounds are freely accessible; the southern footway planted with trees; the adjoining properties have front garden plots 9m deep. The east part of Schützengraben, not including the 15m deep front garden plots along one side, is 27m wide and consists of only one roadway with two footways planted with trees; every two or three trees stand in a strip of lawn. The west part of the Steinengraben is treated in the same way but is not so wide and has no front garden plots. On the side towards the city the east part of the Steinengraben leads to a park on the side of former ramparts, on the other side it leads round it. The wide roadway that encloses the one garden area ends at the highest point in the park from where a beautiful view of the city, particularly of St. Elisabeth’s Church is obtained. On the Steinentorberg a second bastion is still standing. The Elisabethen-Anlage is bordered on the side towards the city by a public park, on the other side by front garden plots 19m deep. The same arrangement is continued on the first stretch of the Aeschengraben; then
follow two roadways with a strip of parking between them, as on the west part of the Schützengraben but on a larger scale, as the street width at this point without front garden plots ranges between 38.50 and 41.80m. After passing a short connecting stretch the St. Alban-Anlage that leads to the St. Alban-Tor is treated in the same way.
The Kriegstrasse in Karlsruhe is arranged like fig. 903; it would have been better to have reduced the second roadway about 1.50m for the benefit of the planted area. The garden areas are too densely planted with shrubbery and too much cut up.

The group of streets in Mainz, illustrated on the accompanying plate show four different ways of planting: two allées bordering a garden area on the Kaiserstrasse; three rows of trees on the middle plane of the southern Bonifatius-Strasse; front garden plots and sidewalks bordered with trees on the northern Bonifatius-Strasse; front garden plots alone on the Schulstrasse.

The magnificent old Poppelsdorfer Allee in Bonn (fig. 904) possesses a lawn 19m wide between the two double rows of trees; the arrangement of the ways would not be suitable for busy city traffic.

The section of the Wallstrasse (Ringstrasse) in Krefeld on the accompanying
plate shows three ways of planting; the effect is attractive but for busy traffic the roadways are too narrow.

Fig. 902 shows the 80cm wide garden areas in the rows of trees on the Promenade des Anglais in Nice; they consist not of strips of lawn but of thick hedges of southern ornamental plants; the method of affording views of the promenade and the sea from the hotels by building out the windows sideways, like the teeth of a saw, is unusual.

Finally the accompanying plate illustrates the parking on the Avenue du Bois de Boulogne in Paris, 110m wide not including the front garden plots. The main street is 36m side; the planted areas that lie beside it and rise slightly towards the houses are beautiful in effect. From most of the cross streets only foot paths lead through the garden area so that the connected character of the whole is preserved as far as possible.

The most effective means of enlivening streets with garden areas is by the use of water, running water in the shape of natural or artificial brooks (compare heading 287) and artificial springs, grottos and fountains from which water trickles or is thrown up. The latter are often used to adorn the streets even where there are no garden areas; but it is usual also in such cases to surround the basin of the fountain of whatever form it may be with a flower bed. It is important that the edge of the basin should not be higher than the street; is it better that it should be a little lower so that a good view of the surface of the water is obtained. Hence the bed surrounding the basin, to be planted with groups of plants and flowers in geometrical or architectural patterns, should slope slightly towards the basin (fig. 905).

The fences or railings used to separate the garden areas from the ways are important both
as regards their lines and the material of which they are made. The lines must accord with the shape of the street and the directions of the traffic. Hard lines are unavoidable if street engineers and landscape gardeners work independently of one another; cooperation is essential. If it is possible not to enclose the area at
all so much the better for the effect.

The simplest, but a poor kind of enclosure, is a wire stretched between wooden posts. It should be possible to tighten the wire when necessary otherwise it soon becomes loose and untidy looking (fig. 907). Sometimes two or three wires are stretched one above the other; but even if iron posts are used instead of wood such an arrangement is of no permanent value. An improvement is the use, instead of a wire, of a flat iron rail screwed onto the posts. A round iron rail, an iron bar, a hollow bar or a twisted bar offers greater resistance (figs. 906, 908, & 911). Also the railings illustrated in figs. 855 to 888 may be used in such cases. These simple enclosures should not be higher than from 30 to 50cm. They do not serve to keep dogs out or people who intentionally step in; but this is generally not necessary.

Other low fences are those in the form of a chain (fig. 910) or a massive edging of stone or cement. (fig. 896). Stone sockles surmounted by low cast or wrought iron railings in ornamental patterns are very frequent (fig. 912). A strong,
Fig. 903
Of the *Kriegs Street* in Karlsruhe

Von der Kriegsstraße zu Karlsruhe,
\( \frac{1}{500} \text{ n. Gr.} \)

Fig. 904
*Poppelsdorfer Allee in Bonn*

\( \frac{1}{500} \text{ n. Gr.} \)
(922 m lang.)
also low fence is shown in fig. 909. Higher fences that make it difficult to get in and also keep out dogs are also suitable for larger garden areas; they are fastened either on single stones at the bottom or to a continuous stone base and are stayed or propped at the back. They are often 1.30 and more meters high but a greater height than 80cm is not advisable, otherwise they interfere with the view of the plants and give the garden areas which are not extensive in any case, a caged appearance. Points and edges on which children or adults might injure themselves should be avoided. This subject of fencing is more extensively dealt with in part III, vol. 8, treatise 2 (under C) of this “Handbook”.

If parking in the streets is to present a good appearance it is essential that the fences and the edges of the lawns should be well kept. If the fences are low or if there are none flower beds may be protected from dogs by special light woven wire enclosures.

c) Front Garden Plots

Front gardens adorn both the street and the house and are also of high
sanitary value. They enlarge the free, unbuilt on space without increasing the dirt, dust and noise of the street; eyes and lungs are benefited by their vegetation and they also aid the growth of the rows of trees in the street. They separate the dwellings from dust and noise and from actual contact with the public traffic. If they are at all deep it is even pleasant to sit out in them, particularly on beautiful evenings when they are not as close as inside courts and small back gardens. They may be connected with the dwellings by terraces or balconies or be entirely separate. It is clear however that on the south side of narrow streets front garden plots that get little or no sun are not practicable. It also adds variety if some of the streets have plots on both, some only on one side.
The depth of the front garden plots, that is the space between the street flush-line and the building flush-line varies between 2 and 30m. The Prussian flush-line law unreasonably prescribes that, as a rule, the depth shall not exceed 3m although the above mentioned advantages can only be enjoyed if the front gardens are at least 5m deep. The common use of small dimensions and this provision in the law are the result of a secondary purpose of the front gardens, that is, to make it possible when traffic increases to widen the street, that is to extend it over the area occupied by the plots and to do away with the later. Leaving this out of the question the most pleasant depth for front gardens both for the street and for the houses, is between 6 and 15m; deeper ones are seldom found and are only possible if the building lots are very deep. The unusual depth of 30m and more, found in the Kaiser-Wilhelm-Strasse in Breslau, is owing in this particular case to the fact that on both sides of an old curved street the building flush-lines run straight and parallel whereas the street flush-lines follow the curve (fig. 913).

For front gardens which, in case traffic requires it, are to be absorbed into the street, the same rules must be observed, as regards projections and recesses in the fronts of the buildings, as those that apply on the open street. Porches, terraces etc. that extend in front of the building line must be regarded as temporary structures, if allowed at all. This is not so if the front gardens are to be permanent when we must distinguish between open (detached) and closed construction.

If closed construction is used the strict observance of the building flush-line is indeed necessary, unless some agreement be made among the neighbors, so that the unsightliness of bare side walls is avoided. If the neighbors are agreed it is however very desirable to have projections and recesses extending across the front of several houses, or of one house alone (fig. 914 & 915). It is to be regretted that such agreements among the neighbors are rare. As a rule therefore only projections from the building line can be made and they must be subject to certain limitations as regards length, height and depth so that the purpose of the plots is not frustrated and to prevent one neighbors interfering with another.

Frequent regulations regarding projections in front gardens are as follows:

1) Low structures in front of the house not more than 1m high, such as approaches, steps, terraces, light shafts etc. may extend up to the line of the street.

2) Higher front structures like portals, verandahs, bay windows, stairways etc. may occupy two fifths of the front of the building and project one third of the depth of the front garden.

3) The space between the building flush-line and the street flush-lines that is not used for structures must be laid out as a garden with paths and must always be kept in good order.

4) On the street flush-line and on the boundary of the adjoining property an iron or wooden fence on a stone base must be erected; the base must be from 20 to 50cm, the fence not more than 1.20 m high.
Front garden plots without a fence next the street are common in English and American cities and should be introduced with us because of their quiet, pleasant effect.

If the houses are built detached it is very advisable to allow owners to
set them as far back from the building flush-lines – the distance of which from the street line must be definitely fixed – as they may desire. If groups of two or more adjoining houses are allowed, the owners of such a group must, as when closed construction is used, come to an agreement among themselves. Whether construction be open or closed projections in front of the building flush-line can be made only within certain limitations. Considerable freedom in the treatment of the building should however be allowed for in villa districts variety in the street view is desirable and expected.

The horticultural treatment of front gardens that are from 3 to 10m deep will as a rule have to be along strictly architectural lines; only if the depth is greater is informal treatment possible. In figs. 2 and 3 a few forms of planting were indicated. Similar arrangements are shown in figs. 916 to 918. The combinations that can be made with such geometrical forms are inexhaustible for in this case real gardening is of secondary importance. An example of landscape gardening is shown in fig. 919. The path leading to the door is generally flagged, paved with asphalt or mosaic (compare heading 565); the other paths which serve only to divide the beds are covered with gravel, sometimes colored gravel. The edges are generally bordered with evergreen plants (ilex, rhododendrons etc.) more rarely with ornamental shrubbery; the inner plots which are sometimes slightly sunk are generally planted with flowers that bloom in succession; sometimes expensive “carpet” beds are made. Climbing plants (ivy, clematis, grapevines etc.) may be trained along the fence next the street and the neighboring boundary, also up the front of the house where they make pretty coverings for balconies, terraces etc. Vases, figures, grottos, fountains, arbors etc. may also be used; high growing trees, on the contrary, only in exceptional cases, unless, as is often the case, the plot is to be used for a restaurant garden. In all cases it is essential that the garden should be most carefully kept.

Fig. 920 shows the treatment of a front garden that rises towards the house (on a hillside). The ascending steps on the left correspond to the easier slope on the right while at the door of the house the steps are terrace-like in form so that three characters are combined in the small space lending charm and variety to the effect.

The landscape treatment of front gardens of greater depth must also be kept within very modes bounds. More informal treatment is possible only on wider properties where the front garden connects with the real garden or park. Figs. 921 and 922 give examples of this although the subject really lies outside the province of city building.

The fence in front of the garden plot and on the neighboring boundary must be open if the plot is to benefit the street as well as the house. Hence both massive and perforated walls are admissible only along short stretches. Wooden fences may be attractive but are not durable and must be very carefully kept; it would be unjust however to prohibit them. Hedges are beautiful but only
possible under rural conditions. Iron railings are most widely used. They should have a stone or cement base as it makes them firmer, looks cleaner and provides proper connection with the sidewalk; pointed bars should be avoided because of their disquieting effect.

High sockle and high railings detract from the effect of the plot. Hence it is advisable to limit the height of the sockle or base to from 20 to 40cm, the height of the railing so from 1 to 1.3m, measured from the sidewalk. Railings in the form of spears, harpoons etc. should be excluded as they are dangerous and cannot really keep people out if they are determined to get in. A large number of suitable fences are illustrated in part II, vol. 2, treatise 2 of this "Handbook".
If the fences are longer than approximately 10m the pattern should be interrupted and this is also customary at the gates. In individual cases a certain pattern has been prescribed for use along a whole street but in general variety is to be preferred.

If, where the houses are built in closed rows, the fences next the street are omitted altogether, following the example set by American and English cities, the effect is most pleasing especially if the plots are as deep as from 8 to 12m and they are on narrow residential streets. The effect is much enhanced if the whole series of front garden plots are treated and planted as a whole, instead of each plot being separately laid out.

Sometimes it is inconvenient or inartistic to continue the plots right up
Fig. 921

Front and main yard (a. residence, b. stable, c. glass hall, d. gallery, e. pavilion, f. fountain, g. front yard, h. fountain drain, i. sports and playground, k. fruit garden, l. pond, m. pergola, n. creek, p. sculpture)

Fig. 922

Front and main yard
to the end of the street. In such cases they may be terminated on one or both sides (figs. 923 & 924), care being taken that the last plot does not lie next a bare boundary wall but comes next to a projecting part of a building.

Whereas the front gardens with which we have been concerned up to now were parts of private property it sometimes occurs that they are laid out as parts of the public street. Fig. 925 gives an example of this where the houses are built in closed rows; it is rarely found with us but is frequent in America; the plots are interrupted only at the entrances to the houses, are enclosed by low edgings or not at all and are kept up by the city. Sometimes there are public as well as private front garden plots on the same street as is seen in fig. 926 showing the vegetation on the Königswall in Dortmund which runs in front of villa properties.
a) General Remarks

Practically all public city squares are more or less suitable for planting; vegetation in some form is the most widespread and in most cases the best means of adorning them. On the traffic centres (compare part II, chapter 8 under a) rows of trees can generally be planted on the edges of the sidewalks and of the isles of safety; sometimes there is an area in the centre out of the way of traffic that can be ornamented with garden beds, fountains etc. The useful areas (market-places etc.) can usually be surrounded with trees or have trees planted on some part of them. The really ornamental squares are absolutely dependent on garden areas and walks with trees. On architectural squares trees are less in place as they interfere with the view of the buildings, but squares in front of monumental buildings (squares of approach) may be planted with beds and even high groups of trees are not undesirable. The movements of the traffic must of course be considered and not interfered with.

Plantings in squares that interfere with the traffic are just as inexcusable as
those that are too much cut up by the lines of traffic, especially roadways, (compare Pelikanplatz in Zürich and Georgs-Platz in Hannover (fig. 404)). Concealing the view of buildings and blocking lines of traffic are two dangerous points that
must be avoided in planting city squares. It may be necessary, in certain cases, to dispense with vegetation as a means of decoration, altogether.

It would be wrong to confine the use of horticultural decoration to large and important squares; on the contrary every space that can be planted without detracting from the architectural effect of streets and squares and interfering with the traffic, should be used for this purpose; it beautifies the city and benefits all classes of the population. In cities that are laid out on a rectangular scheme we are often confronted with the question whether a whole block shall be “sacrificed” for an ornamental area; one of the advantages of the “natural” plan of construction of cities; in which the streets are adapted to the directions of traffic, the form of the land and property boundaries, that small open space of different shapes are often formed, lying between the directions of traffic, which can be used for nothing else.

As far as possible all such ornamental areas should be regular in shape. But as the form is largely dependent on the streets that lead into the square or surround it, the directions, width and division of the streets must be determined in connection with the size and shape of the ornamental square. This should be done in the plan of construction. It would be a mistake to determine the boundaries of the streets and squares in the plan of construction and to leave the arrangement of the garden areas entirely to the gardner. Indispensable as the work of the latter is in the final arrangement and in the technical execution, it is just as important that the arrangement of the planted areas, ornamental squares and public gardens as a whole should be provided for in the city building plan according to their size, shape and distribution.

b) Rows of trees

As in the streets so too in the squares the simplest manner of planting consists in rows of trees. We must distinguish between rows of trees round the edges of the squares and those that form a sort of grove in the centre. The former method of planting is more common sometimes the rows are single, more often double or triple, so that shady walks are formed; in some places there are six, eight, even ten rows. The second method, planting in groves, is rarer. Examples are parts of the Stuttgart Schlossplatz and the Peters-Platz in Basel; in both cases the regular rows of trees are combined with lawns, benches, etc. As regards the kind of trees, method of planting, protection against illuminating gas and injuries, cultivation and irrigation the same rules apply as those given in chapter 1 of this part (under a). The distance between the trees and the rows should be somewhat greater than in the streets so that the square may remain airy. Grass round the single trunks and strips of lawn under the rows are also sometimes found. Clipping the tops of the trees was particularly popular on French squares during the Baroque period and may still sometimes be justified.

Greater care must be exercised in the choice of trees for squares than in
that of those for streets for on the equal development of the tops of the trees depends the whole appearance of the place. For this reason it is better not to attempt the use of different varieties on the same square, nor to try to obtain variety in the size, shape and form of the top.

The arrangement of the rows is always regular; not only in the long direction but also across and diagonally they should form regular figures, generally straight lines. This makes it difficult to plant groves or even edgings on irregularly shaped squares which however are especially adapted for ornamentation by free garden areas and groups of trees.

The surface of the square between the rows of trees is generally covered simply with gravel or with the kind of pavement described by us under heading 564. If on account of the usage, for instance, market traffic, it is necessary to put down a stone or other impenetrable pavement, the trees, even if there is a free space around each one, will generally suffer. Hence, in their interest the pavement, mosaic, cement or asphalt, should be confined to the portions of the square over which the greatest amount of traffic passes.

In order to protect the trees and keep out vehicles different kinds of barriers were formerly erected round the edges of the square. Sometimes rows of posts of stone, wood or cast iron were used, or railings of iron or wood, or wooden posts connected with chains; occasionally even walls or ditches were employed. Another method was to raise the whole surfaces of the square and support it with buttresses. The most that is done today however is, as a rule, to put a slightly raised curbstone round the edge which keeps out vehicles without interfering with foot passengers. Though we may rejoice that this simple method has taken the place of the former, often unsightly, one yet we must regret that it makes the more monumental development of the streets and squares impossible. Where the means and the locality permit should not hesitate today to make the “frame” of the square more corporeal by means of attractive chain barriers etc. combined with seats, candelabra, fountains, statuary and such like.

c) Garden Styles

Before we go farther in the discussion of the horticultural treatment of squares it is necessary to review briefly the different garden styles.

As the next half volume of this “Handbook” deals in detail with this subject the following remarks will suffice here. The principal historical garden styles are: the Arabian (Moorish), the Roman (Italian), the Dutch, the French, the Chinese and the English. The first four are called regular, formal, architectural or geometrical styles; their forms agree with those of the corresponding styles of architecture. In the same way we speak of Greek, Gothic, and especially of Renaissance and Baroque gardens. A contrast to these are the Chinese and the English garden styles which are designated as irregular, informal or natural and are usually called “landscape style” because their forms are in accordance with
Fig. 927
From the Tuscanum des Plinius (a. path, b. decorative element, c. fountain, d. plane tree hedge, e. rose plants, f. garden house, g. forest)

Fig. 928
Median of the Villa d’Este in Tivoli (a. court yard with columns, b. living room, c. upper terrace with view of Rome and Campagna, d. lower terrace with water art, e. large fountain with semi-circle stairs up, f. staircase with cascading water edging, g. water basin with cascading water feed on the side, h. bridge)

Fig. 929
Parterre de broderie: The dark stripes are made of flowers; the leaf and tendril ornaments are made of manicured buxus
considerations of natural beauty as they seek to imitate and idealize nature and aim first of all at producing views that are effective as landscapes.

Fig. 927, taken from the Tuscum of Plinius, is an example of a Roman garde; fig. 928, part of the Villa d’Este in Tivoli, may be regarded as an example of the gardens of the Italian Renaissance period. Regular, architectural lines, colonnades, fountains, niches, figures, waterfalls, terraces and flights of steps characterize the gardens of this style. Especially do terraces and flights of steps pay an important part in Renaissance gardens. Architecture and gardening are bound up together; the latter does not appear independently but as an accompaniment of the former.

The Dutch and the French garden styles also belong to the Renaissance period that developed according to the character of the country. But in this case architecture was not so prominent and gardening became more independent. The straight lines and geometrical figures of the paths, rows of trees, lawns, cascades, terraces and flower beds are retained, in Holland treated very stiffly and quaintly; the influential French garden artist Le Nôtre applied them all to the clipped trees, hedges etc. Many French gardens are distinguished by excellent taste. This style which was also dominant in Germany in the eighteenth century and finally went astray in Baroque oddities, finally had to give way as a whole to English art in gardening but is still used occasionally in large ornamental squares and is especially adapted for use in small ones. Its finest points are the so-called “parterres “(level regular lawns and flower beds)1, “carpet beds”, borders, rose gardens, circular beds etc. Because of the importance of this kind of decoration for city squares examples of several older and more recent parterres and “carpet beds” are given in figs. 929 to 937. Fig. 938 shows a circular flower garden; figs. 939 to 942 are borders; fig. 943 shows the rose garden near the marble palace in Potsdam, a conventional arrangement of beds with a raised path around them. The carpet beds are often raised in the form of flat balls, coats of arms etc.

English gardening, which owes its development partly to the study of the old, labyrinth-like gardens of China, is more independent of architecture. It aims at imitating or artificially beautifying nature. Under the leadership of the Prince Pückler-Muskau it has also become the basis of modern German landscape gardening. It is often also united to works or architecture or sculpture; but in this case, in contrast to Italian gardens, architecture and statuary serve the garden art: pavillons, arbors, statues, fountains etc. serve to enliven the landscape. Only in the neighborhood of the main building (the castle, concert hall etc.) does the landscape give way to the flower garden (pleasure grounds) and more conventional lines. Parts of English parks in the so-called modern style are shown in figs. 945 and 946 and on the accompanying plate, while fig. 944 shows a flower garden in a pleasure ground. On the accompanying plate the main building is

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1 this word parterre does not mean “ground floor” or on a level with the ground but is derived from the Latin “partiri” to divide
raised and affords a view of the whole park; the flower garden is separated by a hedge 2m high except in spots where the height is reduced from 50 to 60cm to afford a view; in addition it is much concealed from outside by other vegetation; the seats, surrounded by hedges, are in nooks that would be suitable places for vases and statuary.

d) Ornamental Areas.

After this comparison of the different garden styles it is clear that for the city areas that are not to be ornamented merely with rows of trees but are to receive more extensive horticultural treatment which however is dependent on the surrounding structures and streets, the regular forms of the Italian and French garden styles are especially adapted, of course without limiting modern serviceableness and individual creative work. But if the area is large and irregular in form the landscape style is just as suitable.

The gardens that serve to adorn public areas are either enclosed or open. The former have a strong fence round them and are entered only by the gardener. The open gardens on the contrary are traversed by footpaths. The difference lies mainly in the size of the area, not so much in the way it is planted and arranged.
Fig. 931
French Parterre composed of box, lawn and flower components

Fig. 932
Renaissance-Parterre à l'anglaise (lawn with flower beds)

Fig. 933
French Parterre with box, lawn and flower components
Fig. 934

French Parterre made of bux on gravel, surrounded and crossed by flower beds

Französisches Parterre

aus Bux auf einem Kiesgrund, von Blumen-Rabatten umgeben und durchzogen.
Oval Parterre or carpet garden (the individual plants in the three round elements are decorative foliage plants. Taller and smaller roses alternate on the circular path. The groups are made of ornamental bushes).

Modern Parterres or flower gardens (a. Gravel oath, b. lawn, c. flowerbed, d. individual plants)

Modern Parterres or flower gardens (a. Gravel oath, b. lawn, c. flowerbed, d. individual plants, d. decorative foliage plants)
Fig. 938
Circular rose garden in English garden

Fig. 809.
Fig. 810.
Fig. 811.

Randmuster (Borduren).

Figs. 939 - 941
Border patterns
The enclosed garden areas on squares resemble the geometrical garden areas on broad streets discussed under heading 640 and what was said of the latter applies also to the former. Two examples in Cologne are given in figs. 947 and 948.

There is more variety in the arrangement of the ornamental open areas because they consist of a larger or smaller number of plots formed by the ways that cross the square. To prevent the space being too much cut up the ways should be limited to what is necessary. Driveways should be excluded from an ornamental area altogether; but this requirement must be taken into account when the city plan of construction is made so that the garden is not disadvantageously placed or traffic directions blocked. Ornamental areas that are traversed by roadways lose much by having their surface cut up (compare heading 179 & 208, also figs. 325, 326 and 404). Examples of ornamental squares with footpaths only are shown
in figs. 398 to 402 and 406, also figs. 949 to 952 and especially the Viktoria-Luise-Platz in Schöneberg near Berlin (fig. 953).

Provision should be made for some shady walks and quiet seats, if possible with a view of fine buildings or of particularly attractive parts of the square, also for fountains, monuments, vases and, where the area is more extensive, for pillars, columns and similar architectural pieces. Rows of trees may surround the area but only if it is large should they should cross it. Those varieties should be chosen that get their leaves early, have beautiful blossoms, do not bear any of the seeds or fruit that littler up the walks and that keep their leaves late into the autumn. The inner space should be ornamented with lawns, evergreen plants, shrubbery and regular flower beds, the position of which depends on the nature of the square and especially on the position of the fountains etc. Suitable evergreen plants are Ilex, evonymus, rhododendrons, cherry-laurels; ornamental shrubs are: spirea, weigelia, deutzia, barberry, lilac, elderberry, etc. Conifers have the disadvantage that the dust sticks to them; in any case only those sorts should be used that can stand the climate.

If the landscape garden style is used it is even more necessary to limit the number of ways as far as possible so as to obtain at least a few landscape scenes of some extent; the ground should be undulating so as not to give sharp contrasts to the regular forms of the buildings and streets and to the stiff lines of the enclosing fence. Especially in French garden areas the artificial depressions and rises in the ground are often unnaturally exaggerated.

e) Recreational areas.

We use this term for these spaces whose principal purpose is not to ornament the squares but rather to provide quiet, shady spots where people and children can rest or play. These recreation areas are not as common in Germany
as in France and England. In figs. 410 to 412 three simple German examples are given; fig. 954 is an example in the old city in Cologne; Hamburg has beautiful spaces of this kind. Figs. 855 to 960 are Parisian recreation areas.

The Cäcilien-Kloster in Cologne(fig. 954) shows a rectangular playground with seats inside a regular setting. The six Parisian squares: SteClotilde, Montholon, Popincourt, Innocents, St. Jacques and Ste. Geneviève are informally treated, liberally provided with chairs and benches where the ways widen also offer some space for children’s play. Ste. Clotilde and Popincourt are perhaps a little too stiff
Landscaping of Friesen Plaza in Cologne (a. circular element with ornamental bushes, b. ivy bands with flowers inbetween, both elevated towards the median, c. foliage plants, d. tall roses, connected through clematis garland, e. restroom (not completed), surrounded by ornamental bushes, f. bench, g. linden tree, h. enclosure, i. gravel path)
and studied in effect but the squares Montholon, Innocents and St Jacques are magnificent, offering beautiful, quiet spots for rest in the middle of the bustle of the city. The Grotto pond in the square Montholon, the large fountain in the Square des Innocents and the old Jacob’s Tower in the Square St Jacques lend a special charm to the garden areas. The Square Ste. Geneviève in Belleville is surrounded by four rows of trees under which the children play while the planted
Fig. 949
Oval garden plaza

Fig. 950
Landscaping of a rectangular public plaza with regular pattern (1-6 seats, a. foliage plants and evergreen bushes, b. very low hedge, c. ornamental elements of periwinkle and ivy, d. median group)
space in the centre offers a pleasant opportunity to sit.

Similar to the Cäcilien-Kloster, but circular, is the Square de la Réunion in Paris, (fig. 962) consisting of a double ring with trees, a fountain in the centre and a thick hedge round the whole. But particularly worthy of imitation are the recreation areas on both sides of the fountain between the streets Mignard and Spontini (fig. 961); although these are really nothing more than wide planted streets inside the hedge-like enclosures place has been gained for two rows of comfortable seats.

Recreation areas for children (children’s playgrounds) should be properly
equipped (compare heading 212); there should also be a covered pavilion or hall in which they can take refuge when it rains, a drinking fountain and a lavatory if the area is large enough to accommodate them.

Recreation areas are quite differently enclosed from ornamental squares. The ways through the latter are always open, those in the latter only at special times. Consequently recreation areas are strongly fenced in and have gates; while it is being used however the whole area inside is under the constant supervision of the superintendent so that only very low divisions between the lawns and the ways are required. These may consist merely of a low iron rail or wire fastened to posts, low iron railings, arches of cast iron etc. (compare figs. 885 to 888 and 906 to 912). The outside fences of both closed and open ornamental squares may consist of the same; often however ornamental oak fences of graceful design (for instance, those by Schliessmann in Kastel-Mainz) or higher iron fences are used. If the outside fence is low the flower beds are often enclosed by special higher fences or wire.

Two strong railings or balustrades round Parisian recreation areas are
shown in figs. 963 and 9644; the latter figure also shows the gate. As these are intended really to enclose the areas such railing should be at least 1.10m better 1.25 or 1.35m high; in some places they are as high as from 1.35m to 2.50 m. The disadvantage of having them so high is that they interfere with the view from outside.

The general use of such recreation and playgrounds also in German cities would be very desirable.
PART VI

CHAPTER 3

Parks

a) Park Gardens and Park Woods

Parks include on the one side park gardens and park woods covering connected areas of from 5 to 200 ha and on the other the long planted walks or park promenades (parkways). As regards the former only those areas come under consideration for us that are generally accessible to the urban population, offering opportunity for exercise in the open air, the enjoyment of nature, recreation and companionship, such as public gardens, folkgardens, city parks, woods, etc.

The larger these artificial landscapes can be made the better – but with a definite limitation which is based on the fact that the value of a park or woods sinks the farther it is removed from the city, hence that for a large city several smaller areas are preferable to one large park or woods. 5 ha was given above as the minimum size; it is hardly possible to develop landscape scenes with walks and pleasure grounds for large numbers of people on smaller areas. It is better if possible to have

Fig. 954
Recreational place Cäcilien-Kloster in Cologne

Fig. 824.
Fig. 955
Square des Innocents in Paris

Fig. 956
Square Ste.-Clotilde in Paris
Square Montholon in Paris

Fig. 957
Square St.-Jacques in Paris
As no city of 20,000 or more inhabitants should be without its public garden, so too large cities need several parks so that all parts of the population may be benefited by them. An average proportion would be one park of 10 ha in size for every 50,000 inhabitants. If the density of the population were 250 persons per 1 ha the relation of the public garden area to the city area would be 1:20, not including the ornamental streets and squares. If these be included the average relation would be 1:10 as that of 100 ha of city area about 30 ha would be in ordinary streets and squares, 10 ha in planted area and 50 ha in building land. If the proportion of planted area is greater so much the better. In addition there may be one or more larger wooded parks outside of the city limits. Areas of less than 30 ha in extent may be regarded as park gardens, those above that as park woods.

The city park is either open or closed according to whether it is accessible from all sides or is entered through certain gates. The latter is more like a private park in the country; it is desirable for city purposes only if owing to local conditions the public garden is not surrounded by streets and properties but has to be laid out at a certain distance from the city and therefore requires greater protection. Open, readily accessible parks and woods, like the Tiergarten in Berlin, the Hofgarten in Düsseldorf, the Wallanlagen in Hamburg, are better adapted to city needs. There is no reason why special parts (restaurant gardens,
Fig. 961
Tree alleés with benches between Mignard and Spontini Streets in Paris

Fig. 962
Landscaped Square de la Réunion in Paris

Fig. 963
Enclosure of the Square des Innocents in Paris
concert gardens, flower gardens, botanical gardens, greenhouse) should not be separated from the open park by some kind of enclosure. In general it is ugly to make the backs of properties the boundaries of a public garden because the view of the yards and rear buildings is not usually calculated to rejoice the eye of the spectator or to add to the landscape. But an exception, and indeed an exception worthy of imitation, is the arrangement by which the park connects directly with the properties the owners of which have the right of entry, and which are built with special consideration for the park. A magnificent example of this is seen in the Parc de Monceaux in Paris (fig. 965) which is surrounded by buildings on three sides in such a way that between the park enclosure and the closed fronts of the houses there are private gardens of from 10 to 13m in depth from which little gates lead into the public park. In this way park dwellings are formed that are among the finest in Paris.

Similar to this is the Blasewitz wooded park near Dresden, laid out by Neumann and improved by Bertram (see accompanying plate) the public street fronts of which are bordered by a circle of villas which have private entrances to the park in the rear. This arrangement is of great economic advantage as by making the most use of the street fronts for building the cost of the park construction is reduced and a special enclosure which would otherwise be necessary because of the distance from the city, is not essential. Other examples of this sort are shown in fig. 966 in Magdeburg and fig. 967 after a design by R. Hömann. It seems as if such inside parks were becoming more and more popular both in Germany and in Switzerland. It is important as we have already said that the architecture
of the houses surrounding the parks, whether they be built in closed rows or detached, should be such that both the view of the parks from the houses and the houses form the parks are pleasing. This is especially true of areas like that in fig. 968 which, like the Parc de Monceaux, is not entirely surrounded by houses.

In almost every case these parks are laid out in the natural or English style, because this best corresponds to the purpose of bringing a bit of nature into the city or into its neighborhood. Public gardens in the French or Italian style are now seldom laid out; but single parts in this style, like allees, terraces, flower gardens etc. may well be used at the entrances, in front of buildings, meeting places etc. A park should be not merely a beautiful piece of nature but should show the work of human hands and human minds. Hence we shall always find a mixture of natural landscape and geometrical lines.

The making of a park is divided into the disposition of the ways, the treatment of the ground, the vegetation, the arrangements for recreation and social gathering and the artistic decoration. The latter will be dealt with under c in this chapter.

On the one hand the ways should form the necessary, nearest possible connections between the interesting points of the garden, and on the other they should lead the spectator unconsciously in such a way that he sees the landscape views one after another in the most effective succession. The direction and situation of the ways should always be natural; hence circuitous routes should not be taken where natural conditions allow of the point being reached directly; the way must not lead over a hill of the line of progress on the level is without obstacles. Also in order to realize a curve that look beautiful on paper unpleasant conditions of ascent must not be carried out; even an ascent leading to the top of a hill from which a view is obtained must be made as natural and unconscious as possible. Straight lined ways are admissible in parks only as exceptions because straight lines do not accord with the natural formation of the ground and the variety of the vegetation and because the views seen from a straight-lined way lack variety. Only in large traffic ways cutting through the park which are not intended as pints from which to view the landscape, in approaches to important works of art which may form terminal points and finally in the neighborhood of buildings are straight lines in the ways permissible and then only for short distances. Apart from these the ways should run in pleasant curved lines in such a manner that they are pleasing to view and so that the park figures which they outline appear, as far as they can be seen, in attractive forms. As such figures are seen much foreshortened the ways should be so arranged that they are viewed in the long rather than in the cross direction. Care should be taken that the area is not too much cut up by ways; those without a definite purpose are superfluous and had better be omitted. The ways must never be regarded as the principal but only as the subordinate parts of the park; the chief end is to choose the right kind of vegetation, group it gracefully and to produce fine landscape views.

The width of the footpaths is from 3 to 10m; it varies according to the need. The ways may only be planted with rows of trees if they do not affect the landscape views; hence shady walks, lovers lanes etc. should be situated along the edges of the landscape or inside dense groups of foliage. Driveways and riding paths are admissible only in parks of considerable size, at least more than 10 ha. In addition it is advisable to separate the footpaths
Fig. 965
Parc de Monceaux
in Paris
from the driveways and riding ways and if possible also to the two latter from each other. The division is made by narrow or wide park fields or at least by strips of lawn with or without rows of trees as shown in fig. 969. If the formation of the ground admits of it charming results can sometimes be obtained by leading one way – it had best be the footpath – across the other by means of bridges or tunnels. It is desirable to have all the ways meet at some one point so that people may easily meet one another and find their way without difficulty; spots from which a fine view is obtained, shady seats or small ornamental buildings are excellent points for this purpose.

The treatment of the surface of the ground is the necessary accompaniment
of the arrangement of the ways, whether the formal or the natural garden style is used. An undulating surface is more beautiful and effective than a flat or steadily ascending one because it lends variety to the views and admits of a more attractive grouping of vegetation and lawns, also because a garden appears the more attractive the more opportunity there is to look at it from above. Hence the terraces and steps in the Italian gardens; hence also the high-lying paths and the hollows in the surfaces of the English parks. Looked at from a certain distance a slightly rising lawn or flower garden presents a much better appearance than a level one, or worse one that slopes downward.

But the gardener must never do violence to the natural formation of the ground; he may improve it and slightly change its form but only in so far as these changes do not oppose its natural shape. The artificial surface of the park must always look as if nature herself might have formed the ground as it is. It must not look artificial; all that is unnatural must be avoided. Bodies of water and streams belong in the lowest points, grottos of rock on steep slopes or similar places where they would naturally be, meadows in the valleys, woods or groves on the heights etc. It is a matter of course that points and ways affording fine views should be on the sides or tops of slopes; at the same time these views should be not only of parts of the park but also of the whole surrounding landscape, as well as of prominent buildings; mountains and other distant views should be carefully

**Fig. 967.**

*Hömann’s Entwurf für einen Innenpark.*

Fig.967

*Hömann's draft for an inside park*
taken into account. For the design as well as for the execution a complete topographical plan of the garden area is indispensable; the appearance of the landscape views and especially the perspectives are largely dependent on the topographical lines. Once the whole formation of the park surface is established the work on the details can be begun. The lawns and plots must be closely adapted in their shapes to the character of the land; pattern-like hollows with the customary elevations at the edges and where bushes are planted are entirely inadequate. As the relation between the park and the natural scenery about it is a very close one no imitation of an already existing park can be made in another place; every new park must be a development and supplementation of the natural material at hand.

As the landscape views that the designer has in mind when a park is planted can be realized only after years have passed the planting must always be considered only
preparatory. A park without old trees is only in the process of becoming a park; without water it is a deficient one. Young planting must retain the character of woods and consist generally of trees that predominate in the landscape. The grouping requires natural free lines with careful consideration of light and shade, light and dark tones and should be so combined that good views are obtained from certain points. In this respect the work of the landscape gardener is rightly placed side by side with that of the landscape painter. Both must learn from nature the way her beauties are created and both must seek to idealize and reproduce them, the one in reality, the other on canvas.

The chief difference of light and shade is expressed in the light bright lawns and the dense dark groups of trees. The higher slopes should be covered with woods which gradually decrease in density towards the bottom of the valley. The proper relation between woods and lawns is therefore determinative in making the landscape peaceful and pleasant or dark and rugged. Another way of obtaining color effects is to mass the trees in such a manner that they meet the eye like the wings of a stage which produces an artistic toning down and graduation of the views; a few single trees or groups of trees planted in front of the outlines of the massed trees relieve the hard impression and intensify the appearance of easy naturalness. And just as the painter finally puts in a few high lights or very deep shadows, so too the gardener is able by touches of light and shade, by lightening one group of trees and making another denser, to intensify or complete the intended effect. But the contrasts by means of which both the gardener and the painter obtain the greatest effects do not consist in mingling or uniting what is contradictory but in contrasting what is rough with what is soft, the harsh and the mild, the light and the dark.

The main view of the park should be developed from the point where the people gather, hence from the principal resting place, the restaurant building etc. Also the first view obtained on entering the park should be especially considered. It is customary to beautify the foreground at such points by flower gardens in the conventional style and by fountains and statuary; but the main view should still be of the whole park. In wide curves, in artistically increased perspectives the whole landscape should lie before us and when we leave this point and stroll on into the landscape we are confronted by a series of ever changing views; at important points distant views are kept open and sometimes in the dense woods we are surprised by a sudden light opening through which we catch a clear glimpse of a beautiful vista.

It would take us beyond the purpose of this volume to enter more fully into the principles and details of landscape gardening. These suggestions should suffice for the architect, for the "city builder" it is not his task to lay out parks without the aid of the landscape gardener. He must however from and train his judgment of this subject; his artistic taste will then enable him to understand the details. He is mainly concerned with choosing the locality and making the programme for smaller garden areas as well as for parks. Hence be it once more emphasized that the low lying parts of the city are the most suitable for this purpose (see heading 210). Just as pieces of architecture look best when situated on a height or an ascent, that is when we must raise our eyes to look at them, gardens appear at their best when we look down at them. It is of great value when the locality chosen for such a garden or park already possesses trees, or better woods, as was the
Fig. 971
Parc des Buttes Chaumont in Paris
case for instance in the Tiergarten in Berlin, in the Bois de Boulogne in Paris and in the Bois de la Cambre near Brussels. Under such conditions it is easy to make shady walks, magnificent natural groves, which otherwise would take decades to develop.

Opportunities for recreation, diversion and social gatherings are of paramount importance in the public park. There should be grounds for people’s festivals and children’s games, especially separate children’s playgrounds, grounds for ball games or croquet, an outdoor gymnasium, a racetrack, a range of shooting and similar arrangements. A lake or pond bordered partly by low meadows, partly by steep shady banks offers an opportunity for boating in summer, skating in winter. Besides these things outdoors there should be half-covered structures like arbors, colonnades etc. and finally a roomy, closed restaurant building is always indispensable, serving not only as an attraction during doubtful seasons but also as a refuge in case of showers. But once the necessity for such a covered building is seen it is easy to go a step farther and make a concert hall in the restaurant building. It this main building is carried out in monumental style it occupies the same position with regard to the park as a country house or castle does to the
private park. Examples of this are seen in the Stadtpark in Vienna, the Palmengarten in Frankfurt a. M. the Stadtgarten in Karlsruhe and in other places. Smaller structures like gardners’ dwellings, nurseries, a dairy, a shelter for riders, are placed in secluded parts of the park where they may aid in forming pretty scenes. For foliage is very effective against the background of light-colored walls. These buildings should not however be painted white which from a distance produces the effect of a wash out on the line, but should be light grayish or brownish in tone that harmonizes with the green and throws the colors of the landscape into relief. Dark slate roofs look like a hole in the landscape, consequently red is an advisable color and one that is found in some kinds of slate and in most roofing tiles.

What has been said of the treatment of park gardens applies also to the treatment of park woods with the natural distinction that in the latter case the proportions are greater, there are not as many paths and the denser mass of woods and groves with a few meadows and vistas takes the place of the carefully cultivated open character of the garden. There is no sharp division between them; the garden merges unnoticeably into the woods.

The English parks generally consist of rural scenes with wide lawns and little woods; sometimes even trees seem to be lacking. People sit or play on the grass consequently few paths are necessary; flowers are not much used for ornamentation; domestic animals roam about and graze at large. Fig. 970 shows Battersea Park in London, about 75 ha in extent, unusually rich in flowers and foliage plants and characterized by the usual extensive grassy fields. Hyde Park (158 ha), Regents Park (190 ha) and especially the new Victoria Park (117 ha), show the English characteristics of wide driveways, extensive grassy areas, numerous grounds for athletics and games (tennis, cricket etc.) in a perhaps still more pronounced manner.

In North America parks, patterned after the English ones, are widespread, especially in New York, Boston, Chicago and Washington. As long ago as in 1890 Chicago possessed besides a number of smaller areas, 10 larger public gardens with a total area of 2847 Morgen.

The French parks often suffer under exaggeratedly small landscape scenes, too many little hills, valleys and ways, a superfluity of flowers and foliage plants. This is especially true of the Paro de Monceaux in Paris (fig. 965), where the surrounding of the tree trunks and bushes with regular borders of flowers, the plentifulness of horticultural and architectural motives, the overloading with colored foliage indisputably produces an impression of magnificence but also of exotic artificiality. The same is true in a greater or less degree of several of the Parisian recreation areas discussed under heading 670. Less artificial and richer in grand landscape views and sheets of water are the park woods of Boulogne and Vincennes; wildly romantic scenery is found in the mountain parks on Montmartre and in the Buttes Chaumont (fig. 971). In the last named park which is only 27 ha in size, old stone quarries have been used and actual mountain scenes created with cliffs fifty meters high, grottos, waterfalls, a stone bridge thirty meters high and a suspension bridge 64 m in length which is stretched high in the air from rock to rock above the lake and street. Thus in the French parks we must admire the boldness and grandeur of the designs, the

3 See: New Review, May 1890
tasteful decoration and excellent technical construction of the ways, waterways etc. but the quiet simple beauty of nature is often lost in the mass of artificial ornamentation.

The parks in German cities try to avoid the exaggerations of English and French areas; they are carefully created landscapes combined or dotted with regularly formed gardens. They do not conceal their artificial origin and seek to adapt themselves as closely as possible to their purpose, recreation in the open air. As examples we give in figs. 972 and 974 the Humboldt-Hain in Berlin and the Volksgarten in Cologne which scarcely need further explanation; they are respectively 35 and 15 ha in size. The Humboldt-Hain, designed and executed by G. Meyer, is at the same time instructive, the plants being geographically arranged and the botanical names given. The Cologne Volksgarten, laid out by Kowallek, is fortunate in that the streets surrounding it are high and have changes of level amounting to 10m. Mention should be made of several examples of amusement parks given in part IV, half volume 4 of this “Handbook”, Tivoli in Copenhagen, Palmengarten in Frankfurt a. M., Stadtpark in Mannheim etc. as well as of the Innocentia-Park and the Eppendorfer Park in Hamburg.4

The advantage of lying in a hollow between two higher streets is also possessed by the Oersted-Park in Copenhagen (fig. 973), but the treatment of the lake and the manner of planting leaves something to be desired. Nothing is more beautiful than parks that spread up out of the valley over the side of the hill with views down and into the distance! The environs of Rome, Naples, Florence, the garden-like towns on the Riviera, the park about the palace in Buda, the Wilhelms-Höhe near Cassel are well-known examples of such areas. The Gartendirektor Mächtig5 has beautified the Kreuzberg in Berlin in a similar manner; the whole slope of the mountain has been transformed into a public park with grand cascade-steps (fig. 975) in the axis of the Grossbeerenstrasse and of the National-Kriegerdenkmal.

b) Park Promenades

An intermediate thing between the park gardens and the city streets with rows of trees and garden areas, discussed in chapter 1 of this part, are the planted parklike walks leading out from the city, or in its environs; the park promenades. They have the same natural curved lines as the park gardens but are long like the city streets. But whereas the latter are surrounded by buildings the park promenades should as far as possible afford a free view of nature, over valley and city of which only the uglinesses should be concealed – in contrast to the park gardens and park woods which should offer landscape views in themselves.

Other park promenades serve to connect different parks in the city.

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4 See: Hamburg und seine Bauten. Hamburg. 1890 pp286,287
5 See this design in: Deutsche Bauz. 1880, p. 237
Particularly in American cities, for instance, in Boston are the parkways running through the city and making all the public gardens in a certain sense one large park, developed in an admirable manner.6

It is not very rare to find one side of the promenade lined with country houses or city villas. Among these we should have to include first of all the ring promenades on the sites of old city walls which were discussed under heading 418 and illustrated by figs 596 to 598, parts of Bremen and Frankfurt. The authorities in those cities – not only in the large ones but also in towns – in which the walls and ramparts are still preserved, at least in part, should take the utmost care to preserve the ring promenades and develop them by horticultural treatment.

The promenades that lead out from the city into the country are treated like parkways or country roads; in the former case the planting is more like a landscape in character, in the latter it is more regular and formal. Figs. 976 and 977 are two examples. Those ways that are intended either for foot passengers alone or for carriages and riders usually lead to a point where a fine view is obtained, to a rest or bathing resort, to a park, a forest or a cemetery. Especially in the main approaches to the city cemeteries there is room in many places for considerable improvement. Two terminal points of promenades, affording beautiful views, are shown in figs 978 and 979.

One of the finest city promenades in existence is the so-called Rheinanlage near Coblenz; it was laid out by command of the Empress Augusta and extends along the banks of the Rhine above the city for 3km. The accompanying plate gives a fair idea of it. It is in general a driveway and walk between rows of high trees (chiefly elms and plane-trees), ornamented both on the side towards the water and that towards the land with almost too plentiful horticultural and artistic decoration and widens in parts into large planted areas.

In bathing and pleasure resorts and sometimes in other cities even the ways that lie in the farther environs of the town are beautified by horticultural and artistic decoration. If such park promenades are extended all round the city and connected with one another the whole locality is to a certain extent transformed into a single park area especially if there are small ornamental ponds and brooks; the few buildings and farms that adjoin it and the agricultural fields influence its character but do not detract from it. In this way a monotonous landscape can be beautified, one that is beautiful in itself can be made the most of. There are many examples of this in the surrounding of English country seats but they are also not lacking in the environs of our bathing resorts and towns which are the residence of a ruling prince. To the former belong Baden-Baden, Harzburg and San Remo, to the latter Potsdam and Wörlitz near Dessau. The treatment of such a park area is shown in fig. 980.

Finally as examples of park promenades in the farther environs of large cities mention may be made of the beautiful Viale dei Colli which surrounds Florence on the hilly side to the south and affords beautiful views of the city and valley, and the Nuovo Passeggio

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6 “Der Städtebau” 1905, p. 113.
del Gianicolo. The latter lies on the mountain slope of the Gianicolo, embraces a part of Rome beyond the Tiber and offers, especially at sunset, beautiful and far views of the eternal city, the Campagna and mountains.

c) Decoration

Just as dwellings and city streets must be furnished and ornamented so too parks require adornment. The latter is the more necessary the smaller the park is, hence in the city gardens proper and in the ornamental and recreation areas discussed under d and e in the last chapter.

The nature of the articles used for adornment is either horticultural or architectural. The former will be found exhaustively treated in a textbook of gardening, the latter in a work on garden architecture. Brief mention is all that can be undertaken here.

To horticultural decoration belong all kinds of flower pieces (compare headings 664 and 665, figs. 927 to 944 and fig. 947), ornamental ponds and fountains, grottos and labyrinths, arbors and places to sit; also flower stands of iron and wood, of tree stumps and pieces of rock; single pieces of rock and boulders, covered with ferns, moss and climbing plants; also climbing plants on walls and trees.

Architecture comes into play in all kinds of garden furniture, steps, terraces and fountains (fig. 981 to 984), in the equipment for conducting water and illuminating the grounds (fig. 985 & 986), in bridges, cascades, seats, colonnades and verandahs, in notice boards and signposts (fig. 987 to 989 and 990), in fences and gates, pavillons and shelters of all kinds, in Belvederes and all
Fig. 974
Layout of the new Volksgarten (People's garden) in Cologne
kinds of houses for swans, ducks and other birds, in large and small buildings for
dwelling, refreshment and amusement\textsuperscript{7}.

The sculptor’s work is seen in monuments and other figures, in vases and
fountains, in imitations of antique and modern sculpture.

It would take us too far to deal with all these things at length. It must
suffice here to say that the garden with everything in and about it must be in
harmony that the whole may express a single conception in some one style and
that too much artificial decoration is rather to be feared than too little. But
nowhere do works of art find a more suitable, effective place than in public
gardens where they can be looked at and enjoyed in peace and quiet and where
the human mind, calmed and elevated by the influence of nature, is most ready to
receive the impressions of art.

In parks laid out in the Italian and French styles the placing and
arrangement of artistic ornaments is more or less dependent on axial relations. But
even in landscape gardens works of art cannot be arbitrarily set up. Keeping open
or closing the intended lines of vision, careful consideration of the distance from

\textsuperscript{7} See also part IV, half vol. 4 of this “Handbook” (part IV, sec 2, chapter 2: Volksbelustigungsgärten und sonstige
grössere Anlagen für öffentliche Lustbarkeit.)
which it is desirable to view the object (compare headings 600 to 603), choice of effective background, the fitting of every object into the landscape – all these are considerations which rightly limit and guide the fantasy of whoever places the works of art.

An artificial water supply is as a rule indispensable, either by connection with existing water works or by constructing them especially for the park. Because of its life and its contrast to the plants and ways, water gives the greatest charm to a park: a lake or clear pond is rightly called the eye of the landscape.

As regards the construction of the ways reference may be made to headings 558 to 566; as regards illumination to part V, chapter 2. On account of the vegetation electric light is indeed to be preferred to gas; but we can scarcely expect that the latter should be entirely excluded. Every possible precaution however must be taken to prevent the poisonous fumes penetrating into the soil. In order that the fumes may easily reach the air it is customary to lay the pipes very near the surface, that is directly underneath the sod or the surface of the ways; it is still better to lay them above ground, on the surface wherever this can conveniently be done.

Open parks and open ornamental areas require illumination at the same time and to the same extent as public streets and squares; enclosed ornamental area (see heading 667) require no light at night or only on very special occasions; the enclosed park or recreation area can dispense with illumination as soon as the gates are closed late in the evening.
Fig. 977
Aachener Street in Cologne - Street zum Friedhof (cemetery) (draft)
CONCLUSION

If, at the end of our considerations we glance back over the whole field of city building, we will gladly recognize that the significance of this word is greater than appeared in the introduction. City building is not only the entirety of all that construction which makes the building of dwellings and the traffic possible to the inhabitants, and the erection of public buildings to the community; city building does not provide only the ground and the frame for constructive individual activities, but it is also a comprehensive activity that provides for the physical and mental well-being of the inhabitants; it is the fundamental practical public guardian of sanitation and health; it is the cradle, the robe, the ornament of the city, the comprehension of all private and public enterprise in a higher unity. City building is an important, independent art. Through it a very large part of the population receives the external comforts of life; what is produces is for the poor as well as for the rich. In city building we see the artistic activity of equalizing justice, cooperation in the removal of social abuses and hence an active influence for social well-being. It is not very long since the German, coming home from abroad, especially from Belgian and French cities, sadly perceived how far behind his home cities stood in the various provinces of city building and also how little the cities themselves were conscious of this neglect, how they devoted themselves with enthusiasm and earnestness to the cultivation of art and science without feeling that the ground on which they lived and the surrounding in which they sought refreshment and recreation were directly opposed to these efforts. They might be compared to a sage in a torn coat in a dusty attic. The last decades have brought about great changes in these conditions particularly owing to men like R. Baumeister and C. Sitte; the political rise of the Fatherland has also
Landweg-Verfeinerung in der Umgebung der Stadt.

Fig. 980

Beautification of rural path near the city
benefited the development and the building of cities.

It is not rare now for Belgians and Frenchmen to visit our cities to learn from our progress.

But there is still much to be done to remove the old evils and new generations like new tasks always require renewed activity. It is not alone the architect or technical expert that is concerned in this activity; he is seldom given the leading position; he is mainly the workman and at the same time the instigator. The political representatives of the citizens must cooperate with him and above all he needs the aid of the energetic administrative officials. This final work is addressed to them all; ever to bear in mind the high requirements that city building makes of them, under which many have hitherto understood only the pavement and the building flush-lines but which means to the man with a grasp of the subject that whole artistic form and technical robe in which the city appears before us and which is one of the principal works for the welfare of mankind.
Fig. 985

Park street lamp with flower base in Hamburg
Fig. 853.

Park-Candelaber mit Blumensockel zu Hamburg.

Fig. 986

Park street lamp with flower base in Hamburg
Fig. 987
Sign in the zoological garden in Cologne

Fig. 988
Sign in Hamburg
Fig. 856.

Promenaden-Anzeigetafel zu Altona.

$\frac{1}{2} \text{ n. Gr.}$

Fig. 989
Promenade sign in Altona

Fig. 857.

Wegweiser im Park.

$\frac{1}{2} \text{ n. Gr.}$

Fig. 990
Signpost in park
Appendix
A. LAWS

I. Prussian Law of July 2, 1875, relative to the laying out and alteration of streets and squares in cities and rural districts

§ 1.
For the laying out or alteration of streets and squares in cities and rural districts the street and building flush-lines are to be established by the magistrate (Gemeindevorstand) in agreement with the local board according to the public needs and with the consent of the local police authorities.

The local police authorities may require the establishment of flush-lines if, in the exercise of their authority, they perceive it to be necessary.

A street in the sense of this law includes the roadway and the footways.

The street flush-lines form at the same time the building flush-lines, that is the boundaries beyond which buildings may not be constructed. For special reasons however a separate building flush-line, but one that, as a rule, retreats not more than 3m from the street flush-line, may be established.

§ 2.
The establishment of flush-lines (§1) may be for single streets or parts of streets or, according to the probable needs of the near future, building plans for larger areas may be made.

If the matter at issue is the rebuilding of whole city districts that have been destroyed by fire or other catastrophes it is the duty of the local board to decide at once whether and to what extent a new building plan is to be made and if so to provide immediately for the establishment of such a new plan.

§ 3
In establishing flush-lines consideration is to be given to the needs of traffic, protection against fire, and public sanitation, also care is to be taken that the streets and squares are not rendered unsightly.

Hence provision must be made for adequate width in the streets and for good connections between newly constructed highways and those already in existence.

§ 4
Every establishment of flush-lines (§1) must contain an exact designation of the properties and parts of properties affected and must fix the level and indicate the intended drainage of the streets and squares involved.
§5

The consent of the local police authorities (§1) may only be refused if these authorities find that the exercise of their duties requires such a refusal.

If the magistrate of the district does not acquiesce the departmental committee decides the matter at his request.

The same body, at the request of the local police authorities, decides the question of needs if the magistrate of the district (Gemeindevorstand) refuses the establishment requested by the local police authorities.

§6

If the plan of the intended establishments (§4) affects a fortification or if public rivers, roads, railways or railway stations are involved the local police authorities must see that the authorities involved are early given opportunity to protect their interests.

§7

After the consent of the local police authorities, or of the departmental committee (§5) has been obtained the magistrate must make the plan public so that it may be examined by everyone. The manner in which this is done depends upon local custom but at the same time notice must also be given that objections to the plan must be filed with the magistrate within a certain definite period of not less than 4 weeks.

If the establishments affect only single properties it is sufficient, instead of making the plan public and laying it open to view, to notify the owners of the properties affected.

§8

If the objections that are raised (§7) cannot be settled between the magistrate and the persons who raise the objections the departmental committee disposes of them. If no objections are raised or after they have been finally settled (§16) the magistrate must formally establish the plan, lay it open to public view and give notice according to local custom of the manner in which this will be done.

§9

If in the establishment of flush-lines several districts or towns are affected a conference on the matter must take place between the magistrates of the communities involved. Points about which the magistrates fail to arrive at an agreement are to be referred to the departmental committee for settlement.

§10

All flush-lines established prior to the enactment of this law can be done away with or altered only in accordance with the preceding regulations. For the establishment of new or the alteration of existing building plans in the cities of Berlin, Potsdam, Charlottenburg and their immediate surroundings the royal consent is necessary.
§11

On the day on which the plans are made public (§8) the regulation restricting property owners from building or making alterations that extend beyond the flush-line becomes effective. At the same time the town or city receives the right to take from the owner the area determined by the street flush-lines for streets and squares.

§12

Local statutes may provide that on streets or parts of streets which have not yet been completed, according to the regulations of the building police, for public traffic and for construction, dwellings with an entrance on these streets may not be erected.

The statute must fix the more precise regulations within the limits of the foregoing order and requires the approval of the district councillor. Objections to the decision of the district councillor must be presented to the Provincial Councillor (Provinzialrat) within a period of 21 days.

After that statute has been approved it must be made public according to local custom.

§13

An indemnity for the limitation of construction provided for in §12 cannot be demanded; and for the deprivation of limitation of property in consequence of the establishment of new flush-lines it can be demanded by property owners only in the following cases:

1. if the areas for streets and squares are given up to public traffic at the request of the city or town
2. if the street building flush-lines affect existing buildings and the property is cleared of buildings up to the new flush-line;
3. if the flush-line of a street that is to be newly laid out affects an as yet unbuilt on building plot which, at the time this new flush-line is established, lies on an already existing street that is completed and ready for public traffic and for construction, and the buildings are erected in the flush-line of the new street.

In all cases where land is taken for streets and squares indemnity is granted. It is also granted in those cases under No 2 in which the limitation results owing to the establishment of a building flush-line that differs from the street flush-line if the area lying between these two flush-lines was formerly built on.

In all the above mentioned cases the owner may demand that the city or town take over the whole of his property if the flush-line cuts it up to such an extent that the remaining piece is not fit for construction according to the regulations of the building police.
§14

In fixing the indemnities (§13) and carrying out expropriation of land the §§24ff of the act of June 11, 1874, relating to the expropriation of land, are applicable.

Disputes about the dates when claims for indemnities become due must be settled by the courts.

Unless for special legal reasons some one individual is responsible for the indemnities they must be raised by the city or town within the limits of which the land in question lies.

§15

By local statutes it may be provided that when a new street is laid out or an existing one extended, if such a street or extension is intended for construction, and when construction is begun on hitherto unbuilt on streets or parts of streets, the promoter of the enterprise or the owners of the adjacent property— the latter as soon as buildings are erected on the new street— are responsible for the “clearing”, equipment, drainage and illumination of the street to the extent in which it is required and for their maintenance at periods not exceeding 5 years, or they may be required to pay a sum sufficient to cover these costs. The owners of the adjacent property cannot be assessed for more than half of the street width and if such width exceeds 26m for not more than 13m width.

In calculating the costs, the cost of the first construction of the street and of its maintenance must be taken and distributed among the owners according to the length of the street frontage of their properties.

The statute must fix the more precise regulations within the limits of the foregoing order. As regards its approval, contestableness and publication the rules given in §12 apply.

For the city of Berlin until such a statute shall be issued, the regulations of December 31, 1838 remain in force.

§16

In the cases of §§5, 8, and 9 appeals against the decision of the Kreisausschuss (departmental committee— no exact English equivalent) may be filed within a period of 21 days with the Bezirksrat (district councillor— no English equivalent).

When it is a case of re-building whole parts of towns or cities destroyed by fire or other catastrophes the period in which such appeals may be made is 1 week.

§17

The duties and obligations assigned to the Kreisausschuss (departmental committee) and in a higher instance to the Bezirksrat (district councillor) in §§5, 8 and 9 are endorsed by the Bezirksrat and in a higher instance by the Provinzialrat (provincial Councillor— no English equivalent) in towns with more than 10 000 inhabitants belonging to a rural district or, when several townships are involved (§9) if one of them is of this size. In urban districts the endorsement lies with the Provinzialrat and, at the
request of the city in a higher instance with the Minister of Commerce.

In Hohenzollern lands the Amtsaußschuss (official committee—no English equivalent) takes the place of the Kreisausschuss and also approves the local statutes (§§ 12, 15). Appeals are made to the Landesausschuss (committee of the estates of the realm—no English equivalent)

§18

Until Kreisausschüsse, Bezirks- and Provinzialräte are formed in the various provinces of the monarchy the Bezirksregierung (district government,—no English equivalent) must perform the duties accruing from the passage of this law.

Decisions in the higher instances, §§5, 8 and 9 are made by the Minister of Commerce, in §§12 and 15 by the Oberpräsident (highest administrative official at the head of the province—no English equivalent, similar to Lord Lieutenant).

For the city of Berlin, until a separate province of Berlin is formed, the exercise of the functions assigned in §§5, 8 and 9 to the Kreisausschuss is performed by the Minister of Commerce etc., the approval of the statute (§§ 12 and 15) rests with the Minister of the Interior.

§19

All general and special legal acts that conflict with the provisions of this law are herewith abrogated.

All the regulations issued by administrative authorities, police regulations, local statutes that conflict with the provisions of this law are nullified.

§20

The Minister of the Interior is commissioned with the execution of this law.

The following instructions for carrying out the foregoing law were issued on May 28, 1876 by the Minister of Commerce, Trade and Public Works.

Instructions for the Establishment of Flush-Lines and Building Plans.

In accordance with the act of July 2, 1875 relative to the laying out of streets and squares in cities and rural districts the following instructions and regulations are issued in order that the process of establishing flush-lines may be made as uniform as possible and that a sufficient basis may be obtained for judging of the practicability of the intended establishment of flush-lines.

§1

General instructions.

For the establishment of flush-lines according to the act of July 2, 1875 in as far as the appended regulations do not apply, the following measures are to be taken:
I. Situation Plans;
   a. flush-line plans in as far as the establishment of flush-lines in the construction of or alteration of single streets or parts of streets is concerned
   b. building plans in as far as the establishment of flush-lines for larger areas and whole districts is concerned;
   c. general plans

II. Elevations, under which are understood:
   a. longitudinal profile
   b. cross sections,
   c. horizontal curves and figures of the elevations in the situation plans

III. Written Explanations

§2
These proposals should present clearly and distinctly:
A. the present condition,
B. the condition that will result from the establishment of the flush-lines when the streets and squares are laid out.
The proposals must be made or endorsed by a certified surveyor and must be approved by a duly qualified architect or a building official in the employ of the city or town who can certify their correctness with his signature.

§3
A. Presentation of the Present Situation

I. Situation Plans
The scale to which the situation plans (flush-line and building plans) are drawn must not as a rule be smaller than 1:1000. Connecting streets must be presented in connection. If consequently the drawings of larger building plans are too widely for convenient use, they may be drawn to a smaller scale, not smaller than 1:2500. In such a case a separate flush-line plan on a scale of at least 1:1000 of each street on which the flush-lines are to be established, must be presented.
Every project must be accompanied by a general plan for which an existing printed or drawn plan or apart of such plan may be used.

§4
The situation plans must be extensive enough to make it possible to judge of the requirements that must be made in the interests of traffic protection against fire and public sanitation, in accordance with §3 of the act of July 2, 1875.
All existing structures, streets, ways, yards, gardens, fountains, open and covered drains etc, all boundaries must be indicated in this plan with black lines and, as far as clarity requires it, must be colored but only faintly. In addition the numbers or other marks of identification by which the separate building plots are entered in the register of
landed property and the names of the owners must be written in on the plan. Signs and figures referring to the present condition must be black. Every plan must be provided with a north line and a scale.

§5

II. Elevations

The indications of the levels must refer to a specially designated, as far as possible well-known fixed point, as for instance to the zero mark on a water gauge in the neighborhood, best of all, of the Amsterdam water-gauge and must be exclusively in positive figures.

Of every street projected in a flush-line or building plan, in as far as the exceptional regulations appended (§13) do not apply, a longitudinal profile on the longitudinal scale of the situation plan belonging to it and on an altitude scale of 1:100, must be presented. The line of the level which as a rule is to be drawn in the middle of the roadway and is to be interrupted by stations 100m apart with the necessary between stations at a distance of at least 50 m, must be indicated with its stations in the situation plans by a dotted red line.

Where considerable changes in the surface of the ground are to be undertaken or where near buildings, walls, ways etc. require special consideration cross sections are to be given. These must be on a scale not smaller than 1:250 and if they are not made at right angles to the main level their position must also be given in the situation plan.

In addition, if the ground is hilly this must be indicated in the building plans by horizontal curves at distances of from 1 to 5 m drawn in black dotted lines and the altitude figures given.

Altitudes must be given in meters and the figures rounded off to two decimal places.

§6

The altitudes of the existing streets and their surroundings must be so given that it is entirely possible to judge of the demands of traffic and of future drainage, also of the conditions of a possible later continuation.

The highest and lowest levels of all the waters that may affect the construction in view must be given, also existing sluice-sills, water-gauges etc, especially the water levels as far as they have been ascertained or seen necessary. In particular cases, the depths of the swamps or other characteristics of the ground that may affect the construction of streets, the thresholds of existing buildings, the level of the rails on neighboring railways etc all these must be clearly indicated in the profiles. Bodies of water are to be tinted blue and described, all other objects to be in black, the lines of the ground to be washed in in brown.
§7
Presentation of the Future Condition
General Instructions.

The setting up of the projects requires careful consideration of present needs and of those of the near future, special attention being paid to those points mentioned in §3 of the act of July 2, 1875.

In the interest of the furtherance of public sanitation and of security from fire a practical distribution of the public squares and fountains must be provided for.

As regards the street width in new streets it is advisable to assume that the limit beyond which building may not extend is:

a. in streets forming the main arteries of traffic not less than 30m
b. in side traffic streets of considerable length not less than 20m
c. in all other streets not less than 12m

As far as possible the grades of the streets under a and b should be not more than 1:50 and 1:40 respectively, that of the gutters should be not less than 1:200.

§8
Special Instructions
I. Situation Plans

In the general plan the streets and squares to be newly laid out or altered should be clearly indicated in red.

In the situation plans the projected flush-lines should be drawn in with heavy vermilion lines. If they are not identical with the street flush-lines the latter should be indicated with lighter strokes and the space between washed in with pale green. The projected gutters should be indicated by sharp dark-blue lines, covered drains with dotted lines and the direction of the current indicated by blue arrows, the streets and public squares to be pale red, those sides of the streets that are not to be built on, green. Existing buildings or parts of them which need not be pulled down when the flush-lines are established should be washed in darker in their characteristic colors than those to be demolished.

The names, numbers or other designations of projected streets and squares as well as their width are to be written in in vermilion.

§9
II. Indications of Elevations

In the longitudinal profiles the projected elevations of the streets especially the lines of the crowns of the streets should be drawn in in vermilion. The bridges, sluices, subterranean water drains, etc should be indicated with their width and heights.

At all the points where the slope is interrupted, at crossings, branchings of streets and other characteristic points vermilion is to be used, but figures referring to the levels of the drainage should be in blue.

The length of the street lines from one point of interrruption to the next together
with the proportional figures of the slope should be written in vermillion above the profile, the names, numbers or other designations of the streets above or below them.

If several longitudinal profiles belong to one situation plan care must be taken that the points where they join agree and are clear.

§ 10

If every street in which flush-lines are to be established as many cross sections are to be made as there are different width in the street. If there are special conditions, mentioned in §5, a correspondingly greater number of cross sections are required.

The graphic treatment of the cross sections corresponds to that of the longitudinal profiles.

§ 11

III. Written Explanations

Written explanations must accompany the flush-line and building plans giving information relative to the nature, former use and drainage of the ground and the reasons for the changes contained in the projects.

This report must be accompanied by:
1. a list of streets, that is, a conveniently arranged list of the streets and squares that are to be changed, extended or newly laid out.
   The list should contain:
   a. names, numbers and other designations;
   b. the width of every street between the building flush-lines, respectively the street flush-lines;
   c. the slopes of the streets and their length according to their different sections and as a whole
2. Tables of survey of the property affected by the establishment of the new flush-lines, they must contain:
   a. the names, residences etc of the owners involved;
   b. the numbers or other designations by which the properties are entered in the register of landed property
   c. the size of the areas to be given up to streets and squares for public traffic
   d. the way they are to be used
   e. the designations and descriptions of the existing buildings or parts of buildings which will be affected by a street or building flush-line and which will have to be pulled down;
   f. the size of the remaining pieces of property
   g. the information whether, according to the building regulations these will be fit for building on or not.

§ 12

The drawings and written explanations should not be rolled but must be presented
flat in a portfolio. The single plans which should be mounted on linen and must be at least bound round the edges with tape, must not be larger than 0.50 by 0.66 m and if necessary must be so joined together that they can be opened and closed without creasing the plans.

§13

Exceptional Regulations

The plans may be limited to a situation plan with the necessary explanations if the matter involved is:

a. a simple regulation or alteration of existing streets without the necessity of changing the level of the roadway;
b. an inconsiderable extension of rural places or small towns that are not in the immediate neighborhood of large cities, in as far as the extension is not related to the construction of large factories, railways, cemeteries, or other institutions that might affect the security from fire, the traffic conditions and the public health;
c. the establishment of flush-lines that must be carried out at once and where, in the opinion of the Vorstand (no English equivalent) and of the town council, it is not necessary to present detailed plans.

In addition those authorities who, in the first instance, are concerned with the establishment of the flush-lines, may in other cases, for special reasons, declare the simplification of the plans admissible as an exception, and may declare which parts of the foregoing instructions (§§ 1 to 12) need not be carried out.

In all these exceptional cases including those under a, b and c the authorities who, according to the act of July 2, 1875 control the establishment of the flush-lines, may at any time during the process of carrying out the establishment, require the completion of the plans according to the instructions contained in §§1 to 12.
II

Extract from the Hessian Law of April 30, 1881, relating to
Building Regulations in General

Article 4

For the laying out or alteration of streets and squares in cities and rural communities the street and building flush-lines are to be determined by the mayor and town council according to the public needs.

These flush-lines may be established in whole towns or parts of towns, respectively whole streets or parts of streets and this is necessary, especially if the building up of large areas, hitherto unbuilt on is intended, or if the need or a suitable opportunity is at hand to regulate or widen existing streets and public squares.

Every establishment of flush-lines must contain an exact designation of the properties affected including the buildings on them and must fix the level and the intended drainage of the streets and squares in question.

If the matter at issue is the re-building of whole city districts that have been destroyed by fire or other catastrophes it is the duty of the mayor and town council to decide at once whether, and to what extent, a new building plan is to be made and if so to provide immediately for the establishment of such a new plan.

New flush-lines must be established in parts of streets where they are lacking at the time that a new building is erected or an existing building rebuilt or altered.

Article 5

After the establishment of a building plan or of a street or building flush-line the plan must be exhibited to public view by the mayor, accompanied by the notice that objections are to be presented at the mayor’s office within a certain definite period which according to the extent of the plan varies from 14 days to 4 weeks.

If only single building plots are involved it is sufficient to notify the different owners of the property of the plan.

If the plan affects the rayons of the fortress Mainz or public rivers, roads, railways or railway stations, property of the state or public institutions or if several townships or cities are involved it is the duty of the mayor to see that the various authorities affected are early given opportunity to protect their interests.

Article 6

If the objections raised cannot be settled by those involved and the town council, those authorities that grant the permit for carrying out the plan must dispose of them; buildings plans of places and whole streets, after being approved by the Kreisausschuss, must be laid before the Ministry of the Interior and of Justice for approval. If the plans are only for establishment of flush-lines in parts of streets the approval of the Kreisausschuss suffices.
Article 7

After the plan has been approved the mayor must make it public without delay and must give notice according to local custom that the plans are open to view in the mayor’s office. - If only single building plots are concerned special notice to the owners involved may also in this instance take the place of publication.

All establishments of squares, streets and flush-lines that have been made before or since this law was enacted can be nullified or changed only in accordance with the foregoing regulations.

Article 8

The regulations given in article 10 last paragraph, article 20 last paragraph, article 21 and 29 second paragraph are regarded as parts, respectively supplementary parts of the city building plan and are to be treated according to article 5 to 7.

Article 9

The street flush-lines form at the same time the building flush-lines, that is, the limits up to which buildings are to be erected and beyond which towards the street construction must not be carried out (art. 30). For special reasons however building flush-lines that differ from the street flush-lines may be established in order to provide space for front garden plots.

Article 10

In establishing the flush-lines the demands of traffic, security from fire and public sanitation are to be considered, care must also be taken that the streets and squares are not rendered unsightly.

Hence it is necessary to provide for sufficient width and drainage in the streets and for good connections between existing streets and new ones.

Public streets that are newly constructed or are extended with buildings on both sides should not be less than 12.5m wide in cities, 10m in the country, including sidewalks. A lesser width in new streets is admissable only where local conditions make it unavoidable.

Whether and in how far a street may be lined with buildings only on one side must be determined in the city building plan, respectively in the local statute that belongs to it.

Article 18

In committees in which the city building plan make ample provision for the laying out of new streets local statutes may be issued forbidding the erection of buildings outside the limits of the city building plan. Exceptions to this may only be permitted by the Ministerium in single cases in consideration of the purpose, situation or other conditions of the intended structures.
Article 21

The local statute belonging to the local building plan may provide that, when a new street is laid out or an existing street extended, or when buildings begin to be erected on a hitherto unbuilt on street, the owners or the properties fronting on the street must bear the entire or partial cost of the land required for the street and of the construction including gutters, drains, pavement and everything necessary to complete the street for public traffic. The owners of properties along one side of the street cannot be assessed for more than the cost of half the street width and if this width exceeds 16m not for more than 8m width.

In reckoning the cost the cost of the whole street construction must be calculated including the street crossings and distributed among the owners of property along the street according to the length of their street frontage. This calculation must not include the value of land belonging to the city or town that is used for the street.

Local statutes may further provide that the owners of properties on streets that are to be newly laid out may be assessed for the cost of constructing and maintaining the footways in front of their properties. The same regulation may be made applicable to already existing streets.

The local statute must fix the more precise regulations within the limits of the foregoing regulations and may require that, in order that these regulations be punctually carried out, the property owners deposit a certain sum to be fixed by the town council before building permits are granted them. This cannot be extended to include the maintenance of the footways.

III

Extract From The General Building Law of June 1, 1900
For The Kingdom Of Saxony.

Third Section

Establishment and Effect of Building-, Flush-line- and City Extension Plans

§15

If a hitherto mainly unbuilt on territory is to be opened to construction the establishment of a building plan according to the local laws is, as a rule, necessary. Such a plan can also however be made for territory, that is already built on.

§16

Building plans regulate in particular:

a. the flush-lines within which construction on building plots is allowed and according to which the area intended for traffic or for front gardens plots and that which is established by the administrative authorities as a “high tide district” is excluded;

b. the method of construction, the distance of the buildings from the street flush-lines and from the neighboring boundary, the height of the buildings, whether or
not industrial plants are admissible and the extent to which buildings may be erected on the rear land;
c. the regulation of water courses, the drainage of the territory and the raising or sinking of street crossings.

§17

Building plans must consist of the necessary drawings and the special building regulation to be issued relative to construction on the territory. The more definite requirements as to the manner and nature of the parts necessary to compose a building plan are determined by the instructions issued relative to the carrying out of the plan or by municipal regulations.

§18

In making building plans the following points must be considered: security from fire, the amount of public traffic that may reasonably be expected, public sanitation, servicable and adequate water supply and drainage, situation and development of the town or city or the part of the town or city in question, local housing conditions, and finally the appearance of the streets and squares. Special attention must be given to the following:

a. the position of the building blocks and of the street and building flush-lines must be adapted to the territory and should be so arranged that the dwelling rooms receive the sun;
b. the size and proportions of the single building blocks must be such that advantageous use of the land is made possible;
c. the width of the streets and footways is determined according to the needs of local traffic and must be graduated according to whether the streets are main, side, or merely residential streets. In streets where the houses are detached and there is no through traffic proper, the width of the traffic area may be reduced to 8m. If it is expected that at a later date through traffic will pass through the street (especially street railways) and that it will therefore be necessary to widen the street, front garden plots of corresponding depth should be laid out on both sides. Private streets that serve as entrances to the rear of several properties may not be less than 6m wide. Streets in which the houses are built detached and where there is moderate through traffic as well as all streets in which the houses are built in closed rows must be at least 12m wide; streets with much business or through traffic must be at least 17m wide;
d. ascents in the streets should be distributed as equally as possible, great ascents, streets cut into the hillsides and straight lined streets of excessive length must be avoided.
e. in establishing the street directions short and convenient connections of the streets with one another and the main points of traffic should be provided for.
f. public open spaces and planted areas must be laid out in size, situation and
number so that they meet the demands of traffic and of public welfare. Sites for churches and schools as well as public playgrounds and recreation areas must be provided in sufficient number; in determining the method of construction to be employed and the admissibility of factories and industrial plants the present character of the city or town or of the district must be considered as well as the existing needs. In all cases care must be taken that streets where the houses are built in closed rows—if such are not altogether excluded by municipal regulation—are frequently interrupted with streets of detached houses and in the outlying districts that density of construction and of population is reasonably limited.

h. Front garden plots unless they are intended to be used later for widening the street should be at least 4.5m deep.

i. The admissible number of stories must be determined according to the character of the city or town in question and the width of the street. In rural places and villa districts the houses must contain at the most 3, in other districts 4 stories, and only in the central districts of larger cities, on especially wide streets and squares or along river courses that have been regulated at considerable expense to the owners of adjacent property are 5 stories admissible in exceptional cases.

k. The necessary courts and gardens in the inside of a building block must be provided for by regulations concerning their extent and position, if necessary by the establishment of rear flush-lines;

l. As far as construction on the rear land enters into the question at all it must be made dependent on the size of the court or garden and such structures may be used as dwellings on, as a rule, if all the windows of the rear building receive the light at an angle of at least 45° and the space between the front and rear buildings in suitable cases is laid out as a garden. Exceptions may be made under special conditions in the central districts of large cities. In no case may the rear buildings of a street form closed rows.

m. The building police authorities may retain the right of granting permission to those involved to construct residential streets in large building blocks that are suitable for the purpose but in such cases only detached houses of at most 3 stories may be erected.

§22

The building plan must be laid open to public view for at least 4 weeks. Public notice must be given of the time and place where it can be seen. Objections to the building plan must be made within 4 weeks from the beginning of the time when it is made public otherwise they will not be considered. Notice of this fact must be given.

If the building plan affects only single building plots it is sufficient to notify the
owners of the properties and set a period of at least 14 days in which objections may be made.

§23

The objections made to the building plan are settled by the building police authorities.

§24

If no objections are made or after they have been settled by withdrawal, compromise or decision the building plan must be laid before the Ministerium of the Interior for approval.

Fourth Section

Provision For, Construction and Maintenance of Public Traffic Areas.

§39

The land which is set aside for the streets by the building or flush-line plans must be given to the city by the abuttors and, if the city itself does not undertake the work must be constructed as a street by them and must be drained. On streets that are built on both sides the width of land which the abuttors must contribute must not exceed 24m, on streets built on only on one side 15m. Every abuttor contributes land

a. along his property, thus, if his building plot is a corner one, on both sides
b. beyond this point as far as it is necessary so that the street reaches from crossing to crossing and in addition so that towards the one side of the building plot, it joins with a street that already serves traffic.

Fifth Section

Redistribution and Expropriation of Building Plots

§54

If suitable construction on the land lying within the limits of a building plan is prevented or made unreasonably difficult by the position, form or size of the building plots or parts of such plots, in order to gain suitable building plots the land may be redistributed by changing the boundaries of the position of the lots even against the will of the owners if such a redistribution is in the public interest and is requested either

a. by the Gemeindevertretung (local board-no English equivalent)
b. by more than half of the property owners involved who together possess more than half of the whole area.

The request must be made of the building police authorities.

§55

If the redistribution of building plots is required the buildings on which have been destroyed by fire, water or other elementary forces, the local board is obliged to
§56

Individual pieces of land lying in the redistribution territory which are built on or put to some special use (for instance market gardens, nurseries etc) the value of which it would be difficult to replace with other pieces of land may be completely or partially excluded from the redistribution.

The owner must however submit to simple changes in his boundaries even in this case.

§57

In order to carry out the redistribution the local board or authorities (Gemeindebehörde) must provide a redistribution plan with the necessary instructions for carrying it out. But if the request for redistribution is made as provided for in §54 under b this plan may be presented by the owners instead.

§58

The land of all the owners is to be united in one mass including the public ways which, according to the public plan, are dispensable. From this mass the land is first set aside that is required for public traffic areas and the remainder is distributed among the owners in such a way that every owner receives land of the same proportional value as that which he owned before the redistribution. The city receives public traffic areas in place of the public ways it contributed. In calculating the value of the plots technical experts are to be consulted and all practical and legal factors that influence the value must be taken into consideration.

In place of single building plots or, according to the amount of land in the original property, one or more suitable building lots as near as possible in the former position are to be granted. After the changes have been made in the boundaries built-on lots are, as a rule, to be returned to the former owner.

The land apportioned in the building plan to future streets if it does not find immediate use after the necessary ways have been constructed, is to be redistributed among the different owners as far as possible in such a way that an owners building plot and his share of the future street land lie together.

Unavoidable differences in value between the original and the redistributed territory may be made up for by levying, respectively granting an indemnity in money.

§59

Plots that are too small for building lots are to be, unless those concerned do not voluntarily come to an agreement about them, sold to the town or city which will distribute them again among the other owners on receipt of the sum that is paid for them.
§60
The building police authorities must confirm with the owners concerned about the proposed redistribution plan and endeavor to reach a mutually agreeable settlement. To those concerned belong also the owners of property outside the redistribution area whose property may be benefited by the redistribution. If an agreement is reached the plan can, without delay, be laid before the Ministry of the Interior for approval. In this case no further proof of public interest need be produced.

§61
If no agreement is reached among all those concerned the redistribution plan must be laid before the Ministry of the Interior for examination in the first instance and after the settlement of any objections made to it must be laid open to public view in the same manner as the building plan. The regulations contained in §§ 21-25 are then to be applied.

§62
The redistribution plan can be elaborated and laid before the Ministry for approval in combination with the building plan. But the carrying out of the redistribution plan presupposes the earlier establishment of the building plan.

§63
With the establishment of the redistribution plan the newly distributed building lot takes the place of the original building lot as regards all legal rights and public legal burdens with the exception of the amounts to be paid in accordance with the act of August 15, 1855, for the construction and maintenance of a drain, and in legal respects receives all the qualities of the latter. Duties and privileges regarding the use of the land remain the same as before except where changed by the redistribution plan. New ones may also be based on this plan.

§64
Properties that change hands in consequence of the redistribution are exempt from the change-of-ownership tax.

§65
If the erection of buildings on a building block would make the practical redistribution of the building plots difficult or impossible all construction may be forbidden. This prohibition ceases however if the redistribution plan is not established within a period of 2 years.
§66
Also outside the process of redistribution the building police authorities, in order to make inconsiderable boundary changes, may make the granting of building permits dependent on the builder’s purchasing or relinquishing for compensation small strips of land which are necessary to complete his own or a neighboring building lot.
This is especially the case if, in consequence of the changing of a flush-line, land that formerly belonged to the street is included in the building land.

§67
If land must be obtained
a. for widening, straightening or continuing streets, ways or squares that are intended for traffic in the inner city districts
b. for constructing and extending new such streets, ways and squares,
c. for the construction or widening of bridges
d. for embankments and dams
e. for the construction of drains and aqueducts, for their introduction into single pieces of property or their connection with those of neighboring communities
f. for the supplementation or inclusion of unbuilt-on areas in the closed rows of houses,
the necessary property may be expropriated by the building police authorities at the request of the local board with the consent of the Ministry of the Interior, even against the will of the owners concerned.

§68
If the pulling down of buildings or groups of buildings is indispensable in the interest of traffic or of public sanitation, or if the building plan for a territory the buildings on which have been destroyed by fire, water or other elementary forces, cannot be carried out otherwise in a way to hinder the recurrence of similar dangers, the Ministry of the Interior is empowered at the request of the local board to grant a permit of expropriation for the whole territory in order that the undertaking may be practically carried out.

§69
The request for the expropriation permit must be accompanied by a building plan or, if such a plan does not yet enter into the question, by a special expropriation plan.

§70
Before the request is sent to the Ministry of the Interior the building police authorities must endeavor to bring about an amicable agreement among those concerned.

§71
After the permit of expropriation has been granted the property owners
concerned may, within a period fixed by the Ministry of the Interior, undertake themselves the new structures on their property provided for in the building or expropriation plan. At the end of this period those building lots or pieces of ground on which structures have not been erected as provided for in the plans, are expropriated.

§72

By local statute the city or town may retain the right of immediate expropriation of areas for public places that are provided for in a building plan that has been established according to the local regulation.

IV

Extract From the Hamburg Law of December 30, 1892
§9

If in carrying out the approved building plan, in order to make possible practical construction on the areas lying between the established streets and squares, it seems necessary to the building deputation to change the boundaries of the building lots in relation to one another and to the street in the plan the process of redistribution may be proceeded with.

The same process takes place if the owners of the larger half of the area in question request it. A special plan is then designed by the building deputation according to which the building plots in question are laid together and redistributed, the public ways and squares that are no longer necessary according to the plan, being done away with, and new lots formed, the boundaries of which if possible should be cut at right angles by the line of the street. After the redistribution every owner receives the same proportional value in land as that which he owned before the redistribution.

(There follow regulations respecting the establishment and payment of indemnities).

V

Extract From The Street Law of July 6, 1896
Of The Grand Duchy of Baden

Art.11. Where a building plan is established but suitable construction on the territory it covers is hindered by the position, form or size of the building plots, in order to gain suitable building lots the land may be redistributed by changing the boundaries or position of the lots at the request of the town council, even against the will of the owners concerned, in as far as the redistribution is in the public interest and the street land for this purpose has either been obtained or will be obtained in the process of redistribution.

This process is to be carried out in accordance with the regulations contained in articles 12-18.
Art.12 1. All the properties lying within the territory covered by the redistribution plan— including the superfluous public ways— are combined in one mass.

2. If necessary the land for the streets and squares provided for in the building plan...
is first separated from this mass.
The area taken from each owner is in proportion to the area that he has contributed to the mass.
3. The remaining area is redistributed among the owners in such a way that each receives a share that corresponds in proportion to the share that he owned before the redistribution.
4. Pieces of land that are too small to be used for building lots if they cannot be combined with other pieces belonging to the same owner and thus building lots formed, must be sold to the city which relinquishes them to be included in the mass.
5. Unavoidable differences in value must be made good by compensation in money.
Compensation that is granted to the owners must be paid by the city, compensation for which the owners are responsible is paid to the city.
Such money compensation is especially intended to balance the value of the land that is contributed by the city in accordance with §4.
Art. 13.5. On the receipt of the request for redistribution in accordance with §2 the erection of structures on the territory in question may be forbidden by the building police authorities until the whole question of redistribution has been settled.

VI
Extract From The Prussian Law Of July 28, 1902
Relative To The Redistribution of Parcels Of Land
In Frankfurt a. M.

§2
The redistribution can be undertaken only in a single part of the city district (in the redistribution area). The redistribution area must be so bounded that the redistribution can be practically carried out and must not be made larger than is necessary for the purpose; special attention must be given to the character of the territory and to existing streets or those provided for in the building plan....

§3
The redistribution may take place
1. at the request of the magistrate following the decision of the city or
2. at the request of the owners of the property the assessed valuation of which is half the assessed valuation of the whole area, provided that these owners constitute more than half the whole number of owners of the whole area

§4
If following the decision of the city the magistrate is prepared to request the redistribution or after he has received the request made by the owners in accordance...
with §3, he must notify the building police authorities of the proposed redistribution. In addition, if none has already been made, he must make out a list or index containing the designations of the properties to be redistributed together with the names of their owners, also stating what percentage of the contributed area is to be given up for public streets and squares and setting the period within which the streets and squares provided for in the building plan are to be completed for traffic and construction. A plan must accompany the report on which the position, size, construction, if any exists, and special use of the plots to be redistributed can be seen. Plan and index must be laid open by the magistrate to public view...

§5

The magistrate must endeavor to bring about an amicable settlement of the objections raised and must then send the request for redistribution together with the written papers bearing on the subject, to the Bezirksausschuss (departmental committee - no English equivalent) without delay. After conferring with the local police authorities about the existence of the preliminary conditions for redistribution mentioned in §§1-4 the Bezirksausschuss decides the question of redistribution and all objections that are still unsettled....

§8

If the legal preliminary conditions for the introduction of the process of redistribution are established the Regierungspräsident orders it to be begun and appoints a commission to carry out the process.

The commission must consist of 2 commissioners of the Regierungspräsident of whom one is president of the commission, the other vice-president and in addition one technical building expert, one jurist qualified as judge, one duly qualified surveyor and one expert for the valuation of the building plots. Members of the magistracy cannot be members of the commission....

§10

The plots that are to be redistributed are to be united in a mass. The existing public ways and squares are also to be included.

From the whole area that required for public ways and squares is to be separated and turned over to the city or to those who are responsible for the maintenance of the ways. This area takes the place of the former ways contributed by the city to the whole mass.

The remainder is to be distributed among the owners.

§12

The distribution according to §10 must be practically and economically carried out and in such a way that each owner receives, as far as possible the same proportion of the area as that that he contributed. The building plots should be laid as far as possible at
right angles to the street and apportioned to the owners in the same approximate position that they held before the redistribution.

§13

The owners are to be compensated in money for the land required for streets and squares over and above the area that was contributed by the city if this area required exceeds 30% of the area contributed by the owners. The compensation is to be reckoned as a fraction of the whole value of the area required for streets and squares.

§17

Pieces of land that are too small for building lots are to be combined if they belong to the same owner.

If they belong to different owners they are, with the consent of the owners, to be so combined, that suitable building lots are formed which are then held in common by the several owners each owner being apprised of the amount of his share...

VII

Extract From The Law of July 27, 1895
Of Basel
Pertaining To Superstructures
§52

If a property owner within a distance of 13m from the building line of an unbuilt-on neighboring boundary which does not lie at right angles to the building-line wishes to erect a new structure a boundary as far as possible at right angles to the building line shall be formed if and in as far as this can be done without great disadvantage to the two neighbors. If the building police cannot succeed in bringing about an amicable settlement between the two neighbors the Regierungsrat (council) may of its own accord provide for the establishment of a suitable boundary line. As regards the indemnity which one neighbor may have to pay the other a valuation commission decides the appointment and duties of which are provided for in the act of June 15, 1837, pertaining to the relinquishing of property for general use.

The above regulations do not apply outside the city limits.

VIII

Extract from The Belgian Law of July 1, 1858 And November 15, 1867
Pertaining To The Expropriation Of Zones
(in French)
see original at: www.archive.org.
Ministerial Decrees, Police Regulations And Local Statutes

IX

Decree Of The Ministry of The Interior of the Grand Duchy Of Hessen, Relative to The Establishment Of Local Building Plans Of December 28, 1898

In the local building plans that have recently been drawn up and laid before us for approval, in the effort to provide for the carrying out of straight-lined courses too little attention has as a rule been paid to present conditions, existing ways, the direction of the building plots and boundaries. Thereby not only the usefulness of the plots is frequently affected and the interests of the owners injured, but the laying out of pattern-like, straight-lined streets in which too little consideration is given to the esthetic effect of the construction, leads to uniform and monotonous street views, whereas efforts should be directed towards creating a certain variety in the street scenes as far as this is compatible with the requirements of servicableness.

Moreover it has proved to be disadvantageous that the plans are frequently made by surveyors without the aid of building experts; the former should be entrusted only with the situation plan including the altitude figures; the projection and drawing in of the street flush-lines on the contrary should be left exclusively to architectural experts.

Local building plans that are made in this way are not as a rule laid before us until they have already been made public and the owners involved have assumed a definite attitude in regard to them. If we then propose alterations in the street or building flush-lines such proposals often cause dissatisfaction among those concerned, apart from the fact, that such changes necessitate a second decision on the part of the local board and the repetition of the process of publication etc. which entails the loss of much time and work. It is therefore advisable when the first draught of the building plan is made, before it is laid before the city or town council and made public to give adequate consideration to the above named points and this should be done with the assistance of the local technical authorities and of the ministerial department of building.

You will therefore notify in a suitable manner the municipal authorities of the towns of the Grand Duchy that wherever the need occurs for a new building plan or for the alteration or extension of an existing one, it will aid in avoiding delays entailed by the subsequent alteration of the plan if the first draught of the plan accompanied by a surveyor’s situation plan containing no flush-line project, is sent to the Kreisamt (district office - no English equivalent) so that the Grand Ducal district building inspector may add the main points of the street projects based on the wishes of the town. The project must then be laid before the Ministerial Building Department for approval. In suitable cases a personal conference with the inspector is advised. Not until this process has been carried out should the plans be laid before the council for acceptance be published and finally laid before us for definite approval.

In cities and in those townships which have suitable building experts or are
willing to engage them for the purpose in question the project should, as a rule, be undertaken by these building experts. But also in such cases the projected plan should be brought to the notice of the council before it is presented for acceptance so that the council may lay it before us.

X

Instructions Of The Royal Bavarian Ministry Of The Interior To The Government And Municipal Authorities, Relative to The Making Of Building Line Plans, Of July 18, 1905

In accordance with §3 of the building law of February 17, 1901 when new building lines are established or existing ones changed, streets and ways are laid out with a width insuring the safety and convenience of traffic and, as far as possible, straight. In establishing the building lines the demands of traffic, sanitary housing conditions and esthetic considerations must be regarded, local needs and conditions must be determinative in meeting these demands. Hence the width of the street and the street direction must be determined from case to case to correspond to the variation in the amount of public traffic, the need for dwelling houses and the requirements of industrial development.

Experience shows however that in carrying out the provisions of the law the emphasis is always laid on the “straightness” of the street and that without regard for existing conditions this is required everywhere where nature itself does not put an end to the rule of the compass. Such a treatment of the matter by no means corresponds to the intentions of the law, is entirely uneconomical and leads to unnecessary and therefore unjustified interference with property.

To the pattern-like arrangement of perfectly straight streets of unvarying width, the exclusively rectangular scheme and the often unnecessary beveled corners land and property are frequently quite senselessly sacrificed and well-built houses cut into. It is also often forgotten that the lines are not only street flush-lines but also building flush-lines and that the serviceableness of the adjoining properties as well as practical and pleasing construction should be taken into account.

Owing to their lack of technical knowledge those concerned are not usually conscious of the detriment done to their property until, when buildings are erected difficulties arise connected with the flush-lines that were not objected to at the time of their establishment, hence at a time when alterations are no longer possible. In short, the present practice frequently incurs expense to the town and to property owners which might easily be spared with a little forethought.

Experience also shows that these mistaken measures unnecessarily destroy beautiful street views, greatly detract from the landscape and impress on places where construction is much developed an inexpressibly bare and monotonous stamp.

It is therefore advisable to impress upon towns and all authorities who are entrusted with the granting of building line plans what important economic and esthetic significance is involved in the establishment of flush-lines and to how great an extent
the public welfare depends upon well-thought out plans. It must be pointed out that the infinite variety of needs imperatively demands that we break with old geometrical street scheme and employ as much freedom as possible. Proper consideration must be given to property and boundary conditions, to the shape and serviceableness of the building blocks, to the growing need of sanitary houses, the development of industrial life, to traffic and the proportions that it will probably assume in the future especially at street crossings, bridge ends, railway station squares and such places. Further, attention must be paid to the natural character of the land, the surrounding landscape, characteristic differences in level, water courses, trees, to the climate, winds, sunniness, distant view, to the protection of attractive parts of streets and squares, to the closed (framed) appearance of the views in the streets and squares, to the customary style of architecture, to monumental or otherwise interesting buildings, to future needs in the way of public buildings, green places of recreation, playgrounds with seats, fountains and such like.

It is also advisable to mark in the plans those structures, views etc, that should receive special consideration in determining the lines.

If all these considerations receive due attention it must follow that curved streets, breaks and irregularities in the building lines are everywhere admissable where local needs and desirable variety demand them and that narrow streets for special purposes, as for instance, in quiet residential districts with low houses, have their advantages, that instead of the customary average street width we must have, especially in large cities, a large number of graduated width from the extremely broad main traffic streets to the quite narrow residential streets, in short, that every street and part of a street must be adapted to the traffic that is expected to pass through it. Hence the main lines of travel must be correctly foreseen, the important traffic centres properly connected and the width of the streets be determined by the needs of the future. Broad front garden plots may be laid out when traffic is expected to increase in the future and yet until such time the street will bear a residential character.

By carefully considering and properly applying the principles of city building and by working always with a view to the needs of the future we shall succeed in providing for the development of business traffic by laying out wide traffic streets and in providing for the inhabitants healthy residential sections removed from the noise and dust of the centre of the city. This will be the case especially when at the same time as the flush-line plans the system of construction is established, variety in the heights of the buildings and the distances of the buildings from one another provided for and where detached building is used permission is given in certain cases to place the house well back from the street in the garden.

But if the building flush-lines and the architecture correspond to the various practical needs so that the whole town bears the character of serviceableness, the development of the towns will be various and charming and to this extent practical and sanitary development in a town is the basis of beautiful views in the streets and squares.

Finally it should be emphasized that flush-lines should be drawn only where they are needed and that it is not proper to provide small places where building activity is at a
standstill with detailed flush-line plans.

If in the foregoing several of the principles of city building have been touched upon as they are taught by the masters of this art, the intention is by no means to give instructions as to how streets are to be laid out; the art of city building cannot be compressed into formulas; natural feeling must decide. The intention was only to point out the great importance of these questions not only for the town but for the individual and to make clear that the tasks set by city building can be successfully accomplished only by those who are trained in this work, by technical experts who have not only special technical training in laying out streets and the advantageous use of the land but who also have insight into and understanding of the needs and development of local traffic, of business life and industry. Towns as a rule do not possess the services of such well trained and experienced experts. It is however practically impossible for persons at a distance to judge of the plans for the most important preliminary condition for this success of a plan is that it should be made on the spot, the only place where the real needs of the town and the inhabitants can be judged.

In view of the importance of the matter towns, both great and small, are therefore urgently advised whenever they stand in need of extensive or in any way important flush-line plans to call to their aid a trained architect and if necessary also engineers as has lately been done by the towns of Pfersee, Lechhausen, Friedberg and Memmingen.

It also seems very urgent just now, when there is little activity in building, to subject the older flush-line plans to a complete revision.

The costs involved in the employment of technical experts are more than outweighed by economy in other directions and by the case with which the plans when once established can be carried out.

The Bavarian “Verein für Volkskunst und Volkskunde” in Munich (Heustr. 18) and the Bavarian “Architekten- und Ingenieur-Verein” in Munich with its eight branches, have offered to assist the various towns and authorities if desired and to name experts who are familiar with the technical and economic problems of city building and who are also prepared, in view of the necessity of having the plans made in the towns where they are to be used, to make such plans or to assist in their making.

Building line projects that have been made in this way are to be laid before the Ministry of Interior for examination.

The Royal Governments, Kammern des Inneren (chamberlains of the Interior) and the district administrative authorities must see that these regulations are carried out.

XI

Police Ordinances And Local Statutes
Of Berlin of 1875, 1877, 1879
a. Police Ordinance of September 12, 1879
§1

A street or part of a street is to be regarded as ready for public traffic and for construction when the following conditions are fulfilled:
I. For Streets that are laid out after this ordinance is issued:
1. The area necessary for the street and lying between the street flush-lines must have been made over to the city
2. The street must agree with the building plan of Berlin and its vicinity as regards
   a. position in the plan
   b. level
   c. width and division of width
3. The roadway must be covered with paving (stone, wood, iron, asphalt etc)
   In stone paving the stones used must be rectangular and must be at least two thirds as large at the bottom as they are at the top; also they must not vary in breadth and height more than 1 cm. The pavement must be laid on a gravel foundation of at least 20 cm.
4. The street must be provided with drains connecting with an existing public drain according to the plan of construction.
5. The street must be joined to an already regulated street by means of a roadway crossing
6. The footways must be made according to the building police regulations of April 21, 1853 and January 17, 1873

II. In existing streets the whole surface of the street between the street flush-lines must be paved across its entire width, as footway and roadway, with stone, asphalt or macadam and there must be underground drainage canals or paved gutters connecting with a public drain in accordance with the building plan.

§ 2
Streets or parts of streets that are maintained only as roads cannot be regarded as ready for construction,

§ 7
Whether or not the foregoing conditions are fulfilled is subject to the joint decision of the royal “Polizeipräsidium” (no English equivalent) and the Police Administration of Street Construction.

b. Local Statute I Of October 8, 1875

§ 1
Dwellings may be erected on streets or parts of streets on which they have an entrance only if these streets or parts of streets are paved according to the police regulations, are drained and are accessible by means of at least one regulated street.

§ 2
Exceptions in individual cases with consideration of the extent, purpose, local position etc of the intended structures, may be made by the municipal building
administration with the consent of the building police authorities.
(Approved by the Minister of the Interior November 19, 1875)

c. Local Statute II Of March 7, 1877 (Extract)
The Laying Out Of New Streets By The City

§1
If the city lays out a new or extends an already existing street which is intended to
be built-on, the owners of the adjoining properties, as soon as buildings are erected on the
latter must pay to the city the cost of clearing, constructing, paving and draining the street.

§2
In the cost of clearing is included also the cost of the land for the street including
the footways.
If part of the land for the street has been contributed without compensation by
the adjoining properties, in order to determine the share of each owner in the purchase cost
the value of the contributed land is reckoned with consideration of the price paid for the
purchased land and this is subtracted from the share that those owners have to pay who
contributed the land.

§3
The costs of construction and paving include also the cost of connections with side
streets and of foot and carriage bridges.
As the cost of the material used in paving including wages a fixed price per square
meter is set annually by municipal decision. This should be different for main and side
streets and should not exceed the price of the poorest quality of pavement admissible in
such streets according to municipal decision.
The magistracy decided whether a street is to be regarded as a main or side street.
The cost of constructing promenades and of trees and other vegetation is not to be
paid.

§4
In dividing the entire costs that part of the street that was regulated at one time is
to be considered as a unit.

§5
In streets of more than 26m in width only the cost of 26m width is to be paid by
the abuttors; the remainder is paid by the city.
Construction and Maintenance of New Streets, That are Established in the Building Plan, by Promoters or Abuttors

§9

If promoters or abuttors wish to lay out a street or part of a street that is established in the building plan, the consent of the Magistracy is necessary as well as that of the building police.

A situation plan and a nivellement plan must be made showing clearly especially the connection of the drains with the public drainage system, and five copies of each of these plans must be presented.

For these plans the experts employed by the abuttors may make use at cost of the materials at the magistracy as far as this is compatible with the interests of the administration.

The situation plan must show the building plots in the street up to a distance of 30m from the street flush-lines and must contain the designations by which they are entered in the register of landed property and the names of the owners.

The permit can be refused only if reasons connected with the public interest oppose the street.

The reasons must be given in the notification of refusal.

§10

If the promotors or abuttors declare themselves prepared to undertake the construction of the street or if they actually begin it they are obliged to complete it within the period fixed by the permit, otherwise the necessary work may be carried out by the city at the expense of the promotors or abuttors. The land necessary for the street is to be made over to the city without encumbrance before the construction of the street is begun.

§16

A new street in this sense includes also the turning of an unregulated way or a country road into a city street.

(Approved by the Minister of the Interior March, 19, 1877)

Note: A new form of this statute is at present before the Minister for approval.

XII

Extract From The Building Law
For The City Of Cologne
Of June 1, 1901

Relation of the structures to the streets.

§3 Structures on unfinished streets

2.Streets and parts of streets, existing ways as well as those to be newly laid out, are ready for public traffic and for construction if they:
   a.are made over to the city from the point where construction is to begin up to an
already finished street and are paved in a manner suitable for city traffic and are
provided with footways,
b. are provided with proper underground drains and
c. are sufficiently lighted in the way that is customary in that locality
(In certain suburban districts the requirements are not as strict)

Admissable Construction on the Building Plots.

§11 Distance between the Buildings

4. On the building plots of class IV (detached construction) the buildings must
be at least 5m from the neighboring boundary and 10m from the neighboring buildings.
On the street however two houses may be built directly against one another if each one
observes the prescribed distances in other respects and the frontage of the two buildings
together is not more than 30m. In the Ossendorfer district of class IB the measurements
are 3.50m, 7m and 30m.

6. In the prescribed spaces the following structures may be erected:
a. low structures in front of less than 2m in height under the condition that they
do not extend more than 1.75m in front of the building.
b. structures up the front of the building under the condition that they do not
project more than 1m from the front of the building nor cover more than 2/5 of
the length and 1/3 of the surface of the front of the building;
c. open glass roofs covering not more than 6sqm;
d. in the rear, at least 20m from the street flush-line outbuildings may be erected
such as one story stables and sheds, greenhouses etc with at the most two sides
directly on the boundary, if between such buildings and the opposite boundary or
the other buildings on the property a space of at least 5m remains and the
character of detached construction is retained.

XIII

Extract From The Local Statute of March 13, 1890
Pertaining To Construction In The City District Of Cologne
with changes of April 10, 1894 and October 24, 1900

Construction on New or on already Existing but as yet Unbuilt on Streets and Parts of

Streets

1. Obligations of the Property owners

§1

If after November 21, 1878, the day on which the former local statute pertaining
the construction in Old Cologne went into effect, a building is erected on a new,
extended or existing street hitherto unbuilt on, or on a part of such a street, the owner is
obliged to bear a share of the cost of clearing, constructing, draining and illuminating the
street and of the cost of maintenance during the first 5 years.

If only certain of the above processes are carried out (for instance clearing,
constructing, drainage, illumination) the cost of these various processes may be paid for
separately.

§2

The cost of clearing includes also the purchase cost of the land.

If a part of the street land has been given by the owners of adjoining properties or purchased from them at a low price, in fixing the share of the purchase cost of the whole street land for which each owner is responsible the value of the land that was given or sold to the city at a low price is included in the calculation of the cost of the whole land and is deducted from the shares of those owners who contributed the land at their request. The value of land belonging to the city and used for public ways is not included in the calculation.

The value of the land contributed or sold to the city at a low price is determined by three technical experts appointed from case to case by the town or city council.

§3

In the costs mentioned in §1 are included especially:

1. The cost of earth works, making and paving the roadway and the footways in the manner determined by the city council, the cost of proper connections with other streets and the cost of covering the drains.

As a rule the pavement of the roadway should consist of the best paving material customarily used in the locality (stone, wood or asphalt) that of the footways of flat-topped, smooth, square stones of the same size or of asphalt;

2. The cost of the sewers with their connections with the clarifying stations.

2. Distribution of the Costs among those responsible for them

§4

In distributing the cost of construction and maintenance, with the exception of the cost of the sewers, each street in its whole length or each part of a street fixed by the city council, including the street crossings is regarded as a unit. The amount for which each piece of property is assessed is determined by the length of its street frontage.

The assessment for the sewers on the contrary is on the basis of a fixed sum per meter of frontage which sum must not exceed the amount obtained if the entire cost of the street sewer system, the rain gutters the pipes to the clarifying station, the connections with the houses, as far as these are made by the city, is divided by the number of meters of street frontage that can be built on,

Corner properties pay their corresponding shares on each street on which they lie.

§5

If the width of a street exceeds 26m the abuttor’s share of the cost is limited to the cost of 13m width.
3. Time at which the Payments are due and their Collection

§6
Payment of the taxes, provided for in §§1-5 must be made as soon as buildings are erected on the street or part of the street and after all or some of the works of construction have been carried out.

§7
The sums for which the owners are responsible bear the character of public municipal taxes.
The collection of the sums takes place by the Verwaltungszwangsverfahren (untranslatable - the process employed by the administration to compel payment)

The Laying out of New Streets by Promoters

§8
Permission to lay out new streets is granted to promoters only if the construction of such streets is not opposed to the public interest. The definite obligations of such promoters are fixed by written contracts. In all cases the promoter must make over to the city the land required for the street and must fulfill the obligations described in §§1-4.

§9
In single cases the city council may decide that the work of constructing a street is not to be left to the promoter but is to be carried out wholly or in part by the city building department at the expense of the promoter. The sewer construction is carried out by the city in all cases and charged to the promoter in accordance with §4.

Construction on Unfinished Streets and Parts of Streets.

§10
On streets or parts of streets that are not yet ready for public traffic and for construction according to the regulations of the building police, the erection of dwellings with entrances on such a street can be permitted only in exceptional cases by the council with the consent of the police authorities.
(There follow regulations limiting these requirements in the case of construction in the suburbs).

XIV
Extract From The Building Law Of The City Of Posen
March 31, 1903

§29
Front Gardens; Front and Rear Projections into them.
Sec4. The following regulations apply to projections in front gardens:
a. Low front structures up to 1.25m height from the ground, such as approaches, steps, terraces, may extend to the middle between the building and the street flush lines.

b. Front structures that extend up the front of the house such as portals, projecting roofs, bay windows, balconies, verandahs, may project over 1/3 of the space between the building and street flush lines but not more than 2m. Their entire width must not amount to more than 2/5 of the front of the building not including porches and balconies.

c. The portions of the building mentioned under a and b must be removed 11/2 times the extent of their projection from the neighboring boundary unless the front projections of the neighboring houses are built directly against one another.

§78
Rear Building Line.
Sec.1. In the districts of the building classes IIb, IIIb and IVb the city building police authorities will, with the consent of the council, designate the building blocks on which construction may be carried out only up to a parallel line along the rear (rear building line). The area that is thus kept open in the inside of the blocks, behind the rear building line must not exceed 1/4 of the area of the whole block.

Sec 2. Behind this rear building line only such structures as those named in §§29 sec.4 under a and b may project and of these the low structures may project 5m, the ascending structure 2m.

Sec 3. In addition arbors, garden houses and other one story structures covering not more than 20 sqm may be erected in the inside of the blocks.

§79
Detached and Semi-detached Construction, Yield.
Sec.1. Detached Construction a. In the districts of the building classes IIIa and IVa every front building and every rear building of more than one story must stand the width of the so called “yield” from the neighboring boundary at least on one side.

b. On the other side the buildings mentioned may be erected directly on the boundary provided the neighbor consents and contracts with the city building police authorities to build up to this same boundary within a stated period.

Sec 2. A pair of buildings erected thus must not have a frontage of more than 35m and corner buildings must not have a frontage of more than 45m measured round the corner.

Sec 3. If the conditions of 1b and 2 are not fulfilled every front building and every rear building of more than one story must observe the “yield” on both sides.

Sec 4. In sections 1 to 3 in the building class IVa the yield is at least 2m+1/15 of the depth of the building, in building class IIIa it is at least 3m+ 1/15 of the depth of the building. Under the latter the distance of the back of the rearmost part of the building
from the building flush-line is to be understood.

Sec. 5 Group Building. Connecting houses in groups of three, four or five houses are admissible under the condition that the frontage of each of the two end buildings does not exceed 15m and that the middle houses at least that are not free on either side, are one-family houses. In this case the yield in building class IVa is 3m, 4m, or 5m respectively +1/10 of the depth of the building, in building class IIIa it is 1m more.

Sec. 6 Half-open construction. The whole side of a block or two opposite sides of a block may also be built up in closed rows if in the inside of the block there is a connecting open space at least 20m wide which has an opening on both the other sides of the block, such opening to be formed by two yields and at least 20m.

Sec. 7. In the yield (see §29, sec. 4a and b) low structures may project 1.50m, ascending structures 0.50m, the latter however may not cover more than 1/5 of the side of the building.

Sec. 8 Where there is a bare boundary wall on the neighboring boundary the yield may be dispensed with.

Sec. 9. The buildings may extend as far as is desired behind the building flush-line; they need not stand parallel to it. Bare side walls should however be avoided.

Sec. 10. Arbors, garden houses, stables, carriage sheds and other one story structures not connected with the front building may be erected directly on the boundary. Arbors and garden houses are also permitted in the open space provided for in sec. 6.

XV

Extract From The Building Law Of Vienna Of January 17, 1883

§3

In dividing a piece of ground into building lots, before a building permit for the separate buildings is applied for the approval of the authorities that grant such permits must be obtained.

This division of the ground is either:

a. an allotment, if the opening of new streets leading across the ground or bordering it, or the extension of existing streets, lanes or squares is proposed, or
b. a subdivision, if a piece of land lying on existing streets, lanes or a square is divided into several building lots without causing the opening of new or the extension of existing streets, lanes or squares.

§5

In examining the plans for the division of the ground the building authorities must see that the building lots are of the proper size and shape to permit the erection on them of buildings that conform to the requirements as regards light and air.

§7

The permission to divide the land becomes ineffective if, within 3 years from the date it is granted construction is not begun on the divided building lots or if, during this
period the necessary entries have not been made in the register of landed property.

C.  
Resolutions of Societies  
XVI  
Fundamental Points In City Extensions In Technical and Economic  
Respects And In Their Relation To Police Regulations.  
Resolved at the meeting of the “Verband Deutscher Architekten-  
und Ingenieur-Vereine” in Berlin, Sept.25,1874.

1.  
The projection of city extensions consists mainly in establishing the fundamental  
directions of all the means of traffic streets, horse railways, steam railways, canals, which  
are to be treated systematically and therefore over an extensive area.

2.  
The street system should contain at first only the main lines, existing ways being  
considered as far as possible and those side lines that owing to local conditions, are to be  
retained. The subordinate division is to be undertaken according to the need from time to  
time or is to be left to private enterprise.

3.  
The grouping of different kinds of city districts should be determined by the  
situation and other characteristics, it should be forced only by sanitary regulations relating  
to trade.

4.  
It is the duty of the building police to protect the interests of the tenants of the  
houses, the neighbors and the whole community. Such interests are: security from fire,  
traffic freedom, health. As against these considerations all esthetic regulations are to be  
rejected.

5.  
It is desirable for city extensions that the expropriation and inpropriation of  
remnants of land be legally facilitated. Still more important would be the enactment of  
a law facilitating the redistribution of building plots with the object of cutting through  
streets and regulating the forms of the building lots.

6.  
The city has the right of collecting from property owners a sum sufficient to cover  
the cost of street construction. Under the corresponding financial forms it is advisable,  
especially when the process of regulation has been carried out, that an average amount per
meter of property frontage be fixed.

7.

The conditions of property holding which are formed when a city extension plan is established, the obligations of the abuttors on the one hand and of the municipality on the other, require legal regulation. On land which is intended for future streets and squares construction should not be permitted or only temporary structures should be erected after the plan has once been legally established. The owner has no right to claim an indemnity for this restriction, he has however the right to demand that land lying in future squares be purchased as soon as the surrounding streets are constructed. The owner of single, scattered new structures must, in the first instance provide for their accessibility and drainage. but the city should undertake to complete and maintain a new street as soon as it is certain buildings will be erected on a certain part of all the plots fronting on it.

(Referent: R. Baumeister)

XVII

Principles Of City Extension Especially In Respect To Hygiene.

Resolved by the “Deutscher Verein für öffentliche Gesundheitspflege” at the meeting in Freiburg i.B. Sept. 15, 1885.

1. Plan

a. Every growing city requires, for its extension towards the outside and for its improvement a uniform comprehensive city building plan which must be made with due attention to suitable streets widths, practical placing of the streets, open spaces, means of traffic, planted areas (rows of trees, front gardens, squares) public gardens, a situation with proper drainage conditions, keeping the natural water courses clean, suitable size of the building lots, sites for public buildings and other municipal institutions.

b. As a rule it is necessary to establish and make public only the main streets and according to the need those subdivisions which it is expected will be built on the near future.

2. Execution

   c. Streets should be provided with water and drains and measures taken to ensure the keeping clean of the natural water courses before construction on the building is begun.

   d. The use of decaying material or material that may decay for filling in streets and lots is to be avoided. When construction reaches the areas that have formerly been used as dumps these are to be cleaned if the material on them has not already lost its objectionable character.

   e. The city extensions should be as connected in character as possible.

3. Police, Statutary and Legal Regulations.

   f. Police regulation must enforce the observance of all hygenic requirements when new houses are built and old ones altered; consideration should be given in this respect to
the resolutions of the German Society for Public Sanitation passed at the meeting of the society in Munich 1875, relative to new structures in new quarters of large cities.

g. Municipalities should be legally empowered:
  aa. to refuse permits for structures that do not accord with the building plan of the city extension, without granting an indemnity
  bb. to expropriate the land necessary to carry out the building plan including building plot remnants;
  cc. to compel abutters to pay the costs of street construction up to a certain width
  dd. to forbid the carrying on of certain objectionable trades in certain districts of the city;
  ee. to require the connection of all built-on properties with the drainage and water supply systems;
  ff. to alter or rebuild unhealthy city districts by using the right of expropriation, without incurring disproportionate costs;
  gg. to require front garden plots in a street, also to require open or closed construction allowing however the property owners a voice in the matter

Finally the right of inpropriation of parts of building plots that are not suitable for building on and the right of redistribution should be legally granted to those interested.

4.

1. It is urgently desirable that the hygienic-technical questions of city extension should be more fully treated at our universities and technical institutes than is now the case and that they should be made the subject of whole courses of instruction.

(Referenten: Stübben and Becker)

XVIII

Draught Of Legal Regulations To Ensure Sanitary Dwellings.
Approved at the meeting of the “Deutscher Verein für öffentliche Gesundheitspflege “in Strassburg, September 14, 1889

I. Streets and Building Lots

§1

1. The construction widening or alteration of a street may only be carried out in accordance with the building plan established by the responsible authorities.

2. In establishing a building plan for a city or town district a suitable portion of the whole area must be reserved for streets, squares or public gardens.

3. The building plan may require that in certain streets or parts of streets the building flush-line be set back from the street flush-line (front garden plots), and that a certain space be left open at the side between the buildings (detached construction).

4. For filling in streets and building lots only such material may be used as contains nothing unsanitary
II. New Construction of Buildings

§2
1. The height of a building on a street must not be greater than the distance of the building from the opposite building flush-line.
2. The greatest admissible height of the walls next the courts or yards, that are provided with windows according to §7, is one and a half times the distance from the opposite boundary of the unbuilt-on space.
3. The average width of a yard or court on which windows look must not be less than 4m.
4. The combination of the yards of neighboring properties for the purpose of gaining the required space or minimum width is admissible if the yards are kept free from buildings.
5. Every part of a piece of property remaining unbuilt-on must have an entrance of at least 1m in width and 2m in height in order that it can be kept clean.

§3
1. In case of rebuilding on building lots that were formerly more densely built up than the regulations in §2 allow the following regulations apply:
   - The height of a building on the street may be one and a half times the distance to the opposite building flush-line and on the yards or courts three times the width of the court.
   - The width of the court may be reduced to 2.50m.
2. In applying these regulations however under no circumstances may more unfavorable conditions of light and air be produced than the former ones.

§4
A new building may not be erected until a proper supply of drinking water and proper sewerage has been provided for.

§5
1. The number of necessary water closets in a building is determined by the number of persons who regularly use the building. As a rule each dwelling must have a separate, enclosed, covered water closer that can be locked.
2. In order to ensure proper ventilation every water closet must have a window opening directly into the open air.
3. The water closet pipes must be made of impenetrable material and as a rule must be continued out over the roof as an air pipe.
4. The floors and ceilings of stables and the walls dividing from dwelling rooms must be impermiable.
5. The same applies to the floors, ceilings and division walls of those localities used for trades or business that may be injurious to health.
6. The use of unsanitary material for filling the floors and ceilings is forbidden.
III. New Construction of Localities in which persons will remain for Longer Periods of Time

§6
1. Localities in which people remain for longer periods of time must be at least 2.50m high.
2. Dwellings are not permissible above the fourth story, that is the fourth story above the ground floor.

§7
1. All localities used by people for longer periods must have windows opening directly into the open air. This rule need not be strictly enforced if sufficient light and air are provided for in some other way.
2. In every such locality the window area must be at least 1/12 the floor area. Deviations from this rule are admissible in places of business and attic rooms.

§8
1. The floor of every room must be above the level of high water.
2. The floors and walls of all localities used by people for longer periods must be protected against dampness from the ground.
3. Dwellings in cellars, that is where the floors are below the surface of the earth are inadmissible.
4. Localities in which people remain for longer periods, especially living rooms may be in cellars only if the floor is at the most 1m below the surface of the ground and the lintel of the window at least 1m above it. Exceptions are admissible if the use to which the rooms are put requires that they be deeper.

IV. Use of Localities in which People remain for longer Periods.

§9
1. All localities in which people remain for longer periods may be used for this purpose only after a proper permit has been secured.
2. This permit should not be issued for new and altered buildings if the localities in question are not sufficiently dry.

§10
1. Localities the windows of which do not meet the requirements of §7 may not be used as living rooms.
2. Rooms that are let as sleeping rooms must contain for every child under 10 years at least 5 cbm of air, for every older person at least 10cbm. In lodging rooms where exceptions are permitted according to §7, if the rooms are used as sleeping rooms, the
window area must be at least 1qm for every child under 10 years, 0.2qm for every older person. Children under one year are not included.

3. These rules do not go into effect for existing buildings till after the lapse of 5 years but may be made effective after 2 years by every change of dwelling.

4. Suitable notice to vacate the observance of which if necessary be enforced by penalty, should be fixed by the responsible authorities.

§11

1. Localities that do not conform to the foregoing regulations or are unsanitary for some other reasons should be declared unfit for longer use by people.

2. If for these reasons whole groups of houses or city districts are condemned as unfit for use the city has the right to undertake or to cause to be undertaken their complete reconstruction. For this purpose it is empowered to expropriate all the land and buildings within the district to be reconstructed. The process of expropriation is to be carried out in accordance with the laws of the land.

The provisions of this law are regarded as minimum requirements and do not exclude further national, provincial and local legislation.

Regulations pertaining to the carrying out of this law are to be issued by the state authorities.

The enforcement of this law is the duty of all the building police and sanitary police authorities unless other provision is made by state legislation.

(Referenten: Miquel and Baumeister)

XIX Recommendations Of The “Deutscher Verein Für Öffentliche Gesundheitspflege” Pertaining To The Different Treatment Of The Building Regulation In The Inner And Outlying Districts Of The City And In Its Environs.

Meeting in Würzburg in May 1893.

1. Owing to the rapid growth of the population in German cities, especially in the larger ones, and the extreme importance of good housing conditions for social development, practical construction of new city districts is becoming a vital matter.

2. The building police regulations for older districts of the city, because of the necessity for considering existing conditions in such districts, cannot naturally be suitable for application in the new districts which consist mainly of fields or unfinished building areas and a few sparcely built up properties.

3. In nearly all cities the old town and the new districts receive the same treatment
with the result that too great density of population is not hindered and, as the extent to which the building regulations permit land to be used, is an important factor in fixing its price, an unhealthy rise in the price of land has taken place which makes it very difficult to introduce airy, open construction in the new building quarters. Moreover the application to new districts of regulations intended for the old district prevent the necessary divisions in the new parts (large and small dwellings, factories and smaller industrial plants).

4. The special regulations that exist in some places in respect to
   a. densely built up older districts,
   b. properties on unregulated streets without sewers,
   c. built-on lots in contrast to vacant ones,
   d. factory districts,
   e. districts with detached construction,
are not sufficient to ensure good housing conditions in the new districts especially for the poorer classes, on the contrary comprehensive and uniform special regulations for new districts are required so that healthy housing conditions for all classes of the population may be brought about and the demands of the definitely limited districts (residential, factory, mixed quarters) met.

5. In particular, energetic measures are necessary to prevent permanently the too great use of the building plots, limiting the height of the buildings and providing for sufficient yard space and in some instances for free space between the buildings (yield). The amount of space to be left unbuilt-on should be made dependent on the number and character of the dwellings on the building plot, the front garden plots and also parts of wider streets being taken into consideration under some conditions.

6. The different degrees of density of construction can only be ensured by establishing fixed limits between definite zones and special regulations applying to properties already built on.

7. Rational treatment of the regulations relative to fire-proofing would make graduation of such regulations for the different districts unnecessary.

8. Of practical use are differences in the width and paving of the streets in the treatment of front spaces and in the construction of different small structures against and in front of the houses. Regulations pertaining to these matters however should not be for
whole districts but in accordance with the character of certain single streets and blocks.

9.
Under new districts in this sense is to be understood not only the land actually within the city limits but also those environs that within a calculable time may become incorporated in the city and these should be subject to building regulations to which end the cooperation of all the authorities concerned should be striven for.

10.
Besides police regulations private restrictions imposed at the time of sale are very desirable as they tend to make the character of certain streets and blocks individual by going farther than the municipal regulations would be justified in doing (exclusion of flathouses, restaurants etc).

11.
The special regulations here recommended should be introduced by law or local statute. National legislation would indeed facilitate the enforcement of certain regulations pertaining to factory districts etc. but is by no means necessary before such special regulations can be introduced by the police ordinances.

(Referenten: Adickes and Baumeister)

XX

Recommendations Of The “Deutscher Verein Für öffentliche Gesundheitspflege” Relative To Open Construction.
Meeting in Magdeburg in September 1894.

1. The custom of dense crowding together of the population in many of the large cities in Germany, in contrast to other countries, especially England, endangers health, injures family life and makes the purchase of land impossible for the majority of the inhabitants.

2. This condition with the high rents that result is mainly due to the increasing speculation in land and buildings which makes open construction difficult and often impossible.

3. The restriction of this speculation and the introduction of more open construction as well as the removal of all obstacles to this end must hence be recognized as an urgent need.

4. These obstacles are of two kinds, legislative and constructive. the latter in addition to traffic problems are:
   a. The establishment in the building plans of too deep building blocks which favor the erection of court and rear dwellings.
   b. Too great width in the streets intended merely to sub-divide the building land resulting in too great an expense to the abutters.
   c. The disproportionately high cost of street construction and drainage frequently
reckoned without any consideration of the number of stories and dwellings and only according to the street frontage.
d. The unnecessary application to smaller houses of police regulations intended for large buildings with many stories
e. The increased price of land in the city extension districts partly due to the building police regulations which have hitherto allowed as great use to be made of land in such sections as in the inner districts.
f. The lack of regulations for the protection of small dwelling houses against the disadvantageous arising from the erection of high and deep buildings on neighboring properties.
5. For the removal of these obstacles the following measures are recommended:
a. To remedy the too great use of the land the blocks in residential sections should be made of such a depth that the erection of front buildings only is encouraged.
b. Streets intended merely to subdivide the building land, without much traffic, should be limited in width.
It is very desirable to set the building line back from the street line so that front garden plots, lawns and trees are made possible.
c. The pavement used in the streets under b should be as simple and cheap as possible.
In reckoning the cost to the abutters of street construction, paving and drainage the use to which the land is put should be taken into consideration as far as possible.
d. Building police requirement as regards the number and construction of staircases etc. should be more moderate for buildings with fewer stories than for large buildings.
e. Wherever the price of land and existing buildings still permit of it police regulations should be made as soon as possible restricting the use of the land and the height of the buildings so that these sections may not also become objects of speculation and sites for barrack-like flat-houses, but that on the contrary the erection of houses with only few dwellings is encouraged and permanently protected.

(Referenten: Adickes, Hinckeldeyn and Classen)

XXI
Recommendations Of The “Deutscher Verein Für Öffentliche Gesundheitspflege” Relative to Measures To Bring About The Healthy and Practical Development Of Cities.
Meeting in Strassburg in September 1895
Among the measures that serve to make construction in city extension districts healthy and practical and tend to improve unsanitary conditions in the inner districts are:
I. The establishment of a building plan that corresponds to the demands of sanitation (on the basis of a suitable flush-line law);
II. The legal establishment of an official process for redistributing unbuilt on city properties so that suitable building lots may be formed.
III. The extension of the municipal right of expropriation (act pertaining to zone expropriation);
IV. The establishment of different building police regulations for inner and outer city districts (graduated building regulations).

I. Building Plan
a. The interests of health demand cleanliness and dryness of the foundations, rapid and thorough removal of the garbage, cleanliness of the water courses; adequate supply of water, light, air and vegetation; protection against objectionable industries, considerable extension of the building plan, practical dimensions of street widths and building blocks.
b. In establishing the widths of the streets and the size of the blocks efforts should be made to gain suitable streets and building plots for different kinds of structures, to avoid rear buildings as far as possible, to encourage the erection of smaller dwelling houses. There should be provided: wide traffic streets, medium sized and narrow residential streets, large blocks for factories and villas, medium ones for ordinary dwellings and business houses, small ones for the dwellings of the poorer classes.
c. Existing city building plans should be examined in these points and improved as far as possible.
d. Where legislation still prevents or makes difficult the establishment of extensive and practical building plans these difficulties should be overcome by the establishment of a suitable flush-line law.

II. Redistribution
a. In the majority of cases the street lines of the city building plan cannot be so adapted to the property areas that suitable building lots can be laid out on these areas without some alteration of the property boundaries. The regulation of the boundaries or redistribution of the properties is necessary. This is sometimes accomplished after much trouble and loss of time by the agreement of all those concerned; but in view of the opposition to this process encountered among owners a redistribution law is needed, that is the right to redistribute such areas without the consent of each individual owner. This right is necessary, aa. in order to prevent unsanitary, uneconomical and impractical construction and to make practical construction possible;
bb. to protect all the other owners from the malice of one and the small owners from the large ones;
cc. to increase the number of building lots in the market and thus work against the increase in price;
dd. to be able to carry out the systematic, connected development of the
city in territory where the building lots are in a mass, in the interests of the
owners, the future tenants, the neighborhood and the city.
b. The basis of redistribution is the building plan which must previously be
established.
c. The erection of structures on unregulated land that makes redistribution difficult
is to be forbidden.

III. Expropriation
The city’s right of expropriation should cover
a. the land necessary for the construction of new streets, open spaces and planted
areas.
b. the remnants of pieces of property on new streets that are unfit for construction
on account of their small size;
c. those properties in old city districts the possession of which is necessary before
the reconstruction of such districts can be carried out and the requirements of
sanitation and the traffic met.

IV. Building Regulations
a. The uniformity of the building regulations for the inner and outer city districts
has resulted, in many city extensions, in housing conditions that are greatly to be
regretted from the standpoint of health. Density of construction has increased
from year to year and the roominess of the dwellings decreased.
b. The application to city extension territory of building regulations suited only to
inner city districts and allowing the greatest possible use to be made of the land
has not produced but has encouraged a speculation in land and buildings
that has lowered the standard and increased the cost of living and in the whole
realm of social life has produced one of the most lamentable conditions of our
times.
c. Among the measures which should be taken to remedy this are building police
regulations providing for lower and less dense construction in the outlying districts.
To this end it is advisable to divide the city into districts with graduated building
regulations for each district which are made with due consideration of the value of
land and the desirability of encouraging single and combatting large flat houses.
d. In graduating the building regulations the following districts should be
separately provided for according to the need and local conditions:
   aa. detached building districts,
   bb. districts in which the construction and operation of factories and objectionable
      industrial plants are forbidden,
   cc. districts in which the construction and operation of factories are encouraged.
   (Referenten: Stübben and Küchler)
XXII

Resolutions Of The Meeting For The Preservation
Of Historic Monuments
Held in Erfurt 1903 Relative to Building Flush-Lines
In Old Cities.

1. Old structures of artistic and historic value especially characteristic private houses must be marked as such on the flush-line plans.
2. A building flush-line that extends in front of or retreats behind the flush-line of such structures is to be established only if the demands of traffic and health absolutely require it.

Ways must be considered how the structures can be adapted to the new flush-line, or how they can be altered if necessary. Especially the building over of footways demands attention.

In picturesque towns and places that are developing slowly changing the walls of the streets by the establishment of flush-lines should rarely be undertaken. If alterations are urgently necessary the town should proceed from case to case acting under the advice of technical experts.

3. Changing the level of the street in front of the structures mentioned in 1 is admissible only if traffic considerations, protection against high water etc make any other course impossible.

Also in such cases ways must be considered of adapting the old structure to the new level.

4. New building flush-lines should if possible be so established that not only the old structures are protected but also the character of the old streets preserved. Straight flush-lines and levels are not to be carried out if injuries of this kind are to be feared.

In establishing new flush-lines for the widening and improvement of the streets curved streets and street walls and characteristic differences in level must be retained as far as possible.

5. The closed appearance of the walls in old streets and squares must be protected as far as possible when, for the sake of traffic, widening of the streets, changes in direction and cutting through new streets is undertaken.

6. The needs of traffic or esthetic considerations may require that a clearing be made about an edifice. In both cases before the establishment of the preliminary flush-lines the question must be carefully considered whether the whole view of the building and its surroundings will gain or lose by the intended “clearing”.

If it is feared that it will lose and the clearing is to be undertaken for the sake of the traffic the latter should, if possible be led into other channels. If esthetic reasons are the motive it is doubly necessary to omit the clearing and, if necessary, improve the surroundings of the building in another way.

(Referenten: J. Stübben, K. Hofmann and C. Gurlitt)
XXIII

Resolutions Of The “Denkmalpflegetag” in Mainz 1904
Pertaining To Building Police Protection Of The Views
In Old Streets And Squares

The fifth meeting for the preservation of historic monuments recommends that the erection of new buildings or the alteration of old ones in the immediate vicinity of historic monuments be made subject to permits to be issued by the building police also as regards the outward appearance of such buildings which must be harmonious and in accord with the general view of the old structures or streets. This applies also to shop signs, advertising posters etc.

In this connection it is pointed out that in order to obtain this necessary harmony the heights and outlines, shapes of the roofs, walls and superstructures and the materials and colors to be used in the exterior architecture must be suitable while as regards the details artistic freedom may be allowed considerable room.

In deciding the artistic questions that arise it is advisable to obtain the advice of experts, including architects, art historians representatives of the national preservation of monuments and artistically inclined laymen.

In as far as legislation does not afford a basis for the necessary legal regulation the supplementation of the law is to be advised.

(Referenten:Frentzen and Stübben)