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 In this book we publish Albrecht’s translation basically unrevised, as a historical document, with all of its flaws.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

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

This translation of the typescript (497 pages) was published courtesy of the Rotch Library at MIT. We thank the MIT library staff, in particular Jennifer Friedman and Jenn Morris, for their assistance. MIT Libraries Document Service was helpful in making the translated copy available to us in image form in 2008. A group of staff and students at Arizona State University then helped transcribe the 497 pages of image files into text format since OCR techniques could not be used. We are especially grateful to Sue Mahalov in this context and also appreciate the contributions of Tyler Eltringham, Geoff Prall, and Tracy Geiger. Amanda Bosse and Dan Bartman were instrumental in formatting the text in InDesign. Thanks also to Aaron Kimberlin for technical support. We thank Peter Swift for his initial encouragement and advice on the historical importance of Stübben’s work. Finally, librarians at the Ludwig Maximilian University in Munich, and Dr.-Ing. Renate Fritz-Haendeler helped with reference searches and the libraries made the original hardcopy versions of the books available. Thank you to all!
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 Stübben 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 Bezirksordner (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 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 kinds\(^1\), 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 subordmate 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
revenge 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 parcelled 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 unbuilt 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. 1889, 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 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

![Fig. 630](image)
classification of the construction area gained through the expropriation
described in Fig. 629

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.
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 flats 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 mentiones in footnote 8
5 from: Deutsche Bauzeitung.1904. p. 333
Fig. 633

Restructuring of the city center of Florence

Umbau der Stadtmitte von Florenz

(Alter Zustand?!)
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 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. 637; 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.

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

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.

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7 Deutsche Vierteljahresschrift für öffentliche Gesundheitspflege 1890.p. 60
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

Fig. 638
Schiefe Grundstückslage an der Heinrichs-Allee zu Aachen.

crooked sitation of building plots at the Heinrichs-Allee in Aachen
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 Volksgartenstreet in Cologne before the restructuring
Fig. 642
position of plots between Lothringen- und 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.
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

Fig. 644
proposed rearrangement of plots at the Bismarck-, Kamecke- and Werderstreet in 1885
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 of 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 redistribution 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
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.

Fig. 651
mixture of plots in Hannover
Fig. 652
environment of plots of Fig. 651

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. 653, restructuring of plots in Hamburg.
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 abutters with
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.”
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
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></th>
<th>A + B .</th>
<th>645qnm</th>
<th>450qnm</th>
<th>N .</th>
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<th>195qnm</th>
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<tr>
<td></td>
<td>C .</td>
<td>828</td>
<td>578</td>
<td>O</td>
<td>1920</td>
<td>1340</td>
</tr>
<tr>
<td></td>
<td>D + E .</td>
<td>660</td>
<td>461</td>
<td>P</td>
<td>740</td>
<td>516</td>
</tr>
<tr>
<td></td>
<td>F + J .</td>
<td>669</td>
<td>467</td>
<td>Q</td>
<td>1076</td>
<td>751</td>
</tr>
<tr>
<td></td>
<td>G .</td>
<td>266</td>
<td>185</td>
<td>R + V</td>
<td>346</td>
<td>242</td>
</tr>
<tr>
<td></td>
<td>H .</td>
<td>470</td>
<td>328</td>
<td>S</td>
<td>1016</td>
<td>709</td>
</tr>
<tr>
<td></td>
<td>K .</td>
<td>2002</td>
<td>1396</td>
<td>T</td>
<td>1648</td>
<td>1150</td>
</tr>
<tr>
<td></td>
<td>L .</td>
<td>338</td>
<td>236</td>
<td>U</td>
<td>1004</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>M .</td>
<td>1140</td>
<td>796</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8030qnm</td>
<td>5603qnm</td>
</tr>
</tbody>
</table>

Total 15048 10500qnm

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 benefitted 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.
Baumblock und Straßen im ungeordneten Zustande.

Fig. 659
construction block and streets in unstructured state

Umlegung der Grundfläcke in Fig. 524 unter Freigabe der Straßenflächen
bis zur Straßemitte.

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 pipe 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>
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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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<td>I</td>
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<td>17</td>
<td>frontb.4</td>
</tr>
<tr>
<td>IIa</td>
<td></td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>IIb</td>
<td>open</td>
<td>1</td>
<td>3</td>
</tr>
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<td>frontb.3</td>
</tr>
<tr>
<td>IIIb</td>
<td>open</td>
<td>23</td>
<td>3</td>
</tr>
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<td>IIIc</td>
<td>open</td>
<td>12</td>
<td>2</td>
</tr>
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<td>Cologne</td>
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<td>1.50</td>
<td>4</td>
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<td>Ib</td>
<td>closed</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
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<td>17</td>
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<td>57</td>
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### In Recent Building Regulations

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<th>Minimum yard space (m)</th>
<th>Maximum height of buildings (to roof gutter)</th>
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<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>
<td>40</td>
<td>15 **in addition 0.10</td>
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<td>15 one story</td>
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<td>15</td>
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<td>0.40**</td>
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<td>50</td>
<td>15</td>
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<td>0.75</td>
<td>2.50min.widt</td>
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<td>0.65</td>
<td>3m &quot; &quot;</td>
<td>20 present all areas lying outside the building plan</td>
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<td>3m &quot; &quot;</td>
<td>15 ** 0.65 with structures up to 9m height</td>
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<td>3m &quot; &quot;</td>
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<td>50</td>
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<td>50</td>
<td>18</td>
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<td>0.67*</td>
<td>-</td>
<td>0.75 to 0.80 frontb. 22 * on old properties</td>
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<td>-</td>
<td>frontb. 22</td>
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<td>-</td>
<td>rearb. 18</td>
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<td>-</td>
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<td>is closed construction allowed or open construction prescribed?</td>
<td>approx. portion of the whole building area</td>
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<td>---------------------------------------------------------------</td>
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<tr>
<td>IV</td>
<td>closed</td>
<td>-</td>
</tr>
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<td>V</td>
<td>closed</td>
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<td>6</td>
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<td>open or half-open**</td>
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</tr>
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<td>closed</td>
<td>25</td>
</tr>
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<td>open or half-open**</td>
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<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>
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<td>--------------------------------------------------------</td>
<td>--------------------</td>
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<td>0.67</td>
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<tr>
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<td>-</td>
<td>frontb.12 neither front gardens nor side yields</td>
</tr>
<tr>
<td>0.67</td>
<td>-</td>
<td>rearb. 9 gardens nor side yields</td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>frontb.20 side yields are reckoned</td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>rearb. 20</td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>frontb.18</td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>rearb. 12</td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>frontb.15</td>
</tr>
<tr>
<td>0.67**</td>
<td>-</td>
<td>rearb. 12</td>
</tr>
<tr>
<td>0.50**</td>
<td>-</td>
<td>frontb.12</td>
</tr>
<tr>
<td>0.50**</td>
<td>-</td>
<td>rearb. 9</td>
</tr>
<tr>
<td>0.70*</td>
<td>33</td>
<td>20 *covered yards sometimes admissible</td>
</tr>
<tr>
<td>0.67</td>
<td>-</td>
<td>22</td>
</tr>
<tr>
<td>0.67</td>
<td>33</td>
<td>17.50 **in the classes 3a/4a owners may choose between open, group or semi-detached construction</td>
</tr>
<tr>
<td>0.60</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>0.60</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>0.55</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0.55</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>
<tr>
<td>Wiesbaden</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>closed</td>
<td>3.60%</td>
<td>frontb.4, rearb. 3</td>
</tr>
<tr>
<td>II</td>
<td>closed</td>
<td>15.40%</td>
<td>frontb.4, rearb. 3</td>
</tr>
<tr>
<td>III</td>
<td>closed</td>
<td>7%</td>
<td>3</td>
</tr>
<tr>
<td>IV</td>
<td>group</td>
<td>7%</td>
<td>3</td>
</tr>
<tr>
<td>V</td>
<td>open</td>
<td>9.50%</td>
<td>3</td>
</tr>
<tr>
<td>VI</td>
<td>open</td>
<td>14%</td>
<td>3</td>
</tr>
<tr>
<td>VII*</td>
<td>open</td>
<td>43.30%</td>
<td>3</td>
</tr>
<tr>
<td>VIII</td>
<td>semi detached</td>
<td>0.20%</td>
<td>frontb.4, rearb. 3</td>
</tr>
</tbody>
</table>
### 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 tory 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 tory consisting of parks, woods, meadows, Danube river and -canal, is not included in any building class</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>
</tbody>
</table>

| 1. strip 1.00                                           | 80sqm              | 19m * a large area will not be built on at present |
| 2. strip 0.60                                           |                    | 19m be built on at present |
| 3. strip 0.50                                           | or                 | 19m a part of it may later |
| 1. strip 1.00                                           |                    | 19m be opened for denser construction |
| 2. strip 0.50                                           | 60sqm              | 19m be opened for denser construction |
| 3. strip 0.35                                           | or                 | 19m be opened for denser construction |
| 1. strip 1.00                                           |                    | 19m be opened for denser construction |
| 2. strip 0.35                                           |                    | 19m be opened for denser construction |
| 3. strip 0.30                                           | 40sqm*             | 15m ** 1. strip extends from building line to a depth of 6m |
| 0.40                                                    |                    | 15m ** 1. strip extends from building line to a depth of 6m |
| 0.33                                                    |                    | 15m ** 1. strip extends from building line to a depth of 6m |
| 0.25                                                    |                    | 15m ** 1. strip extends from building line to a depth of 6m |
| 0.20*                                                   |                    | 15m ** 1. strip extends from building line to a depth of 32m |
| 0.50                                                    |                    | 15m ** 1. strip extends from building line to a depth of 32m |
| 0.50                                                    |                    | 15m ** 1. strip extends from building line to a depth of 32m |

2. strip from there to depth of 32 m
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 120cm in those of 20m in width; bay windows are not admissible in streets that are less than 7m wide; the maximum extent of projections is 1.20m. 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 25cm 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 25cm) 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 0.50cm to 1.50cm 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 1.25m in height) may well be permitted to extend out to the line of the street, while high

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 not 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 householder 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 householder 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.
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. \[^{10}\] 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 Miquel’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°) is 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.12

12 compare the following writings of W.P. Gerhard: Die Einrichtung der Hausentwässerungsanlagen. Berlin 1879
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. $5^{\text{cbm}}$ of air for a child and $10^{\text{cbm}}$ 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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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).