CAN OUR CITIES SURVIVE?

J.L.SERT

AND

C. I. A. M.

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CAN OUR CITIES SURVIVE?

an ABC of urban problems, their analysis, their solutions

based on the proposals formulated by the

C.I.A.M.

International Congresses for Modern Architecture
Congrès Internationaux d'Architecture Moderne

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FOREWORD

At the beginning of his *Discours de la méthode* Descartes describes the perfect city, "geometric and regular as an architect's plan." Laid out like the garden of Versailles in a rigid and geometric pattern, this town was to capture in a fixed network of parallel and radiating lines all of those confused and contrary organisms which the strange evolution of civic society had brought into being. Around the magic cross of coördinates the public monuments and private dwellings of this city, the shops and playhouses and factories, the schools and prisons and churches, were to dance eternal quadrilles with the precise elegance of lines and points in a theorem of Euclid. An irrational reality, a phenomenon biological in origin and in development, was thus to be made conformable to a pure creation of the mind.

Here then was a philosophic sanction for that classical city, *clara et distincta perceptio*, which architects had conjured out of the turbulent culture of Greece and Rome. The order and serenity which they had discovered in the Parthenon and in the columned *fora* of Trajan and Augustus, expanded into the vaster patterns of cities, should give plastic form to that Cartesian *logic* which had spread itself over Europe with the slow irresistible force of a glacier. The structures of cities could be as coolly analyzed as the abstractions of geometry and as neatly resolved into their component parts; and these, being purified of everything which could be illumined by reason, could be reassembled into mathematical Heavens, crystal clear. After that the life of man, having submitted to a commensurate purification — being made free of that error called passion and of that accident called growth — could be invited by architects to assume in their cool theaters the measured, well-proportioned, and graceful tempo which is, logically, its destiny.

It was not often, even in the eighteenth century, that the idea could escape from ink-and-paper into stone-and-space. It molded, to be sure, a fragment of Paris and, aided by accident, welded the pavilioned Louvre to the Place de la Concorde and the Place de l'Étoile — and we know how, at Nancy, it gave spatial unity to the graceful squares of Héré de Corny — but the quality of order here established did not penetrate the wide orderless areas which enveloped these oases of geometric peace. Unmindful of architecture, the cities flung their great arms outward into an expanding penumbra of dishevelment. The Plan of Washington, which translated into sculpture the American constitution, imprisoned in an iron cast the insurgent energies of the government, and yet its mighty geometry makes all the more evident that surrounding chaos which threatens at every crisis to break through the not too indurate boundaries separating the calculated Plan and the unpredictable City.

How does it happen that this ideal of civic form so persistent throughout the nineteenth century, this *perfect city* planned and pictured in innumerable documents, has left so feeble and so equivocal a mold upon the actual world? The claims it made upon our imagination are evident enough, the aesthetic satisfactions it afforded could not have been wholly illusory, and the logic from which it proceeded was, so far as it went, faultless. There will never come a time when men will not wish to overcome their disordered and fragmentary world with a coherent and finite scheme of things or to build each his private Versailles sheltered against tumult and uncertainty. Nor can we discover the source of our failure in the idea and principle of architecture, whose ancient promises remain, even in this tortured moment, as valid as ever. To be persuaded of that we have only to enter the portals of Chartres.

The trouble lies, I think, not in architecture but in an architecture having a basis no firmer than a logic of form and a reward no deeper than an aesthetic experience. The trouble lies not in order but in a specific quality of order. The unfruitfulness of the ideal which is crystallized in Paris, in the Plan of Washington, in all of the sumptuous tradition of the Renaissance, arises not from any failure to express that which it was meant to express, but rather from that which it has excluded from expression. It was barricaded, by its own principle, from the deepest sources of vitality in

the arts. Its authority and parade, its invention and color and occasional fantasy, were built not out of experience but out of thought, and appear flat and meager when measured against the demands which the soul makes upon architecture.

It will be considered strange that I should find in a program for civic betterment, such as that proposed by and in part achieved by the Congrès Internationaux d'Architecture Moderne, the basis for a new architecture: for that new architecture which will exhibit not a principle of logic or of aesthetics merely but the true character and direction of our evolving civic culture. Housing and traffic control, transportation, recreation, the distribution of industry and commerce: these are homely themes not often thought of as having anything to do with the loftier arts of expression. Yet these practical arts, which are applications of science to economic and social problems, are of such a nature that they could not progress very far unsustained by a vision of humanity which transcends both art and science. Because our cities are compounded not of streets and buildings merely, nor of aggregations of people merely, but equally of the heart and content of society, so it may happen that the arts which serve that society may be compounded also from its will and its aspirations. Not as something added on in the name of art, but as an essential part of those processes by which material things are shaped and assembled for civic use, these will be given the meanings which architects — continuing their immemorable tradition — will discover in the new attitudes of our collective life.

It is precisely at such times, when they share the methods and aims of science, that the arts attain their greatest power over our hearts. Therefore I do not despair of an architecture of cities — by which term I mean cities which are patterned not only by those intellectual forces which seek to bend natural law to human betterment but also by those spiritual forces which throughout human history have left repeated imprints upon human environment. In this essay by Mr. Sert, which is essentially an inquiry into the nature of contemporary cities and a search for remedies for the frightful ills with which these are afflicted, I perceive also, beyond science, beyond knowledge and beyond compassion, that new faith which, no less than science, will shape and illumine the cities of tomorrow.

Joseph Hudnut

Cambridge, Massachusetts
February 27, 1942

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INTRODUCTION

In February 1928 I received a letter from Mme Hélène de Mandrot from La Sarraz saying that she would come to visit me at Zurich. When I met her at the station and before we left the platform, she began to disclose the purpose of her coming. She wanted to invite the outstanding contemporary architects of Europe to meet at her castle of La Sarraz, some miles north of Lake Geneva in the Canton de Vaud, Switzerland.

Mme de Mandrot had previously spoken with Le Corbusier and other friends in Paris. The time seemed ripe for all the protagonists of the different architectural developments in Austria, Belgium, Germany, Holland, Italy, Spain, and Switzerland to come together in a neutral, central place in Europe. A previous attempt by German architects to accomplish such a union at the occasion of the opening of the Weissenhof Settlement in Stuttgart in 1927 had not been successful.

In June 1928 the representatives of the different countries sat together in the Gothic chapel of the castle of La Sarraz, discussing and building up what was later called the Manifesto of La Sarraz (see p. 242). A common platform was found in the belief that planning and building could be greatly improved in spite of the heavy odds that had to be overcome.

The association then formed was called the Congrès Internationaux d'Architecture Moderne — in abbreviated form, the C.I.A.M. The word "congress" was used in its original sense of a "marching together." It is a congress based on collaboration, not a congress in which everyone merely contributes circumscribed knowledge from his own special field, as in the nineteenth century. Professor Karl Moser of Zurich, the eminent teacher and architect, was chosen as the first president of the C.I.A.M.

In Europe in 1928 housing for the lower-income classes was in the foreground, just as today defense housing stands in the foreground of building in the United States. The Congress wished to be informed of developments in the various countries in this field of housing. There were some scattered publications, but we wanted to be able to compare the proposals in the different countries with one another. In consequence, *all C.I.A.M. plans were designed on the same scale and used the same method of presentation*. This method, which allowed close comparisons, was used not only in the Second Congress in Frankfort on Main (promoted by Ernst May of the city of Frankfort) but in all later work of the Congress. An exhibition of low-cost dwelling units thus became the first child of the Frankfort Congress, and this was sent on tour from one country to another. It was then presented to the Eidgenoessischen Technische Hochschule in Zurich. The graphic material, the papers read in Frankfort, and the conclusions of the C.I.A.M. were published in a volume called *Die Wohnung für Existenzminimum* ("Dwellings for Lowest Income"), which appeared in Stuttgart in 1930.

After that we could move a step further. The Third Congress, held in Brussels in 1930 with the help of the Belgian architect Victor Bourgeois, was concerned with the question of how to organize whole groups of dwellings into neighborhood units in such a way that human needs could be satisfied, and with the further question of what legislative changes were necessary to allow workable solutions. (Lectures were given by Le Corbusier, Walter Gropius, Richard Neutra, and others.) The graphic material and the results of this Third Congress were published in *Rationelle Bebauungsweisen* ("Rational Lot-Division"), published in Stuttgart in 1931.

The Congress of Brussels marks the point at which the study of city planning became an activity of the C.I.A.M. City and regional planning, which from the first had been considered indispensable for any real solution of architectural problems, now became the center of interest. To mark this point, the newly appointed head of the Department of Town Planning in Amsterdam, Cornel van Eesteren, was chosen president of the C.I.A.M., in which capacity he is still active.

To gain insight into urban development, the difficult task of establishing new symbols for the complicated functions of a modern city was entrusted to van Eesteren and the Dutch group. You will find details of the procedure in the present volume. It was the city of

Amsterdam which graciously offered to print for the C.I.A.M. the plans in three colors which were necessary for the purpose, so that every group in every country had an example at hand with which to work.

The preparatory work was not at all easy, and demanded from each group long and careful investigation before the plans could be drawn up. The delegates from the various countries had therefore to meet several times — in Berlin in 1931, in Barcelona in 1932, in Paris in 1933.

In 1933 it was agreed to hold the Fourth Congress, which was to deal with "The Functional City," on board the steamship *Patris II* en route from Marseilles to Athens and return. Through the help of friends, this Greek steamer was placed at our disposal, and we hoped that the quiet Mediterranean would afford us three weeks of concentrated work. And, indeed, it turned out to be the most inspired of all congresses. Our assemblies were held on the promenade of the *Patris II*. Although not all participated in the discussions, the presence of musicians, poets, authors, and painters helped to keep the spirit of these discussions from being a closed and specialized one.

In Athens, with the help of the Greek delegate to the C.I.A.M., Stamo Papadaki, and the Greek group, who secured the sponsorship of the Greek government, the discussions were held in the open court of the University at the foot of the Acropolis, and in the lecture halls were exhibited the plans of the thirty-three cities analyzed by the C.I.A.M. The plans of London, Berlin, Paris, and Detroit, reaching from the ceiling to the floor of the hall, hung one beside the other, next to the smaller plans of Stockholm, Zurich, Athens, and the colonial cities. During our return and in Marseilles we formulated our point of view on city planning in the "Chart of Athens" (p. 246), or "Town-Planning Chart," which is developed in a free form in *Can Our Cities Survive?*

At the assembly of the delegates in London in 1934, Rudolf Steiger (Zurich) submitted to the meeting a layout proposed by the Swiss group for the publication of a book on the Functional City. In La Sarraz in 1936 the Dutch group (represented by Mart Stam) showed in an elaborate analysis of the city of Berlin how all other cities could be analyzed in single monographs. For many reasons it has been impossible, until now, to execute this plan. In September 1936, during the meeting of delegates at La Sarraz, the French and Spanish groups took over the suggestions and sample pages worked out by the Swiss and the Dutch group and continued to work on them in Paris, where a great part of the material was collected during the years 1937–1938. Circumstances in Europe making the work more difficult, J. L. Sert was finally asked by the Congress to complete the layout and write the entire text of the book. Complete freedom was given him, and his later experiences, particularly in America, enlarged its material in many respects. The accompanying text is exclusively the work of Mr. Sert.

The last meeting of the C.I.A.M. was held in Paris in 1937 and came about through the initiative of Le Corbusier and his collaborators, with the sponsorship of the French government. In this Congress synthesizing propositions based on previous analytical studies were presented in four reports. A new theme was discussed during this Congress, the reorganization of agricultural areas, or, as the French call it, *Urbanisme rural*, which stressed the need of a planned organization of these areas in different countries (p. 220). The Sixth Congress, which should have been held in Liège in September 1939, was canceled on account of the war.

Can Our Cities Survive? presents in a manner comprehensible to everyone the present state of our urban life and its earlier development. It traces as far as is possible today the paths of future development; it points the way out of existing urban chaos. It shows that our cities have become unserviceable instruments but that at the same time they are eternal phenomena connected with every culture. "Civilization and city are words from the same root."

Thus the C.I.A.M. began by investigating the smallest unit, the low-cost dwelling. It then proceeded to survey the neighborhood unit found in urban settlements, and finally widened its scope to include an analysis of present-day cities, with suggestions as to what the approach should be in the attempt to solve the problems of human communities in our day.

The experience of the C.I.A.M. since 1928, as represented in this volume, may prove to be valuable for the reconstruction — and rehabilitation — work of the post-war period. From the beginning, the activities of the C.I.A.M. moved toward collective work and integration — long before the events of the day showed everybody that there was no other way out of the chaotic state of our cities but *planning*, and planning *from a human point of view*. Planning on a human scale, in terms of the most elementary needs of man, can only be accomplished under one condition: that the average man become aware what a reduced form of life he is obliged to lead because of the present state of our cities. Public opinion will then exert the pressure necessary to set in motion the extensive machinery of administration that alone can bring about the changes requisite for an organic existence.

Can Our Cities Survive? reflecting the collective work of many years, endeavors to offer guidance in the fulfillment of that aim.

Sigfried Giedion
Secretary of the C.I.A.M.

The material here assembled and the text, written by José Luis Sert, Vice President of the C.I.A.M., are based on the resolutions of the Fourth (1933) and Fifth (1937) Congresses of the C.I.A.M. and on the researches and recommendations of the following collaborating groups and members of the C.I.A.M.

William Tatton Brown (England)
Le Corbusier (France)
Cornel van Ersteren (Holland)
Maxwell Fry (England)
Sigfried Giedion (Switzerland)
Walter Gropius (U.S.A.)
G.A.T.E.P.A.C. Group (Spain)
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The Swiss, Dutch, and French groups of the C.I.A.M. have made special contributions in planning the layout and in assembling data and illustrations for this work.

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J. L. S.

PART ONE

A TOWN–PLANNING CHART

Our Cities and Their Problems

"Our analytical studies of cities give us the necessary assurance to act at once in accordance with our findings.

"The C.I.A.M. has become a vast laboratory of urbanistic and architectural problems.

"The sole object of our efforts is to develop architectural and town-planning methods that are appropriate to both the needs and the technical means of our day, so as to contribute toward giving men healthier and happier surroundings." — From the report by Cornel van Eesteren (president of the C.I.A.M.) to the Fifth Congress

URBAN PROBLEMS AND THE LAYMAN

In great population centers of the world today man is a victim of urban chaos. His health, his security, and his happiness are menaced in cities inimical to an orderly existence. Instinctively he is aware that his daily life is conditioned by the turbulent streets about him.

Today urban problems affect a great part of the world's population, 10 per cent of it living in cities of over 100,000 inhabitants. In the United States the proportion is 56.5 of the nation's total population.[1] Yet *town planning*, or the re-creation of cities to fill man's most urgent needs, *is still to many of us a kind of mysterious science*, while the most immediate urban problems, those affecting the everyday lives of nearly all people, are largely ignored by the layman.

And why should this be so? Perhaps partly because these problems, when presented in books, are usually discussed in abstruse scientific language and in bulky texts intended for the specialist. So, whatever man may *feel* toward his urban environment, he has had little occasion to become acquainted either with the grave problems created by his cities or with their far-reaching consequences; and the knowledge that technical means are at hand to contribute toward solving these problems escapes him. In this light may be explained the widespread attitude of resignation before the persistence of a disorganized and chaotic city life. *People believe that cities must necessarily continue to be what they are.*

Aware of the menace of death and destruction which hangs over our cities in these fateful days, and considering the tremendous labors of planning and reconstruction which will be required later, we believe it worth while to show our cities as they are today and at the same time to state the possibilities of their surviving the crisis into which the world has been plunged.

In both text and illustration, the present work, addressed to laymen as well as to specialists, examines those urban problems which should be known to all who would like to enjoy a better life in a healthful city. Penetrating the outward aspects of the city of today, it reveals how certain "utopias" of yesterday have become the immediate possibilities of the present.

Our Changing Cities — Cities have undergone great changes during the modern era. These changes have taken place, and are taking place, in such rapid succession that few people have a full and clear idea of their nature, their magnitude, and the consequences that may follow from them.

Within the brief span of the last hundred years, the Industrial Revolution has subjected cities to the influences of the most varied innovations. Among these are:

mechanized production
mechanized transportation
new building technics
new ideas on health and recreation
vulnerability from the air

As a result, the basic character of cities and the lives and needs of their inhabitants are no longer the same as they were a century ago.

New Means of Research — Through the airplane and the camera we have acquired *a complete and precise view of our cities from above.* Air views have revealed to man a new "urban façade," a perspective which has never before been known.

Recent years have also seen the development of the field of *statistics* and its employment as a scientific method. This has enabled us to assemble data on all aspects of city problems — a valuable basis for research, unobtainable forty years ago.

Urban Biology — It has become necessary to resort to all the means of research at our disposal, both old and new, in order to know our cities thoroughly. This knowledge should not be sought in the manner of the past, ignoring the mobility, the changing structure, and the future possibilities of cities, but *by considering cities*

[1] The distribution of total population in the United States (1940 census) is the following: farm, 22.8 per cent; rural non-farm, 20.6 per cent; urban, 56.5 per cent.

THE NEW PERSPECTIVE. Air views reveal a new urban "façade" — a perspective never before known. Here is no individual building, or street, or neighborhood, but the whole city and, with it, a revelation of its composition.

as living organisms; as things which are born and which develop, disintegrate, and die. For cities can no longer be studied as immobile and finite units. In its academic and traditional sense, city planning has become obsolete. *In its place must be substituted urban biology, or the study of the life of cities and of the living conditions within them.*

New Technical Means — With the development of modern technical knowledge, it would seem that a vast domain of opportunities had appeared for the creation of *new* cities. Steel, concrete, glass, elevators, electricity, as well as many other materials and forces, together with mass production methods, now at man's disposal, should have facilitated the construction of cities planned for the welfare of the many. Instead, these innovations were given but limited application, and always within the outmoded framework of nineteenth-century cities. Consequently they increased congestion and intensified the problems of an already unsatisfactory urban structure. *The skyscraper soared to heaven — but out of the narrow, congested alleys of the old city!*

The Critical Phase of the City — Up to recent times city planners have disregarded the fact that, when a certain degree of maturity is reached in the cities of today, they universally exhibit the same alarming symptoms. These endanger their very existence.

Through want of courage to attack this critical situation, the only possible solutions are cast aside as "utopian." In the meantime:

Congestion increases, its causes growing.
Blight spreads, the same urban ills persisting.
Chaos intensifies, efficacious planning, backed by adequate legislation, being absent.

Anyone living in a large metropolitan center can observe this process going on — from his home, on his way to work, or in the vicinity of his office, shop, or factory. Throughout the whole daily cycle, his life is in some way affected by the city's ills, and he is aware that something is wrong. "Cooped up in the city" is the city dweller's stock phrase for the plight of not being able to leave town. And when he can, he flees, together with thousands of his kind, to beach or country.

Our Cities Anti-Human, Therefore Anti-Functional — The city of today is largely the product of *modern machine development*. As applied to the city, however, the machine technique has been employed only as a means of exploiting the old city framework. Therefore it carries within itself *the elements capable of destroying the concentrated metropolis it has helped to create.*

As machine development intensifies the concentration of population within the city, people start to abandon their ever-crowding neighborhoods for "a quiet home" in remote suburbs, undeterred by hours of uncomfortable travel back and forth. Industry, too, moves out — to cheaper land, to regions of lower taxes, to convenient sites on rail sidings or side roads. *The city is breaking up.*

Such dispersion of great cities knows neither control nor planning. It is provoked by urban chaos itself, and is facilitated by modern means of transportation.

A Challenge to Planners and Official Authorities — The foregoing observations should prompt several fundamental questions:

What is it that fails to function properly?
Under what conditions do most city-dwellers live?
Are these conditions generally the same in all cities?
What has caused the ills of the cities of today?

The unprecedented changes which have taken place in the structure of the city, and which continue unabated, should impel official authorities and city planners to investigate what has happened and to resume their labors on a new basis. This basis should be:

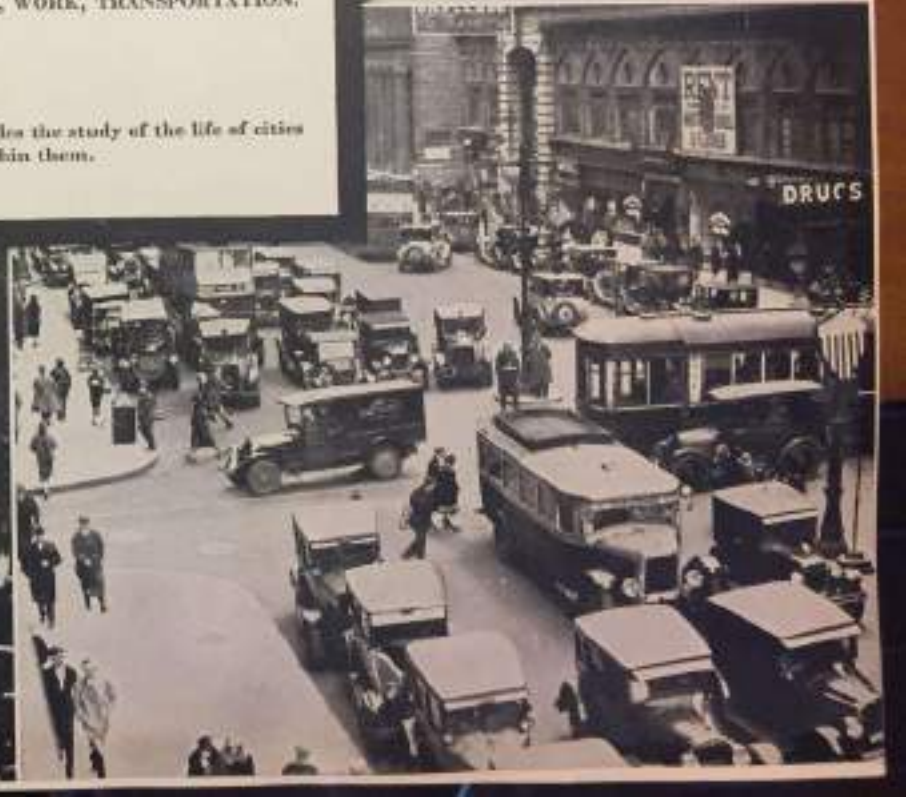
THE ANALYSIS OF CITIES

This is not an unexplored field. Much has already been achieved through researches which have become increasingly extensive and accurate in detail. It is to be regretted, however, that the various activities involved have never been properly coördinated. As conditions become constantly more chaotic, the need for a broader view of all phases of the problem becomes more urgent. *It is important, too, that the findings of these researches be widely disseminated and*

TOWN PLANNING is the organization of the functions of the collective life of cities:

DWELLING, RECREATION, WORK, TRANSPORTATION.

Its province therefore includes the study of the life of cities and of living conditions within them.



made accessible to the layman; for his sense of responsibility toward the subject should be stimulated.

To accomplish this, to achieve the fullest documentation corroborated by reliable statistics, and at the same time to acquire a wide and general understanding of the most important urban problems, the International Congresses for Modern Architecture (the C.I.A.M.)[2] decided *to analyze living conditions in cities,* taking *man* as the focal point of its studies.

In the approach to this analysis, it was observed that ordinary city plans, as previously used, would serve no purpose. At their best, they merely indicate the direction and width of streets and squares, the location of public parks and buildings, coastal or river lines, and little more. Of those factors which reach directly into the life of the city — the locations of industry and business, of fine residential districts and slums, the greater population densities, their distribution, and other important matters — ordinary maps reveal nothing.

It was also found that to make this analytical study of general use common denominators of comparison had to be established for the discoveries made through research in different cities. Obviously the vehicle for the expression of these discoveries had to be some international graphic form, applicable to all localities and of universal comprehension.

For these reasons, the C.I.A.M. contrived what was a genuinely new method of comparing life in cities. Through this method, the presentation of urban living conditions is achieved by means of three visualized plans, or "city radiographs," whose symbols indicate at sight the functions of the various districts of cities and the correlation of these different functions.

The three plans [3] were supplemented by a report in questionnaire form. This report described the living conditions in each city analyzed, and was presented in four chapters corresponding to the four functions of the city: *dwelling,*[4] *work* (or production), *recreation,* and *transportation.* While describing existing conditions, the report also made recommendations for improvement.

The significance of this analytical study is that by it, for the first time, *a universal basis for the comparison of cities was established. All plans were designed on the same scale and interpreted by the same symbols,* so that slum areas, traffic problems, concentrations of population, locations of industry, and other phases of urban life, in communities of widely differing character and in different nations and continents, could readily be compared.

On this basis, eighteen national groups made plans of thirty-three cities, representing a great variety of national circumstances and climates. This list included large capitals, like London, Paris, and Berlin; new industrial centers, like Detroit and Los Angeles; old cradles of civilization, like Athens and Rome; industrial and commercial harbors, like Amsterdam, Genoa, and Barcelona; residential centers, like The Hague, Stockholm, Madrid, and Zurich; cities originating as crossroad communities, like Warsaw and Zagreb; and colonial cities like Dalat and Bandoeng.[5]

These thirty-three cities offered sufficient variety in their types, origin, historical evolution, and economic conditions to permit,

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[2] Congrès Internationaux d'architecture moderne. See Appendix.

[3] The model plans were those prepared by the Amsterdam group of the C.I.A.M., reproduced on pp. 7, 8, 9.

[4] The word "dwelling," for lack of a better one, is used here in a special sense not to be found in the dictionaries. By "dwelling" we mean everything in a city that is related to home life in its broadest sense. We use it instead of "housing" because "housing" has been used so frequently to designate either low-cost buildings that take the place of slum areas or suburban developments hastily built for defense needs that its connotations have been limited. In studying the function of dwelling, we shall consider not only the home unit — apartment or detached house — but also all its complements, good or bad: its location and planning, or lack of it; whether it is surrounded by the necessary open spaces and provided with the necessary service units for the use of the community, etc. For example, in criticising living conditions in slums, we are concerned not merely with the buildings themselves but with their general environment and their failure to satisfy man's most elementary needs.

[5] The following is the complete list of cities analyzed by the C.I.A.M.: Amsterdam, Athens, Baltimore, Bandoeng, Barcelona, Berlin, Brussels, Budapest, Charleroi, Cologne, Como, Dalat, Dessau, Detroit, Frankfort on Main, Geneva, Genoa, Littoria, London, Los Angeles, Madrid, Oslo, Paris, Prague, Rome, Rotterdam, Stockholm, The Hague, Utrecht, Verona, Warsaw, Zagreb, and Zurich.

THREE CITY MAPS WHICH ANALYZE CITIES. The three plans shown on the opposite page and on pp. 8 and 9 were used as models by the different national groups of the C.I.A.M. The index of symbols accompanying these maps of Amsterdam made the main problems of that city comprehensible without further explanation. More specific problems were detailed in the report, which answered the "Questionnaire" sent to the groups with these model maps.

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AMSTERDAM. MAP I. LAND USE

← SYMBOLS used:

- Slums
- Low-income housing
- Low-class detached dwellings with gardens
- Middle-class dwellings
- Middle-class dwellings with gardens
- High-income dwellings
- Business areas
- Industry
- Public buildings
- Central market
- Docks and warehouses
- Oil docks
- Timber docks
- Steamship lines
- Wooded areas
- Parks
- Allotment gardens
- Sports grounds
- Pools and beaches
- Nautical sports
- Yachting harbors
- Zoölogical gardens
- Cemeteries
- Railways
- Railway yards
- 1931 — Date of construction
- 163 — Dwellings to the hectare
- ④ — Number of stories
- City and town lines

(First column of symbols: existing elements. Second column: projected elements.)

AMSTERDAM. MAP II. The transportation network connecting different areas of the city.

SYMBOLS used:

Main roads and streets		
Secondary roads and streets		
Boulevards and parkways		
Freight railroads		
Local railroads		
Passenger stations		
Freight stations		
Subway routes		
Streetcar routes		
Suburban railroads		
Bus routes		
Bus stations		
Coastwise shipping		
Ferries		
Boat lines on canals or rivers		
Principal steamship routes		
Airports		
Seaplane bases		
Express traffic		
Slow traffic		

(First column: existing services and routes. Second column: projected services or routes.)

AMSTERDAM. MAP III. The relation between the city and its environs (zoning and transport lines).

SYMBOLS used:

- Residential zones
- Suburban dwellings
- Number of commuters
- Industrial areas
- Small farms
- Open areas (public)
- Park lands (not public)
- Public recreation
- Wooded areas
- Nautical sports
- Beaches
- City line
- Main highways
- Secondary roads
- Railroads (main lines)
- Suburban railroads
- Streetcar lines
- Bus routes
- Cross sections of highways (express traffic)
- Local traffic
- Streetcar routes
- Cyclist trails
- Pedestrian paths
- Mixed traffic
- Navigation lanes (local)
- Main steamship lanes
- Airports
- Seaplane bases
- Direction of traffic
- Cross section designed for study

through analytical study, a deduction of the general principles which constitute the "Town-Planning Chart" formulated by the C.I.A.M.[6]

A TOWN-PLANNING CHART

The Town-Planning Chart analyzes the four primary functions of the city: dwelling, work, recreation, and transportation. It is a synthesis resulting from an analysis of the thirty-three reports, which are also divided according to the four urban functions. Revealing those ills which are common to all cities today, it also points the way to the most essential steps to be taken toward the solution of urban problems.

In the following pages the contents of the Town-Planning Chart are examined and many of its affirmations are confirmed by statistical data. The illustrations serve as living documents on the variegated aspects of city life.

It will perhaps be said that the revelations of the chart stress only the negative aspects of our cities, often in their most sordid manifestations. This has not been done without intention; for the purpose which has shaped all the conclusions of the chart is that of revealing where cities have failed in their functions, in order that the underlying causes may be corrected or removed.

As to the city's positive aspects, it is assumed that the technical advances of the Machine Age have brought many far-reaching contributions to the life of cities — in lighting, sanitation, means of transportation, the layout of certain districts, and other innovations. These progressive trends, however, do not fulfill the fundamental needs of cities. At best they represent but superficial improvements, since they do not alter the chaotic structure of cities nor remove the causes of existing problems.

[6] Numerous examples of the city problems discussed in the present work are illustrated from the original plans of the C.I.A.M.

Since the ideas expressed in this book are derived from the common labors of the town planners of eighteen different countries, they are not the opinions of one man, nor should they be construed as the personal formula of the writer for the solution of urban problems.[7]

PREMISE: THE CORNERSTONE

- *"Approaching any analysis of the four urban functions, it must be remembered that every city forms part of a geographic, economic, social, cultural, and political unit, upon which its development depends."* *Town-Planning Chart*[8]

With this fact in mind, we shall begin this analysis of cities by examining what is closest to us, closest to the monotony of everyday life.

Let us therefore turn our attention to our immediate environment and seek to determine why its particular composition should be what it is.

Let us take note of what we see in our city, as a pedestrian would in its streets and parks, or visiting its dwellings, offices, factories, and shops.

By assembling our observations, we should arrive at a view of the whole which will help us to understand the urban organism in all its functions. But before approaching the problem by studying the four primary urban functions which are inseparable from our everyday lives (dwelling, work, recreation, and transportation), we should like to emphasize the fact that our suggestions for the reorganization of these elementary functions are made *in the hope of a better fulfillment of the cultural role of cities*, which constitutes the main justification of their existence.

This role will be considered at length later in this study, when a broader view of the city and the region about it is taken.

[7] In spite of this, only the quotations from the Town-Planning Chart and others similarly identified represent the opinion of the C.I.A.M. as a body and have been approved by the Congresses.
[8] Quotations presented in this form are from the C.I.A.M. Town-Planning Chart. This chart is reproduced on pp. 246–249.

PART TWO

DWELLING: THE FIRST URBAN FUNCTION

"There is no visible end of work to be done in making urban life really livable. There is no measuring the economic returns in a healthy and happy civilization that can be thus achieved." — National Planning Association, *Guides for Post-War Planning*

DWELLING: THE FIRST URBAN FUNCTION

Towns and town life were born out of the primary needs of shelter and mutual aid — shelter against exterior factors, like those of climate or invasion, and mutual aid in the material and spiritual problems of social life. While the cities of our time owe their amazing growth to economic forces, fundamentally the town unit is the result of man's desire to live a better life. It should therefore function in such a way as to help its inhabitants attain that better life and to promote the arts of peace.

But what has happened to our cities? Are the lives of their inhabitants always improved? Are they not sometimes made miserable? Do cities satisfy the social, political, and economic conditions that determined their formation and development?

It will be found that all these questions have a part in our discussion of the four urban functions and the state they are in today.

Because *dwelling* is the primary function of the urban unit,[1] we shall devote the first section of this study to an investigation of dwelling conditions in the cities of the present.

Urban Dwellings — Living conditions in a city dwelling are shaped by the elements within which it is framed. In itself, the city dwelling can be considered as existing only in relationship to its environment — that is, to its neighborhood or district. An isolated city dwelling, suspended as it were in space, is but a utopian dream. City dwellings should therefore always be considered as the component parts of groups of structures, or districts.

Taking any city as an example, it will be observed that *groups of dwellings are scattered generally throughout its whole area.* They occupy both good and bad sites, are more or less crowded together, follow the alignments of both regular and irregular streets, are of varied height, and are sometimes situated adjacent to factories, office buildings, or other structures unlike themselves.

Reflecting upon these heterogeneous groups of dwellings, repeated throughout the urban structure and often covering 40 per cent of the city area, one wonders in what manner people live in them. What are their *living* conditions?

It is from the *human point of view* that we raise this question; for this is the approach to be emphasized in this book. And it is from this standpoint that we intend to depict urban dwellings, revealing their defects and the measures which we believe the most efficacious for their correction.

The following pages treat this subject summarily, recapitulating the observations made on housing conditions in the various cities analyzed by the C.I.A.M., together with others added to this study.

Many recent works devoted to housing have limited their thesis to the slum problem.[2] To us, taking a broader view of the city, slums represent only one phase of the general process of decay which our cities are going through — something like the last stage of a protracted malady.

In view of the present state of cities, we believe that the housing problem requires this larger view, in which *the four urban functions are considered as interdependent and indissoluble.*

The very idea of the *city* carries with it that of a concentration of population. For it is evident that it is due to the human and communal needs of this population, on the one hand, and its economic circumstances, on the other, that dwellings have been constructed in groups, as in cities.

It is also easy to see, by glancing at any city, that a relationship exists between the diverse housing conditions found in different parts of the city and the material circumstances of its inhabitants.

Let us investigate, then, in what manner city populations are grouped with respect to the function of *dwelling in the city*, and to

[1] If dwellings are conceived so as to fulfill the total requirements of populations, as presented on pp. 68–76.

[2] In medicine, this would be the same as devoting one's attention exclusively to maladies which had reached a crisis, neglecting those in earlier stages which might also lead to the critical phase.

EMBARRASSING QUESTIONS FOR THE CITY RESIDENT OF TODAY:

When you go home at the end of a hard day's work, after the inconveniences of the journey from your office, shop, or factory, what do you find when you seek repose and relaxation?

Why is this repose not to be found in your street?

Why is your house gloomy?

Why is it placed on a narrow strip of land, squeezed in between the houses on either side, so that it has bad lighting and ventilation?

Why do your front rooms face the street, with its noise and dust and gasoline odors?

Why do the other windows of your house look upon badly lighted and ill-ventilated inner courts?

Why do you not see open space, trees, and sky from your windows?

Your children need space for play. Why do they not find it here? Why must they be exposed to the dangers of traffic instead?

Do you think that you and your children benefit by dwelling in the city? Have you ever stopped to compare its advantages with its discomforts and inconveniences?

When someone speaks of a housing problem, do you realize that this concerns not only houses in themselves but *how you and your family live*?

Since your life is affected by the housing problem, should you not be interested in its solution?

what extent this grouping of dwellings corresponds to the needs of their inhabitants.

Population Distribution — Because it is fundamentally the basis of any examination of urban conditions, one of the first factors to be considered is that of the *distribution of population throughout the urban area*. Since the distribution of population is in direct relation to the distribution of dwellings, it has an immediate bearing upon living conditions.

DENSITY OF POPULATION AND OVERCROWDING

By *density of population* we mean the number of inhabitants in a given area (usually the acre, or the hectare where the metric system is used).

Density varies greatly from one part of the city to another. The higher densities, or superdensities, are usually found in the more centrally located — frequently the oldest — districts of cities.

It may be cited as a general rule that:

- *"The density of the population is too great in central districts; in many cases it exceeds 400 inhabitants to the acre (1,000 to the hectare)."* — *Town-Planning Chart*

As the central districts are generally those of older date, the dwellings found in them have long since passed the brilliance of their youth. They have changed owners and occupants many times. As they became more and more unattractive, they had to be rented at lower figures, finally becoming obsolete. Yet dwellings, unlike automobiles, are not sold as junk but are used for habitation *as long as they are sources of revenue*. And this purpose they may long have served,[3] even though the character of the population of the neighborhood may have changed several times, owing to the decline of living conditions. Every time these changes take place families of lower incomes move into these buildings, replacing wealthier renters who have left them to live in new suburban districts. Finally, still lower rents attract and attach poor families to these dwellings.

But, populations having continued to concentrate in cities during this time, land prices in these old districts have also continued to mount. So the owners seek, and find, a means of counteracting this price rise without suffering a reduction of their incomes. This is accomplished by dividing apartments and by building additions which fill the whole surface of the lot — in short, by increasing the density of the population. In this way, gardens, open spaces, and other features that once made these neighborhoods pleasant to live in disappear.

Superdensity in these areas, reached under such conditions, *means lack of space, pure air, sun, light, privacy, and community services.*

Growing outward from the center, superdensities ultimately occupied vast areas and reached a high peak, with a drop after improved transportation facilities and the exodus of industry, among other factors, led to decentralization.

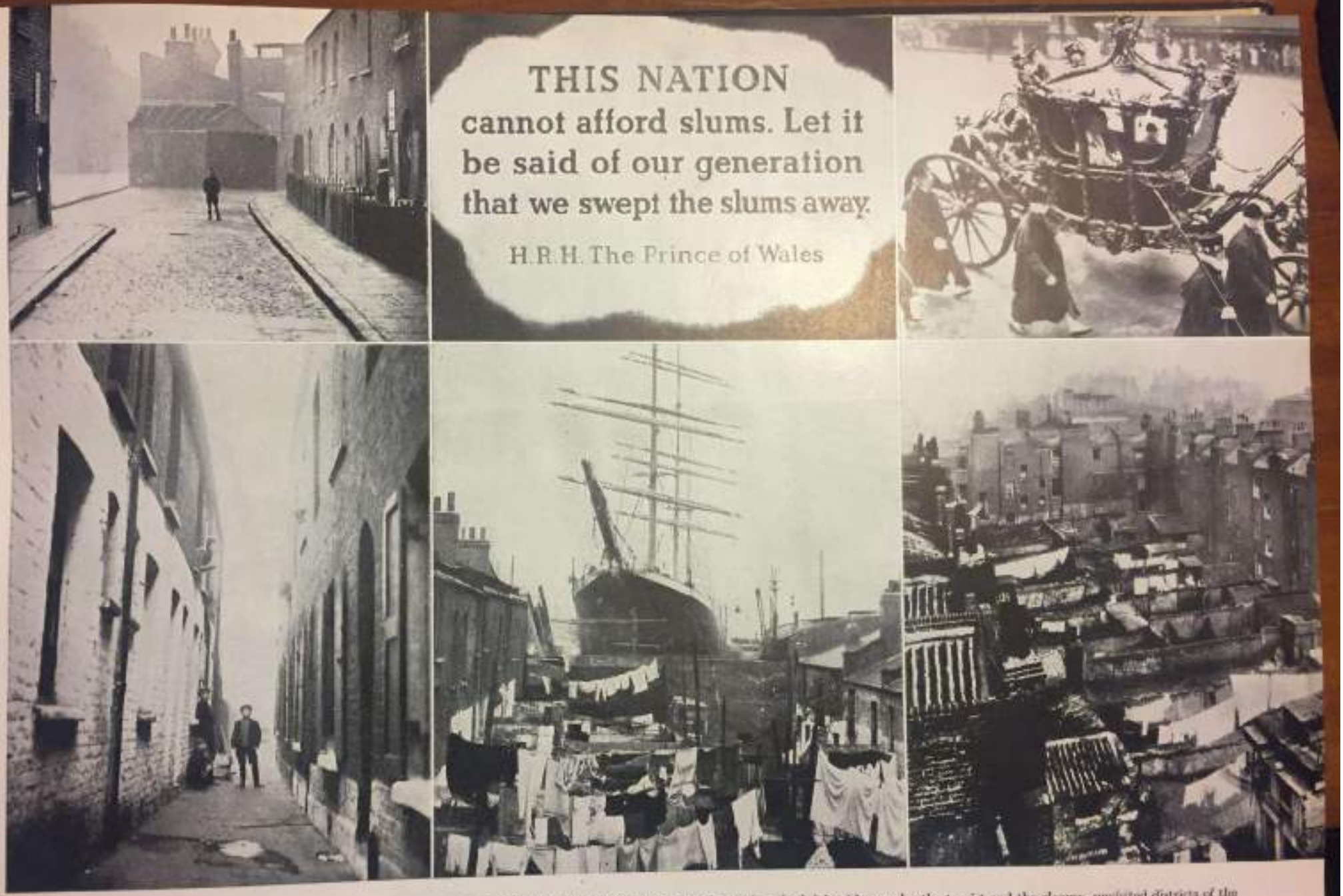
Overcrowding — Crowding has been generally defined as a condition in housing in which there are more persons than rooms, while *overcrowding* is a situation in which there are at least twice as many persons as rooms.

Statistics indicate that, at the point where crowding begins, illness and death rates increase. As the number of persons per room is increased, the possibilities of contact infection multiply, involving a great diversity of contagious diseases. Overcrowding should therefore be eliminated.

From the foregoing it may be inferred that high densities do not necessarily involve overcrowding; these represent two different conditions. It is obvious that there may be overcrowding without a high population density if the number of dwellings in a given area is low. Conversely, a residential district may have a high density of population without overcrowding if the district is properly planned.

As found in the cities of today, however, *high densities* usually mean *bad housing* in the worst sense. Since they signify overcrowding, they represent low standards of living, the propagation of disease,

[3] In many capitals of western Europe, landlords received a 10 per cent net return on buildings of this type.



THERE ARE TWO SIDES TO EVERY BIG CITY — the bright side seen by the tourist and the gloomy, unvisited districts of the poor. *London, the world's greatest capital,* has thousands of slum alleys, lined with dark, disease-breeding cottages and tenements. "Slum-clearance," an outmoded term, would merely scratch the surface of London's problems. Not this, but *only large-scale replanning can solve these problems.*

high mortality rates, increased traffic accidents, and the breeding of delinquency and crime. Districts whose housing conditions are of this character are commonly known as *blighted areas* and, in their worst stages, as *slums*.

BLIGHTED AREAS AND SLUMS

Blighted areas and slums have been officially defined as follows:

"A blighted residential area is one on the down-grade, which has not reached the slum stage" but which frequently exhibits at least some of the characteristics of slums.

"A slum is most simply defined as housing (on whatever scale) so inadequate or so deteriorated as to endanger the health, safety or morals of its inhabitants."[4]

Unfortunately it is often the case that districts termed "blighted areas" or "slums" by public officials are loosely and arbitrarily delimited, to the exclusion of streets which are equally blighted or slum-like.

Yet, irrespective of what official maps may disclose, slums and blight cry aloud their actual extent in the substandard conditions by which they may be recognized. These conditions may be observed in:

Inadequate living space inside the dwellings:

lack of light and sunshine (bad orientation)
lack of fresh air and ventilation
lack of privacy and isolation

Inadequate space outside the dwellings:

lack of play areas
lack of plants and trees
inadequate yard space
undue proximity of traffic

The buildings themselves are usually characterized by:

poor heating
poor plumbing
poor toilet facilities
insanitation
hazards from fire and building collapse
lack of proper repairs
unsightliness

Further slum factors are:

high rates of dependency
crime
delinquency
illness and mortality
illiteracy

It is obvious that high densities and overcrowding have greatly contributed to the development of these substandard conditions in central slums. Yet a distinction should be made between high densities in obsolete districts and high densities *controlled by modern planning*.

Lot Crowding — High density in an obsolete district is something to be condemned. For here density has resulted from the continuous effort to lodge more and more people in buildings that originally were not intended to house so many. Thus, substandard apartments built during the last hundred years to shelter a few families have been repeatedly "remodeled." Such remodeling usually consists of the addition of new interior partitions and new stories.[5] In this manner, one-family houses become many-family apartments; and when periods of economic crisis become acute, each apartment often serves to lodge several families. The process does not stop here; for the gardens and courtyards of these buildings, necessary for light and ventilation, are then utilized for further additions. With this, *lot crowding takes place*.

Lot crowding in residential districts is an index of high densities and bad living conditions. Like overcrowding, by which it is usually accompanied, it should be considered antithetical to all decent housing standards.

[4] Edith E. Wood, *Slums and Blighted Areas in the United States* (Washington: United States Housing Authority, 1936), p. 3.

[5] Except when, in recent years, the new legislation has obliged owners to take the opposite course.

DARK SPOTS IN THE CITY OF LIGHT. This map indicates the location and area of the unhealthful districts in Paris. The greater number of these "islands" are found in the eastern side of the city. The west side of Paris, composed of more prosperous districts, is completely isolated from these slums. And from these unhealthful islands, their gloomy dwellings, and their dark streets come children like this typical Paris slum child — a life born out of misery and doomed to ill-health. These streets are his playgrounds. Streets of this type favor a rapid propagation of disease. Malnutrition helps. *Tuberculosis is a permanent guest in these slum areas.*

Overcrowding Covers Vast Areas — As a general rule, residential districts removed from the central part of the city do not show population superdensities. On the other hand, however:

- *"Overcrowding is not only to be found in the central parts of our cities. It also occurs in the vast residential areas which developed as a consequence of the industrial growth of the past century."*

Town-Planning Chart

In these districts, which often cover large expanses of the city, the outward appearance of the buildings is not so depressing as that of the central slums. Huge blocks of apartments constructed *en masse* by real estate and building promoters here present their monotonous façades. Yet it is only when one enters them that their bad living conditions become apparent. Many of the plans of these apartments antedate housing legislation; they are therefore wanting in light, in ventilation, and in the most elementary sanitary requirements. But in spite of their dark rooms and halls, at the time of their construction they did have one advantage over buildings in the central parts, that of more space per family, land being still comparatively cheap in these districts.

This space advantage was altered with the expansion of the city, when rents mounted without improvements to justify the increase. Unable to pay the higher rents, especially during bad times or because of the absence of low-rent dwellings, the occupants of these apartments have too frequently been forced to share them with other families. In this way overcrowding has set in, often without altering the outer aspects of these districts. With overcrowding, bad living conditions have developed, and slums have spread.

It should be observed that, while this overcrowding process was going on, there naturally were many apartments for rent throughout the city. To working people, however, a housing shortage does not begin with the day when there are no more "for rent" signs, but when they are unable to find dwellings within their means. At this point, families crowd together in whatever hovels they can find, cramped in space, damp, dark, and poorly ventilated, while at the same time comfortable, well-aired dwellings often remain vacant, lacking renters who can afford them.[6]

To What Incredible Limits Have Men Been Herded Together in Cities! — Statistics in themselves are unexciting. Yet, when they represent human beings and their daily lives, they should give pause for reflection.

In the next few pages we present examples of high population densities and overcrowding in certain cities, followed by data on slums, to which these conditions are related. The photographs should serve to interpret the statistical statements as revelations of their actual consequences.

Densities of Population in American Cities — New York and Boston are two American cities which present high densities of population.

The most densely populated block in New York City in 1930 had 2,761 residents, or 635 persons per gross acre and 890 per net acre.[7] Maximum block densities have been decreasing in Manhattan for many years. In 1905 there were thirty-nine blocks with densities in excess of 1,000 persons per gross acre, but by 1925 none reached these densities.

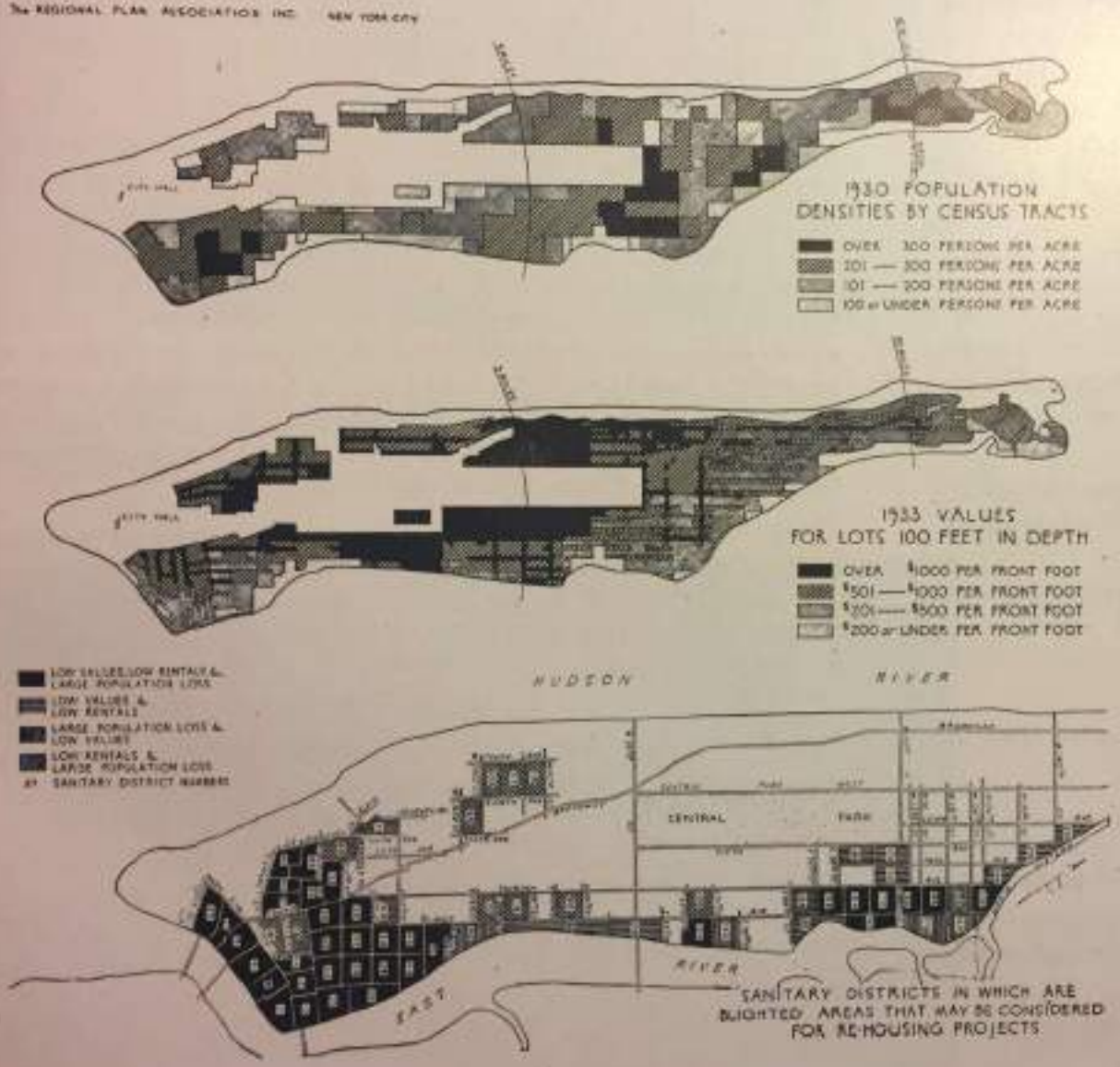
The average population density in Manhattan in 1930 per gross acre of residential area, including business areas outside of southern Manhattan, was 214. (Since that date the increase of population in Manhattan has been 1 per cent.)

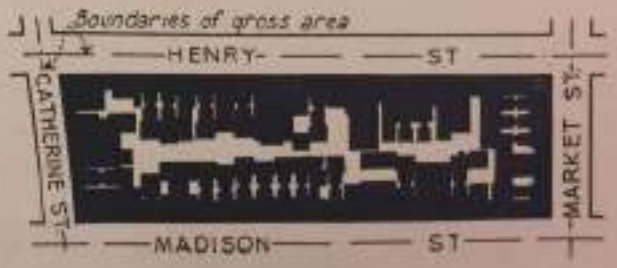
Still Manhattan is one of the most densely populated areas in the world.[8]

As a general rule, American cities exemplify comparatively low densities of population in residential districts, these districts being comprised chiefly or one- or two-family houses. In Chicago, Philadelphia, and Baltimore, over 50 per cent of the dwellings are owner-occupied. This may also be observed in a city like Detroit, where over 56 per cent of the homes are single-family houses, and 22 per cent two-family houses. (See illustrations on p. 47.) "The char-

[6] This was especially true in Paris, not to mention other large cities, two decades ago.
[7] *Gross area* includes half the area of bounding streets; *net area* excludes the area of streets.
[8] Especially if its daytime population is considered. See pp. 134–136.

BLIGHT AND SLUMS MEAN DECREASING LAND VALUES. It is curious to observe in the maps below the relationship between high densities of population and overcrowding and land values in blighted areas. Vast areas in Manhattan are blighted, as is shown on the lowest map. Right: these slum dwellings in East Harlem are a sample of what these neighborhoods look like. Right, below: the most densely populated block in New York City in 1930, *2,761 residents*, a population of 890 persons per net acre, lived in this limited area!





acteristics of slums in a city like Detroit are the decrepitude of the buildings and a certain degree in the index of density of persons per room. [See illustration on p. 21.] Highest densities occur in districts adjoining industrial and business sections." [9]

Densities of Population in European Cities — Continental European cities generally present high densities of population in their old districts.

In the case of Paris two zones of density should be distinguished: that of Paris proper (that is, within the political limits of the "Ville de Paris"), with an average of 147 inhabitants to the acre, and that of the region of Paris, or the outer city (excluding Paris proper), with eighteen inhabitants to the acre.

The inner city presents an extraordinary congestion. In certain working-class districts (Saint-Gervais, Bonne-Nouvelle) the population figures are exceedingly high, considering living conditions: 432 and 410 to the acre. The population figures for these and other districts reveal the fact that Paris has reached a degree of overcrowding unknown in Berlin, London, Vienna, or Leningrad, and in this respect is comparable to New York.

In London *the highest density of population* occurs in the borough of Shoreditch. This represents a density of only 220 inhabitants to the acre — low, if compared with New York or Paris.

On the other hand, many London dwellings are overcrowded. In the whole of London, with a population of 4,397,003,

150,130 people live at over 3 per room.
1,206,894 people live at over 1 per room.
287,000 rooms are required merely to abate overcrowding at over 1 per room.
165,750 houses are required altogether.[10]

In 1926 there were 1,064,525 people in Paris lodged in crowded or overcrowded dwellings, or a total of 37 per cent of the population. In the census of March 8, 1931, the proportion of inhabitants living in overcrowded or inadequate dwellings rose to 42 per cent of the population of Paris.[11] Yet populations in central areas as a whole were decreasing. This proves that those who could not afford houses in the suburbs continued to overcrowd old homes.

We can sum up by saying that, although the densities of population in the central districts of most cities have shown a tendency to decrease in late years, these densities and the accompanying overcrowding still constitute dangers to the health of the people living in these areas, considering the actual conditions that still predominate there.

American and European Slums — In American cities the cleavage of population groups representing different classes is not so marked as it is in Europe. Here slums and blighted areas often form patches in the vicinity of the most attractive business centers, at only a short distance from the most important avenues and in the shadow of the proudest skyscrapers. These blighted areas constitute *reserve zones* of possible future development, as their owners await "the next boom" and hold the land for speculative reasons. While awaiting these days of better business, the owners pay high rates of taxation, which in some cases they strive to offset with the rents collected from their overcrowded dwellings.

"Meanwhile the owner and the assessor have agreed to put high valuations on this land, not because of its present use or the income derived from it, but because they believe that it is destined, sooner or later, with the growth of the city, to be in demand for high grade business, on account of its proximity to the center of the town.

"Until a few years ago, our cities grew so fast that this expectation seemed fairly warranted. Owners, mortgage holders, and real estate operators are just *beginning to awaken to the fact that we are now facing wholly different conditions.* When immigration was stopped, the spectacular growth of our cities stopped with it. In addition to which, the birth rate is continuously falling. The drift from the farms to the cities seems to have turned in the other direc-

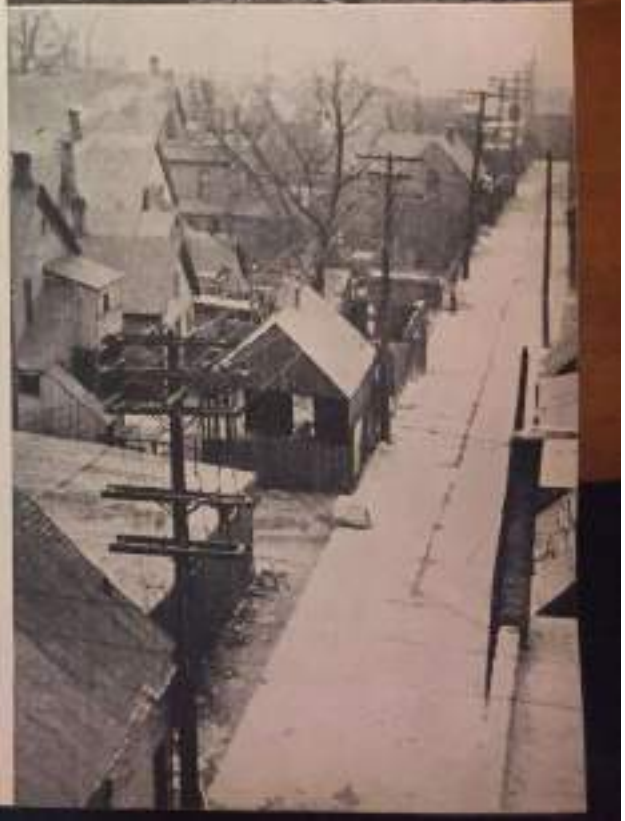
[9] From the report sent to the Fourth Congress by the American group of the C.I.A.M. *Architects' Journal* (London), October 26, 1933, p. 547.

[10] Figures for 1933. See *Architects' Journal* (London), October 26, 1933, p. 547.

[11] "After the census of 1931, no statistics on housing conditions were published, for these were still worse than those of 1926" (A. Chipeaux, *Le Taudis, ses victimes, ses causes*, Paris, 1938, p. 4).

A HUMAN SKYSCRAPER. The piling up of human beings in a densely populated European slum (Barcelona, Spain). The figures indicate densities of population per hectare; heights suggested are proportionate to densities. Below: A view of this district. A district of dark, narrow streets, treeless and grassless. A breeding-place of ill-health. This is a typical central district of an old European city.

In American cities slum areas are often scattered. Slums and blight are found in the vicinity of the most important avenues, in the shadows of the greatest skyscrapers. →



Blight in Detroit: dilapidated frame construction, with lot crowding in an area of relatively low population density. →

tion, and the development of skyscrapers has tended to a vertical rather than a horizontal expansion of business districts." [11]

Present defense needs and the shortage of housing facilities tend today toward more overcrowding in substandard homes.

European slums occupy central locations and are frequently limited by the streets or boulevards that replaced the old fortified belts. These areas are largely ignored by people who dwell in the better-class districts.

With rare exceptions, such as New York and Boston, densities of population are generally lower in American cities, where one-family houses predominate. Slums in the European sense of a given area overcrowded with high dwelling structures do not exist.

The processes through which high densities of population have occurred differ in American and European cities, though the consequences are much the same. Up to comparatively recent times, the great stream of immigrants pouring into the United States necessarily settled in the cheaper dwelling districts near the central business section. With each succeeding wave of immigrants, newcomers sought the same cheap dwellings, usually the worst, crowding the previous group of immigrants out into better districts, the earlier immigrants gradually being able to afford to move because of greater labor opportunities.

As a result, the worst and most densely populated districts remained near the centers of cities, while the more desirable residential districts kept moving outward, followed by concentric zones marked by mixed use and blight.

When immigration in America decreased around 1911, the situation within the slum became more static, as it had before in European cities. People remained in slums. At length a whole generation in America reached maturity, born and bred in dingy tenements and squalid streets.

Decentralization has affected American slums, and the American city as a whole, to a greater extent than is the case in Europe, since the degree to which transportation has been motorized is more advanced in the American city.

During late decades there has been as a rule less mobility in the slum population of European cities. Certain European slums have maintained essentially the same character for centuries; they might even be called historic slums.

The decline of central districts in European cities is not so noticeable as in American cities. The difference of tempo in the process of growth and decay in these districts is the most striking factor.

If European and American slums differ in their apparent origins, as well as in their types and modes of development, the general economic factors which have produced them are often similar, and their consequences for their inhabitants are everywhere the same.

The Magnitude of the Slum Problem — *Slum dwellers are numerous in large cities.*

"Of New York City's 7,500,000 people about 1,800,000, or nearly one in four, live in antiquated tenements or other houses that authorities call 'substandard.' The City Planning Commission recently marked out thirty-two sections of the city containing the greatest concentrations of substandard areas. *It is estimated that at least two-thirds of the 1,800,000 ill-housed people live in the antiquated houses of these sections — enough men, women and children to fill any city in America except the five greatest.*" [12]

It has also been calculated that about 681,000 families in New York City live under "substandard" conditions.

Blighted dwellings cover vast areas in many American cities.

Of the 264 sanitary districts into which Manhattan is divided, sixty-four, or one in every four, are blighted.

Presenting housing problems largely incidental to its rapid growth and decidedly aggravated by the extensive use of frame construction, the city of Detroit contains a vast area which may serve as a typical example of blight.

[11] Edith E. Wood, *Slums and Blighted Areas in the United States* (Washington: United States Housing Authority, 1938), pp. 17–18.

[12] Dorothy Rosenman, "Two X's of Housing," *New York Times Magazine*, February 11, 1940.

APPARENT CONSEQUENCES OF OVERCROWDING: TREES AND MEN. Superdensities in our cities mean lot crowding and, in consequence, the destruction of the natural environment of dwellings. As trees need space and light in order to grow, it may be affirmed that *the absence of trees is an index to substandard living conditions.*

Here, for example, are four neighborhoods in four different sections of Amsterdam analyzed by the Dutch group of the C.I.A.M.:

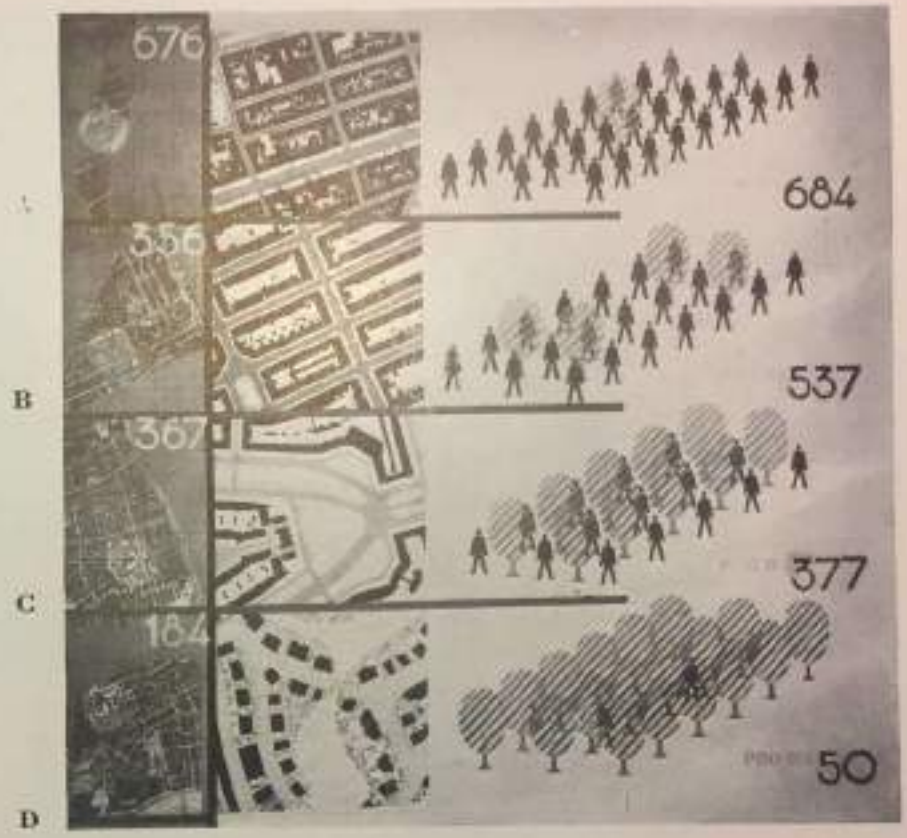
A is a *poor residential district* with a density of 676 inhabitants to the hectare. On the right is a portion of this district, with a density of 684 inhabitants to the hectare and a corresponding ratio of *one tree to every 27 inhabitants.*

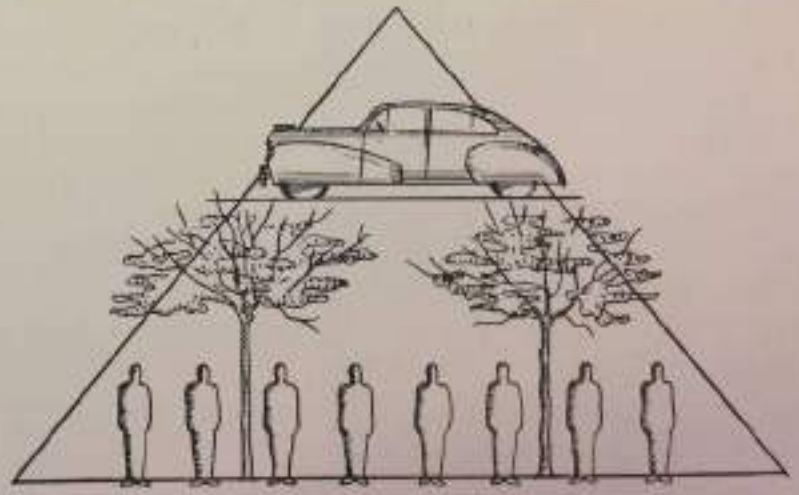
B is a *middle-class district* with a density of 356 inhabitants to the hectare. Examination of one part of this district, containing 537 inhabitants per hectare, reveals four trees to every 21 inhabitants, or *one to 5.25 inhabitants.*

C is a *higher-income district* with an average density of 367 inhabitants to the hectare. In a neighborhood with a density of 377 inhabitants per hectare we find 10 trees to every 15 inhabitants, or *one tree to 1.5 inhabitants.*

D is a *higher-income district* with an average density of 184 inhabitants to the hectare. Part of this district, laid out as a garden city, shows a density of 50 inhabitants to the hectare and a ratio of *9 trees to every inhabitant.*

As for the city of New York, though its five boroughs contain about 2,000,000 trees, this figure represents but little more than *one tree to every four inhabitants!* While the want of trees is only a superficial aspect of overcrowding in cities, it is one of the outward signs of slums and blighted areas — of their lack of space and air, their exclusion of nature, and the intolerable living conditions of their inhabitants.





Above: the ratio of trees to inhabitants in four different neighborhoods of the Dutch city of Amsterdam. Below: the ratio of automobiles and trees to inhabitants in New York City.

This area extends south of Grand Boulevard and both east and west of Woodward Avenue, the main business street. Originally built up with bungalows and story-and-a-half frame cottages of five rooms and bath, *these areas became progressively less desirable as they were invaded by business and industry and afflicted by dust and noise.*

Too often, in order to increase the income from one of these properties, another building was squeezed into the side yard of an original forty- or fifty-foot lot, or an addition was built at the rear to house another family. *The congestion resulted in many gloomy rooms, whose light and air had been cut off.* To this unhealthful condition must be added the fact that when several families were crowded into a house built for one, structural changes were seldom made to give them separate cooking, bathing, and toilet facilities.

A Typical Slum Area — The slums of one large city will serve to exemplify slum conditions in all cities, since these conditions are general. As our example, we shall take the following typical London slum:

In Shoreditch, which is the most "Cockney" area in London, almost 10 per cent of the whole population lives at more than three per room, and over 50 per cent at more than one per room. The area of the borough is a little over one square mile; the population is nearly 100,000. Half the houses are occupied by two or more families. Underneath the houses is a five-foot layer of refuse.

"Besides the insanitary character of the houses, and their decay, Shoreditch has to contend with the steadily increasing expansion of the City. There are now some 3,000 business premises and 14,000 structurally separate dwellings. *Land values in the southern parts of the borough are ever soaring higher* — far beyond the point possible for housing work. The inhabitants are forced to crowd into other houses. Few can afford to move to new estates.

"*Open spaces* — There is no playing field, park, or large open space.

"*Poverty* — There are about 5,000 persons recorded as unemployed, about 3,000 receiving domiciliary relief.

"In 1932 there were 1,180 deaths belonging to the borough; 818 of these, 69.3% occurred in public institutions.

"*Disease* — Cancer accounted for 148 (12.5%) of the 1,180 deaths. Tuberculosis, in all forms, for 101 (8.6%). Pneumonia, in all forms, for 96 (8.1%). . . .

"*Infantile Mortality* — The borough rate for 1932 was 80. [The London average is 66.]" [14]

Analysis of other boroughs has revealed similar conditions.

Slums Cannot be Remodeled — In 1923, on the basis of information assembled from board of health statistics ("Service du casier sanitaire"), the city of Paris prepared a program of vast extent for the cleaning-up of the city's insanitary "islands," or districts. This program covered seventeen districts, consisting of a total of 4,300 individual apartments, with about 200,000 inhabitants.

The steps which have been taken during the past fifteen years to render sanitary the conditions within these houses have revealed irrefutably that it is impossible to make healthful the houses situated in these islands.

Their particular insalubrity results from the narrowness of the streets and from the lack or insufficiency of interior courts. Owing to these facts, the rooms of these houses are almost without light, so that they become excellent depositories of the virulent disease germs transmitted to them by their occupants or by passers-by.

The only remedy for this condition is the demolition of the infected houses and the reconstruction, upon the reclaimed land, of sanitary dwellings surrounded by open areas, so that air and sunshine can penetrate into their rooms without hindrance.[15]

The important general deduction to be made from the reports and data examined by the C.I.A.M. is that *all cities — European and American, large, medium-sized, and small — present aspects of slum problems, though these may differ as to scale and type.*

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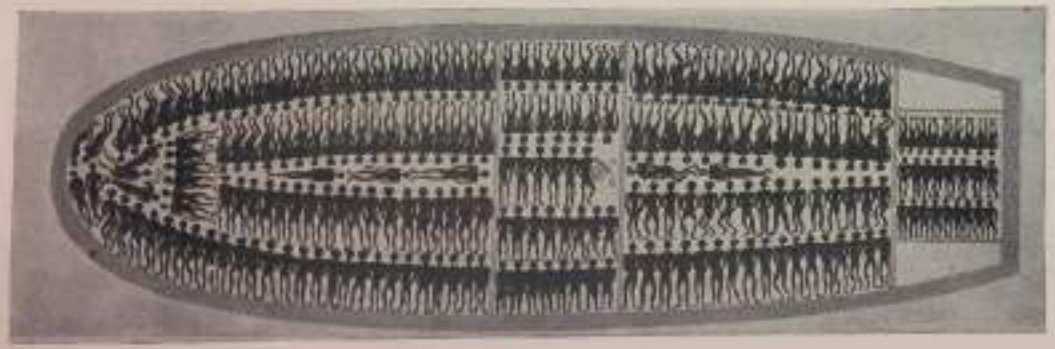
[14] *Architects' Journal* (London), October 26, 1933, pp. 519–520.

[15] From the report presented to the Fourth Congress by the C.I.A.M. group of France.

OVERCROWDING. *Nine persons in one bedroom!* A miner's family in Jemappes (Belgium). The entire floor space is covered by mattresses, the entire mattress area by human bodies. This is an extreme case of overcrowding, but there are millions of other cases only slightly better. Overcrowded homes with three and four per room are common in many big cities. To the right are other typical views of slum homes (above, looking down into a "ventilation and lighting" court; below, the family's "bathroom"). Compare the plan below of a black slave cargo ready for a voyage with the view of the bedroom above.



Plan of a slave cargo

CONSEQUENCES OF OVERCROWDING

- *"In overcrowded districts, living conditions are unhealthful. This is due to the fact that the land surface is overbuilt, open spaces are lacking, and the buildings themselves are in a dilapidated and insanitary state. This fact is all the more serious in view of the low economic means of the inhabitants of such districts."*

Town-Planning Chart

The consequences of overcrowding in slums and blighted areas must necessarily be tragic. Malnutrition, rapid propagation of disease, and high mortality rates are the natural results of the low living standards found in these parts of our cities.

Here tuberculosis is always to be found. Fresh air, light, sunshine, and all that is most essential for the healthful development of the human organism are insufficient in these districts. The small interior "ventilating" courts of some buildings do not afford ventilation; instead, dark and damp, they form ideal breeding places for bacilli, spreading disease from window to window across the tiny court, from room to room, from family to family. Under such conditions, the isolation of diseased persons is practically impossible.

"We cannot afford to keep our slums. Our overcrowded areas are the happy hunting grounds of germs. There they thrive and multiply to their hearts' content. Among the germ population of the slums, pride of place must go to the tuberculosis germ. . . . Pneumonia, meningitis, fevers and all the other ailments that are of verminous origin flourish where people are herded together." [16]

Lack of light, especially direct sunlight, lowers the general tone, lessens resistance to disease, and may be a contributing factor in rickets in children. A five-year study made by the New York Association for Improving the Condition of the Poor reported that three out of four tenement babies have rickets from lack of sunshine and/or faulty diet.[17]

[16] E. Goodwin Rowlinson, Director of Bacteriological Laboratories, Royal Institute of Public Health, London, quoted in *Architects' Journal*, October 26, 1933, p. 509. Many articles about slum clearance have recently been published as a consequence of the bombardments of the East End areas in London.

[17] Experiments with laboratory animals confirm this.

As to tuberculosis, where one member of a family has an advanced case, the danger of infecting other members is multiplied many times if the rooms are dark or badly lighted. For the tuberculosis bacillus in the sputum of an advanced coughing patient can live and remain active

several months — in a dark room
weeks — in a dimly lighted room
about two days — in a well-lighted room with northern exposure
about two hours — in a sunny room
fifteen minutes — exposed to direct sunlight

That the absence of fresh air has ill effects on the well-being and vitality of the human body is known to everyone. In this respect, it should be remarked that the lack of cross-ventilation is one of the shortcomings of bad housing.

Unclean streets, refuse heaps, and the frequently inadequate state of sewage disposal contribute to the insanitary conditions of individual dwellings. Cities build new hospitals, sanatoria, and dispensaries, yet permit slum districts to exist and to spread disease throughout the community at large.

"What would you think of the mayor of a city who, having proof of the contamination of his community's water supply, advocated the construction of a magnificent hospital in which to lodge the sick, instead of taking the necessary measures to purify the water? Anyone would naturally doubt that the man was in his right mind. . . .

"I regret to have to say that the political program of inaction with respect to slum problems is of the same nature." [18]

Among the consequences of overcrowding, moral factors should be included. Maps of delinquency areas reveal that delinquency, immorality, and crime are not uniformly distributed throughout the city but for the most part are concentrated in slums and in crowded areas near the centers of cities.[19]

[18] Louis Bollin, in *Le Journal*, Paris, December 17, 1936.

[19] Dr. Clifford R. Shaw, *Delinquency Areas, A Study of the Geographic Distribution of School Truants, Juvenile Delinquents, and Adult Offenders in Chicago* (Chicago: University of Chicago Press, 1929).

Tuberculosis Is a Permanent Guest of Slums — "In Paris deaths caused by tuberculosis total 2.2 per 1,000 inhabitants in the third arrondissement, 1.5 in the 11th, 1.83 in the 13th, and 2.11 in the 14th, against 0.43 in the 8th, which is a district inhabited by the wealthy. . . ." [20]

The narrowness of the streets, the lack or insufficiency of fresh air and light, admitted to some dwellings only through small interior courts,[21] keep many rooms in darkness. These houses cannot be made healthful.

In poor districts not ordinarily considered unhealthful, the tuberculosis death rate is more than five times greater than that of the districts inhabited by the wealthier families of Paris.

In a typical example, that of "Insanitary Island, No. 1," the forty-four condemned dwellings housed 1,398 inhabitants, including 245 children. From 1919 to 1930 there was an annual mortality due to tuberculosis of 13 per thousand inhabitants, while the average for the whole of Paris is 2.24 and for France 1.41 per thousand.[22]

The following figures [23] contrast the health statistics of part of Detroit's east side blighted area with the same statistics for the city as a whole:

	City Average	Slum Average
Pneumonia cases per 100,000 population	74.3	217
Tuberculosis cases per 100,000	75.6	488
Infant mortality	57.7	83

These differences cannot be attributed entirely to housing conditions and to the character of the neighborhood. Undernourishment and other factors have undoubtedly played their part. Nevertheless, *bad housing alone must take a tremendous share of the blame.*

[20] A. Chipaux, *Le Taudis, ses victimes, ses causes* (Paris, 1938), p. 9.
[21] One whole insanitary district contains a total of 4,163.8 square feet of dwelling space and 528.9, or 12.7 per cent, of court.
[22] The foregoing observations on Paris slums and tuberculosis mortality are from the report of the French group of the C.I.A.M.
[23] Edith E. Wood, *Slums and Blighted Areas in the United States* (Washington, 1938), p. 49.

The Disorderly Growth of Cities Has Made Living Conditions Worse in Central Areas

● *"The progressive extension of the urban area has destroyed the green open spaces once surrounding the dwelling districts of the city. This has served to deny many people the opportunity to enjoy the healthful benefits of living near the open country."* *Town-Planning Chart*

The disorderly growth of cities, with respect to their destructive encroachment upon the adjacent countryside, has drastically altered the relationship of country and city. Where the open country once was within walking distance or, at most, a short journey from the city, now it can be reached only by traveling great distances, at an expense which many city-dwellers cannot afford. As a result, countless city children are confined to their own neighborhoods, have only city pavements on which to play, and pay a tragic toll of injury or death in traffic.

While the popular use of the automobile in the United States has made the country accessible to far greater numbers of people than elsewhere in the world, certain circumstances which have universal application hold true even here. It may therefore be stated categorically that *the modern metropolis has destroyed its natural setting. It has established between city and open country many barriers of blight and industry.* In short, *it has imposed its mark upon its natural environment, instead of adapting the advantages of that environment to the benefit of the lives it shelters.*

Aware of the increasing gravity of the problem, during recent decades municipal councils in many cities have sought means of forestalling the ruthless destruction of nature in the vicinity of large cities. Yet the measures adopted have always been too circumscribed; at best, only a few isolated efforts in the right direction are to be noted.

Unfortunately, however, even these efforts make no compensation for the vast areas of open land sacrificed for the purpose. As an example of the limits to which abuses of this nature may lead, we cite the following experience of the city of Paris:

"A zone of 250 meters in width and under military control formed a belt encircling the whole city of Paris. So that artillery fire would

not be blocked by high buildings, in case of war and a siege of the town, it was forbidden to build within this area, consequently classified as 'non edificandi.'

"The war of 1914–1918, however, proved that this type of fortified area was of little military use. It was therefore proposed that the old fortifications be razed, their sites sold for dwelling purposes, and the proceeds of the sale invested in the creation of a 'park belt' around the city, in the zone classed as 'non edificandi.'"

But what has happened instead?

The so-called "park belt" has already been built up to an extent of over twenty miles and covered by low-rent apartments. The view of the country has been screened off by high blocks of buildings that virtually constitute new ramparts around Paris. Structures with small windows and narrow inner courts repeat their monotonous patterns, additional buildings of the same type gradually achieving the encirclement of the city. Already 2,033 acres of land have been sacrificed to this construction. Paris has lost its "park belt" forever.[34]

BLIGHT AND SLUMS COST MONEY

Besides the ill effects which blighted areas and slums have on the health and morale of their inhabitants, it should be observed that they are costly to city governments and consequently to taxpayers.

The slum problem affects all citizens. Their upkeep includes a constant struggle against disease and the problem of preventing its spread to the rest of the city. For slums are within cities, and cannot be isolated. They need special public health work, special policing, and vigilant fire protection. Since these extra services cannot be maintained out of the taxes of these poor districts alone, their cost must be shared by the city's taxpayers in general.

The following figures on the city of Boston substantiate these statements:

[34] From the report by the French group of the C.I.A.M.

COMPARISON OF COSTS TO CITY OF VARIOUS DISTRICTS[35]

District	Profit or Deficit	Amount per Net Acre
Business district	Profit	$110,146
Industrial district	Profit	5,334
High-rent residential district	Profit	17,154
Miscellaneous residential district	Profit	1,544
Suburban residential district	Deficit	803
Low-rent residential district	Deficit	15,104

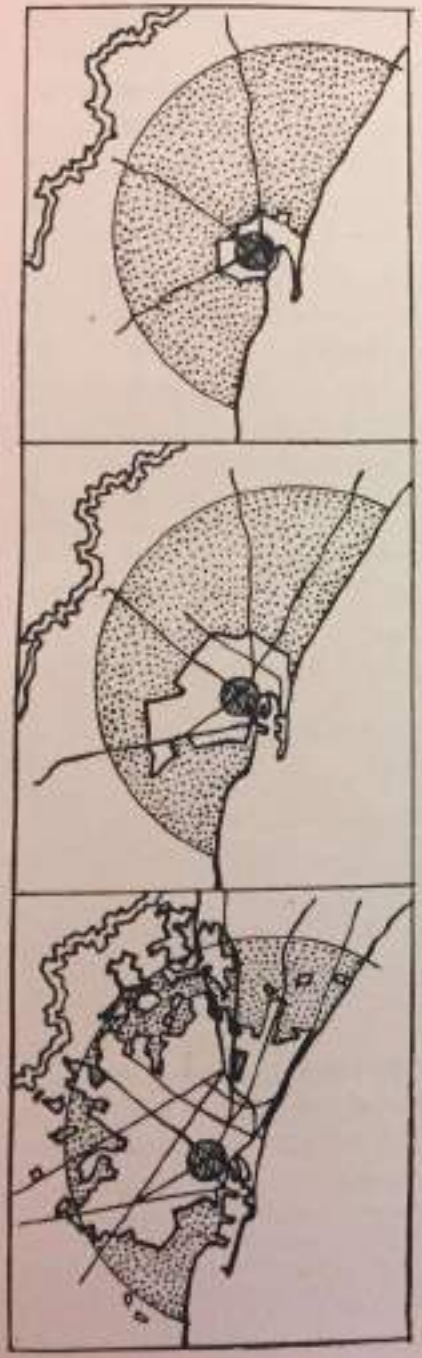
Certain recent population trends have made matters worse from the economic standpoint. With the outward expansion of cities, new areas are developed, requiring the laying out of new streets and sidewalks, the extension of sewers, water mains, and lighting, the building of schools, and the expansion of other municipal services. As long as the population increases rapidly (and this was especially true while immigration contributed to the growth of cities), the older and more centrally located districts maintain their population density and thereby continue to carry their share of the city's budget burden.

When, however, the city continues to expand even though there is no increase in population, the blighted and slum areas of the central part of the city lose part of their population. While this decline in population may improve hygienic conditions, nevertheless these parts of the city still require the same municipal services. Still carrying the burden of providing for these old districts, the city also has the additional expense incurred by the development of new areas. Consequently, while the number of taxpayers has not increased, taxes must increase.

The blighted areas have therefore become a liability, since their upkeep costs the same or more, while their decrease in population has considerably reduced their possible taxation.

In some cases, laissez-faire policies and rampant speculation have brought cities to the verge of bankruptcy. If this process of uncontrolled decentralization continues, it may mean the economic death of our cities.

[35] Edith E. Wood, *Slums and Blighted Areas in the United States* (Washington: United States Housing Authority, 1938), p. 60.



The old fortifications of Paris no longer exist but have been replaced by a new belt of brick and stone. These low-cost dwellings, known as the "Habitations à Bon Marché," have often been talked of as *future taudis* or *future slums. This is an outstanding example of the relentless destruction of open spaces in suburban areas.* Instead of the planned park belt that might have benefited the dwellers in the central districts, this densely built area has made their plight worse by eliminating the nearest open spaces.

During the last few decades all cities have made the countryside less accessible to their populations by developing vast suburban areas. These three graphs of the city of Barcelona show this process. The small circle indicates the location of the worst slums, the outer circle the easily accessible countryside. ←

Types of Slums and Their Causes — There are various types of slums, of different origins, but whose principal varieties may be reduced to three groups.

Box-Towns — Also known as shanty towns, box-towns are composed of shacks built of salvaged materials of all kinds. Usually situated outside the administrative limits of the city, they are able to escape its housing laws and taxation. As a means of justifying their existence, they are often regarded as temporary by public officials, even though they may have all the appearance of becoming permanent.

Housing for the Poor — Some forty to seventy or more years ago, when housing laws were practically nonexistent, large areas of low-standard dwellings were erected, intended for working people or "to house the poor." Construction was bad and of cheap materials, generally of wood in American cities. These houses, which quickly became dilapidated, represent the slums of the nineteenth century, products of the rapid urban expansion of that period. Buildings of the same pattern were still constructed right into the present century. Many of them, especially in Europe, are not officially classified as slums.

Central Slums — The worst and best-known type of slum is the one situated in the central part of the city, which has been described in the preceding pages. In American cities it is located near the business center; in Europe, in what was once the city proper, or the old nucleus of the city. These are districts that have known better days. *Not originally built as slums, they have deteriorated into slums.*

Both public authorities and real estate speculators are greatly responsible for the development of slum areas of any type.

Where laws exist, or have existed, regulating the sanitary requirements of housing, they are often insufficient and ineffective. And where they may even seem to have met certain immediate needs, it frequently happens that they are not enforced, *the executive functions of the municipality lagging far behind the legislative.*

Real estate, on its side, has followed short-sighted policies concerned only with immediate gains. Lacking a long view, it has encouraged the haphazard and spontaneous expansion of cities, either altogether without planning or with only piecemeal planning, too often tolerated in the name of private initiative. In this manner, it has fostered blighted areas and the development of slums,[9] much to the detriment of its own interests in the long run.

Other factors, such as periods of depression and economic crisis, have hastened the deterioration of these districts.

Misuse of the Land Surface Results in Lot Crowding — As we have previously shown, the population of the city is irrationally distributed throughout the urban area.

With the misuse of the land surface, certain districts are characterized by lot crowding, while others contain many vacant lots. While some dwellings lack all but the most elementary living and breathing space, others stand boarded up for years, falling to ruin.

As a rule, average densities for the whole of the city are low. If we examine those of certain districts, or parts of them, however, these densities will be found to be high.

What are the causes that have determined this abnormal distribution of dwellings? They may be classed in two groups: (*a*) those that result from the attraction of great populations to urban centers, and (*b*) barriers to the expansion of cities.

(*a*) Among the first group the most outstanding factors are:

The growth of industry. Owing to the widespread use of machines, the growth of industry has been responsible for the greatest increase in population density. With the coming of the Industrial Revolution this growth caused unprecedented migrations of people to cities.[10]

The railroad facilitated and sped this concentration.

The resultant demand for dwellings encouraged *private speculation.* During the past century, speculators found new formulas to multiply their profits. This they accomplished without opposition, since

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[9] It is recognized, for example, that blight increases when suburban areas develop without balance or control, regardless of what is happening in other zones of the city.

[10] In late months the defense program has attracted great numbers of workers to many cities in the United States, and in this way has tended to reverse the decentralizing trends of the last few years.

housing laws were either nonexistent or ineffective and public officials notoriously failed in their task of protecting the interests of the community.

The result was what might be expected. Land values were determined only through free speculation, which, in protecting its interests, made them rise to fabulous heights. As land prices continued to increase, rents could be kept relatively low only by crowding together the greatest possible number of dwellings upon the same limited land surface.

This process of lot crowding continued in the areas whose land values were highest. As speculators "developing" suburban or outlying districts began to compete with those who were overbuilding the central districts, new concentrations took place. Since the houses in the outlying sections of the city offered increased comforts, made available by the new technics, rents on the older dwellings of the central areas were forced lower, a fact which resulted in additional lot crowding to compensate for the decrease in rents.

This process has undoubtedly been the principal cause of the high densities found in central districts.

(*b*) A second group of causes is comprised of those factors which have indirectly produced high population densities by setting up barriers to the expansion of cities. The principal among these are:

Geographical elements. In some cases, geographical elements like rivers (as in the case of New York) or mountains have served as barriers to the expansion of a city, until modern engineering was able to overcome them.

Defense constructions. In certain European and Asiatic urban centers, fortifications around the city formed a belt that tended to constrict the population. When modern artillery at a relatively recent date finally made these defenses useless and the city could expand freely over the surrounding countryside, a high concentration of population had already been attained within the belt.

Other factors may also contribute to the concentration of populations within certain areas. Among these are differences in tax rates and in transportation facilities, and arbitrary political boundaries.

The irrational distribution of dwellings resulting from the foregoing causes is one of the origins of the bad living conditions found in the cities of today.

How Slums Are Formed: Two Examples — The origins of slums and the processes of their formation vary considerably. Since the required details are often available, it is possible to trace the evolution of some slums from their origins to the present, arriving, quite in the manner of the medical examiner, at a form of case history for each slum examined.

We propose, therefore, to examine two slums, one in London and the other in New York, from whose case histories — which would require more space than we have at our disposal — it should be possible to discover the chief factors which have brought them to their present state.

A London Slum and Its Formation: How a Prosperous Parish Became a Slum [28]

Let us outline some of the factors in the evolution of one section of the city, the borough of Bethnal Green, which forms only a small part of present-day London. In certain facts in the historical development of Bethnal Green, now far from the country and totally absorbed within the great mass of the city, we shall recognize some of the causes of its present slum condition.

1700. Bethnal Green is a small, wealthy parish, with a population of semi-peasant weavers.

1750. It is the center of the most important silk-weaving district in England.

1775. Bethnal Green has 12,000 to 15,000 looms and almost 30,000 weavers. At this moment the world market has suffered setbacks in northern Europe and in those countries reached by trade routes leading from the ports of Genoa and Venice toward the East.

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[28] "From a Prosperous Parish to a London Slum," a study of Bethnal Green by the M.A.R.S. group (Modern Architectural Research) of the C.I.A.M., presented in the form of an exhibition of photographs, graphs, statistics, and commentaries at the Building Trades Exhibition at Olympia, London, September 1934.

The growth of London parallels that of Bethnal Green. Constantly drawing nearer to the little village, it thrusts out its tentacles and prepares for additional annexations.

The growth of the British Empire during the same time has an enormous influence on the development of London. New colonies open up huge markets. Improvements in navigation reduce distances considerably.

1800. Before 1800 two classes appear: *the rich master weavers* and *the pauperized piece-workers*, bereft of their land but working at hand looms in the factories of the masters.

The conditions of this proletariat were rendered more acute by the Industrial Revolution of the nineteenth century, which smashed hand-weaving completely.

1860. The most important single event, which had a catastrophic effect on the life of the borough, was the trade agreement with France in 1860, which removed the tariff on imported silk and, almost at one stroke, put 50,000 weavers out of employment.

The creation of a proletariat, together with its pauperization through low wages and unemployment, may be recognized as the basis of this slum development.

1880. Imperial expansion and the enlargement of world markets between 1880 and today caused the growth of Greater London, of which Bethnal Green becomes a central borough. As is frequently the case in cities, the first eastern suburb, in which Bethnal Green lies, became the poorest, worst, and cheapest, while the wealthier people moved further out.

1900. By 1900 only forty-three families were still weaving, though the mercantile tradition of small-scale industry continued, cabinet making, tailoring, shoemaking, and other small trades being substituted for silk weaving.

London, whose residential districts are for the most part composed of low buildings of two or three stories, does not present great densities of population. In contrast, however, the slum districts show much overcrowding per dwelling.

The following statistics reveal comparative housing conditions in three London boroughs: Bethnal Green (working-class slum district), Chelsea (middle-class), and Hampstead (upper middle-class, comfortably housed):

1. *Bethnal Green.* Population 108,194.

7,322 people living at over 3 per room.
49,623 people living at over 1½ per room.
12,500 rooms required merely to abate overcrowding at over 1½ per room.
23,000 rooms, or approximately *6,000 houses, appear to be needed altogether.*

2. *Chelsea.*[29] Population 59,031.

1,186 people living at over 3 per room.
13,218 people living at over 1½ per room.
3,000 rooms required merely to abate overcrowding at over 1½ per room.
5,750 rooms, approximately 1,500 houses, required altogether.

3. *Hampstead.* Population 88,947.

663 people living at over 3 per room.
9,900 people living at over 1½ per room.
2,000 rooms required merely to abate overcrowding at over 1½ per room.
4,000 rooms, or more than 1,000 houses, appear to be required. One thousand houses will be taken as sufficient.[30]

Comparison of the data on these three boroughs should suggest the bad living conditions of Bethnal Green and its slum character, especially from the standpoint of extremes of overcrowding.

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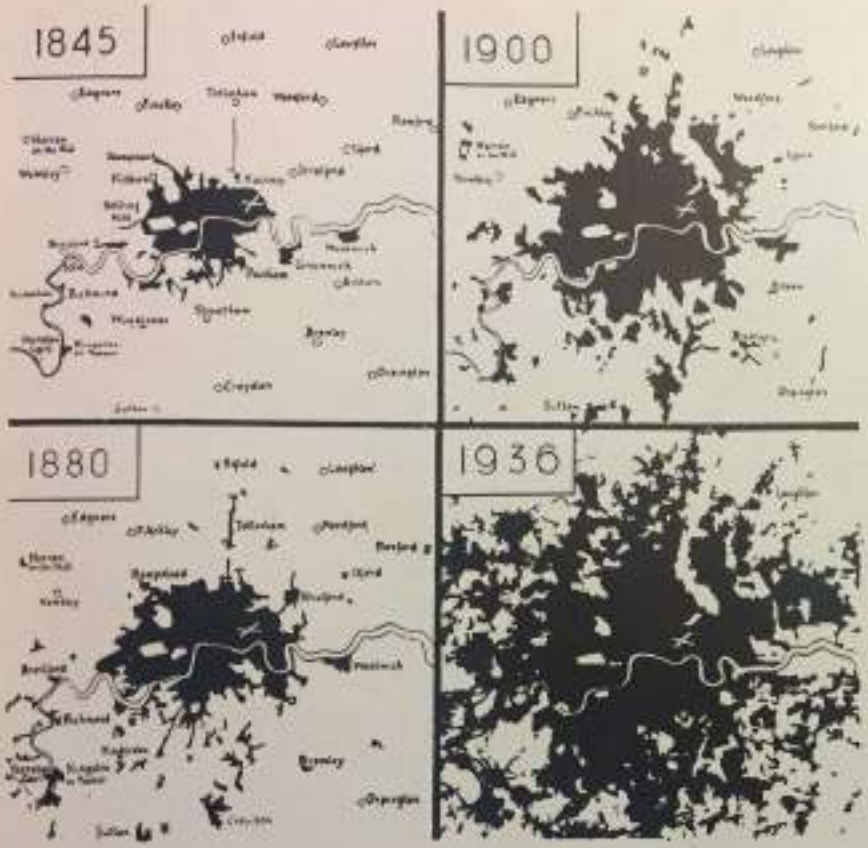
[29] The inhabitants of Chelsea are of the middle class. In spite of the fact that certain parts of the borough are overcrowded and that its open spaces are insufficient, its living conditions are superior to those of Bethnal Green. In the latter, even though there is a park, open space represents only 40.4 per cent of the total area of the borough. The figure for Chelsea is 53.8 per cent. (This percentage must be considered in relation to others in London only.)

[30] *Architects' Journal*, October 26, 1933, pp. 546-547.



In these four maps, showing the growth of London during the last ninety years, the slums of Bethnal Green are indicated by an X.

FROM A PROSPEROUS PARISH TO A LONDON SLUM. Bethnal Green was still a peaceful parish around 1820. The open country lay about its dwellings, which were light and airy; its streets, like the one on the right (above), were relatively quiet.
Swiftly, like a huge octopus, the big city extends its tentacles and finally absorbs all the villages around it. Bethnal Green is one of them. (See maps above.)

This is Bethnal Green, no longer green. Note the tenement blocks built by the London County Council (visible on the left and at the center). They add little to the attractiveness of the district. If the whole of it were rebuilt on this basis, it would perhaps look even more gloomy than it does today. →

A New York Slum — Our second example, which has certain fundamental analogies with the first, is that of Harlem, in New York City.[8]

1658. The village of Nieuw Haarlem is established in the center of a rich farm area, about ten miles from the town of Nieuw Amsterdam (New York).

1658–1858. For two centuries Harlem retained most of its pastoral charm, while the town below expanded northward, becoming the country's most important commercial center.

1830. The building of the Harlem railroad converts the rural area into a rapidly growing suburb.

1853. The Third Avenue horse railroad is chartered.

1880. With the extension of the elevated rapid transit lines to Harlem, the section becomes a fashionable neighborhood.

1889. The peak of this phase is reached with the opening of the Harlem Opera House.

1880–1900. During the great immigration waves of the 1880's and 1890's, many Jews and Italians settle in Harlem.

1901. Negroes begin to move into Harlem, and white groups begin to move out of middle Harlem. The Negroes are attracted to Harlem because of a deflated boom in real estate there. Because of inadequate transportation facilities, fine apartments built by speculative real estate promoters had been left tenantless.

1910–1919. In the early 1910's Negroes continue to move into Harlem from lower Manhattan. By 1919 the Negro population of Harlem had quadrupled.

As in the case of Bethnal Green, it may be observed that Harlem, too, lost its charm as a village in the transition here outlined. Its natural environment was destroyed by the growing city.

When wealthy people who had apartments there moved out and the poor population came in, the property owners became preoccupied with speculation on their holdings. This speculation, without regard for the future of the district, contributed much to Harlem's transformation into a slum.

Harlem Today — The slums of Harlem are among the most miserable in New York. Health and social conditions are extremely poor. A 1934 survey showed that among 20,000 people 3 per cent suffered from pulmonary tuberculosis. One block in particular, from Lenox Avenue to Seventh Avenue, between 142nd and 143rd streets, was referred to as the "lung block," the death rate from tuberculosis being twice that of Manhattan. Maternal and infant mortality rates are more than double those of the city of New York as a whole.

Past Errors; Future Effects — An analysis of slums in general, as in the case of the Harlem area in New York or that of Bethnal Green in London, would reveal that their housing conditions result from all kinds of errors committed in the past, due principally to lack of foresight and the absence of planning. These errors, persisting up to the present, have had increasingly grave consequences as speculation has grown more intense.

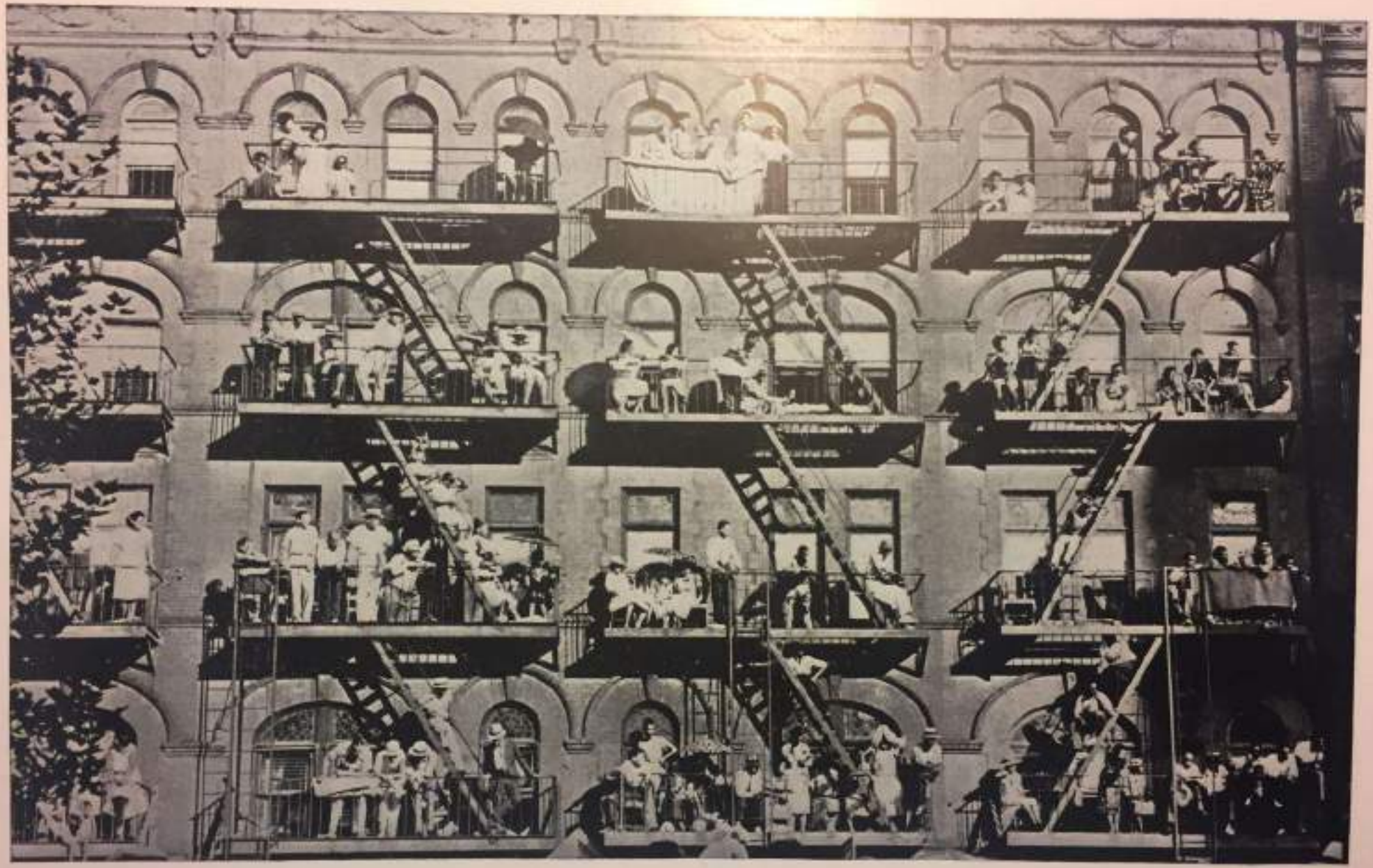
More detailed analyses would reveal that slums are not only bad for their inhabitants but in the long run bad for the real estate owners as well. In their ill effects on health, on morality, and on property values, and in the fact that they represent added burdens upon the municipal budget, slums are obviously bad for the city as a whole.

HOW SLUMS HAVE BEEN CLEARED

The elimination of slums has been widely discussed during the past hundred years. Little was done in the last century, and what was accomplished was far from being satisfactory. The "housing the poor" tendency predominated; housing was mostly a charitable hobby.

After the first World War, housing became an important item in the public works programs of all great nations. From 1920 to 1930 European countries experienced a period of extensive housing activ-

[8] See description of this district in the Federal Writers' Project *New York City Guide* (New York: Random House, 1939), pp. 258–392.



Less than one hundred years ago a village of pastoral charm occupied this neighborhood. This is a street in Harlem today, during a parade. The overcrowding of balconies is accidental, but it seems to convey to the façades the conditions of a more permanent character that prevail inside these Harlem tenements.

ity. Yet interesting as it is, especially in some isolated cases, the work achieved thus far has not, as a whole, been approached on a sufficiently broad basis.

How relatively little has been accomplished by present slum clearance projects may be realized if they are compared with the magnitude of the whole problem of substandard dwelling. Such projects may be viewed as a mere scratching of the urban surface, considering that they are no more than compromises with the urgent necessity of removing *all* slums from our cities and providing proper housing for vast masses of people within the frame of a healthful environment.

In addition to the fact that slum clearance has in reality not yet gone beyond the most meager beginnings throughout the world, it should be observed that most slum clearance projects exhibit the same general shortcomings:

1. *The want of a master plan.*

The proper approach to slum clearance requires that *the project be considered within the scope of a master plan for the city and its region* and that the zones intended for different urban functions be defined.

The absence of such a master plan has too often resulted in the erection of new dwellings on sites which should have been used for industrial or commercial structures, or which might have been devoted to recreational purposes.

2. *Slum areas minimized.* Very rarely have these projects approached the slum problem in all its magnitude. As a result, official maps, while indicating the areas commonly regarded as slums and selected for clearance, overlook many sections of the city which might justifiably be considered as slums and which certainly should be included in the clearance program.

3. *Neighborhood clearance not applied.* The circumscribed scale on which these zones are rebuilt does not permit, in most cases, the creation of entire neighborhood dwelling units and the adoption of a new urban scale, including new street patterns for modern traffic requirements. (See pp. 68–76.)

4. *The time factor ignored.* Once a project has been planned, a limited period should be set for both clearance and rehousing (timed phases for building), as well as a life limit for the new buildings (limit of obsolescence).[22] The time factor, however, of tremendous importance in this application, is quite generally ignored.

5. *Neighborhood needs overlooked.* The land surfaces liberated by the demolition of old buildings are sometimes too soon rebuilt, without considering whether they might not better serve the needs of the surrounding neighborhoods by being used as parks or playgrounds, or by being only partly occupied by buildings devoted to community services.

6. *The obstacle of land values.* Evaluations placed on such building sites, particularly in central districts, are often much too high, creating a burden which future rents must carry. This always ends in paralyzing the activities of the agencies promoting these projects, whether they be the municipality, the state, a coöperative society, or private initiative.

7. *Misapplication of modern building technics.* Rarely have these projects availed themselves of the tremendous possibilities created by modern technical advances. In most cases, the application of these technical advances, whether of a structural or equipmental nature, has been ignored and even opposed. Yet it is in these large-scale housing projects that increasing specialization and standardization, permitting mass production of the principal component parts of the buildings, would find a vast field, a most desirable laboratory.

8. *No provision against future blight.* Almost all rehousing projects have failed to include provisions for controlling the immediate environs of sites cleared of slums, so that these environs might not again in the future have a deleterious influence upon the newly constructed area.

9. *No air-raid precautions.* Quite generally, precautions against air raids are ignored. This creates a critical situation, especially in

[22] "The production of a structure does not end until its final demolition" — see "Design for Environmental Control" by K. Lönberg-Holm and C. Theodore Larson, *Architectural Record*, August 1936.

DWELLING BLOCKS RESULTING FROM SLUM-CLEARANCE SCHEMES are often built without the necessary space around them. They are deformed so as to fit into valuable and insufficient land areas cleared after much fighting . . . The same limitations are to be found in every great city (land values in central areas, where slums are generally located, being high everywhere). They have ended by imposing a *style in which unattractiveness is the dominant note.*—

This style has traveled round the world. Above and to the right are three typical examples in France, the United States, and England.

One of the outstanding characteristics of these rehousing schemes is the perpetuation of traditional street patterns. The narrow alleys of the old cities often reappear in them ←

Houses, like sardines, have been crammed into a too-limited space. . . .

the case of these rehousing sites which are overbuilt, centrally located, and surrounded by densely populated streets. In case of air raids, many of these new buildings, by virtue of their concentrated construction, would serve as excellent targets. For purposes of air-raid protection, a large open space with shelters for the people of the neighborhood would have been more useful to the district than these new buildings, which only make the area more congested.

10. *Psychological factors overlooked.*

The general aspect of most of these officially conceived housing structures is depressing.

Here are the materials, the design for shelter — *compressed*, one would say, within a prescribed area. Out of the same treeless wastes, carved out of a complex of the city's surface, rise the same drab walls, cut with windows which give upon the same decaying city.

In details of construction, in the disposition of spaces, in the scale of the ensemble, the nineteenth-century "built-in slum" is often perpetuated.

One would say that many of these houses were constructed in the belief that men's eyes have no need to traverse spaces, delineate volumes, or perceive colors, though these are attributes of seeing which become the enrichment of living.

In all of this, one feels that the psychological factors have been overlooked. *Shelter* is here — but often in the form of buildings that already seem prematurely old, like *the shadows of future slums.*

HOUSING ON THE WRONG SITES . . . LAND VALUES THE CAUSE

Queensbridge Houses, the largest public housing development in the United States at the date of its opening on October 25, 1939, occupies forty-seven acres on the East River north of the Long Island City span of the Queensborough Bridge. The project provides homes for 11,387.

"Civic workers in Queens appealed to President Roosevelt for a change in site. They argued eighteen months ago: '*Why put the under-privileged citizens of New York in one of the noisiest, dirtiest areas in the city?*' It was suggested that other parts of the borough would offer clean air, controlled traffic, and better transit facilities. *The low cost of land* on the East River waterfront, however, was said to have been the determining factor." [33]

The same thing has happened too often in every country. Europe is full of similar cases. The first housing schemes of the last century initiated this policy.

The "Society for Improving the Condition of the Labouring Classes" "proceeded to build their first set of *Model Dwellings*, on the only eligible site of ground then offered, and which they had some difficulty in securing. . . . *The form of the site, and the unfavorable condition of the foundation for a lofty building, being newly-made ground, in some degree influenced its appropriation to a double row of two-story houses, facing each other. . . . Where space will admit of it*, some modification in the arrangement of houses built after this general model would be desirable." [34]

A hundred years have since gone by. While greater projects are conceived, the same difficulties persist — on a larger scale. High land values continue to be the main obstacle.

"A conflict of opinion has been aired between Nathan Straus, who heads the USHA, and Chairman Rheinstein of the New York City Housing Authority. . . . The Rheinstein-Straus controversy arose over the question of land costs. Mr. Straus refused to approve projects on sites costing more than $1.50 per square foot, unless the city made up the difference. *Mr. Rheinstein argued that at this price it would be impossible to buy land in New York's congested areas where there are slums to be cleared . . .* [and] that if projects were placed in outlying areas the cost of new schools, sewers, etc., would *outweigh the cheaper land. . . .* Mr. Straus said he doubted if Congress would approve of costly land purchases *'to bail out the owners of slum tenements. . . .'* " [35]

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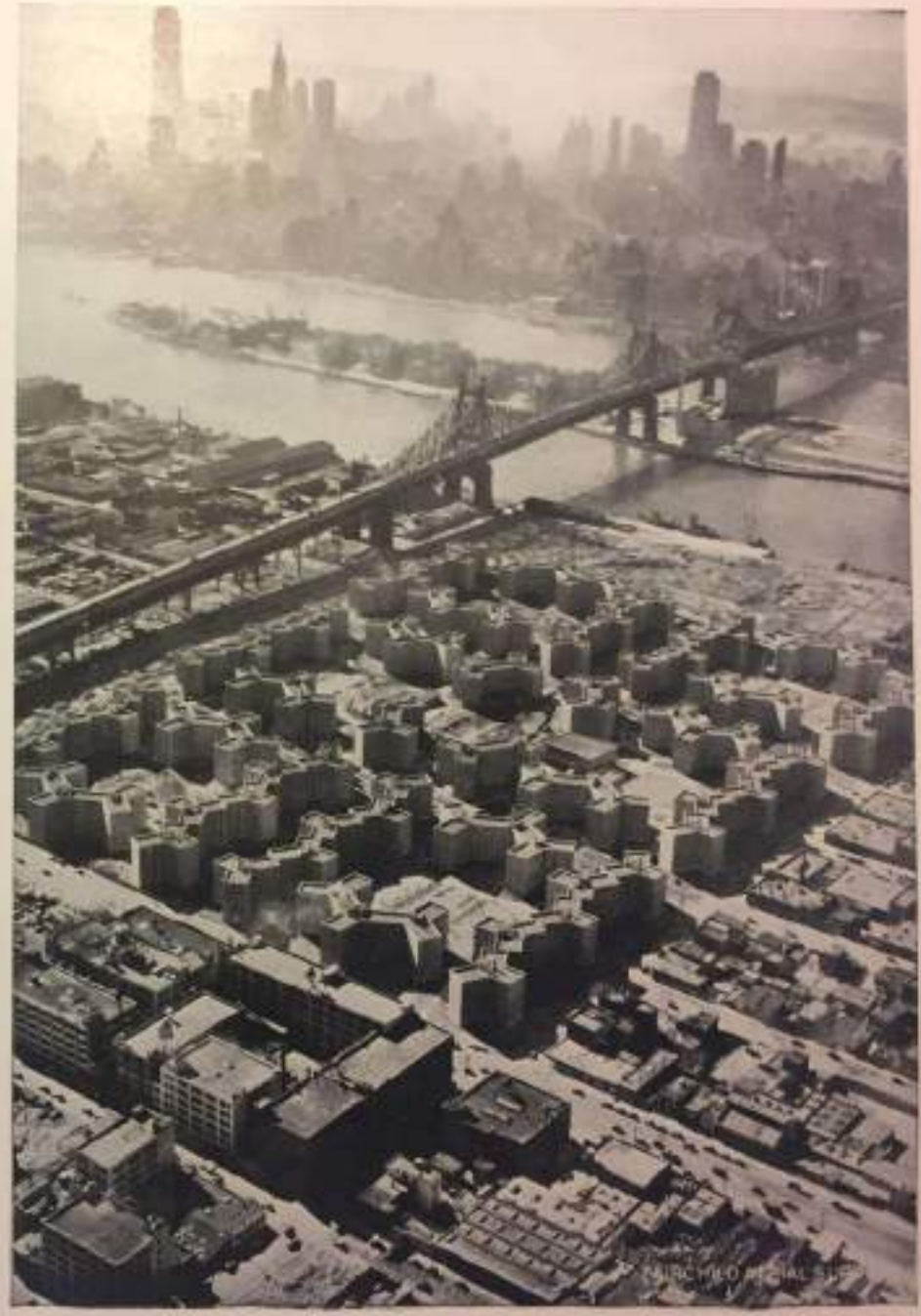
[33] *New York Times*, October 7, 1939.
[34] Henry Roberts, report "On the Dwellings of the Labouring Classes" (London), January 21, 1850, pp. 6, 7.
[35] *New York Times*, October 15, 1939, sec. 4.

PERPETUATION OF THE BUILT-IN SLUM. Built-in slums are typical products of the nineteenth-century attitude toward rehousing. Victorian philanthropists were once proud of them. Their appearance as a consequence of the prevailing spirit of that period was understandable; their construction today is inexcusable. Compare these two views: below, London in 1870; above, Villeurbanne, France, in 1936.

THE TOWN PLANNER'S PROBLEMS AND THOSE OF THE ARCHITECT. Housing schemes cannot possibly be good if the *initial error of selecting the wrong site is committed*. Unattractive lowlands, without any possible isolation from through traffic and its nuisances, or from those of industries settled in their immediate neighborhood, cannot be compensated for by any plan or layout.



As a consequence of the limitation of the land area and of the land's high values, the *built-in slum*[36] made its appearance. This was a typical nineteenth-century product, but one that has found frequent applications even in the last few decades.

In many of these housing schemes, lot crowding because of the "valuable land surface" became an "economic necessity." In spite of the criticism directed against it in recent years, this unfortunate "style" has traveled round the world.

Yet it is not only completed projects that should elicit criticism. A more serious problem is that of *the time factor* involved. We have in mind the problem of what span of time would be required for the *elimination* of slums, and therefore pose the question: *How long would it take to clear slums if the work should progress at its present pace?*

Let us take New York as an example, since this city is one which has displayed great activity in slum clearance during recent years.

[36] Dwellings built in the last century to "house the poor" were, as a rule, large blocks which often covered 90 per cent of a very limited land surface. These housing projects became slums from the very day of their occupation. They have since been frequently referred to as "built-in slums."

Since 1935 New York City, with the help of Federal funds, has completed five large public housing projects and has four more under construction. These projects can accommodate a total of about 41,376 persons.[37] This is no small undertaking compared to what other cities have done. Yet, at this rate of construction, to rehouse the 1,800,000 persons living under substandard conditions (see p. 22) in New York City would require over two hundred years of reconstruction.[38]

The situation is worse in other cities, and it is evident that this is not the way to solve our vast housing problems. Although good intentions on the part of planning commissions in solving these slum problems have been general in late years, and undoubtedly much has been accomplished, city authorities are handicapped in tackling the slum problem as a whole as things stand today. New formulas must be applied. *Something more than these official solutions is obviously required.*

[37] These figures are from the *New York Times*, February 4, 1940.

[38] The City Planning Commission adopted a city-wide map in January 3, 1940, aiming at low-rent subsidized housing for 1,200,000 of the city's 1,800,000 slum dwellers. "This work could be accomplished in a twenty-five-year period." This program would accommodate 240,000 persons in five years.

PART THREE

THE DWELLING PROBLEM IN CITIES IS MORE THAN A SLUM PROBLEM

Slums are universally the sore spots of the city structure — the *obvious* cancer of city growth.

For more than a century, men have talked the subject of slums almost as though it represented the whole housing problem of cities.

Preoccupied with only the most sordid aspect of the diseased city, they have virtually overlooked the latent tendencies that exist throughout the whole organism.

The problem is a vast one, not that of slums and slum clearance, not that of the most shocking symptom alone.

It is not that of treating one small section of the urban organism, not that of low-cost houses or of housing the poor exclusively.

It concerns the housing of our citizenry in general.

No complete solution is to be found in the small-scale slum-clearance projects of today if our cities continue to deteriorate at the present pace.

Only on a *town-planning scale* can our housing problems be solved.

For the roots of these problems are deep-seated, originating where the problems of our cities usually do — in their spontaneous and unplanned development.

Urban dwellings suffer from the consequences of a policy that has fostered the free selection of sites, the unplanned expansion of districts, the inefficiency of housing legislation, the lack of community services, all these being factors that result from the absence of a collective spirit capable of organizing community life to the lasting advantage of the many instead of to the immediate profit of the few.

In the following pages we shall briefly consider the outstanding points that can be treated in a general survey of this nature.

ARBITRARY LOCATION OF DWELLINGS

- *"Dwelling blocks and individual dwellings are often badly located, both in relation to their function and with respect to the sanitary conditions required for healthful housing."* *Town-Planning Chart*

Air views of modern cities reveal the haphazard distribution of their buildings. It can be seen that light, ventilation, space, and greenery have been given little consideration, though these are essential to the health and well-being of the community.

In the absence of adequate zoning laws, in most cities large groups of buildings have tended to crowd together, one structure depriving the next of air, light, sun, and view. With improper zoning there has also occurred the admixture of heterogeneous building types, so that dwellings, business houses, and industry have sprung up in the same neighborhoods.

For the welfare of all, of those who own the land and buildings as well as of those who work or live in them, effective zoning laws are necessary. In residential districts, which always have their special needs, such as play space for children and fresh air, quiet, and sunshine for all, a zoning plan is especially urgent. Where such a plan is lacking, the resultant evils amply demonstrate what happens when private initiative is permitted to conduct its activities without respect for the welfare of a neighborhood or of the community at large.

Legislation conceived without foreseeing later rapid growth is responsible for the evils of improperly zoned districts or those without zoning, since high land values are the chief obstacle to later replanning. It seems unlikely that certain unplanned developments would have taken place in our cities if the immediate consequences could have been predicted or envisioned as an air view reveals them to us today.

This want of foresight has resulted in an irrational distribution of dwellings.

The Worst Sites Provide Dwellings for the Most People

- *"The more densely populated areas are frequently those sites which are the least appropriate for dwelling, such as those having northern exposures on hilly ground, lowlands subject to inundation or fog, or sites too close to industrial districts and consequently disturbed by noises, vibration, and smoke."* *Town-Planning Chart*

Outlying sections of the city and its suburban areas, which have since been incorporated within the city's expanding limits, have developed with incredible rapidity during the last hundred years. In so far as no plan guided or controlled the development of these new areas, buildings arose on them more or less spontaneously.

First, industrial plants settled near the railways, roads, and rivers. Then dwellings clustered about them, regardless of the conditions of the soil they were built on, of the topography of the country, of the amount of sunshine that could reach each apartment, or of the prevailing winds, with their smoke and odors of factories — permanent reminders of the Machine Age. All these factors were overlooked.

Legislation governing improvements was not to come until later; in the meantime, laissez-faire conditions prevailed. While land prices were still low, new factories were built near the city, and the construction of additional cheap dwellings around them flourished. With the advance of the limits of the city, transportation became cheaper and more convenient. As taxes increased, other sites, farther away, were chosen as more advantageous for industry. Factories sought cheap sites, and often found them in unhealthful places. Cheap housing followed industry, regardless of the conditions of the site where dwellings crowded.

What Happened to the Good Sites

- *"Districts of a low concentration of population were developed on the best sites, favored by good climatological and topographical conditions, sheltered from prevailing winds, isolated from industry, and easily accessible by roads."* *Town-Planning Chart*

Real estate speculation developed with greater rapidity than cities. Good sites were quickly purchased and laid out as residential sections. As districts within the older parts of the city became more densely populated, their buildings run-down or obsolete, and their living conditions worse, the demand for good suburban sites in-

The Golden Horn,
Manhattan

AIR VIEWS OF OUR CITIES REVEAL THE HAPHAZARD DISTRIBUTION OF THEIR BUILDINGS. Here are to be found the evils of permitting business houses, dwellings, and industry to be crowded together in vast groups, one block depriving the next of air, light, sun, and view.

creased, together with their prices. Those inhabitants who could afford to do so moved out into the newer districts, where spacious dwellings awaited the few who were privileged to enjoy them.

This has resulted in the following paradox:

It frequently occurs that high concentrations of population in cities are found in those districts which are the least favorable for dwellings; the converse is true of the most favorable dwelling sites.

Building Laws and the Irrational Location of Dwellings

- *"The irrational location of dwellings is still permitted by legislation that does not take into consideration the health factors thereby jeopardized. Zoning plans, together with zoning legislation capable of enforcing such plans, are wanting. In fact, existing laws seem to ignore the consequences of overcrowding, of the lack of open spaces, of the dilapidated condition of many dwellings, of the want of community services. They also ignore the fact that the application of modern planning and modern technics would create illimitable possibilities for the reconstruction of cities."* *Town-Planning Chart*

The chaotic appearance of many of our residential districts raises the question: Where are the building laws and the zoning restrictions?

The evidence before us is more eloquent than all the discussions the subject has provoked. For if these buildings have been constructed in accordance with law, then the laws would seem to sanction the errors committed. In so doing, they have ignored the potentialities of modern planning and its application to housing, very often overlooking even the most elementary human needs.

But how does it happen that such conditions occur when legislation does exist in the form of minimum requirements for both residential districts and the dwellings themselves? We may find the answer to this question in the following reasons:

(*a*) This legislation is in many cases of recent date, numerous buildings antedating the housing measures.[1]

(*b*) This legislation affects only buildings within the city, and many buildings now inside the city limits were beyond them when constructed.

(*c*) Many of these measures have not been enforced; owing to laissez-faire policies, they have often been ignored.

(*d*) The legislation governing dwelling requirements is incomplete and, in numerous cases, of an antiquated character, even though recent in date.

(*e*) Most of the present housing legislation overlooks the possibilities of modern building technics and its application on a large scale (mass production).

(*f*) Where more advanced legislation exists, zoning plans, with zoning regulations for their enforcement, are wanting. Regional planning committees are able to offer no more than "good advice."

(*g*) Most of the housing laws have permitted or tolerated an irrational lotting of the land surface, favoring speculation but making good planning impossible.[2]

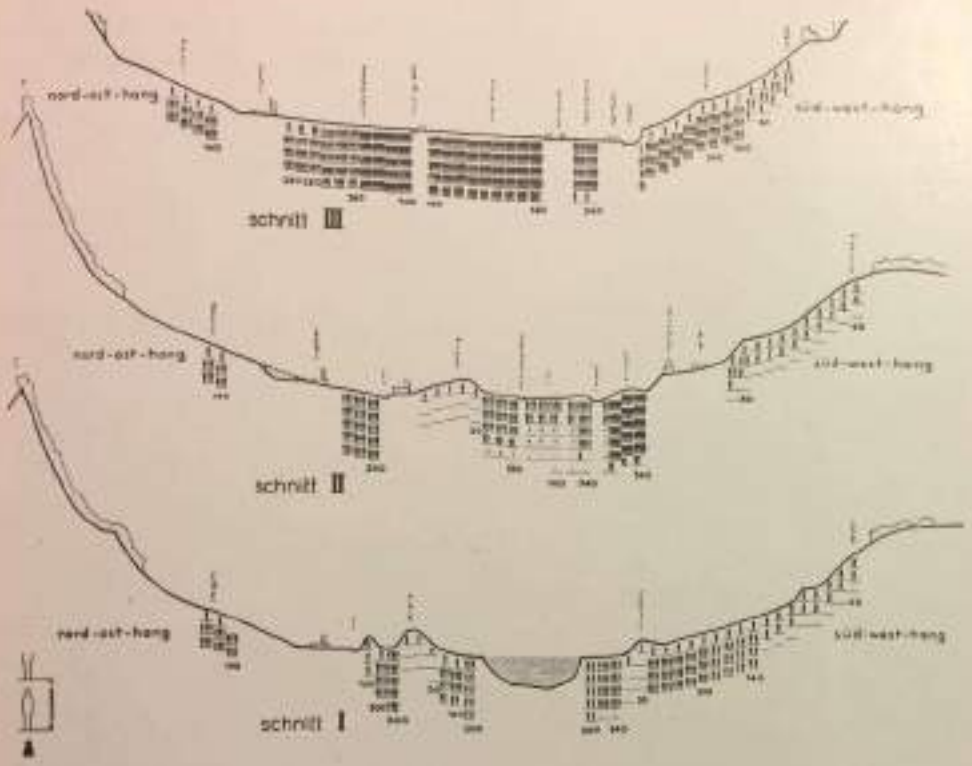
(*h*) The greater number of these laws are still heedless of the consequences of overcrowding, the lack of open spaces, and the need for community services. They apply to the dwelling alone, condemning windowless rooms, fixing a certain minimum area for interior courts, and prescribing other requirements for individual buildings, but making no provision for the neighborhood as a unit.

Yet it is obviously the *neighborhood unit* that must serve as the basis for efficacious urban housing legislation. For, as previously stated, a city dwelling cannot be conceived as isolated from its

[1] The first English public health act was passed in 1848. Three years later came the first housing law of modern times. In 1880 Germany began to set up standards to prevent lot crowding, fire, and collapse. (Yet how many lots were not crowded after that date?) In France, the first "housing societies" were formed in 1853, while the first important housing law was passed in 1894, followed by others in 1906 and 1912. All these first laws are inadequate. Until the turn of the century housing legislation is practically nonexistent.

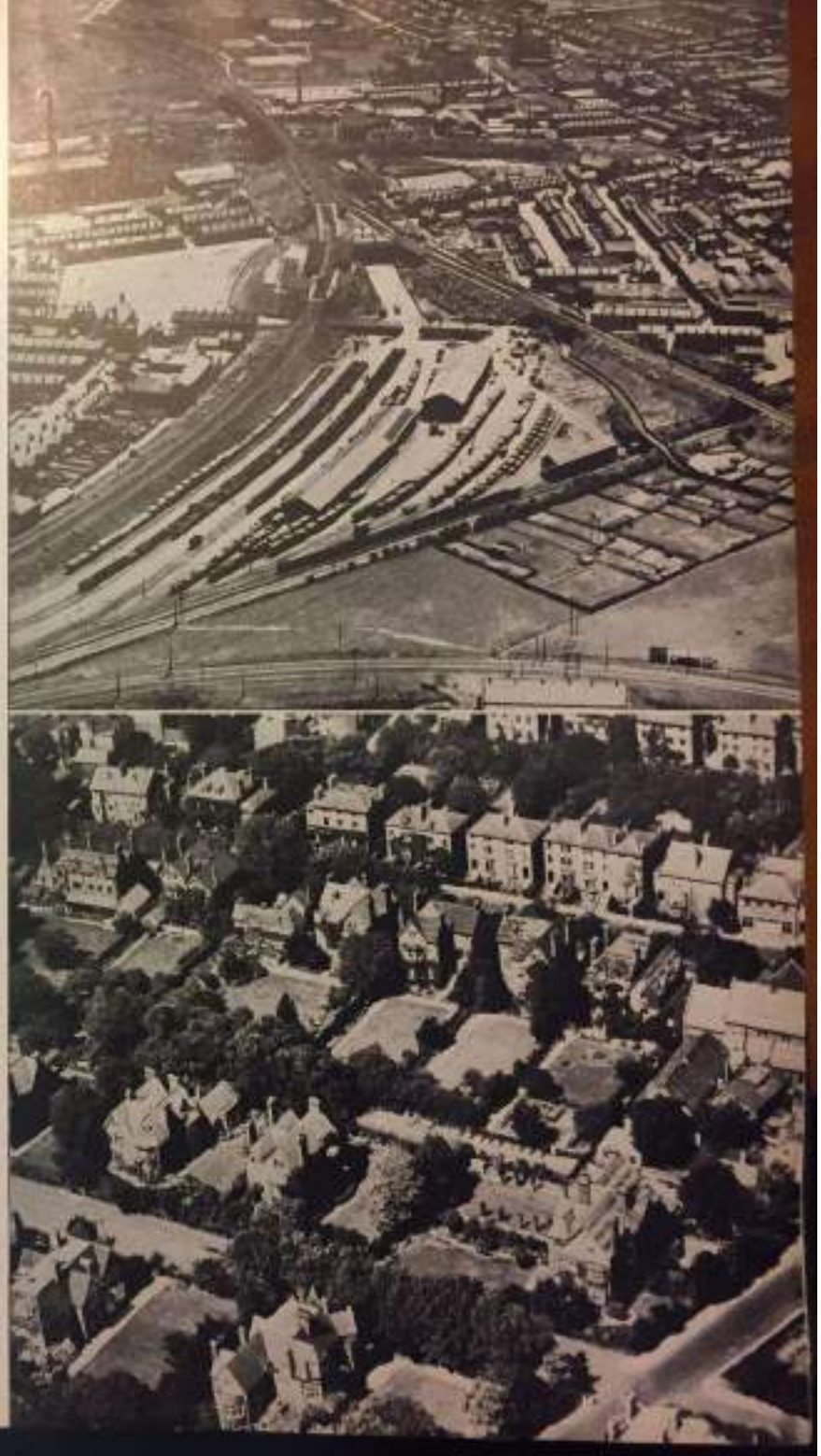
"In the United States Housing Act of 1937, Congress enunciated the principle of minimum standards. In accordance with this, USHA has set up requirements derived out of contemporary American standards representing a minimum of decent, safe and sanitary housing without extravagance in the year 1940." Catherine Bauer and Jacob Crane, "What Every Family Should Have," *Survey Graphic*, February 1940, p. 65.

[2] Housing in New York, Chicago, and other American cities is often affected by the deep, narrow lot, of a frontage of 25 feet and a depth of 125 feet. A similar condition may be found in Europe.



It is curious to note the distribution of dwellings in urban areas. They seem to be scattered everywhere, irrespective of the conditions of the site. *As a rule, in bad sites where land values are low, populations are more crowded.* A cross section of the city of Zurich (above) shows this haphazard distribution. Thousands live on northern mountainsides where the sun's rays do not reach their homes; others, in damp, foggy lowlands.

Opposite: Compare a poor and a prosperous district (England). The contrast in the sites is evident. →



environment. It is vitally affected not only by the appearance and functions of adjacent buildings but also by the locations of schools, playgrounds, parks, and stores, by transportation facilities and near-by traffic conditions, and by many other factors. Since all these reach into the daily life of the neighborhood — into all of its dwellings — housing legislation, like planning, should apply not only to individual dwellings but to the whole neighborhood as a unit.

The inadequacy of present housing legislation has fostered the persistence of old- and new-law tenements, as revealed in the following observation on the tenements of New York City and Chicago.

Old- and New-Law Tenements — In late years, with the passing of new laws, many old-law tenements have been condemned. Nevertheless, the greater number of insanitary dwellings are still inhabited.

When a survey of New York tenements was made in 1909, it was found that there were 641,344 apartments, or family units, in the old tenements. In 1932, twenty-three years later, there were still 524,894 of these in existence. Their average rate of disappearance has been only seven-tenths of 1 per cent annually. In 1932 there were also 904,640 new-law apartments in New York.

Building Laws Have Had Little Effect on Blighted Areas — In Chicago: "Continuous observation of the same areas over a nearly 30-year period has been extremely useful. It shows, among other things, how great is the stagnation in blighted areas. *Private enterprise is dead.* Hardly any new buildings go up, *hardly any old buildings are demolished.* Those which are there receive the minimum of repairs and become progressively worse. . . . The housing laws of 1902 and 1910 had no appreciable effect in improving conditions in the areas investigated in 1901." [3]

An analysis of present housing legislation, even in an abridged form, would comprise sufficient material for a whole volume. The general character of this book permits only a brief commentary. Details

[3] Edith E. Wood, *Slums and Blighted Areas in the United States* (Washington: United States Housing Authority, 1938), p. 36.

such as the present confused handling of the housing problem, errors persisting from the past and new errors of approach, the scarcity of satisfactory reconstruction or rehousing projects — all these are in themselves the best criticism of present legislation and the most direct proof of *the need for new, efficient laws, dictated by actual requirements and the capacities of modern knowledge and technics.* Such new laws should supplant present legislation at the earliest possible moment.

DWELLINGS BORDERING STREET LINES ARE UNDESIRABLE

All the cities of the world contain miles of streets the fronts of whose dwellings border directly upon the sidewalks and follow a direction imposed by that of the street itself.

The parallel façades of these streets receive light, sunshine, and air across those channels of noise, dust, and noxious gases which form the traffic arteries of today.

If there are trees, they are sparse of leaf, wanting soil and moisture. Above the sidewalks, a confusion of electric signs. And the drab façades of one side of the street repeat the unsightliness of those on the other. Between them only a ribbon of sky can be seen.

In spite of all, the rooms behind these façades are considered the best in the dwelling. "My house has three windows on the street side" — how many people still are proud to be able to say this!

Architecture, that learned interplay of volumes, light, shadows, and color, is absent from these grey and dismal streets, which lose themselves in the distance.

But by this system it has been possible to subdivide and build urban land to a maximum degree. Space is expensive, and houses built on the street line do not waste space. Sewer pipes are closer to the house — another economy. No longer are garden fences necessary, nor the care of trees and plants. The whole formula assures the greatest possible return to the speculators who determine the layout of cities.[4]

[4] "In Philadelphia and other American cities the ground plans were greatly influenced by the

THE UNENDING MONOTONOUS STREETS OF OUR BIG CITIES. In 1940 Detroit had 2,607 miles of streets; end to end, they would more than span the distance between Detroit and San Francisco. New York at the time had 5,494 miles, and Los Angeles 4,974 miles. This map (left) of the Detroit region by the American group of the C.I.A.M. shows the vast area covered by a city of this type, which was developed on the basis of automobile transportation during periods of industrial prosperity, regardless of the consequences of unplanned and unlimited dispersion. (Compare the size of Detroit with that of other cities on pp. 198, 199.) The air view (right) of Detroit's residential areas is taken from an altitude of 1,000 feet. A city should be something more than a monotonous and unending series of real estate developments.

In the days of horse-drawn vehicles, when streets were not congested by motorized traffic, life was tolerable behind these façades. If the view was not too attractive, flowered curtains became the window scene, taking the place of the plant life driven from the street.

But suddenly come automobiles and tramways and buses, and cities grow at an unprecedented speed. Crowded with traffic, the streets make the dwellings almost uninhabitable; the confusion of corner crossings, with their signals, traffic whistles, and crush of vehicles, increases.

- *"Buildings erected on heavily traveled streets and in the neighborhood of corner crossings are made undesirable for dwelling because of noise, dust, and noxious gases."* *Town-Planning Chart*

Some of these nuisances, besides being disagreeable and often productive of ill effects upon the nervous system, notably in the case of noises at night, are directly injurious to the health of those who live in houses closely bordering upon the street.

Dust, which in spite of modern paving is still plentiful, and, above all, the exhaust fumes of motor cars are in certain quantities capable of affecting health.

Houses on the Street Line and Exposure to Sunlight

- *"In residential streets whose façades parallel each other on both sides, the varying circumstances of exposure to sunlight have usually not been taken into account. As a general rule, if one side of the street receives the necessary sunlight in the most desirable hours, the sunlight conditions on the opposite side are different and often bad."* *Town-Planning Chart*

These climatological conditions are of great importance to dwellings and have been completely neglected. A different type of street would obviously improve the circumstances of exposure. Because people have become accustomed to regarding the arrangement of our residential streets as entirely normal and inevitable,[5] however, especially where land values are high, no one stops to ask whether it might not, or should not, be different.

Moreover, it has not occurred to most people that the actual function of the street, which is simply that of serving as a channel for traffic, might be independent of the orientation of houses. In overlooking this fact, they are oblivious to the possibilities of the open street and its superiority over the system of closed streets[6] that is the rule in cities today.

In spite of all the disadvantages of overcrowding and traffic confusion, in spite of all the discomforts of noise, dust, and noxious fumes, in spite of all the hazards to health and safety, we have gone on building our streets on the same pattern: a comparatively narrow traffic channel lined with dwellings, frequently high buildings.

THE EXPANDING SUBURB

- *"Modern suburbs have developed rapidly, often without planning and without control. Consequently their later connection with the metropolitan center (by rail, by roads, or by other means) has met physical obstacles which might have been avoided if suburban growth had been considered as part of a regional development. . . .*

  "Suburbs have generally been incorporated under city control only when fully developed as independent units. . . .

  "Their process of growth and decay often escaping all control, frequently these suburbs take on the shape of shack-towns — disorderly groups of hovels constructed of all imaginable kinds of discarded materials. In spite of all, this type of suburb is still openly tolerated in many metropolitan areas." *Town-Planning Chart*

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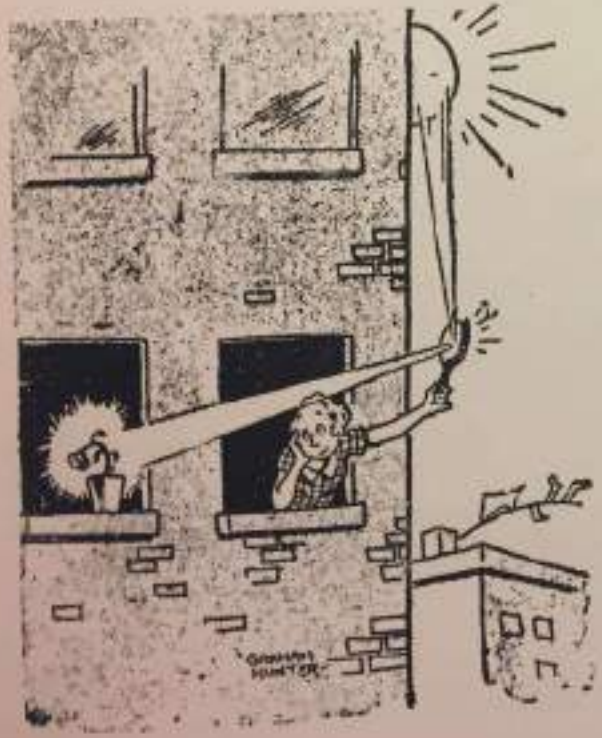
rectangular system of layout of farm lands for settlement. . . . The surveyor planned the city blocks and naturally followed the line of least resistance in making the building lots conform to the original farm lots. In the American city the disposal of the lots to individuals, with liberty to make the best use of them for their private purposes, was the governing factor in development, rather than architectural control in the interests of the community" (*Regional Plan of New York and Its Environs*, col. II, New York, 1931, p. 50).

[5] A proof that to most people the city is identified principally with its streets can be found in the following definition given by the well-known French dictionary, Larousse, for the city (*ville*): "A grouping of a great number of buildings situated along street systems" ("assemblage d'un grand nombre de maisons *disposées par rues*").

[6] Called by Le Corbusier "corridor street" (*rue corridor*) in his report to the Third Congress of the C.I.A.M., "Le Parcellement du sol des villes" in *Rationelle Bebauungsweisen* (Stuttgart, 1931).

FAÇADES ON THE STREET, especially those bordering traffic thoroughfares, receive light and air across channels of noise, dust, and noxious gases. The drab façades on one side of the street often repeat the unsightliness of those of the other side. Our streets are gloomy and monotonous, regardless of the class of their dwellings.

Compare the view of the street in a low-income district of New York, East Harlem (left), with that of a prosperous middle-class street (right). The difference on the whole is not very striking. In our streets problems of orientation have not been considered. If one side of the street receives the necessary sunlight . . . what about the opposite side? (See cartoon below.)



The development of suburban towns, accelerated to an unforeseen tempo during the second half of the last century, still continues. Small villages on the outskirts of cities grow rapidly with the incursion of new industries and the construction of new roads and rail lines. Quickly following the industries, new dwellings cluster around them. Roadsides become lined with structures of all kinds. And before the authorities think of widening the roads, these are built up solidly on either side, so that any modification of their width or direction soon becomes "of prohibitive expense." Ultimately absorbed by the greater city, such prosperous communities become densely populated and overbuilt. The lack of foresight on the part of the municipalities that have not taken adequate steps to collaborate in a general plan of regional development has at length created a situation unfortunate for the community as a whole.

As the expanding cities rapidly absorb the outlying country and suburban villages, city-dwellers who had cherished the dream of "a house in the country" and were finally able to get one find, after a few years, that the outward-growing city has caught up with them, bringing shops, large apartments, and even smoky factories to the new suburban areas. The beauty of nature is engulfed by the city; what was once open country becomes urban in character. And those who insisted on enjoying the quiet of their suburban gardens are confronted by the problem of moving out again if they wish to escape the ever-advancing city.

While suburban areas have experienced their greatest development during the last hundred years (1840–1940), these chaotic zones have been formed in all periods of history, whenever a city has grown beyond its corporate limits.[7] Yet it is the special character of the Machine Age, with its great industries and new modes of transportation, that has accelerated the process, concentrating populations as never before throughout urban areas.[8] Unprecedented chaos has been the inevitable result.

[7] Rome of the Caesars also had a chaotic suburban district: "In reality, the city [Rome] does not stop at its walls; the zone of large estates is succeeded by another zone consisting of both large and small estates, which cover the whole countryside" (Paul Bigot, *Reconstitution de la Rome antique*, Paris, 1937, p. 33).

Growth and Scale of a Suburb — Though enormous suburban areas are common to the cities of today and though we are made conscious of their size in our daily travels, we do not realize the actual vastness of their scale. In the case of Paris we have an example of the extent of suburban growth in relation to that of the city proper.

The "région parisienne" at present occupies a total area of about 193 square miles. This represents a tremendous expansion, of comparatively recent date, facilitated by new roads, railways, and tramways, which have permitted Parisians to move farther away from the central parts of the city.

The distance of suburban homes from the center of Paris is limited only by the time required in commuting, by road and street congestion, and by the cost of fares. Each tentacular advance of the city toward the surrounding country has corresponded to the construction of a new road; each new cluster of houses, to a new rail or subway station. Here, as in all great metropolitan communities, *the expansion of the city is conditioned by the extension of its transportation facilities.*

A study of Paris and its environs has well stated the magnitude of the expansion of Paris and the relative growth of the city and its suburbs:

"If replanning projects for the region of Paris were not to be too soon exceeded by the city's expansion, it would be necessary to include the population [9] contained within a radius of 35 kilometers from Notre Dame Cathedral. This area, comprising 570 communities and more than 6,000,000 inhabitants, represents the actual expanse of the city. . . .

"The population of the Department of the Seine was over 631,000 inhabitants in 1801; 1,421,900 in 1851; 4,933,000 in 1931. But if we omit the population of the city of Paris from this department, we will see that the population of the suburban communities increased from 84,000 in 1801 to 2,042,000 in 1931. *During 70 years*

[8] It is difficult to foresee today the consequences of new suburban developments that are due to the defense program in the United States.

[9] Formed by those who participate in the economic and social life of the city.

THE SUBURBAN ENVIRONMENT. Upper left: Small allotment gardens in a middle-class suburb of the more attractive type. Lower left: Near industrial plants shack towns are a common sight. Upper right: Railway lines and roads have encouraged ribbon developments. Suburban dwellers have come to seek "quiet" homes along these traffic lines! Lower right: In these "temporary" dwellings, the most elementary services are lacking. These unplanned suburbs often represent the growth in which local authorities take so much pride.

the population of the city of Paris grew by 70 per cent and that of its suburbs by 500 per cent." [10]

Toward the end of 1929, within a radius of thirty kilometers (about eighteen miles), the total area of suburban development was 22,219 acres. This was greater than that of Paris proper, which was only 21,296 acres.[11]

In Boston, according to the United States census of 1940, the population of the *central city* is 770,816 inhabitants; those living outside the city, in the *metropolitan district* of Boston, number 1,579,689, or 67.2 per cent of the total population.

Suburban areas are already larger than cities!

Two Phases of Suburban Growth — This expansion of suburban areas has usually taken place in two phases:

In the *first* phase, the concentration of population within the city increases, owing to the growing influx of people to the city. This concentration becomes dense over the central areas of the city, until at length it overflows toward the outlying districts and the suburbs.

In the *second* phase, the suburban areas continue to expand, but their population growth takes place at the expense of that of the city proper, which begins to lose its high densities.

In the three graphs on page 53 showing the process of suburban growth and the depopulation of the central districts in three large cities (London, New York, and Paris), it is curious to note the similarities in the two phases.

The magnitude of this *movement to the suburbs*, the shape it takes, and some of its speculative consequences are revealed in the following examples.

Outward Movement of Population — Between 1920 and 1930 the decrease in the population of Manhattan was 416,791 persons, or an average of more than 40,000 a year. At the same time, other boroughs were gaining at the rate of 183,000 a year and the suburban areas at the rate of 108,000.

In the decade 1930–1940 in some areas in central Manhattan these trends have been reversed.

In London, according to the London Passenger Transport Board Report of 1936, *610,000 inhabitants left the central areas for the suburbs* during the previous fourteen years.

The Shape of Suburbs — From the pattern assumed by residential developments in the environs of New York, it is possible to trace quite accurately the routes followed by the various rail lines converging upon the city, *so closely has building construction followed transportation*. This pattern of dense development assumes the general shape of a gigantic octopus, the body located in the center of the region and approximately a score of tentacles stretching in all directions over the outlying areas. "The sinister character of the sea monster is further substantiated in the unplanned and speculative nature of most of the subdivision activity that is gambling on the further expansion of these projections into the countryside." [12]

Speculation on Suburban Growth — In 1919, in Detroit, 33 per cent of the residential area within the city limits was vacant. A survey for 1930 again showed that 33 per cent was not developed. The rapid expansion of the city (unplanned speculative overdevelopment) was encouraged by the municipalities of the metropolitan area.[13]

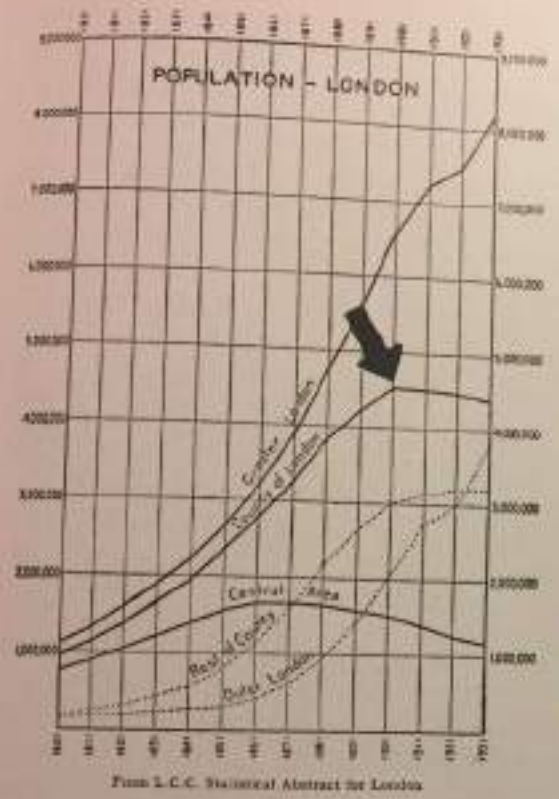
"Since 1900 the population of the Detroit metropolitan area, including all cities, has increased 479 per cent; but the acreage platted into lots in the same area exclusive of Detroit, Highland Park, and Hamtramck, has increased 1105 per cent. An additional two million people could be accommodated on subdivided lots in

[10] Albert Demangeon, *Paris, la ville et sa banlieue* (Paris: Bourrelier et Cie, 1936), p. 19.

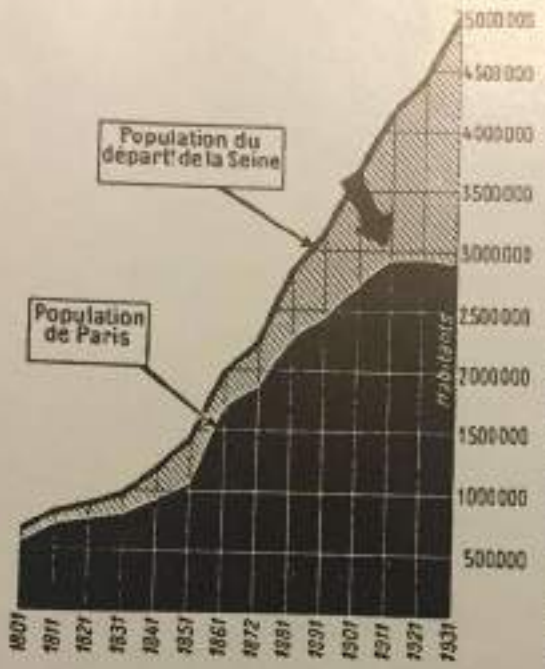
[11] These figures are taken from an article by Georges Risson, "Les Lotissements dans la région parisienne," *Urbanisme* (Paris), December 1933.

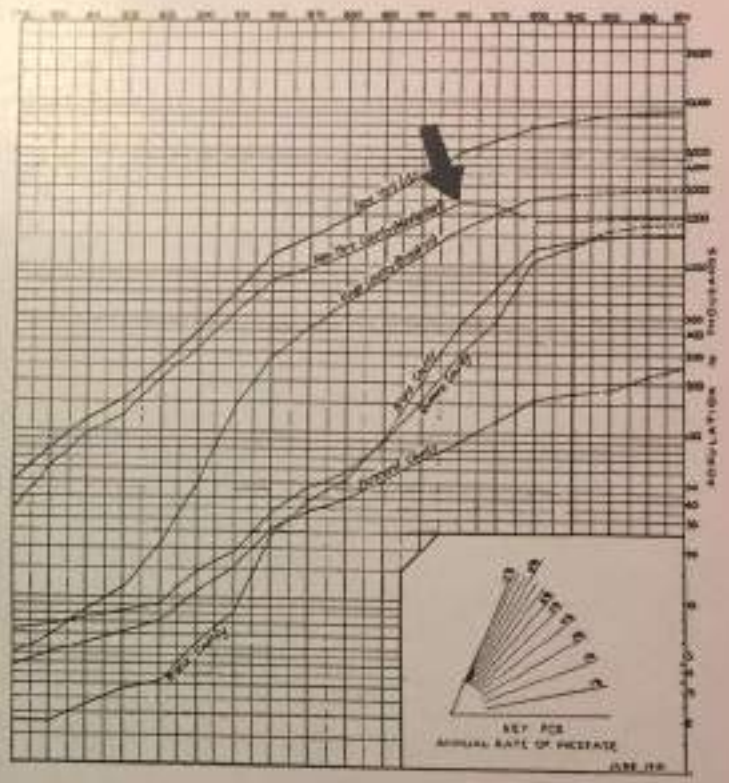
[12] Regional Plan Association, New York, *Regional Plan Information Bulletin*, no. 44, March 29, 1940, and no. 55, July 14, 1941.

[13] From the survey by the American group of the C.I.A.M. sent to the Fourth Congress (Athens 1933) by K. Lönberg-Holm and his collaborators. This survey, which has not yet been superseded, is a remarkable study, an example of foresight and of an understanding of urban problems that in those days were still ignored.



From L.C.C. Statistical Abstract for London





THE GROWTH OF THE CITY AND OF THE SUBURB. In comparing the curves of population growth in three different cities, we observe that the curves corresponding to the changes in population of the central areas (or those of the city proper) decline within the first decades of this century. The date of this decline corresponds to that of the end of the period of urban growth, when big cities were concentrating in their midst vast populations pooled from rural areas and minor towns. When central areas became overpopulated, suburban growth increases more rapidly, and finally, as *blight and congestion make life more difficult near the center*, and greater transportation facilities are offered to citizens by automobiles and new subways, the *suburbs grow at the expense of the city proper. The downward curves in the above graphs mean decaying areas*, spreading circles of blighted dwellings, commerce, and industry. They also mean decrease in taxation power and *bankruptcy* to the city as a whole. It is curious to note that the growth of city suburbs in metropolitan districts in the United States compared to the increase of the total population represented 33.0 per cent in 1920; 44.6 per cent in 1930; 47.3 per cent in 1940.

the area adjacent to Detroit, while the city itself has enough vacant lots to accommodate an increase in population of a million." [14]

The outward movement of the population was stimulated by the extension of streetcar lines and tremendously accelerated, more recently, through the popular use of the automobile. But this movement of the population has greatly expanded the thinly populated areas through which expensive service facilities must pass to reach the people living in the outskirts of the city. In this way, inflated real estate has become a dangerous liability.[15]

Summary — The rapid and uncontrolled development of suburbs has to a large extent complicated all the problems of the city. Traveling within the city, or getting in and out of it, could have been immeasurably simplified, as could also the provision of recreational facilities and the isolation of industry, if suburbs had been developed according to a comprehensive plan.

Today unplanned and ever-growing suburbs present an unparalleled danger, if their growth be continued at the expense of cities. For they may be the principal cause of the ultimate bankruptcy of those cities.

THE INADEQUACY OF COMMUNITY SERVICES AND THEIR ARBITRARY LOCATION

- *"The distribution of buildings intended for community services is of an arbitrary and heedless nature. This is notoriously true of schools, which are often situated on the most congested thoroughfares and too distant from the dwellings they serve." Town-Planning Chart*

Community services are essential organs of city life. Contributing to the health, education, recreation, and comfort of the inhabitants, they represent some of the distinct advantages of living in the city. By virtue of their indispensable nature, they may be considered as prolongations of the dwellings themselves and therefore inseparable from neighborhoods, which form the very basis of city life.

[14] American Society of Planning Officials. *Newsletter*, Chicago, September 1939.

[15] From the survey by the American group of the C.I.A.M., sent to the Fourth Congress (Athens, 1933).

Yet in the cities of today community services are, as a general rule, insufficient for the elementary needs of their inhabitants. In old districts especially, services of this type are practically nonexistent.

In the newer residential districts of the most progressive cities a few community services may be found, usually the most necessary: nursery schools, small playgrounds, elementary schools, public baths, laundries, and dispensaries. Such services being widely scattered, however, they benefit only a limited number of people. In most cases, they are in fact intended to serve only the occupants of a new group of buildings.

While there has been progress in late years, the coördination of community services with the other features of town-planning programs is wanting. *Housing laws and regulations are usually not concerned with neighborhood programs.* Consequently they do not require the institution of community services in sections of the city already built, and seldom impose their inclusion in the plans of new residential areas.

Dwellings themselves show a definite trend toward more advanced standards, especially in comparison with those of the nineteenth century. Such family conveniences as modern bathrooms, heating and lighting equipment, and other improvements are now to be found (excepting in certain countries of lower living standards) not only in high-priced dwellings but also in those of the vast proportion of the populace represented by the middle classes.

While these improvements have been going on within the dwelling, the treatment of the dwelling in relation to its immediate environment — that is, as part of a *planned neighborhood unit*, enjoying the necessary community services — has lagged sadly behind. In fact, such completely planned layouts are still so rare that in the few cities where they exist municipal officials display them to visitors as unusual curiosities.

Since the creation of community services constitutes one of the first means of redeeming urban dwellings, their immediate institution in cities for the well-being of the inhabitants is imperative.

The creation of community services of various kinds is frequently

CHILDREN ARE VICTIMS OF URBAN CHAOS. Our cities lack open spaces where kindergartens and playgrounds could be located. Seeking to compensate for this lack of community services, some parents have discovered new systems. . Above: A *spacious kindergarten*, and a sunny London pavement bordering a through-traffic street where children can safely play . . if tied. Below: Children are obliged to cross traffic arteries on account of the poor distribution of schools and playgrounds. Casualty lists show the results of this want of forethought.

promised in election programs; yet, so honored by politicians, it often remains no more than a promise. At other times, the establishment of community services is obstructed in municipalities where they are considered luxuries. These municipalities hesitate because of difficulties encountered at the start: the need first of arousing the interest of officials and builders who maintain that "they do not pay," and, second, the need of securing the funds that the upkeep of these services requires. In crowded old districts, the problem is further complicated by the difficulty of providing space for building sites in satisfactory locations.

PART FOUR

REQUIREMENTS OF DWELLING AREAS

The outstanding defects of dwelling districts in our cities having been examined, the following pages present the principal measures which might correct conditions in such areas, or which might assure the development of new districts according to the nature of our requirements and the technical means at our disposal.

In the discussion of these requirements it should be understood that we are considering the dwelling needs of man in general, regardless of locality or of any class distinction.

Of the measures to be taken to correct the prevailing conditions of dwelling districts, we indicate the following as the most fundamental:

1. The determination of *proper locations for dwelling areas* . . . . . Site, climate, and natural environment are the deciding factors.

2. The establishment of a *rational distribution of populations* . . . . . *Density limits* in keeping with the possibilities of development on each site must be adopted.

3. *Proper planning and building* . Toward this end, all the *modern technical means* at our disposal should be utilized.

4. General measures, like *new legislation* for better housing . . *Completely equipped dwelling neighborhoods*, constituting units, should be required.

SELECTION OF SITES FOR RESIDENTIAL AREAS

- *"Residential districts ought to occupy the best sites. The climatological and topographical conditions of those sites intended for dwelling purposes must be carefully considered, as well as their proximity to existing unbuilt land surface suitable for recreation purposes. The possible future location of industry and business in the immediate vicinity should also be considered.*

  "Dwellings in these districts should be grouped so as to form neighborhood units." [1]

  Town-Planning Chart

The well-conceived residential district must not only provide the usual comforts and amenities sought by the adult but should also assure a normal development to children and a restful environment for the aged. It should therefore be situated on the best available sites in the whole metropolitan area and should be planned so as to include space for recreation and repose, community services, and neighborhood shops.

The best locations for dwellings will be determined by the following factors:

(*a*) Those created by nature, or climatological and topographical factors: the character of the soil and subsoil, rains, exposure to the sun, vegetation, view, and prevailing winds. The winds must be considered not only because of the temperatures they may bring but because of the smoke and noises they may bear from industrial areas.

(*b*) Those created by man, which frequently modify natural features and change the environment: industries, railway lines, vital highways, harbors, airports, and others.

The proximity of factories or busy highways may offset the natural desirability of certain sites; for obviously the intrusion of such man-made factors into a residential district, otherwise favorably situated, will quickly nullify its advantages. It should also be considered that some of these, such as industrial plants and communication centers, constitute military objectives which modern warfare submits to aerial attack. On this account, their proximity to dwellings is hazardous.

Residential districts should therefore be isolated from areas containing these detrimental factors. The whole neighborhood, moreover, should be developed as part of a master plan providing for its preservation from blighting influences.

Dwellings Need Exposure to the Sun and Natural Surroundings

- *"A minimum amount of exposure to the sun should be established for residential structures, regardless of their location or class."*

  Town-Planning Chart

Sunlight being essential to the health of man, structures intended for dwelling purposes should be situated where they may receive the necessary exposure to the sun's rays.

Obviously, in view of varying conditions in different parts of the world, the factors of climate, season, and latitude may either increase or diminish the relative desirability of sunshine, and influence the plan of residential districts. Dwellings in warm climates, for example, would require less sunshine than those of northern latitudes. Provisions for exposure to the sun would therefore be modified on the basis of climatological factors, as well as in consideration of the needs of the inhabitants and of the way their life is organized.

Gardens, trees, or other natural features which make a building site more attractive and livable should, wherever possible, be preserved, since these are often difficult to replace. Modern planning recognizes these elements as essential to the beauty of the city, especially in residential districts, where good landscaping is an important part of the general layout.

POPULATION DENSITIES SHOULD BE LIMITED

- *"Different density limits should be fixed for different residential districts, based on the factors influencing the living conditions within each district."*

  Town-Planning Chart

[1] See pp. 68–76.

DWELLING AREAS RECLAIM THEIR RIGHT TO OCCUPY THE BEST SITES. They need good soil, favorable topographical conditions, protection from certain winds, open landscaped spaces, sunlight, view, and all those natural elements that can make a neighborhood attractive and healthful to live in. Local conditions and requirements will determine the best layout in each case.' Here are four different types: high isolated structures; low rows; zigzag patterns; medium-height blocks.

Dwelling conditions vary considerably from one locality to another, being subject to the influences of numerous factors peculiar to each neighborhood, city, region, or country. Among these factors may be mentioned the characteristics of the site, its location in relation to other districts, transportation facilities, land values, the age groups of the inhabitants, their standards of life, the customs of the region, and others.

In spite of these varying factors, the density problems of cities follow similar lines. In an abstract form, subject to modification in each particular case, these problems, which have been analyzed in earlier studies made by the C.I.A.M. (*Rationelle Bebauungsweisen*, Stuttgart, 1931), may be discussed in answering the question:

Should density limits be high, medium, or low?

Low Densities of Population in Residential Areas — As a natural reaction to the catastrophic effects of high densities of population in slums, in late years there has been a *marked tendency to condemn high densities in any form*. Low densities have consequently been considered an indispensable condition of good dwelling; and, recognizing the necessity of open spaces, trees, air, and sunlight for the well-being of man, those defending low densities have arrived at the conclusion that the private residential district [3] consisting of single or detached and sometimes semidetached dwellings, with separate gardens, is the formula for residential areas.

In the majority of our cities today, not considering exceptional cases, such districts undoubtedly represent the best residential sections. The houses, in a setting of lawns and shade-trees, enjoy air, sunlight, and space. In such dwellings, especially those of the wealthier classes, a notable progress is revealed over those quarters developed farther within the city, which have no trees or green. It is an established fact, however, that, as the city expands, land values in these outlying and suburban residential districts rise and densities increase.[3] And only those neighborhoods inhabited by the wealthy can maintain their low densities and carry the burden of high taxes.

Owing to their low density and their proportionately vast expanse, private residential districts must either pay high taxes or burden the finances of the city; for the city must maintain a large surface of streets and roads, lengthy sewer and water systems, street lighting, and other public works for the benefit of a comparatively small number of inhabitants.

Because of the dispersion of the population in such districts, community services can be established neither on a sound economic basis nor with equal accessibility to all the inhabitants. For community services cannot be installed to serve a few families without constituting a too-great liability. And even modern transportation facilities cannot satisfactorily solve the problem of accessibility.

As a summary of the preceding paragraphs, we may state in a general way that no type of layout of low density can logically be applied to the inner sections of cities, where certain concentrations of population are necessary and where land values have attained certain heights, because these layouts have a tendency to:

(*a*) *Result in something antithetical to community (civic) life*, their dispersed nature making social intercourse and community activities difficult.

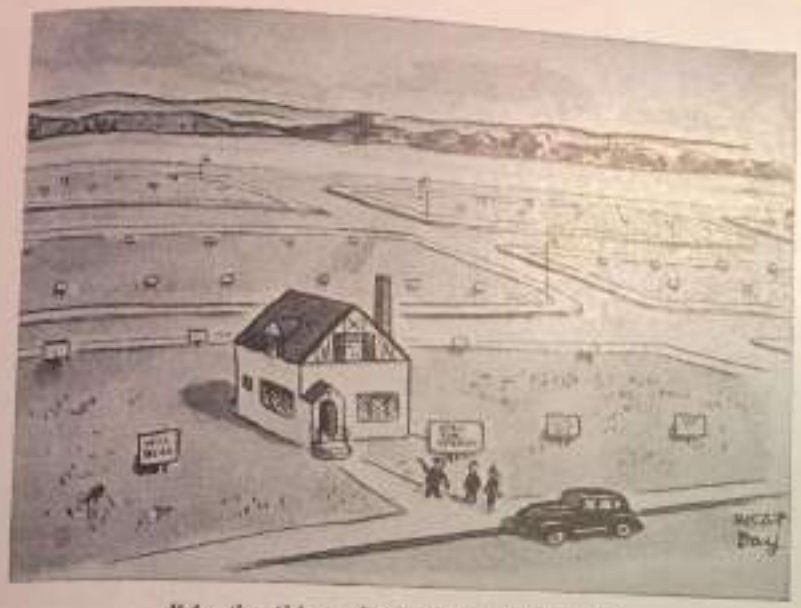
(*b*) *Devaluate the land* and disorganize the whole structure of the city.

(*c*) *Increase distances*, provoking horizontal expansion, already too much developed.

(*d*) *Make community services uneconomical*, because these services require a certain degree of concentration of population.

[3] Often improperly called "garden cities." This term has been commonly applied to any district composed of independent dwellings (one- or two-family houses), surrounded by private gardens. But Ebenezer Howard, creator of the real garden-city theory, employed it in another sense. Howard's garden city is a detached, isolated, limited unit, with complete social services. It is not an urban but a suburban solution, which cannot logically be applied to the inner districts of a big city. (See Ebenezer Howard, *Garden Cities of Tomorrow*, London, 1902.)

[3] "The highest values of land occur where there is the greatest concentration of population and wealth-making activities. . . . Assume an area inhabited by a uniform income group; then the more dense the occupancy, the greater the land value. Assume on the other hand a uniform density; then the more wealthy the people the higher the land values." (Regional Plan Association, New York, *Regional Plan Information Bulletin*, no. 21, November 19, 1934.)



"Another thing. It gets the morning sun."

Below: An air view of Neubühl, a residential district in Zurich (Switzerland). Problems of orientation dominated the layout. All dwellings get the same number of hours of exposure to the sun. This is not absolutely necessary in every case, as long as conditions are similar and a certain amount of sunlight is available to every home.

SUNLIGHT BEING ESSENTIAL TO THE HEALTH OF MAN, structures intended for dwelling purposes should be situated where they receive the necessary exposure to the sun's rays. This must be taken into consideration when planning any residential area. The spacing of the blocks of dwellings and their orientation will be, to a certain measure, affected by the amount of sunlight that their location demands. Housing laws as a rule ignore this. For every home, each city ought to establish a *minimum of sunlight*, to be determined by local climatic characteristics.

(e) *Diminish population densities* to the point where the result is a hybrid product which is neither city nor country.[4]

In spite of this, residential districts of low density of the garden-city type, forming small limited and planned units, their sites isolated from the city, surrounded by open country and thus protected against urban expansion and blight, might form excellent dwelling systems.[5] Regional plans ought to make provision for their proper location in the outer suburban areas.

High Densities of Population in Planned Areas — We have agreed that bringing the beauty and spaciousness of nature to man is more than necessary in the city of today. But if the process be carried to the extremes sometimes suggested, as in the case of certain low-density developments, the city as such would cease to exist. *The problem may be stated as that of maintaining the advantages of community living, as found only in cities, while preserving as much as possible the healthful influences of nature.*

Then the question is: would other solutions, in which greater densities occur, permit good living conditions?

There is a general tendency to condemn, and to try to avoid, high densities of population. This, as we have said, is because *many people think of high densities of population only in terms of slums or of overcrowded districts. They do not realize that modern housing plans, properly conceived on a large scale, can provide for high densities without overcrowding.*

As a matter of fact, high densities make possible the organization of civic life and its community services on an economical basis. At the same time, provided that the dwelling areas are planned on the scale of neighborhood units,[6] they are the only means of maintaining community living.

[4] "The new utility, Neither-Town-Nor-Country, which was so attractively forecast forty years ago, is in fact neither desirable nor genuinely possible" (Thomas Sharp, *Town Planning*, London: Pelican Books, 1940, p. 57).

[5] Welwyn and Letchworth in England, and Radburn, N. J., Greenbelt, Md., Greendale, Wis., and Greenhills, Ohio, in the United States, are among the few well-planned units of this type that have been built so far.

[6] See pp. 68-76.

Opposition to high densities, erroneously interpreted as overcrowding, has occasionally gone to unnecessary extremes. It has sometimes been forgotten that a city is, after all, a place where men have come to live together, so that they may be able to enjoy the benefits and opportunities of community life. Such a life in community implies an interrelationship of interests, an exchange of ideas, the facilitation of acquaintanceships, and many other advantages derived from human association. It has given to cities their schools, libraries, museums, theaters, hospitals and medical care, parks, playgrounds and fields for sports. With proper planning and direction, it could make possible the organization of these and many other services and activities upon a far different scale.

Could these services be organized efficiently without a certain concentration of population? Obviously they could not. It requires but the simplest estimate of the factors involved to discover the high cost and difficulty of transposing the possible advantages of civic life into areas of low population density.

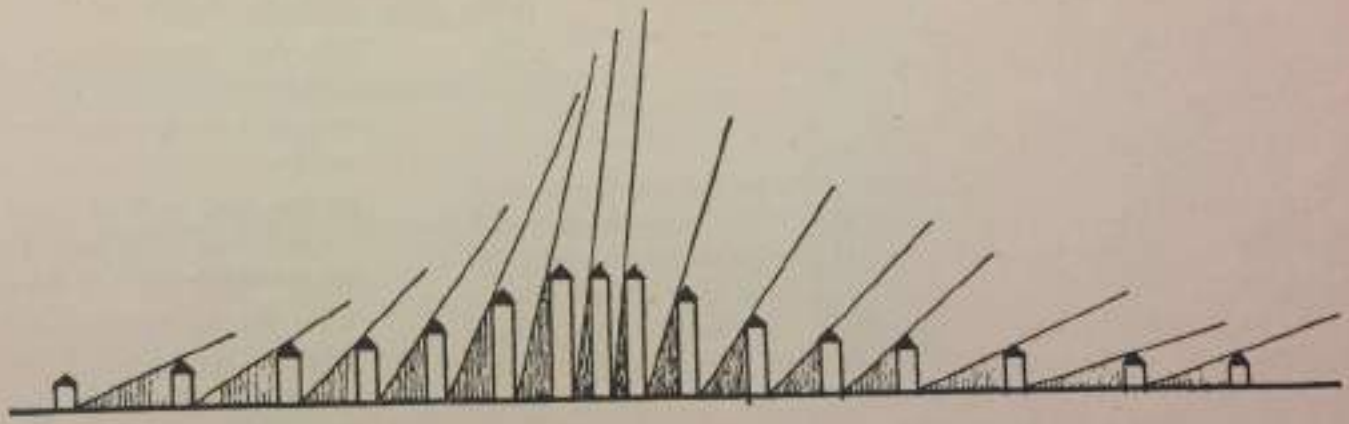
What of Medium Densities? — Medium densities[7] offer neither the great possibilities of community life assured in the higher densities nor certain advantages of garden districts, such as independent dwellings. They require some of the costly conveniences of high buildings, such as elevators, and fail to shorten distances as much as they should in certain locations.

Aside from other aspects of this discussion, the essential fact is that *densities be limited* in each district and that *overcrowding always be avoided.* The conditions prevailing in each case will determine the most appropriate degree of limitation. Whatever the degree of limitation, satisfactory dwelling conditions would be possible, provided that the district be planned so as to accommodate its established density.

Modern Building Technics Can Solve Density Problems

- "*Modern building technics should be employed in constructing high, widely spaced apartment blocks whenever the necessity of housing*

[7] It is difficult to limit these densities numerically, but in its studies the C.I.A.M. has usually considered that detached or semidetached low houses (two or, as a maximum, three stories) can give only low densities; medium densities begin in block construction.



A PARADOX. The haphazard growth of cities has given place to the following paradox: *The height of buildings is as a general rule greater near the central areas, where the streets are narrower and traffic congestion and the nuisances resulting from overcrowding are greater. Lower dwellings spread out toward the suburbs, where the streets are wider and traffic problems are less critical.* This means that in our cities, as they appear today, there is no rational relationship between the height of buildings (dwellings and others) and their spacing. *This relation seems, in fact, to have been reversed.*

←A canyon in the central area (Exchange Place, Manhattan). Above: A typical skyline of an American city (Detroit), and a cross section of a typical modern city, the greater heights concentrated at its center. Right: A New York suburb.

high densities of population exists. Only such a disposition can liberate the necessary land surface for recreation purposes, community services, and parking places, and provide dwellings with light, sun, air, and view." *Town-Planning Chart*

What possibilities exist in the use of high buildings for dwelling purposes, as permitted by modern technics?

Skyscrapers, products of new building technics, were planned to fulfill a special function (that of affording maximum office space on a minimum surface), and owe their origin to high land values. In these structures real estate speculation found a new formula which it developed only so far as promoted its immediate interests.

As a result, the skyscraper formula went only half way toward the utilization of its fullest possibilities. And the opportunities for extending its development so that it might serve a different function — application on a town-planning scale — are still unexplored. *For modern technics, which has permitted the erection of high buildings, has not been rationally applied to dwellings:* consequently they have not received the full benefit of recent technical advances.

The utilization of modern technics, permitting the construction of many-storied dwellings spaced so as to afford the necessary sunlight, air, and view, has not yet been attempted on a *civic* scale [8] or on a pattern of sufficient scope to demonstrate its practical results. Only rare and incomplete attempts have been made to erect high dwelling structures which at the same time have been given the advantages of planned surroundings.

If used for dwelling purposes, high structures would permit:

(*a*) *A greater capacity* above a given land surface than in the case of low buildings spread over the same area.

(*b*) *The consolidation of open spaces into large areas* affording a better organization of community services, an improved layout of parks and playgrounds, and greater landscaping possibilities.

(*c*) *The reduction of road surface* and convenient isolation from busy thoroughfares.

[8] We conceive this as including not only dwellings but the necessary community services, forming several neighborhood units.

(*d*) *The use of the best modern light, heat, and power equipment* and other conveniences, made both more efficient and more economical by centralization.[9]

It should be observed that *high buildings*, which mean concentration of population, *are not acceptable if they do not liberate the areas that surround them.* The open spaces around these high buildings constitute a guarantee that the dwellings will receive the necessary light and sunshine, as well as an ample view of their planned and controlled neighborhood.

A horizontal open space, organized for comfort and recreation, is the complement of vertical growth.

A RELATIONSHIP SHOULD BE ESTABLISHED BETWEEN THE HEIGHT AND SPACING OF BUILDINGS

The skylines of cities have undergone profound changes since the Middle Ages. At that time the only counterparts of the skyscraper were the occasional spires of cathedrals and the towers of castles.

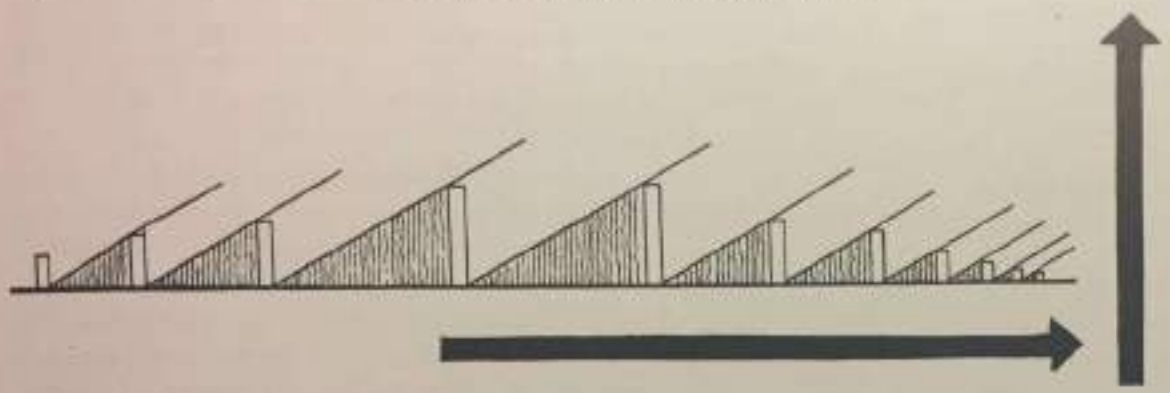
In the first half of the nineteenth century factory smokestacks compete with the height of cathedral spires, while dwellings also mount higher; but the skyscraper itself has not yet come.

After the far-flung expansion of cities, some suddenly increase in height in their central districts. Open spaces disappear completely before this phase of development occurs. And when the upward growth takes place, the congestion at the center of the city reaches an intensity never before known.

The city of today consequently presents the following paradox: Where its buildings are most crowded together, where the streets are narrow and building-courts insufficient in size, where fresh air, sunlight, and open spaces are lacking — *in these most congested districts buildings reach their greatest heights.* In contrast, the structures extending toward the limits of the city are lower; here streets and roads are wider, too, and fresh air and sunlight are more plentiful.

[9] Large air-raid shelters can be better equipped, at less cost per capita, than small shelters for few families.

THE HEIGHT OF BUILDINGS AND THEIR SPACING. If a city is to be designed that will take into consideration the elementary requirements of good living, a relationship must be established between the heights of buildings (dwellings or others) and their spacing. *The higher the buildings, the greater the space required between them.* This statement can be taken as a general principle, though spacing will vary according to the functions of the buildings themselves and according to the climatological characteristics of the city in which they are built. Sunshine and orientation problems, in general, are more important in residential areas than in business districts. The requirements of community services, recreation, parking, etc., also vary, but good lighting conditions, open spaces, and parking areas are necessary no matter where. High structures for residential purposes should be permitted only if open spaces around these buildings are secured so as to guarantee good lighting and view, sufficient exposure to the sun, ventilation, and isolation, together with the necessary open spaces that community services require.



Cross section of a city rationally conceived, in which a definite relationship is established between the height of buildings and the space between them.

A study by Professor Walter Gropius of the C.I.A.M. comparing dwelling conditions (light, ventilation, outlook, etc.) in high blocks of ten stories and low ones of two stories shows that:

1. If we assume a given area of land and a constant angle of light between the buildings (30° in this case), *the useful living space will be considerably greater in the layout using high blocks than in the layout using low ones.* (In the study referred to, the number of flats was increased by 60 per cent.)

2. If we assume that the number of flats and the angle of light are constant, then the amount of land occupied is less in the layout based on high blocks than in that employing low ones, the high-block solution liberating about 40 per cent of the land surface.

3. If the number of flats and the land area are unchanged, the distance between the ten-story buildings can be increased to nearly ten times that between the two-story ones. This amounts to decreasing the angle of light, which becomes 17.5° for the tall buildings as opposed to 30° for the low buildings, and results in a valuable increase in light and air in the layout using high blocks.

Let us compare the cross sections of two cities:

1. That of the present city, whose business center is revealed by the height of its office buildings. This business center has generally sprung from the center of the old city. (See illustrations on p. 63.)

2. That of a modern city rationally conceived. Here the buildings would be distributed according to their height, their distances from each other being in proportion to their relative heights. These heights would be determined by the functions of the buildings and by the plan of the area as a whole. (See illustrations on p. 65.)

Air-Raid Protection and Densities of Residential Areas — In considering different densities of population and their effect upon residential districts, we cannot underestimate a new factor which more and more in recent years has revealed its threat to our cities. For while man has gained, through the perfection of the airplane, a revolutionary means of abbreviating space and of discovering a new urban and world vision, he has also been confronted by a destructive weapon of greater power than any known heretofore. The very power of this destructive force now demands that the structure of cities be subjected to drastic changes.

It is not the first time that new modes of warfare have come to alter the structure of cities and to suggest new patterns to planners. Every new illness suggests a new remedy; every new weapon encourages the discovery of a counter-weapon or of diverse defensive measures. The influence of changes in the arts of war in different periods of history may easily be observed in the changing plans of cities. In fact, this influence upon cities has been far greater than that of all humanitarian theories.

History also reveals that it has usually been long after the destructive force of a weapon was discovered that the defensive formula has been found and its application extended to general use.

Today we are living in one of those fateful periods that lie between the discovery of a weapon and that of the means of counter-defense. Recent events, however, make it appear that this last phase is at hand, while at the same time certain popular notions concerning the effectiveness of the airplane as an instrument of urban destruction have proved to be exaggerated.

Today the world is involved in a great war, and for purposes of defense it is too late now to alter the patterns of our cities. This would require radical changes, which at best could be effected only through evolutionary stages over a period of several decades.

It is useless to deny that our large cities, as they stand today, offer excellent targets from above. Their congested central areas cluttered with huge buildings, as well as their vast suburban extensions formed by an uninterrupted succession of roofs and streets, make any defense plan difficult. And the creation of an efficient shelter system, capable of *protecting the whole population*, is impossible, as recent European experiences have demonstrated.

Consequently, *mass evacuation* affecting the greatest possible number of inhabitants appears to be the only efficient precaution to be taken today. At least the most seriously menaced cities must be so evacuated.

But an organized mass evacuation is *a vast, controlled movement of population*, and a movement of population on such a scale demands special legislation and emergency measures. It would be possible for this to lead to a redistribution of population that might be the beginning of extensive replanning schemes, impossible as long as uncontrolled shifts of population continue to take place.

At present it is difficult to foresee what effects the new war technique will have on cities and city planning, even in the very near future. Nonetheless, we are warranted in assuming that this influence will transform urban patterns.

Immediate requirements for the protection of residential districts from the menace of air raids are becoming increasingly specific.

Far too numerous in our day are the examples of the effects of air raids on cities. The results of such raids, especially in residential districts where dwellings are crowded together, one against another, are most catastrophic. Because of the present structure of cities, again, the menace is greatest where the population is densest, as recent air raids testify.

But at least one thing has been proved by recent events — that not all kinds of residential districts present the same kind of target when subjected to air raids. In planning residential areas today,

OPEN VIEW AND CROSS VENTILATION. The elimination of interior courts in apartment buildings and the need of establishing an efficient system of cross ventilation in each apartment unit led to the planning of slab-like structures surrounded by open space. These high blocks on a lake front allow all their inhabitants to enjoy a view of the lake. A series of low, semi-detached or detached one-family houses would not have given as many people the benefit of this view. The one-family cottages that are characteristic of low, detached structures are, as a rule, useless for sports activities, but such activities can be organized when the land liberated by the superposition of dwelling units is consolidated into one large area for the common benefit of the inhabitants of these blocks.

DWELLINGS AWAY FROM STREETS. Orientation problems have been thoroughly considered in the planning of these dwellings of the Siemensstadt housing scheme in Berlin. The spacing of the blocks was conditioned by the varying height of the sun at different seasons of the year and also by the need for light, view, and privacy. The housing groups built in the twenties and early thirties in Central Europe provided for the isolation of residential structures from traffic thoroughfares. Linear blocks separated by green landscaped areas were often built at right angles to main traffic routes, so that traffic nuisances would not affect the residents of these neighborhoods.

therefore, we cannot ignore the effects of aviation as an offensive weapon on *different types* of residential districts.

Three Types of Targets — Let us imagine three urban districts of different arrangement and determine which would offer its inhabitants the best air-raid protection. We might consider the following examples:

(*a*) In cities as they are today, especially in their overpopulated districts, almost the entire land surface constitutes an enormous target.

The absence of open spaces and the chaotic layout render difficult the construction of shelters. These can be built only at great expense; strategic locations are frequently unavailable.

Consequently the distribution of these shelters throughout residential districts, and in accordance with a rational plan, presents immense difficulties.

(*b*) In the garden district, the existence of open areas facilitates the construction of shelters and affords easier means of protection. These districts present *less* target; their scattered dwellings make them less vulnerable.

In garden districts, however, the construction of shelters becomes costly. Such shelters must of necessity be small, serving only one, two, or a very few families at a maximum.[10] Large shelters, intended to serve greater numbers of people, would not be conveniently accessible to all inhabitants, owing to their wide dispersion throughout the garden-city area. The scale of the automobile no longer holds here, for people *do not usually drive to shelters, but run to them.*

(*c*) Residential districts consisting of high buildings separated by large spaces present *much less target, or roof surface,* per inhabitant, than the two preceding layouts.

Here bomb-proof shelters may be distributed according to a rational and strategic plan. While the housing of great numbers of people in many-storied buildings may present certain disadvantages, owing to the superposition of dwellings, in this type of layout arrangements can be made to solve economically the problem of constructing large shelters favorably protected against gas.[11]

The numerous inhabitants dwelling in these high buildings could rapidly be transported to shelters by the shortest routes, partly subterranean. The subject is one that has been much discussed lately. There is no doubt that the wide dispersion of buildings (high and low) in areas where they are surrounded by open spaces reduces the target and lessens the dangers presented by the closely packed cities of today. But it is also true that the protection of vast areas by anti-aircraft weapons and barrages becomes more difficult with dispersion. Small concentrations in open surroundings may offer a safer formula, as they present small targets and an area more easily defended. (See illustrations on p. 69.)

This does not mean that a plan for a residential district should be selected merely because it presents the best protection against air raids. Since the peril does exist, however, one cannot and should not ignore those conditions which afford the best assurance of protection.

TOWARD THE NEIGHBORHOOD UNIT

If one examines the housing projects constructed during the last twenty years (1920–1940), it will be observed that in some cases there has been recognition of the need of devoting the available land to community uses. In these projects all the necessary community services have been installed. In others, following previous custom, the need for these services has been ignored. Some of the projects in which this omission occurs may be considered as future slums; for existing slums deserve that name not only because of their decrepitude but also because of their failure to meet human needs.

[10] "Metal individual shelters called 'dog-kennels' complement the garden city policy" (*Planned A.R.P.*, by Tecton, the Architectural Press, Westminster, England, 1939). These shelters have since been found inefficient; the recent bombardments of London have proved the necessity (principally psychological) of large, deep shelters.

[11] "It is therefore purely on economic grounds that we advocate large bomb-proof shelters. They provide the most economical means of giving complete protection. . . . If bombs are being dropped at random over a given area, the idea that the people within the area would be safer if they were evenly spread than if they were concentrated in large groups is fallacious." (*Planned A.R.P.*, by Tecton, Westminster, England, 1939.)

WE CANNOT IGNORE THE AIR-RAID MENACE, especially in dwelling areas. Recent bombardments and the data based on them prove that the layout of a residential district may influence its vulnerability from the air, or that some districts offer better targets than others. In the accompanying text (see p. 66) the three targets shown on this page are compared.

Far right, below: A district of an old European city, where open spaces are rare. This type of city offers the best target. It may be difficult to localize a military objective, but it is nearly impossible to miss a hit on some overcrowded building.

Center, below: A district formed by one-family dwellings with private gardens. Chances of a hit and its destructive effects have been considerably reduced.

Left, below: High dwelling blocks widely spaced and surrounded by park land. A hit is comparatively difficult, and the high buildings may offer greater possibilities for an efficient shelter system.

Planners of new housing projects ought to benefit by precious experiences and the knowledge gained from them. After analyzing past experiments, therefore, they should recognize that a housing project must be considered in its entirety, as *composed of groups of dwellings and of community services surrounded by space and other natural elements conducive to better living conditions.* A dwelling cell would not be complete without these community services, which extend its functions. Such a project would form a whole or a unit. This has appropriately been called:

The Neighborhood Unit

Considered on its smallest scale, the neighborhood unit would be composed of the dwellings required to house a sufficient number of people to support an elementary school.

The following are characteristic features of a housing unit of this type:

Population. In a neighborhood unit, dwellings would be distributed over a land surface whose area and population density, established in advance, would be limited to the degree most appropriate for the district. The distribution of the population, being *planned*, would therefore differ from its present haphazard dispersion over unlimited areas.[12]

Size. The population density selected for a neighborhood unit will influence its size, as will also the predetermined percentage of convenient ground coverage, its age groups (children of school age in relation to total population), and the standards adopted by the local school board.

Neighborhood Services — In addition to the elementary school, the primary cell of such a housing plan, the neighborhood unit should include:

Day nursery
Kindergarten
Public library branch
Indoor and open-air recreation space for both adults and children [13]

The community services listed above will be located near the central area of the unit, surrounded by park spaces. Those which follow may be distributed through areas adjoining the main highways, contributing to isolate dwellings from traffic nuisances:

Cinema
Local stores (drug stores, grocery, etc.)
Garages
Small dispensary for emergency cases

Traffic Routes — Through-traffic streets should not be permitted to separate dwelling units by entering the neighborhood area but should by-pass it or, better still, serve it by means of parkway contacts.

Internal streets should occupy no more than the strictly necessary surface and should never invite through traffic by connecting two highways so as to make short-cuts. Wide, curving designs ending in parking areas seem the more desirable pattern.

Local Factors — The number of inhabitants, the density of population, the types of buildings and their community services, selected according to the housing needs which will form the operating basis of the program, must all be precisely determined. For all these aspects of the project are subject to local factors, such as topography, climate, the technical and economic possibilities of the moment, as well as the standards of living and customs of the inhabitants, which may vary in different regions and countries.[14]

Relation to the Rest of the City — The planning of neighborhood units should anticipate the future relationship of the district in which they are situated to the rest of the growing city. In this

[12] The M.A.R.S. Town-Planning Committee (C.I.A.M., England) in a study for the replanning of London (1939) considered the neighborhood units as formed by groups of six thousand inhabitants which give the necessary "number of children (480 from five to ten years old, and 480 from ten to fifteen) for an efficient elementary school."

[13] "By laying out playgrounds and parks at the time the highways are being planned, it is possible to gain ample open spaces with little or no cost to the development" (Clarence A. Perry, in *Regional Plan Bulletin*, July 1, 1940, p. 4.)

[14] "The neighborhood unit principle is capable of application in two principal fields, namely: in open relatively undeveloped territory, and in developed territory where obsolescence or blight makes reconstruction, in whole or in part, imperative" — Wayne D. Heydecker, reporting for the group considering governmental relationships, Planned Neighborhood Development Conference held at the New York Chamber of Commerce, March 28, 1940 (Regional Plan Association, New York, *Regional Plan Information Bulletin*, July 1, 1940, p. 5).

This borough unit (left), composed of several neighborhood units, was designed for the city of Dessau in Germany. The site is located between two important highways that connect this residential area with an industrial zone, allowing at the same time for the necessary separation between dwellings and factories.
The buildings in this borough are of different types and heights, in accordance with the requirements of the population (families with children, married couples, bachelors). High structures and lower linear blocks are spaced and distributed according to the basic principles of proper orientation. The most important cultural and recreational services are located near the center of the borough. Fields for sports, swimming pool, high school, and other elements are intended for the use of the whole borough population. Three elementary schools, nine kindergartens, four shopping centers, and several parking areas are distributed so as to be convenient for the use of individual neighborhoods.
Distances inside the borough unit have been calculated so that they can easily be covered on foot by children and grown-ups. A time scale in minutes accompanies the distance scale on the lower left side of this plan. The difference between the two scales, the pedestrian scale and that of the automobile, is visible in the schematic drawing in the upper right corner. Driving distances to working areas; walking distances everywhere within the limits of the borough.
The model on the right gives an idea of what the central area of a modern borough unit might be like. Community services should be grouped. The section here reproduced includes a central department store, office buildings, a theater, a club. Dwellings appear in the background.

manner it may be possible to avoid the encroachment of elements undesirable in a residential district, such as factories, office buildings, and congested highways. Neighborhood-unit planning must therefore not ignore the factors of time-planning, the obsolescence of structures, and the mobility of cities.

Great inconveniences may be encountered and problems may arise in the future if neighborhood units are not planned according to a general zoning plan for the whole metropolitan area.

Borough Units — Each group of neighborhood units should form part of a larger unit, occupying a greater area, which would constitute a borough or town unit "of such size and population as would make a full measure of social life an economic possibility." [15] Certain community equipment whose efficient operation requires greater populations would therefore serve these larger areas, as, for example:

Administrative offices
Auditoriums for lectures and concerts
Theaters and cinemas
Clubs
Stadium
Secondary schools
Central library
Department stores
Central dispensary and clinics, etc.

The whole plan of the modern city ought to be based on the proper grouping of these units of different types and sizes according to their functions. For, as will be seen in the following chapters, similar unit principles could be applied to industrial, business, and recreational areas.

A New Type of Family Demands a New Dwelling System — So conceived, the neighborhood unit would be a dwelling structure corresponding to the actual organization of the family.

[15] As defined by the M.A.R.S. Town-Planning Committee in their report for the replanning of London (1939). Estimated population of these units 50,000 inhabitants. The population of a borough unit was estimated at 35,000 inhabitants in the study for Amsterdam South (see p. 237).

The patriarchal family life of past centuries, when three generations lived and worked under the same roof, has given place to the more individualistic family pattern of today. Children spend their days in schools; adults go to jobs located outside the family dwelling. Meetings in public places have largely taken the place of entertaining at home. Sick people are taken to hospitals. In this manner the dwelling of today has acquired many complements outside; like the dwelling itself, these call for planning. The neighborhood unit, incorporating the dwelling and its complements, can be the expression of this new form of civic life.

OBSTACLES TO LARGE-SCALE REHOUSING: TWO GRIDIRON SYSTEMS

Besides establishing new formulas for the design of residence districts, the experiences of past decades have also served to reveal the obstacles to be overcome if these formulas, the greater number still untried, are to be applied to future housing projects.

The most successful achievements in city housing are those based on dwelling groups forming neighborhood units, or approaching this pattern. The time has come when it must be admitted that these theorists, called "utopians," who foresaw the need of grouping dwellings within a comprehensively planned whole presented the most efficacious solution of the housing problem.[16]

If the obstacles which hinder the large-scale application of such principles to dwelling districts could be eliminated, the new housing units might serve as the basis for a new civic pattern. The replacement of old districts could then be made according to planned schedule.

Unfortunately, up to the present the methods followed in the reconstruction of these districts have usually been characterized by slowness, inefficiency, and delay. Even at the most rapid rate of housing construction (in some European countries, the pace set

[16] Among these are men like Robert Owen, in England, who in 1816 planned his cooperative communities, complete units (of industrial or agricultural character) lodging 1,200 inhabitants and containing recreation space and community services. In France there was the example of Fourier, who in 1822 planned a complete dwelling unit, for 1,620 inhabitants, which he baptized "Familistère." We note these names as those of pioneers of theories later developed.

THE RELATION BETWEEN OPEN SPACES AND BUILDINGS. This housing scheme for low-income families, formed by 211 apartments (five-room duplex type), is adapted to the climate of Barcelona (Spain). These apartment units with their community services — branch public library, club rooms, swimming pool, cooperative stores, kindergarten, and public school — form a small neighborhood unit. The widely spaced wings of these blocks and the semienclosed open space between them are reminiscent of the traditional Mediterranean patio and to a certain extent reconstruct this element on an urban scale. The relationship between open and built-up spaces is specially important in housing schemes; from it may be derived a great variety of architectural expressions.

between 1920 and 1930), housing problems will require a long time for their solution, for in most cities slums are still in process of formation.

We purposely do not enter into a discussion of the various systems of financing public housing. These systems in themselves are not obstacles, given present circumstances; besides, the subject has already been widely discussed in many works on housing.

The systems employed up to the present (whether they be the investment of public funds in the form of loans at cost price, or of loans below cost, constituting a subsidy, or tax exemptions, or any other form) *are not the barrier that stops the rebuilding of our residential districts. The barrier is the structure of the cities themselves.*

It may be observed anywhere that delays and even the cessation of rehousing projects occur, after years of activity, when municipalities encounter difficulties in acquiring by purchase the necessary land. This was the case with many European cities, even before the latest war menace appeared.

In general the same difficulties are encountered in all cities. In the first years the most easily purchased land among the sites awaiting clearance is acquired by the national government, or by the municipality, or by the agencies subsidized by them. As the work progresses, the purchase of additional land becomes more difficult and more expensive, speculators seeking greater profits. After a certain number of years, the whole project comes to a standstill, the customary principal cause of this termination being the inability to secure land at a price that is not necessarily low but merely reasonable (see example on p. 38).

What, then, are the principal obstacles encountered in the reconstruction of old residential districts? Evidently these obstacles vary considerably from one city to another. They may be financial, political, technical, and sometimes of a purely local or personal nature. But it should be pointed out that, from the technical standpoint, the problem presents two principal barriers, namely:

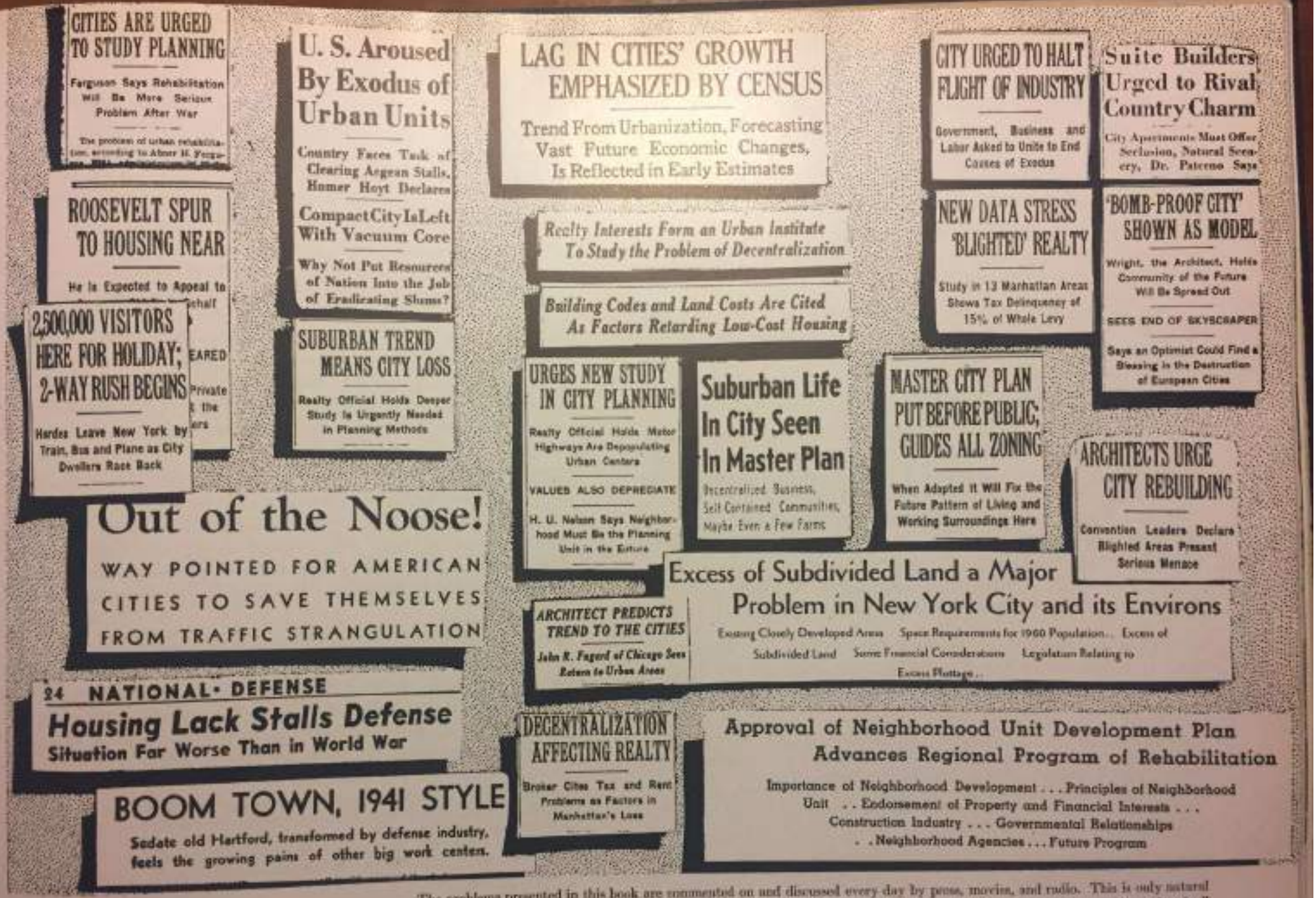
1. *The manner in which the land surface of the city is subdivided* — a chaotic maze of land fragments, entirely opposed to the single land unit required for the project.

2. *The present gridiron system of streets*, which does not correspond to the needs of the motorized traffic of our time and to new rates of speed, because it is really the antiquated street system of the days of horse traction.

This double system of gridirons, that of the streets and that of the subdivided land with its arbitrary divisions, paralyzes every large-scale rehousing project in the city. It should be possible to construct neighborhood units within the scope of a plan requiring a large expanse of land which would not be cut up into fragments either by property limits or by streets.

The Neighborhood Unit Requires a Land Unit — How can such land units be created? Must private ownership of land in these central districts lose some of its rights? This is not technically necessary, as far as the planner is concerned. *Property owners may retain all their rights to the land*, but the subdividing lines (the actual lot limits) within each new land unit would be removed as hindrances to the project planned. And how could this be accomplished? Simply by capitalizing these land units, each owner receiving a number of shares representing his title to the property, proportionate to the extent and value of his land and what the land contains. In this manner the owners and those who finance the buildings would become co-investors in a neighborhood unit, just as, by possessing stock in a steamship company, they would be co-owners of a ship.

As stockholders in the shipping company, they would not own the captain's bridge, or the propellers, or the engine of the ship, but would possess part of an indivisible whole, part of a unit. In the case of the neighborhood unit, possession could be on the same basis, and all actions taken would depend upon the decisions of an administrative council subject to city legislation. The city might also have a voice in the decisions taken, according to the nature of the case and in consideration of its share in the ownership of land or buildings. In turning over the street surface (often 33 per cent) to the common land unit, the city would become one of the principal landholders. This important share, plus the support of the necessary legislation, should guarantee the respect of community



The problems presented in this book are commented on and discussed every day by press, movies, and radio. This is only natural when we consider that *the lives of many millions of people are affected by these town-planning problems.* Yet the phrase "town planning" alarms the public as "too technical," and most persons would not dream of connecting it with the headlines above.

rights.[17] What would happen would be tantamount to a *reassembling* of the land in question. A certain number of small lots would become one large lot.[18]

There is today an increasing recognition of the need — formulated by the C.I.A.M. in 1933 — for this reassembling.

"Economic development of small plots in already blighted areas is not generally feasible, making large scale rehabilitation such as is involved in the neighborhood unit plan the only way out.

"Since the neighborhood unit provides safety of investment and adequate return, stability of economic and social values and the amenities for pleasant and profitable living, it should be considered a public improvement. With adequate safeguards the power of eminent domain should be made available in site assembly." [19]

As to removing the obstacle represented by the antiquated street system, essentially this will already have been accomplished by the reassembling of the land into a single unit. Since this unit represents the surface area of the projected neighborhood unit, the old street network of gridiron pattern inside it becomes useless and is thus automatically eliminated. Through-traffic routes being diverted around the unit, the only streets entering its area would be parkway contacts or short service streets, leading to main entrances of dwellings, garages, and parking places.

Can This Regrouping of Land Be Achieved? — The decentralization which has been taking place in cities in the last few decades has altered public opinion on the problems of the changing central districts. *Hope for the revaluation of these districts through means employed in the past has waned considerably.* In some districts, associations of real estate owners, uniting to study their problems on a district scale, are becoming common. Aware of the fact that they must act together, these owners are endeavoring to formulate programs of united action on a larger scale.[20]

Other landowners, with less foresight, protest that the construction of new motor highways tends to hasten the migration from central districts, and they seek to limit highway construction. They are, of course, aware of the fact that the outskirts of the city and the suburban towns, brought nearer to the inner city by new and faster routes of travel, become increasingly attractive to city-dwellers and create new competition. Because of this competition, the depreciation of property in certain parts of the city is definitely accentuated. And, for the most part, high land values are maintained only by artificial means.

If regional plans permitting the construction of neighborhood units (that is, a formula for the revaluation of central housing districts, by making them attractive) are not adopted, the competition of the suburb, which presents better living conditions, will never be diminished. In the face of this difficult situation, the so-called "utopian" theories discarded a few decades ago begin to assume a vital reality.[21]

This problem is so complex and so far-reaching in importance that its adequate treatment would require the space of several volumes. In a general work of this nature, little more than a statement of a possible solution can be given. As such, this solution humbly submits itself to open discussion and to every point of criticism. For this is what the C.I.A.M. hopes to stimulate.

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[17] This solution, which seems most conservative, is given here as an example by the author of this text. The C.I.A.M. congresses of 1930, 1933, and 1937 discussed this problem of lot assembly into bigger land units, and different proposals were submitted.

[18] Similar regroupings have taken place before. In England in the eighteenth century, as old agricultural methods gave way to new ones, a redistribution of the land became inevitable. "The more rational distribution of the land was a mere matter of the alteration of the shape and size of parcels" (Thomas Sharp, *Town Planning*, London: Pelican Books, 1940, p. 30).

[19] Henry Bruère, spokesman representing property and financial interests in the conference on the Planned Neighborhood Development held at the New York Chamber of Commerce, March 1940. See Regional Plan Association, *Regional Plan Information Bulletin*, July 1, 1940, p. 4. Compare these statements with those in the C.I.A.M. Town-Planning Chart reproduced on pp. 246–249.

[20] "A striking unanimity of opinion as to the desirability of the neighborhood unit plan of development was voiced by bankers, builders, governmental agencies, and civic organizations at the Planned Neighborhood Development Conference held at the New York Chamber of Commerce on March 28th. . . . A group of savings banks has organized the West Harlem and East Harlem sections of Manhattan into districts in which lending policies will be applied uniformly." See Regional Plan Association, New York, *Regional Plan Information Bulletin*, July 1, 1940, p. 1.

[21] The *Architectural Review* (London), July 1941, suggests the advantages of the nationalization of urban land (p. 31).

PART FIVE — RECREATION

"A commons shall be assigned to the town of such size that, although the town continues to grow, there may always be sufficient space for the people to go for recreation. . . ." — Royal Ordinances for the Laying Out of Towns in the New World, issued by Philip II of Spain from the Escorial in 1573

RECREATION IN CITIES: A PROBLEM OF THE PRESENT

Man needs leisure and the recreative capacities of his leisure hours.

More and more the inhabitants of densely populated metropolitan centers lose contact with nature as it is crowded out of cities.

Today the need is urgent to renew this contact — man's communion with sunlight, open spaces, and the green of nature.

This need on the human side is the same as the need in city planning *for space for recreation.*

With the disorderly growth of cities, resulting in extensive lot crowding, outdoor recreation has become difficult, sometimes hazardous, in urban centers.

The increasing popularity of sports in recent years requires more than ever that recreational facilities be *planned.*

Large cities are deserted on holidays and week-ends — the most eloquent proof of man's revolt against the chaotic structure of the city and its lack of facilities for recreation.

His weekly hours of labor shortened by labor-saving machinery and increasing skill, man has gained more time for leisure activities, a fact which represents a further advance made possible by the machine. The average employee in American industry today enjoys twenty more hours per week for leisure than he did forty years ago.[1] Modern household equipment liberates many hours for women.

The shorter working week and paid vacations create enormous opportunities for the planning of recreational activities for the masses, with accompanying benefits to their health and vitality.

Up to the present, most efforts to promote recreation on a large scale have been made upon the initiative of private interests. Yet the exploitation of recreation as a new source of profit has in no way satisfied the fundamental needs of man.

[1] According to studies made by the National Industrial Conference Board, "the average worker in American industry in 1900 worked 60 hours a week. In 1929 the average was 50 hours, and the average for industry at this time is about 40 hours per week." (*Stories of American Industry*, Washington: United States Department of Commerce, 1937, p. 90.) Changes due to the present emergency are accidental.

The following excerpt from the official summary of *Recent Social Trends in the United States* (New York, 1933), compiled by a research committee under former President Hoover[2] suggests the magnitude of commercialized recreational activities in the United States:

"To profit by the potential market offered by increasing leisure, many forms of amusement or recreation have been provided on a commercial basis, as, for instance, moving pictures, automobile touring, travel, radio, boxing, tennis, golf, baseball, football, dancing and 'resorts.' On these and similar recreation in the late 1920's our experts show that we spent *10 to 12 billion dollars a year!* . . ."

Today sport is one of the greatest American industries, "for each year sporting goods and equipment used for recreation, valued at *500 million dollars*, are sold. This estimate includes such items as clothes for sports and outdoor life."[3]

It is obvious, then, that *recreational pursuits* are not limited to people of privileged circumstances but that they *fulfill a definite need of the whole people.*

A responsibility therefore rests with public officials to make adequate provision for recreation in our cities, for only public agencies can meet the recreation problem on the basis of community or regional needs.

Even as governmental authorities failed to face the problems of the newly mechanized cities in the nineteenth century, however, so do most of them remain blind to this one today. While municipalities often fail to exercise powers given them by existing legislation, they also fail to seek authority permitting them to establish recreational

[2] *New York Times*, January 2, 1933. Included in the report sent to the C.I.A.M. by the American group.

[3] *Stories of American Industry*, p. 89.

LEISURE IN CITIES. Pastimes for the haves and the have-nots. Use of the pavements for games by adults and children is a consequence of the universal need of proper recreation areas.

Above: Paris. Below: Rotterdam. →

DANS LA PLUS SOMPTUEUSE ET HUMORISTIQUE REVUE DU MONDE

PLAISIRS DE PARIS

Le chansonnier loufoque **PIERRE DAC**

Les grands numéros américains **SAINT-CLAIR** et **DAY** et The **FOCKKERS**

Les **32 HÉLENA STARS** et une sélection des plus belles femmes de l'univers au **CASINO DE PARIS**

200 ARTISTES - 10 GRANDES ATTRACTIONS

facilities and to supervise them directly. As a consequence, stadiums, beaches, swimming pools, and other recreational facilities are still in many cities in the hands of private interests.

In some cities, and especially in the United States, the outlines of new recreational systems are appearing.[1] In others only the slightest beginnings have been made by the local governments. Yet most cities still lack *a comprehensive recreation program*, in spite of the fact that the problem constantly enlarges with the growth of the city, its high and rising property values, and the difficulty of providing favorable sites.

It often happens that public officials, though conscious of the need for open spaces in their crowded cities and eager to make provision for them, are forced to renounce their projects under the pressure of private interests. On a small scale, this is illustrated in the following incident, which occurred in Paris:

"In Caulaincourt Street, just in front of the painter Renoir's house, a number of wooden hovels occupied about half a hectare of land belonging to the city of Paris.

" 'You'll see,' said Renoir, 'that as soon as these ruins are demolished, buildings six stories high will be put up in their place — in a street that already needs air.' When a fire later destroyed the shacks, the alderman of this district proposed that advantage be taken of the situation, for reasons of health, by creating a square on the site. His proposal having been taken into consideration by his colleagues, feeling suddenly ran high among the neighboring shop-keepers. The alderman was haled before a sort of tribunal, presided over by a pharmacist, whose shop adjoined three 'bistros.'

" 'For fifteen years,' the pharmacist cried out to the alderman, 'we've been waiting for some buildings to be put up on this land that might bring us some business. You don't give a damn about us with your square! If your plan goes through, you know what to expect in the next elections!' "[2]

Though this story represents but a minor case, it signifies a process which is repeated in all countries in numerous variations: the subordination of the welfare of the many to the interests of the few.

Renoir's "street that already needs air" is typical of all crowded city neighborhoods, where want of space is synonymous with want of *breathing spaces*. Here, where they are most needed, the people must often travel far to find them, obliged to bridge both the obstacle of distance and that of the expense of journeying to their destination.

The want of play space in crowded cities fills the streets with idlers, encourages the activities of corner gangs, and consequently creates sociological problems that reach far into the life of the city. To thousands of people, the street is a refuge in their hours of leisure — a place in which to "kill time" until the hour when they must return to the drab dwellings they inhabit.

Neighborhood athletic fields or recreation grounds would be of inestimable value in contributing to the well-being and morale of these countless thousands and of rehabilitating the lives of those already affected by their unhealthful environment. Such recreation grounds should be designed for the use of the many and should not consist solely of stadiums for spectator sports.

People of all ages show their desire to participate in sports — a fact to be observed in any vacant city lot, where those who live near enjoy their games until the space is covered by new buildings. In working-class districts people play in the courts of factories or in side streets where traffic is light. In industrial suburbs, along railroads, and in the slums of the inner city, children are forced to organize their play in hazardous streets or in the midst of rubbish heaps. Under these adverse conditions, their games are like an instinctive revolt against the city — the city without space, and without verdure.

THE LACK OF OPEN SPACES IN CITIES

● *"Open spaces in cities today are generally insufficient."*

Town-Planning Chart

In central districts the unbuilt land surface is usually so insignificant that it could not serve the recreation needs of the immediate neighborhood, even if it were entirely devoted to this purpose.

[1] See "Landscape Design in Urban Environment," *Architectural Record*, May 1939.

[2] A. Vollard, *Souvenirs d'un marchand de tableaux* (Paris, 1937), p. 278.

It is curious to observe the size of the areas allocated to different functions in our cities and the relationship between them. The graph at the left shows how streets and roads predominate at the expense of open spaces. The small percentage of land that the latter occupy poses a problem for the organization of recreational facilities in any city. (See p. 82.)

But, great as the difficulties are, there are still possibilities of clearing vast areas for recreational purposes. Chicago and New York have set an example. Lake and river fronts, lined with obsolete structures, docks, refuse heaps, railroad yards, warehouses and coal piles, etc., have been cleared in recent years. Landscaped areas with playgrounds, yachting harbors, parking lots, and parkways have been assembled in a planned layout. The city of Chicago was a pioneer in this movement.

→

Even the minimum standard of one acre of open space to each hundred inhabitants is rare in American cities. As for England, "an examination of the open space provision in a number of the largest municipalities in this country shows that the average is *less than three acres per one thousand persons.*" [6]

The following average percentages of land use in twenty-two American cities [7] reveal the small amount of space devoted to parks and playgrounds:

Dwellings (largely single-family and their house yards)	39.33
Industry	5.91
Business and commercial uses	2.38
Railroad property	5.50
Streets	33.61
Public and semi-public areas	7.61
Parks and playgrounds	6.33

As has been indicated before, cities have awakened in recent years to the need for open spaces, parks, and playgrounds. Playgrounds, however, are still insufficient everywhere. And though the playground movement had its beginnings in the United States near the turn of the century, under the initiative of the Playground Association of America, so little has been accomplished up to now that the movement may still be said to be in its incipient stages.[8] In many other countries no such movement exists.

In Europe, to take Paris as an example, a similar lack of space may be observed. *The Department of the Seine is almost entirely covered by buildings.* Within this black mass of construction, the green of nature is scarcely to be found anywhere but in the Bois de Boulogne and the Bois de Vincennes. Buildings cover almost the entire valley of the Marne and the great meander of the Seine on the west.

Over a long period of years park areas and other spaces in Paris have been steadily decreasing. While in 1789 the area devoted to park space in Paris occupied 391 hectares out of a total area of 3,390 hectares, in 1908 this area consisted of only 137 hectares out of an equivalent total area. *Within a hundred years, Paris had lost two-thirds of its park area!* [9] While in the course of twenty years the population of Paris increased at the rate of 25 per cent, in the same period public park areas increased only 9 per cent.

Since that time no important new measures have been taken toward the creation of open spaces in Paris, even where the fortifications of the city were razed for this purpose. On the contrary, these sites were rebuilt after the war of 1914–1918 (see p. 29).

In 1938 the areas devoted to sports activities (per inhabitant) amounted to 3 square meters in Germany, 0.92 square meters in France, *0.33 square meters in the Department of the Seine* (Paris)!

In that year, spaces devoted to sports activities were planned for only thirty-four parishes out of 656 in the Paris region, while for the whole of France the proportion was 3,000 parishes out of 38,000.[10]

In London "in 1927 there were 32,000 acres available (as open spaces) within eleven miles of Charing Cross. By 1933 the amount had dwindled to 8,000 acres." [11]

Compared with other cities, New York has been specially successful in expanding its park facilities by acquiring additional land and by improving existing park areas. In the last eight years 8,000 acres of land have been acquired by the city for parks and playgrounds.[12]

These general figures do not convey much, because the *distribution* of open spaces is sometimes more important than their actual acreage, and the need for such spaces varies according to densities of population, types of activity, amount of use, location, and accessibility.

There is no doubt that a play area is much more valuable if it is

[6] "Park Planning," pt. IV, *Town Planning Review*, December 1938, p. 107.
[7] H. Barthelomew, *Urban Land Uses* (Cambridge: Harvard University Press, 1932), vol. IV of Harvard City Planning Studies; see p. 141.
[8] Joseph Lee, father of the American playground movement, wrote the first American book on this subject.

[9] From a report presented to the municipal council of Paris in 1908 by M. Dausot.
[10] Maurice Serre, in *La Mort du bâtiment catastrophe nationale* (Paris, 1938), p. 78.
[11] *Architectural Review* (London), July 1941, p. 33.
[12] From *8 Years of Park Progress*, report of the City of New York Department of Parks (New York, 1941), p. 14.

Some of the first organized civilizations created an architecture for leisure activities: the theater, the stadium, the gymnasium, the public bath. Above: Greece, the theater at Epidaurus, and the stadium at Delphi. Below: Model showing the center of Rome toward the end of the Empire.

The outstanding importance of the buildings dedicated to leisure activities is remarkable, as is their scale. The Colosseum is about 150 feet high. The Circus Maximus (on the left) was about 1,800 feet in length and held 150,000 spectators. Public baths covered large areas. →

located in a congested central section than if it belongs to a suburban neighborhood.

Nonetheless, park areas are more impressive when compared with the populations and total areas of the regions in which cities are located:

The New York region had 105.4 inhabitants to one acre of park in 1930, and 91.7 inhabitants to one acre in 1940. This represents 3.8 per cent of the total acreage of the region.

Chicago had 96.3 inhabitants to one acre of park-land in 1930, and 82.5 to the same surface today. Yet this area represents 1.3 per cent of the total of the region.[13]

Despite the impressive growth of parks in cities like Chicago and New York, there is obviously a pressing need for further expansion of green areas. Improvement in the distribution of recreation facilities in relation to the distribution of population is also to be desired.

The Arbitrary Location of the Few Existing Recreation Grounds.

- *"It often happens that open spaces are poorly situated and consequently difficult of access to many people.*

  "Since most open spaces are situated in outlying and suburban areas, they do not benefit the inhabitants of the unhealthful central districts." *Town-Planning Chart*

In many European cities most of the land devoted to sports activities is only temporarily intended for this purpose. The land so used is rented by some private enterprise, while the owners wait to profit by higher selling prices as the city expands. Upon the sale of the property, the temporary buildings are razed or moved to a site farther away from the center of the city. In this manner, open spaces for sports activities are repeatedly abandoned for other localities, always farther removed from the most populous districts.

It may generally be observed that only those fields for sports and recreation centers established by municipalities or by higher government agencies have any degree of permanency. With private interests such activities must pay their expenses and leave a profit; once they cease to be profitable, they are usually discontinued without any further consideration for the needs of the neighborhood. Consequently, having too often left to private enterprise the task of organizing recreation facilities, the municipalities themselves are greatly responsible for their arbitrary location.

[13] Regional Plan Association, *Regional Plan Information Bulletin*, October 8, 1941.

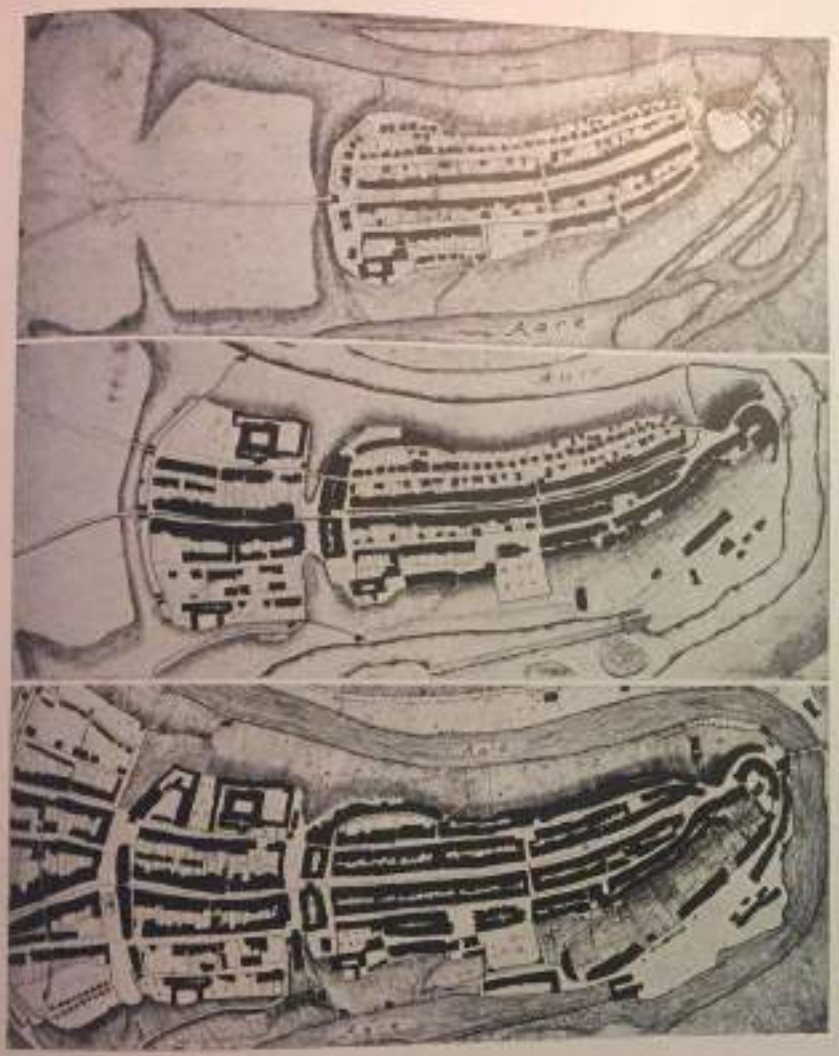
The Plight of Central Districts — Vast expanses of unbuilt land are not found in the central districts of cities, except in certain rare cases. These exceptions are usually old gardens or parks belonging to the city or state, which have been maintained by them for many years.[14] For the most part, these centrally situated parks have been kept like gardens, "to be looked at," the larger portion of their area being protected by fences or by signs prohibiting the playing of games. These constitute passive park areas.

But since the central districts contain the greatest population densities and the least comfortable dwellings, it is precisely here that suffering from the need of outdoor space is most acute. Children, the aged, and many women — all who must remain near their homes — are the saddest victims. And those who are able to seek outdoor recreation elsewhere, in places far from their neighborhood or outside the city, cannot use these places daily because of the expense and time required to reach them.

On the reverse side, it may be observed that some of the neighborhoods which have at their disposal the largest areas of unbuilt land are those which have the least need for it. This does not mean, however, that the less crowded residential districts have sufficient fields for sports and other outdoor recreation facilities.

Conclusion — The provision of sufficient space for recreational purposes has become one of the most urgent problems of growing cities. Municipalities should therefore formulate their programs for parks, playgrounds, athletic fields, swimming pools, and other facilities in such a manner that the vital functions of each of these may be

[14] Central Park, New York City, and Lincoln Park in Chicago should be noted as outstanding exceptions. In 1853 New York City was legally authorized to take over the land that was to become Central Park. Values had to be set on 7,500 separately owned plots.



BERNE 1309

1600

1800

Berne today →

For many centuries the expansion of cities was relatively slow. And though lot crowding increased considerably within fortified areas, the open country remained within walking distance. These three maps of the city of Berne (Switzerland) show this slow process of growth. It is interesting to compare them with the air view of the same city today.

Recreational activities in medieval cities usually took place in the cathedral square, where mystery plays or other shows of religious or secular character were performed. The cathedral itself was often transformed to hold these popular and religious gatherings. Open areas reserved for market days or popular festivities can always be found in or near the cities.

properly fulfilled. *This means careful selection with respect to locations* — in short, *thoughtful planning.*

HOW OUR CITIES LOST THEIR OPEN SPACES

The plans of cities, changing from one period to another, reveal the progressive disappearance of open spaces within their limits.

What were the facilities for recreation in the cities of the past?

Some of the first organized civilizations fostered a rational cultivation of mind and body. They created the architecture of leisure activities: the theater, the stadium, the gymnasium, the public bath.

Gymnasiums and thermae (public baths) occupied a notable part of the areas of Roman cities, and served for both mental and physical recreation. "One could bathe, indulge in gymnastics, and walk under the shade trees; libraries invited the reader and one could tarry to listen to poets and philosophers. The plan, in its general lines, was always the same: an enclosure containing promenades and both indoor and outdoor spaces for gymnastics and games, with a central building devoted especially to baths." [15] A great number of Roman citizens were able to use the thermae, their working hours being arranged to permit this.[16]

In arenas in the center of the cities were presented events that were often spectacular rather than sporting. The Olympic games served mostly to exhibit champions and to stimulate interest in sports. Developed more or less highly, these forms of recreation existed in all the cities of the ancient world and, with slight modification, passed from one country to another.

During these remote periods of history and through the Middle Ages, "the need of security, coupled with the undeveloped character of road communications, influenced the selection of sites and size of cities." [17] Belt-like fortifications compressed the towns they encompassed, gradually increasing the density of the population, crowding buildings together, and absorbing open spaces. So towns, finite and immobile, had to remain small until, centuries later, transportation permitted them to develop.

The very limitations in the size of cities (Rome during the Empire was an exception) made recreation space fairly accessible. The open countryside was within easy walking distance of the center of the town.[18] And here in the near-by green fields, which also gave the townsfolk sustenance, the people enjoyed their hours of leisure and their holiday festivities.

The cathedral, too, was a center of festivities, the open space before it providing ample room for all kinds of festivals, both religious and secular. And in spite of the compactness of the town, streets and squares ordinarily knew no other traffic than that of people on foot, were crowded only on festival and market days, and were comparatively free of traffic dangers.

In the seventeenth and eighteenth centuries towns develop at a quicker pace. Their populations become more dense, slum dwellings multiply, and living conditions grow worse as open spaces in the city disappear and outdoor recreation within the limits of the town decreases.

Yet in the middle of the seventeenth century London had only 200,000 inhabitants and contained many squares. In the eighteenth century the countryside was still near Westminster, not far from the center of the city. It was still possible to find outdoor recreation within walking distance.

About this time the commercial nature of our civilization begins to influence urban patterns, and the growing "business" spirit contrives to suppress everything which is not useful to its own ends. All fields of endeavor reveal this mark of the time, even recreation submitting to it, as is shown in the following incident:

"The Marquis de Tourny, great lover of trees, great 'planter,' as he was called by the Marquis de Mirabeau, found that a garden was

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[15] Paul Bigot, *Reconstitution de la Rome antique* (Paris: Maretheux et Pactat, 1937), p. 21.

[16] Baths were considered as public services, not as sources of revenue.

[17] See T. Adams, *Outline of Town and City Planning* (New York: Russell Sage Foundation, 1935), p. 34.

[18] "No medieval town usually extended more than half a mile (walking distance) from its center" (Lewis Mumford, *The Culture of Cities*, New York, 1938, p. 58).

Above: Gardens of the Palais-Royal, Paris, in the late eighteenth century. These open spaces are very rare in nineteenth-century developments, especially on the Continent. Below: A square in Lille during a military parade. Gardens were often eliminated to facilitate these displays of armed forces.

Above: A café in Paris, *c.* 1820. With the expansion of cities and the elimination of their open spaces, *the nineteenth century saw the development of indoor activities.* Below: The homes of the higher classes were spacious; every important dwelling had its music room.

indispensable to a city like Bordeaux, whose inhabitants were so numerous and so preoccupied with their affairs. 'Not only will it be a great pleasure to them and beneficial to their health,' he said, 'but in a great city of commerce such a garden should be regarded as necessary or at least very useful to business. For business men, who often have occasion to get together, thus attending better to their affairs, will be able to meet here; in a way, this garden will be a second stock exchange, *an evening stock exchange*.' " [19]

This incident is also suggestive of the metamorphosis taking place in cities and of the accentuation of their roles as business centers. It is curious to observe that in the plan of London conceived in 1666 by Sir Christopher Wren, after the Great Fire, the center of the city is selected as the site of the stock exchange.

In many of the plans of this period, spaces left open were intended for military parades rather than for recreation purposes.[20] The people were only to be spectators at these parades.

With the Industrial Revolution, cities grow as never before, subjected to a concentration of population which was to see the disappearance of virtually all their recreation space. In England the old village greens disappear in a few decades. Around 1800 most of the great industrial cities of the present were but villages. Liverpool had but 77,000 inhabitants, which increased to 300,000 by 1841. Manchester grew from 95,000 in 1800 to 228,000 in 1821.

With this growth, urban land values increased at a startling pace. In Lancashire, England, for example, land rents increased 3,000 per cent within a few years, because of the industrial development of this region. In these days "men were so preoccupied with building factories that the towns were forgotten and built themselves. . . . As the Industrial Revolution advanced, a Manchester was growing up in which the workmen would find it harder and harder to escape out of the wide web of smoke and squalor that enveloped their daily lives. . . . And as the towns grew, the spaces of common within their borders became more valuable, and they were appropriated by the powerful classes," who built upon them.[21] *Indoor recreation became predominant.*

Toward the end of the nineteenth century and in the first third of the twentieth, the problem raised by the lack of open spaces in large cities became steadily more acute. The vast growth of industry made the atmosphere unfit to breathe. And the great masses of city people were condemned to live in isolation from all contact with the country and the beauty of nature, for the enormous development of the suburbs had moved the countryside farther away from the city.

After several decades the natural reaction appears:

"One day in the year 1885 wagons drew up to several churches in the city of Boston. These wagons were loaded with sand, which they dumped in the church yards. Then the children from the streets swarmed in the yards to play in the sand piles, while kindly matrons looked on to supervise their play. From this day on, the movement for public playgrounds began to grow." [22]

In the forties many big English cities had no public parks. The adoption of the ten-hour labor day (1847) stimulated their creation. Sports activities develop on a large scale in England toward the seventies. "Sport for adults, until the later 1860's, had been a preserve for Corinthians, and male aristocracy's adventures outside 'high life.' Beyond that circle there had been only country games and wrestling, the cricket of village greens, the croquet of vicarage lawns, and the gentle, genteel archery. . . ." [23]

The development of sports in Germany increases rapidly after 1880. After 1891 a movement starts in the United States for securing places for play in cities. American sports activities in the nineties influence Germany.

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[19] M. Lhéritier, "L'Urbanisme au XVIII[ème] siècle. Les Idées du Marquis de Tourny," *La Vie urbaine*, February 15, 1921, p. 47.

[20] The numerous London squares of residential type built between 1770 and 1850 have not many Continental parallels. See Sigfried Giedion, *Space, Time and Architecture* (Cambridge: Harvard University Press, 1941), p. 449.

[21] J. L. and Barbara Hammond, *The Town Labourer, 1760–1832* (London: Longmans, Green, 1917), p. 44.

[22] *Stories of American Industry* (Washington: United States Department of Commerce, 1926), p. 90.

[23] Alan Bott, *This Was England* (New York: Doubleday, Doran), p. 187.

NEIGHBORHOOD PLANNING CAN BRING RECREATION FACILITIES TO YOUR DOORSTEP. The open spaces that this type of planning requires should not remain passive park areas but should contain playgrounds and fields for sports. The big glass windows of the new houses (left), like this one in Auteuil (Paris), would look out on these recreation areas. The small structures in these playgrounds would make the view interesting and would not cut off light and air. In this model of a neighborhood unit (right), the space around the blocks of dwellings has been organized and planned. By space, we do not merely mean bigger courts than those now generally used; we mean continuous open areas of sufficient size to contain all the necessary complements of modern dwellings, plus the additional park areas that these services require. Flat roofs can be used for kindergartens, sun bathing, or even parking, as is shown here.

Organization of sports activities on a large scale dates from the last few decades, after the adoption of the eight-hour day throughout Europe (1919).

The progress of this movement, however, could not keep pace with the growth of cities. Traditional play areas continued to disappear. At length streets themselves became playgrounds, until the automobile came to make the situation worse.

But popular interest in sports increased, too, and with it a widespread reaction against this want of recreation facilities in cities. As early as 1903 the city of Chicago voted ten million dollars for parks and playgrounds. Other cities have made definite efforts toward the organization of recreation areas. And with the last ten years (1930–1940) the results of these efforts have become evident.

TO MEET URBAN RECREATION NEEDS

- *"It should be required that each new residential district contain the necessary open space appropriately laid out in the form of playgrounds and sports fields for children and adults."*

Town-Planning Chart

Dwelling Areas Must Include Recreation Facilities — All plans for new housing projects should include provision for open spaces to be devoted to sports and other recreational needs, for these are the indispensable complement of the new city dwellings. Without them, their community facilities would not be complete.

The program specifying the distribution of these facilities, their character, their capacity, as well as their most favorable locations, will vary considerably with the customs and tastes of different peoples, the percentages of different age groups in the population, the hours of labor, the climate, and other circumstances. The urban population's need for recreational facilities as an integral part of the dwelling unit is nevertheless universal.

The ensemble of buildings and spaces devoted to recreation, both mental and physical, would form within the dwelling unit a sort of sub-unit, which we shall call *the recreation unit.*

Distributed in the open spaces surrounding the dwellings, these recreation units would bring opportunities for recreation to the very threshold of the house. As a result, their occupants would be spared the need of traveling to distant parks or other outdoor places, thereby saving the expense and loss of time which such journeys mean to many city-dwellers today.

The different standards that have been set up to determine the park and playground needs of a community vary considerably. It is difficult to measure these needs by acres and give a general formula. As has been previously stated in the chapter on dwelling, climate, topography, age groups and their percentages, local customs, and other factors influence any recreation program and must be considered in each particular case.

The following outline (based on a program for the city of Rotterdam, established by the Dutch group of the C.I.A.M. for the needs of that city) is therefore given here merely as an example. This program includes:

1. *Kindergartens, for children up to the age of six years.*

A sandbox, a paved area, and a water basin are requisites for children from the age of two to six.

Places for leaving baby carriages should be provided, as well as benches for those who accompany the children.

The maximum distance from dwellings to kindergartens should not exceed 400 yards.

2. *Playgrounds for children between six and fifteen years.*

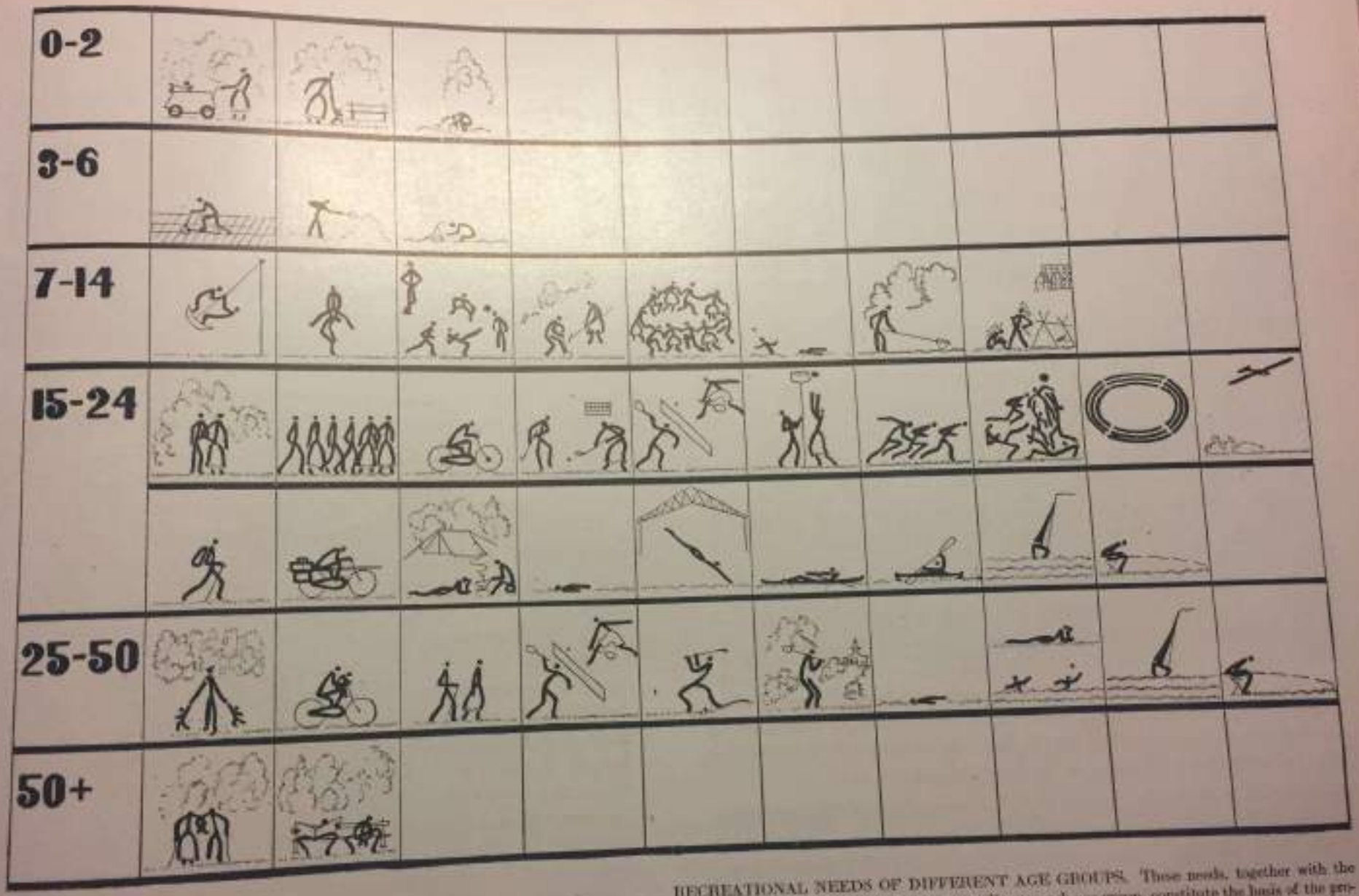
These would be composed of small grassplots and the schoolyard. The latter would be so arranged as to be available for use during vacations, holidays, and during certain hours when the school is closed.

The maximum distance from the dwellings to these playgrounds should not exceed two-thirds of a mile.

It would be advantageous to group playgrounds on an area covering about five acres.

3. *Fields for sports.*

Fields for sports for the organized games of youth and adults should



RECREATIONAL NEEDS OF DIFFERENT AGE GROUPS. These needs, together with the percentages of the total population corresponding to each age group, constitute the basis of the program for the planning of recreational areas. This graph, designed by the Dutch group of the C.I.A.M. for the city of Rotterdam, formed part of a complete study of the recreational needs of that city.

be composed of grass-covered areas for training, grounds for ball games, tracks for competitive events, a swimming pool, and cabins. A club and a high school should be situated in the vicinity.

These fields can be distributed so as to serve a given number of dwelling units, for the grouping of these recreation services within a certain area would lead to more efficient and economical maintenance.

The maximum distance from the dwellings to the fields should not exceed one mile.

All these recreation facilities should be screened from traffic and from automobile parking grounds by means of green bands or park buffers.

The children's section should be separated from that of the adults by one of these buffers in order to isolate noises.

Buildings devoted to intellectual pursuits should also be protected against the noise of the sports fields and of traffic.

The area of the parks surrounding and complementing these different recreation services can be calculated as equal to 50 per cent of the total area required by these services.[34]

In addition to the parks, playgrounds, fields for sports, cabins and other buildings required on these grounds, the recreation layout will include both open-air and enclosed places for intellectual pursuits: an auditorium for lectures or concerts, a theater or cinema, a library, or other installations, according to circumstances.

Obviously, certain installations in such recreation units — stadiums, the larger fields for sports, theaters — will be of sufficient size to serve the requirements of greater numbers of people than those occupying one neighborhood unit. They should therefore be conceived as belonging to a whole district (ward or precinct) of the city, affording facilities for several neighborhood units.

On a broader plane, every city should also encourage the formation of special recreation units in the form of large parks. These would have the particular function of providing a stage for international tournaments, holiday demonstrations, or for other events requiring great space. Such parks should be tied in with the civic center, of which they would be a necessary complement.

Week-end recreation centers and national parks, together with the recreation units just described, constitute a system of varied recreation facilities. Linked together by means of parkways, the whole would form a network of green, a veritable *recreation network*.

[34] In their London researches the M.A.R.S. group of the C.I.A.M. estimated that the total of the two areas — parks and recreation facilities — should represent seven and two-thirds acres per 1,000 inhabitants.

TO EXPAND URBAN RECREATION AREAS

- *"It should be required that the general sanitation of too densely populated districts be improved by razing their overcrowded slums and other buildings, devoting the cleared sites to recreation purposes."*
  Town-Planning Chart

Slum Clearance Should Provide New Recreation Space — In most dwelling districts the creation of open spaces for recreational uses can be accomplished along the lines of a piecemeal program.

First, advantage should be taken of the rare empty lots in the neighborhood, which should be kept free of buildings. To these, further space would later be added by clearing the land of old slum dwellings, which, for health purposes, would not be replaced by other buildings. This space could then be devoted to play-lots, larger playgrounds, and athletic fields, with small outdoor swimming pools, according to the needs of the whole neighborhood.

In recent decades centrally located residential districts, especially in cities in the United States, have shown a marked tendency toward depopulation. Their inhabitants, lacking many conveniences in the old dwellings and tiring of the drabness of their outmoded neighborhoods, have moved out into more comfortable houses in the newer districts. Here they are sometimes able to enjoy the advantages of modern community developments, including recreational facilities in their immediate neighborhood. If this decrease in the population of the central districts results in a decrease of land values, municipalities will be in a more advantageous position to purchase the depreciated land so necessary for recreational purposes. At the same time, such action, conducted in accordance with a comprehensive plan, would be a means of reval-

IN THE OLD OVERCROWDED DISTRICTS recreational areas organized to meet the needs of the neighborhood are of the greatest importance. Slum-clearance projects ought to take this need into consideration. The view shown at the left above is of an old district of the city of Berne. The want of open space is only too evident. Life in these dwellings would be greatly improved if buildings in the central area were demolished and playgrounds, as shown in the picture on the right, were laid out on the cleared site. This was suggested to local authorities by the Swiss group of the C.I.A.M. as an urgent first step to correct the bad living conditions that prevail in these old districts.
In these cleared areas small elementary schools like the one shown at the lower left would be of great use, without occupying too much space or cutting off the light or the view of the surrounding dwellings.

uating the areas surrounding the new open spaces, whose buildings would now enjoy the advantages of fresh air, sunlight, space, and sites for playgrounds and athletic fields.

If the cleared land were not a source of direct revenue to the municipality, it would indirectly improve the city's finances in the long run. For it would retard the outward movement of the population, *reducing the overexpansion of the city* and the attendant high cost of extending street systems, water mains, sewers, and other public services. Moreover, it would permit higher taxes on the revaluated lots benefited by the new open spaces. In addition, it would contribute to a decrease in juvenile delinquency and in accidents to children.[18]

Distribution of Recreation Facilities — Whether they result from slum clearance or not, recreation facilities should be situated where they will most conveniently serve the greatest number of people. Rational planning likewise requires that these recreation centers be situated at fixed distances from transportation lines or traffic routes, the distances varying according to the nature of the recreation center.

In so far as the character of a neighborhood may be transformed *gradually*, it may be found feasible, when additional land is cleared of old dwellings, to alter or expand the recreational facilities installed in the spaces first cleared. For example, the first buildings razed may leave space for no more than a small play-lot or playground for children. With the demolition of further structures adjacent to the playground, the enlarged space may be found of sufficient size to contain an athletic field for the whole neighborhood. The children's playground might then be moved to an equally suitable or better site elsewhere in the vicinity.

[18] See statistics in *8 Years of Park Progress* (New York: Department of Parks of the City of New York, 1941), p. 19.

Foreseeing such progressive changes in a neighborhood, it would be desirable for the cabins or other small buildings installed around these fields and playgrounds to consist of mobile units. This would facilitate their possible later transportation to other sites, with a minimum of waste.

Community Services in Recreation Areas

- *"It should be required that open spaces near the children's gardens or playgrounds be used as sites for nursery schools, or small elementary schools, and that certain sites in parks be devoted to general community purposes, with branch public libraries, small neighborhood museums, or auditoriums."* *Town-Planning Chart*

In its present state housing has not provided the necessary space for the most elementary services. These need not always await the construction of complete housing units.

It is therefore desirable that the rare unbuilt areas already existing, or sites which might easily be cleared, be utilized for the erection of buildings for the use of the community. These would consist of day nurseries, small elementary schools, children's libraries, or similar small installations which could be constructed while awaiting the erection of complete dwelling units, including these and other services.

In some cities roof space has been adapted to the needs of children. As a temporary measure this is not a bad solution, if it be considered that in such locations these services enjoy better air and exposure, and do not occupy the already insufficient ground space.

If a considerable cleared area is available, a minimum part of this might be occupied by buildings devoted to community uses, like auditoriums and lecture halls, libraries, or small neighborhood museums. Such buildings, situated upon a large expanse of land, could in no sense affect surrounding dwellings with respect to their exposure to the sun, their ventilation, and their lighting conditions.

PART SIX

WEEK-END AND VACATION RECREATION

"We have all known those excited card-players of the past, inveterate devotees of Sunday afternoons spent on stuffed moleskin chairs, a generation of sedentaries who took trains only on the most unusual occasions! . . .

"Today man seems to have rediscovered his ancestral need for space, his curiosity to see new vistas, and his desire for a change of air each week-end. Like the telephone and the radio, travel has entered into our lives and has become an integral part of our civilization." [1]

Week-ends and holidays in summer reveal the city in its starkest reality. As a place for working, it has ceased to function; as a place for living, it has been abandoned. Men have fled its hot pavements to seek the freedom of nature — space for play in the open air and sunlight.

Only the stay-at-homes remain — those who have no means of going away and who are forced to pass their leisure hours in the city's rare parks or window-shopping in the streets. In the meantime, the holiday is sandwiched between a yesterday of crowds departing and a morrow of crowds returning — stations mobbed by thousands, roads choked with traffic, transportation lines in a general paralysis.

This evacuation of the city is living evidence of its failure to provide space for recreation for the enjoyment of the many.

Among the problems arising from this failure are those that concern regional planning, the preservation of desirable rural sites, and the creation of week-end recreation centers.

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[1] From a prospectus of the Société nationale des chemins de fer, France.

WEEK-END RECREATION MUST BE PLANNED

The magnitude of the week-end exodus from cities requires that new outlets be planned to conduct it toward new recreation places outside the urban zone. New plans to regulate and control this exodus should be conceived. Points of departure should not be confined, as they are now, to stations in the center of the city but should be distributed conveniently throughout various districts. Small numbers of people might then be handled at a time, minimizing congestion at large terminals.

Because of modern transportation, the countryside is accessible to the people of the city. Unfortunately, however, it is constantly at the mercy of the expansion of the city, which progressively pushes outward, steadily increasing the distance from its center to the countryside that is as yet unspoiled.

But, in the absence of regional planning,

- *"The chaotic development of modern cities has ruthlessly destroyed many sites in the environs of the urban zones which might have been converted into week-end recreation centers." Town-Planning Chart*

Week-End Recreation Sites Are Still Disappearing — The enormous suburbs of today form a composite picture of confusion and drabness. Here, on sites which not long ago displayed the beauty of nature, the city seems to have overflowed, spilling its houses, stores, and apartment buildings over the countryside. Near rail lines, canals, and rivers, and along the highways, factory buildings of all types sprawl, one against another. In their shadows, jerry-built houses repeat the squalor of city slums.

Yet here are some green spaces, too, preserved by chance alone — not yet engulfed by the city. To the eyes of many city-dwellers, this is *the country*! And many who seek a holiday in the open, and who have not the means to make a longer journey, pass the day in these green fringes of the city, their nearest approach to nature.

Rural road and railroad have both left their mark upon the suburban structure. The country road has become the highway or the urban street, lined with buildings. In this process of metamorphosis, the directions taken by traffic routes have not been well planned, and they contribute to the haphazard pattern of the suburban area.

Railroads have blazed their trails in and out of cities, irrespective of the conservation of fine sites which might have been used for recreation purposes. And these were easy to find seventy years ago on the immediate outskirts of cities. Such errors, many committed in the nineteenth century and at a time when it was not foreseen to what extent the mechanization of production would speed urban growth, should not be repeated today.

Although the population growth of cities has, in many cases, practically ceased, their suburban expansion continues. *So the relentless destruction of the suburban landscape still goes on.*

Consequently, every large city should assume the responsibility of contributing to the solution of this problem by creating, within the scope of a regional plan, *week-end recreation centers.* For this purpose, those sites should be selected which are endowed with the finest natural features and which might easily be connected with the city by new roads or through the improvement of old ones. At the same time, rapid transit should be furnished by the best available facilities.

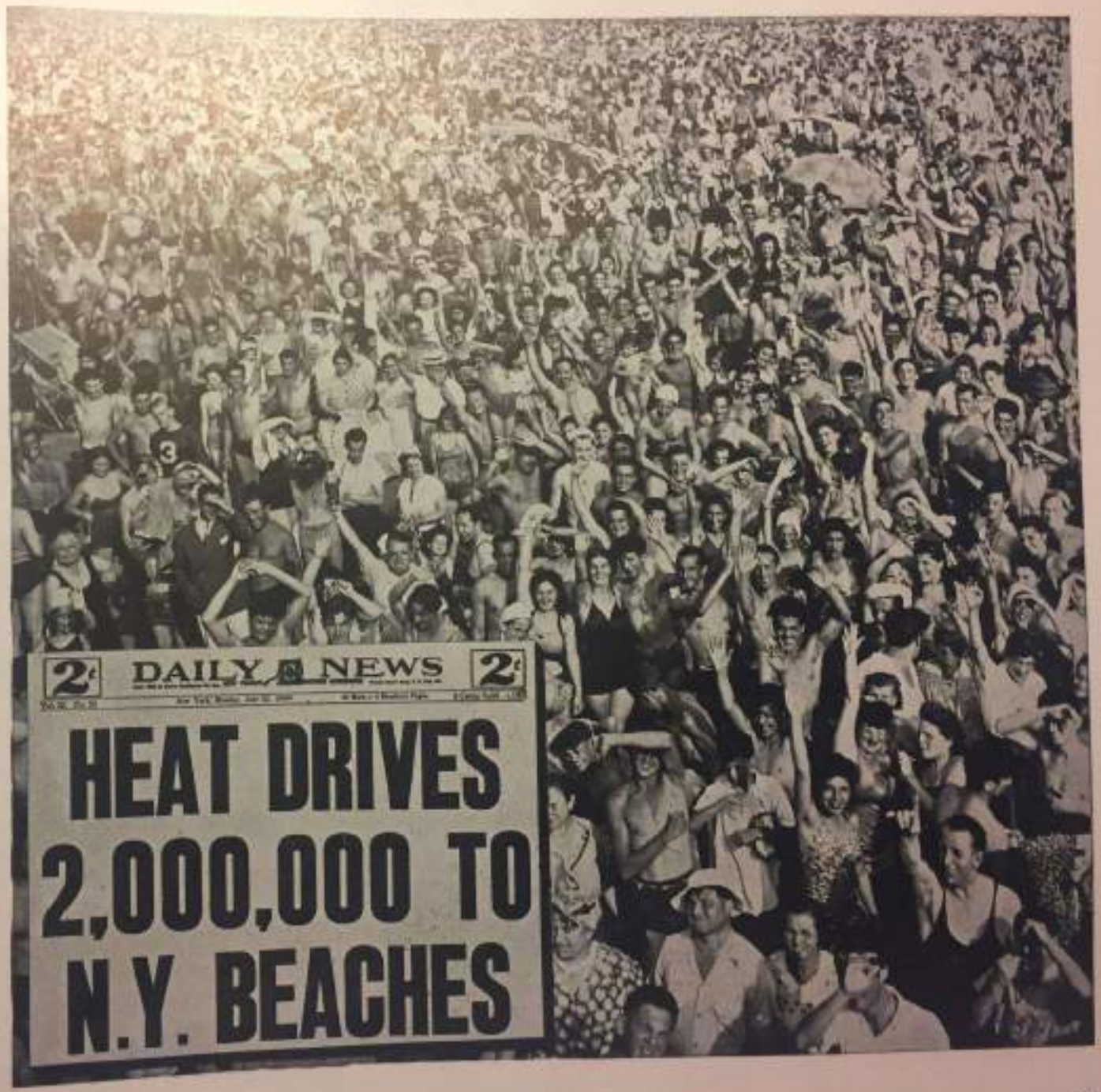
How Can the Week-End Exodus Be Organized?

- *"Advantage should be taken of those sites near cities whose natural features (rivers, beaches, forests, lakes) make them favorable for recreation purposes." Town-Planning Chart*

Some cities are still favored with lands beyond their suburbs, but not too distant, whose natural features make them ideal playgrounds. Because they have preserved their original beauty, these sites could easily be converted into large parks planned as *recreation centers* for the great numbers of city-dwellers who spend their vacations outside the city.

The present state of our cities makes it imperative, in consideration of the health of their inhabitants, that such large "breathing places"

WEEK-END AND VACATION RECREATION. Our cities are inhuman, lacking space, air, sunlight, horizons. It is in quest of these life-giving elements that millions of men are drawn beyond the confines of their towns, as by some centrifugal force.



But overcrowding is not confined to the city; it affects some recreational areas as well. This is a Coney Island multitude on a July Sunday. New Yorkers by millions take the subway to this popular playground.

be reserved for popular use. Cities should therefore acquire these potential playground lands,[3] either directly or through state aid, to prevent their use for other purposes by private interests. Wherever necessary, this acquisition should be facilitated by new legislation, which would invariably have ample justification in the needs of the city for recreation space — that is, in *the health needs of the general public.*

These recreation centers are especially necessary now, while we await the completion of the slower processes of piecemeal slum clearance and the installation of recreation units within the city. The recreation centers outside the city would ultimately complement those within, all being part of a general recreation system coördinated with the regional plan.

Intended to serve tremendous numbers of people, these recreation centers would be of primary importance, requiring a plan vast in scale and entirely new in conception.

The typical vacation or summer resort, which exists in every country, is an excellent example of *what must be avoided.* Many of these resorts, situated in places of unusual natural beauty, have been exploited by private interests entirely to the detriment of their advantages as recreation spots. Most of them, especially those developed in Europe before the war of 1914–1918, give the impression of having been designed in imitation of cities, their layout and general character having largely been determined by real estate speculation and commercialization.

Such resorts have adopted forms of "urbanism" in which little of the original aspect of the site remains. In Europe, their areas are entirely covered by hotels, villas, and fenced-in gardens, inaccessible to the public, who can use only the avenues or streets, as in any large city. Owing to their cost, open spaces for recreational activities are either rare or prohibitive to the masses of the people. The "main boulevard" on the lake or seashore is lined with hotels, villas, cafés, lamp-posts, and other typical city installations. Parking, especially on days of great crowds, becomes a problem as serious as in the city.

Another traditional type is that of the more popular resort, nearer the city, which takes the form of an amusement park. These abound in both Europe and America. Here, on the best sites of the water front, concessionaires have multiplied their stands to such an extent that lot crowding is often as acute as in slum districts. Even substantial parts of the beach are sometimes occupied by nondescript frame buildings of all kinds.

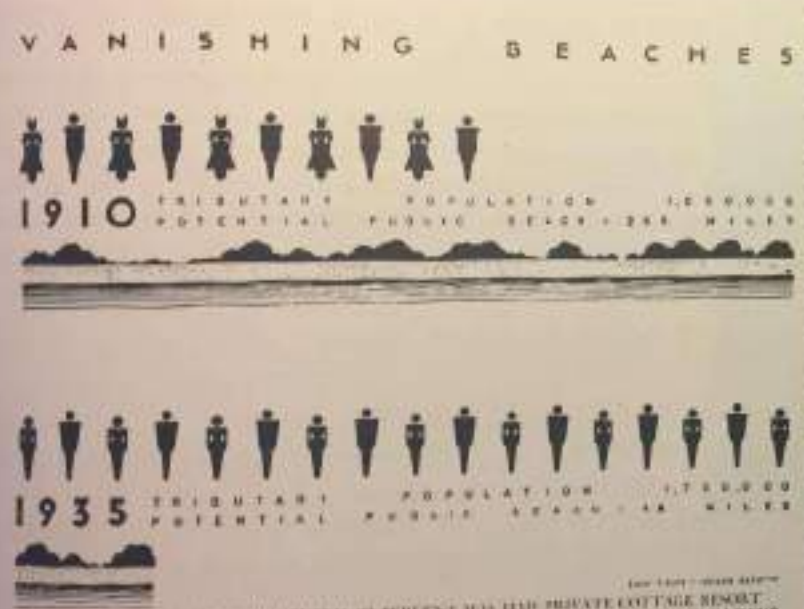
Obviously, both these types have destroyed the original advantages of their natural setting, instead of preserving them and adapting them to their most beneficial uses.

New Needs Require New Plans — People leave cities today seeking space, fresh air, sunlight, a forest or a beach — in short, *to find an un-urban setting.* To serve its purpose, a modern recreation center would satisfy these needs, and would present the aspect of a vast park, throughout which would be distributed facilities for the most popular sports (baseball, soccer, football, tennis, track, and swimming). Foreseeing possible large-scale sports events, a stadium should be provided. Camping grounds, trailer camps, hotels (with cabins or other types) would be included in the layout for the convenience and comfort of those remaining longer than a day.

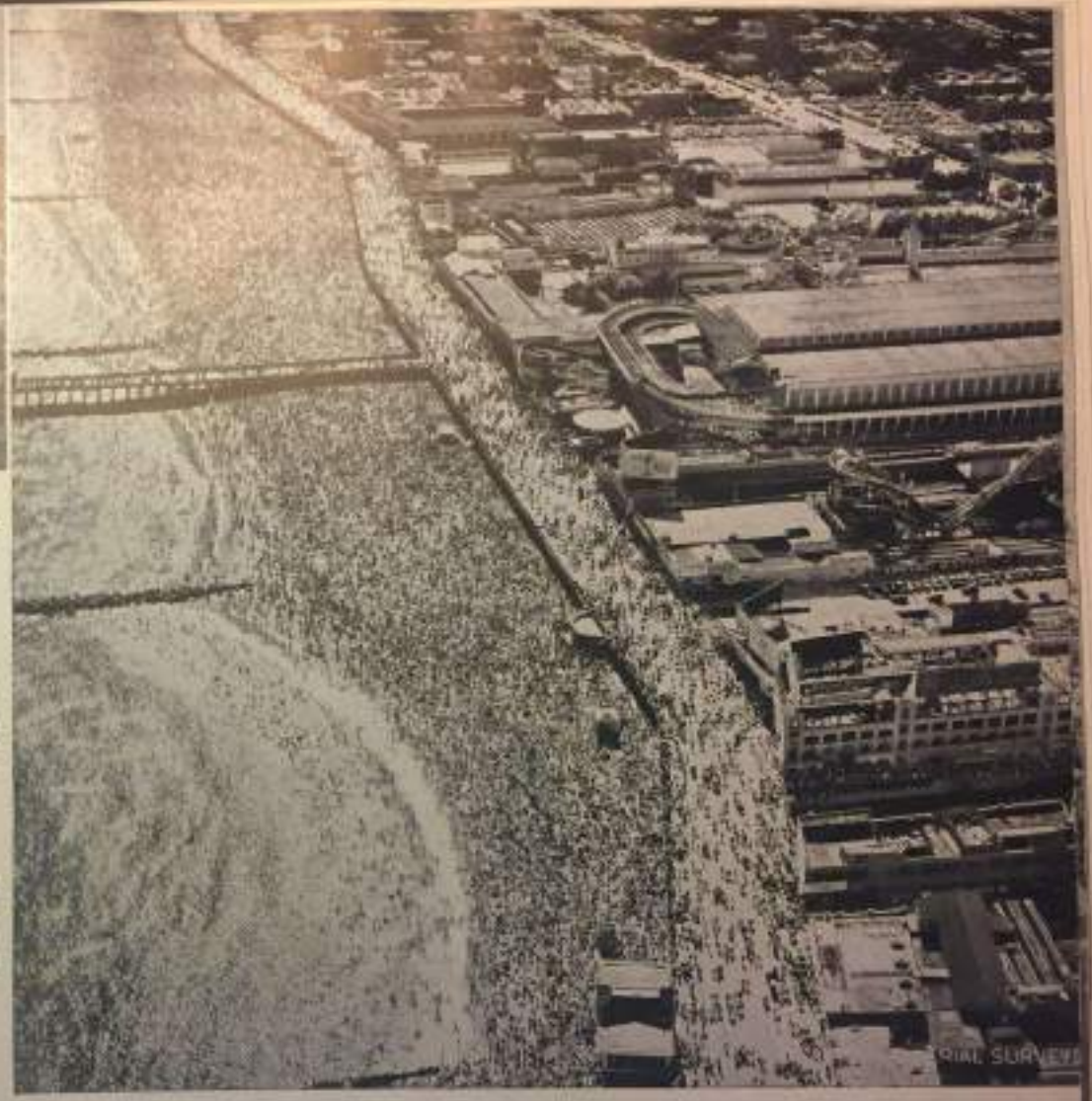
Location and Transportation Problems — Sites isolated from the city because of inadequate transportation or the complete absence of transportation are frequently those which have best preserved their natural attributes. The transportation problem can easily be solved, however, by means of parkways, thereby providing a direct link with the city, even if the location of the recreation center is relatively distant.

The recreation grounds should be screened by a green belt and sufficiently removed from such highways to eliminate dust and noise. The main highways should neither traverse nor border recreation centers, as they did in the case of most resorts of the old

[3] In the acquisition of land for this purpose, Berlin and Amsterdam present interesting examples. In Berlin, for instance, profiting by the situation created in Germany immediately after the first World War, the city purchased at a low price from the biggest landowners vast areas of land forming a great belt. The planners of the city of Amsterdam set a good example when they developed, in recent years, the Amsterdam Bosch, a modernly conceived recreation center covering 2,150 acres of land. The U.S.S.R. has also made many efforts along this line. "Parks of Culture" have appeared in all big cities and in many towns.



IN THE BAY-A AREA SHORELAND 82 PERCENT WAS HAD PRIVATE COTTAGE RESORT DEVELOPMENT IN THE LAST 25 YEARS. HOW MUCH WILL BE LEFT 5 YEARS FROM NOW?



Sea bathing became the fashion less than a hundred years ago. Since then, occupation of the shorelands by commercialized developments has steadily increased. As a result, natural sites of great beauty have been destroyed. This commercialization and destruction continue today. The graph to the left gives an idea of its tempo. In 1929 the United States Department of Agriculture reported that only 1 per cent of the entire coastline of the country was open to the public. What private initiative makes of these recreation areas is illustrated by the two views of Coney Island, a typical example among many in every country. In each case, natural elements like trees have been eliminated. Very often the entire beach is covered by wooden structures, so that the number of "concessionaires" may reach a maximum. The problems involved in the movement of huge multitudes, their hygienic and recreational requirements, have as a rule been overlooked.

type, but should be removed from them, access from the highway being accomplished by means of short approaches leading to parking grounds near the centers. Large spaces should also be provided for the terminals of bus lines, trains, or other means of transportation, always necessary for mass movements of people.

TIDAL MOVEMENTS OF POPULATIONS

With increased transportation facilities, the mobility of populations has acquired a freedom hitherto unknown. In contrast, in cities of past epochs it was an exceptional man who did not live and die within sight of the ramparts of his town.

Vacations with pay today encourage great numbers of people to leave their cities during the summer months and enable them to transform the rhythm of their lives. This exodus, however, like that of the week-end, lacks organization: people should be given every opportunity to go to seaside, forest, or mountain — to find escape from the city — during their vacation days.

Countryside and beach should be planned to receive great masses of city-dwellers. Sea and lake cruises should be within the reach of all. With travel available to the masses and outdoor recreational facilities planned on a vast scale, a tremendous field of activity, profitable to nation as well as region, will increasingly flourish in all countries.

What has been done in this direction? The development of national and state parks in certain countries should be noted as a beginning. Though most countries have ignored the possibilities of large-scale activity on this plane, in the United States national parks have already taken an important place in the recreational life of the country.[3] Large expanses of scenic landscape have here been preserved in their primeval condition and put under national or state supervision. Millions of people can now enjoy these privileged natural acres, become acquainted with vast virgin regions of their country, and return to their cities with new reserves of energy for the daily struggle awaiting them.

[3] Some central and northern European countries and the U.S.S.R. have also developed national parks.

"More and more Americans are learning to live outdoors. In 1936 one out of every five enjoyed camping, fishing, hunting, and picnicking in our national forests. . . ." [4]

"The public flocks to its own domains. . . . About 15,000,000 travelers each year visit [the national and state parks]. . . ." [5]

Must city-planning reach out as far as this? Yes, because the cities of today are elements of a national network of regions. *The vast movements of populations and of goods have extended the radius of planning to regional and national scales.*

THE VACATION EXODUS: A NEW PROBLEM IN CITIES

If vacation recreation centers, whether national parks or others, are related to cities through their regional plan, the exodus occurring during the vacation season defines itself as a city problem. These movements of masses of the populace are something new in city life, and consequently have been unforeseen and unplanned-for. Today they constitute a universal problem which requires special study.

Newspaper headlines repeatedly suggest the seriousness of this exodus:

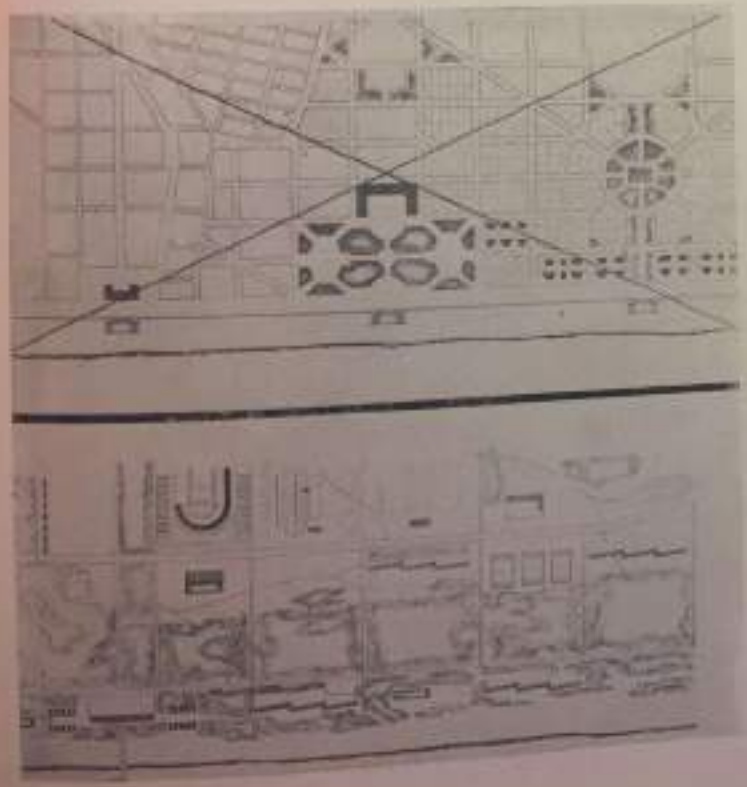
"*Vacations end.* . . . In the month of August (1938) anyone walking in the streets of Paris had the impression of being *all alone in the large city.* . . . On the 5th, 6th and 7th of August vacation departures reached their maximum. Stations were crowded to their walls with people hurrying to bake themselves on sunny beaches.

"The return trips were made from the 20th to the 22nd and from the 27th to the 31st; *in eight days,* 3,435 trains, including 617 extra sections, have brought *1,509,150 travelers back to Paris!*

"And now if you see an incredulous smile on the face of those to whom you say you did not leave Paris, don't be astonished." [6]

[4] *Stories of American Industry* (Washington: United States Department of Commerce, 1937), p. 83.
[5] *Life*, August 5, 1940, p. 60.
[6] *L'Intransigeant* (Paris), September 21, 1938.

A NEW FORMULA FOR SEASIDE RECREATION. In sharp contrast with the examples on the preceding page, *Jones Beach* (New York) reveals the possibilities of good planning. During the hot season as many as 29,000,000 people visit Jones Beach, a vast pool of humanity. For these people fresh air is the main thing; games, swimming, and refreshments are only incidentals. Even with these large crowds *Jones Beach functions*, from its facilities of access and egress (its parkway system and vast parking grounds) to the diversions themselves. Here are game areas, swimming pools, dressing cabins, a board walk, and open-air terraces for the enjoyment of refreshments. →



This graph (designed by the Spanish group of the C.I.A.M.) shows two different principles applied to recreation centers. The one above is based on the type of development prevailing in the French Côte d'Azur. The entire area is divided into lots. The highway borders the beach; beside it, the "promenade"; on the opposite side, hotels, cafés, and villas. When big crowds come to use these beaches, they find them already crowded by those privileged ones who can afford to live on the spot. The lower plan shows a layout on land that has not been divided, where trees and park areas have been preserved for the use of the many. ←

But there is also a reversal of this tidal movement of populations, for vacationers come to visit big cities. This was the experience of New York in the Labor Day week-end of 1940:

"Following a holiday week-end that saw more than 2,500,000 out-of-town visitors pour into New York, a mass migration of almost unprecedented magnitude took place last night, when hordes of travelers started for their homes just at the time when almost as many New Yorkers headed back home from the shore or the country."[1]

Unexpected? Surprising? Naturally. But, given the mobility of our cities and of populations today in general, the most unexpected things may happen — unexpected, that is, by those who consider city planning and human impulses as things apart.

The emergency of 1941–1942 has brought thousands of workers to American cities to carry out the defense program.[2] Had planners studied the possibility of these unforeseen shifts of population, many difficulties could have been avoided.

Cities must be prepared for increasing mass migrations. The mobility of population masses and its causes ought therefore to be thoroughly studied and future trends foreseen. Modern planners would fail in their tasks if they did not include these tidal movements of populations in the data determining their working programs.

SUMMARY

Statement of the Recreation Problem

(1) Recreation is one of the primary needs of man. The masses seek places where they may enjoy their leisure hours to the best advantage, even though they must travel great distances to find favorable play spots.

(2) The recent reductions in hours of labor would permit most people to enjoy outdoor recreation if the city possessed the necessary facilities, if housing plans included recreation units, and if for these purposes the advances of modern technics were properly utilized.

(3) The lack of open space in the central districts of cities and the arbitrary and excessive division of the land surface into lots, together with high land values, are the chief obstacles to the provision of adequate facilities for sports activities and other forms of recreation.

(4) The destruction of natural elements in the suburbs and environs of cities, as well as along highways and railroads, on land exploited without restraint by private interests, increasingly impedes the establishment of large recreation centers near urban zones.

(5) In some countries recreation centers have been created, especially during the last ten years, but such achievements are too often partial and insufficient solutions of the problem, and are not handled with a view toward solving the problem in its whole scope or within the framework of a regional plan.

Immediate Recreation Requirements within the City

(1) All plans for new housing projects should incorporate the necessary facilities for recreation.

(2) All new housing legislation should make provision for the necessary community services, among which should be the devotion of a certain area of land to recreation. Present laws should be revised to fulfill these requirements.

(3) Whenever an open space exists within the city, in a district that lacks sufficient playground space, the municipality should acquire it as an extension of existing playground facilities, thereby benefiting the health of the inhabitants of the district.

(4) In densely populated districts, all land cleared of slum dwellings should be devoted to recreation.

(5) The progressive establishment of recreational facilities should be made in accordance with a regional plan, which might be fulfilled step by step.

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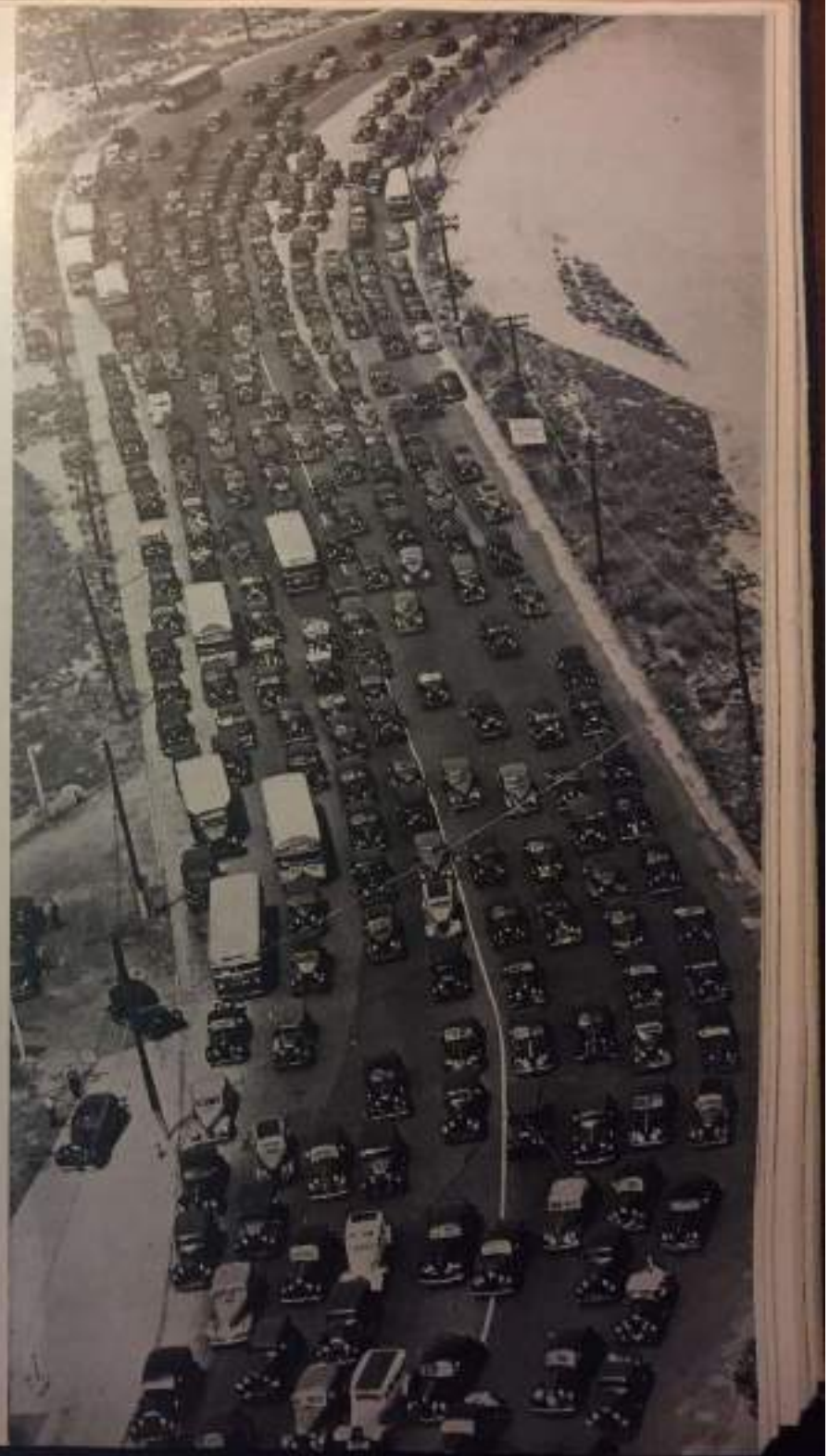
[1] *New York Times*, September 3, 1940.

[2] See *Hearings before the Select Committee Investigating National Defense Migration*, House of Representatives, pt. 17, Washington Hearings, July 18-19-21, 1941.

THE WEEK-END EXODUS. On Saturdays stations are mobbed by thousands. The magnitude of the week-end exodus from cities requires that new outlets be planned and that those now overcrowded be organized. This is a view of Waterloo Station in London on a Saturday.

Nine lanes of outgoing traffic during the Fourth of July week-end on Cross Bay Boulevard, Long Island. (Notice the few incoming cars forced off the concrete onto the shoulder.)

The week-end exodus has contributed toward making a new generation that will demand that air, space, and green areas be incorporated into every neighborhood for daily use.



The Week-End Recreation Problem Requires:

(1) New legislation to encourage the establishment of "recreation centers," simplifying the acquisition of those lands outside the municipal limits which are necessary for the expansion of the city's recreation program. The large recreation centers established on these lands should be considered necessary for the public health, and should be dependent upon the state or on the group of municipalities directly or indirectly affected. The power of eminent domain should be made available so as to facilitate the assembling of this land.

(2) The coördination of the work of various state and municipal officials and that of transportation companies. Such a coördinated group would work toward the improvement of transportation facilities between the city and the recreation centers.

(3) The conservation, by legislation, of the sites most favorable for the intended purpose. If they are distant from large cities and if their natural conditions are exceptional, such sites should be preserved for the establishment of national parks and vacation resorts.

(4) The prohibition of all private speculation in zones selected for recreation purposes, as well as all changes in the direction of roads, felling of trees, or other action which might detract from the natural beauty of the place.*

Obstacles to the Establishment of Recreation Centers

(1) Lack of open spaces of natural beauty, especially near the city.

(2) Real estate speculation, causing a rise in suburban land values and thereby impeding any development of this nature.

(3) Misunderstanding of the problem and its importance by the responsible authorities, especially municipal officials.

(4) Lack of coöperation between the different municipalities affected by the formation of these centers outside their municipal zones. A lack of coöperation also between regional planning departments and city, county, and state departments on the layout of the required road and park system; a similar absence of coöperation between these governmental agencies and the transportation companies relative to the planning of transportation lines.

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* These recreation centers outside the city could also be planned to serve as refugee camps in case of war dangers requiring the evacuation of cities.

PART SEVEN — WORK

"... The town is in most cases the background of industry, and is to a large extent moulded by the particular nature of its contact with industry, past and present." — *Planning* (London), June 14, 1938

WORK–PLACES IN CITIES

It is the hope of finding a job that usually brings people to large cities. There they seek a more lucrative livelihood that will permit them to improve their standards of living. For, while the city offers many opportunities for success, those of the village and farm are comparatively limited and less spectacular. Work in itself, to most people, therefore justifies the existence of the city.

Our own time has seen the commercial development of cities reach limits that never before had been conceived. Our cities have become, above all, *factories* and *centers of trade*. Nearly all of them have been constructed on this basis, factories, office buildings, and shops springing up endlessly throughout the urban area, no matter where or how.

Like so many catalyzing agents, factories and office buildings have attracted to their vicinity the other elements which compose our cities. The confusion caused by the absence of planning in the location of these places of work is transmitted to residential districts, to the street system, to the city in general, all of which is contaminated by the effects of the mushroom-like appearance of factories and other places of work.

Men and women come from everywhere to work in these places, irrespective of the conditions they encounter in them. And because the journeys connecting their homes with their places of work are often long and complicated, they are forced to add the fatigue of commuting to that of a day in the factory, shop, or office.

No one has yet been able to estimate the loss of energy entailed by this maldistribution of work-places in cities; but the disorganization is apparent everywhere. To see it, you have only to walk about in different parts of any large city when places of work are closing. Watch the crowds leaving office buildings, or large department stores, or factories. Observe the exhaustion in their faces, their impatience at delays, their nervous movements. Descend into a subway entrance during the rush hours and repeat the observation. Or stop at a street corner and watch the succession of traffic tie-ups. Or in a railroad station, observe the milling hordes of people and the queues filing past ticket windows.

This human beehive which a great industrial or commercial city forms admittedly produces a tremendous quantity of materials, since all its endeavors seem strained toward an ever-greater volume of production. But what, in the meanwhile, happens to its human elements? While the urban structure is groaning throughout all its parts, like some vast and ponderous machine, what is happening to man? What of the physical and moral forces which the modern city sacrifices?

PLACES OF WORK ARE BADLY DISTRIBUTED

At the beginning of the nineteenth century it was not foreseen how profoundly cities would be changed by the growth of industry. Most economists of a hundred years ago saw in the anarchical development of their cities only the palpable proof of increasing prosperity. They entirely ignored the grave problems which this chaotic and unbridled industrial expansion was soon to bring them. The rapid increase in population and in number of industries was registered in every city with unbounded joy and pride, as being an incontestable source of good fortune to their inhabitants. The numerous smoking chimneys outlined against the horizon obscured the towers of cathedrals and became the symbols of a new faith — they typified the wealth of the town.

For these new factories which sprang up everywhere the owners naturally sought the most advantageous and economical sites, without regard for the consequences of their selection. Little did it concern them if the erection of their buildings meant the defiling of places of scenic beauty, the destruction of trees, the contamination of streams, the creation of refuse heaps.[1] For the sacred principle

[1] "The factory usually claimed the best sites: mainly, in the cotton industry, the chemical industries, and the iron industries, the sites near the waterfront . . ." (Lewis Mumford, *The Culture of Cities*, New York: Harcourt, Brace, 1938, p. 161).

IN THE HUMAN BEEHIVES which are formed by great industrial and commercial centers, all endeavors are strained toward an ever-greater volume of production. How much of this colossal effort benefits man? How many are the physical and moral forces which the chaos of modern cities sacrifices!

of free competition permitted anything, without regard for the future of cities and that of the people who would inhabit them.

As a result of this absence of control, we find that:

- *"Places of work (industrial, business, governmental) are not situated in the city structure according to their functions."*

Town-Planning Chart

This is only natural if the conditions determining the selection of these sites are taken into consideration. These conditions vary considerably.

If the causes which determine the selection of a particular location for an industry be analyzed, it will often be found that this choice was made by chance or determined by conditions which had no bearing upon the industry itself. The founders of many industries have not foreseen their later development.

Factors Influencing Site Selection — In general, the principal conditions which have determined the selection of industrial sites have been the following:

1. Availability of raw materials
2. Suitable labor
3. Transportation facilities
4. Accessibility of markets
5. Financial resources

The relative importance of each of these factors has varied substantially during the last few decades. This is especially true in the case of transportation. The use of electricity, a source of power economically transmitted and easily transformed, has lessened the importance of proximity to other sources of power. The accessibility of large markets has by contrast become more important.

Raw Materials — The relation of industries to raw materials varies greatly with different types of industry. Certain raw materials are used after slight processing, their sources being determined by natural factors. On the other hand, some products must undergo extensive processing; these find their sources of production in the factory, upon which they depend.

Raw materials must sometimes be imported. In this case, the site of the industry will be greatly affected by geographical conditions, or by the location of the port from which shipment of the material is made, as well as by the transportation facilities linking this port with the factory.

Suitable Labor — This is probably the most complex of all the factors determining the location of industry.

Without doubt, the possibility of procuring in a given locality the required type of labor has often encouraged an industry to establish itself there. The availability of cheap labor is a further reason for the selection of certain sites.

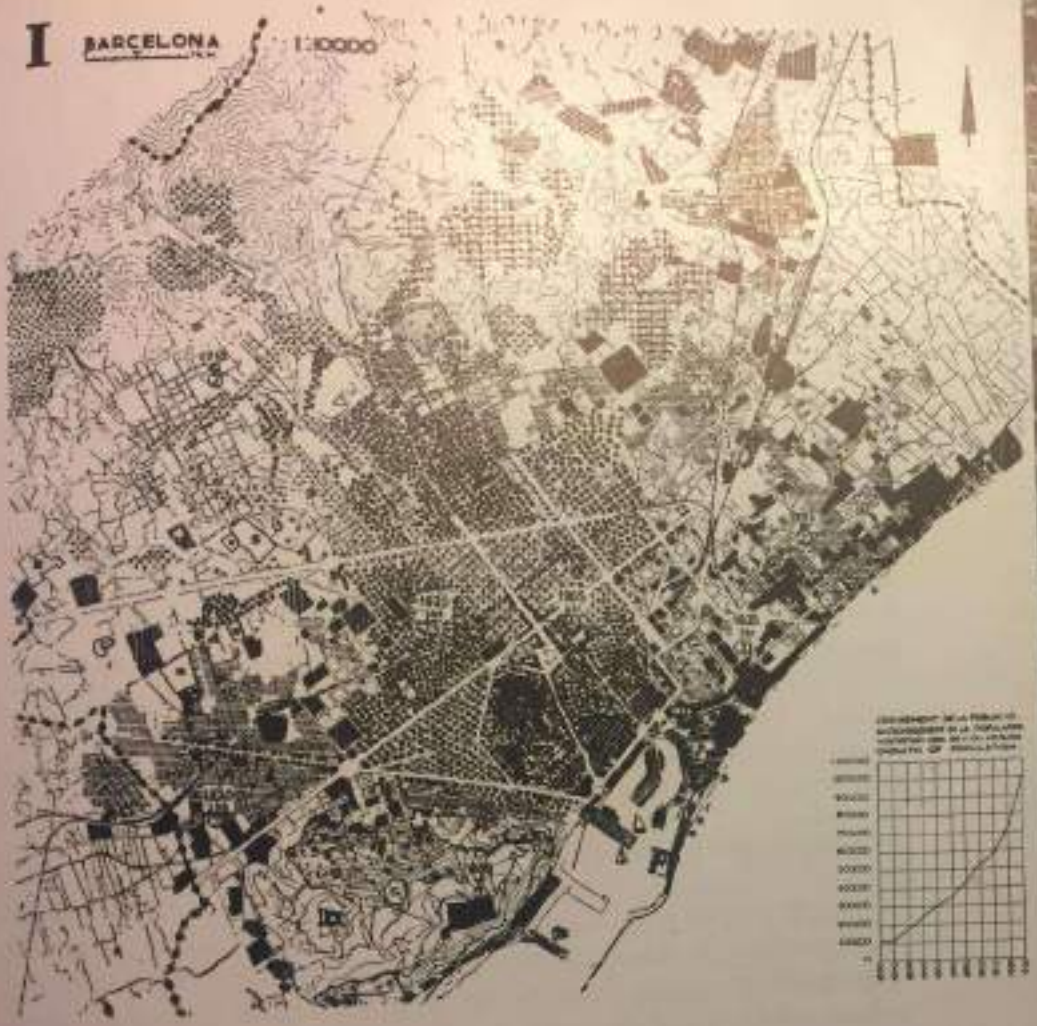
The constantly increasing mechanization of industry has minimized the need for skilled labor everywhere. Whereas certain manufacturing operations of, let us say, fifty years ago required the labor of skilled craftsmen, the same work can today be accomplished by machines. This trend toward the mechanization of industry and its consequent elimination of man-power have constantly accelerated during recent decades.

Many of the new machines require a considerable amount of skill. This does not mean, however, that the machine's operator must have a profound knowledge of the materials used or of the manufacturing operation itself.

The mobility of labor having been increasingly augmented in recent times, especially through the widespread use of the automobile, it may generally be said that the influence of labor upon the establishment of industrial sites is not what it was in the past.

Climatic conditions are no longer the determining factors that they were some years ago, for today artificial climates can be produced anywhere. The air conditioning of factories, for example, has encouraged certain industries to move to the southern part of the United States, where labor is cheaper and taxes lower.

Sometimes attempts have been made to tie labor to a certain locality where industry is already enrooted. A clear example of this is the case of Detroit, where the workers, during a long period of years, were encouraged to purchase their own dwellings. The "own-



Though the old fortified belt of the city of Barcelona was demolished around the 1850's, an industrial belt (black areas on map) encircles that city today. This results in traffic congestion, smoke in residential areas, lack of recreation space. (See key to symbols on page 7.) But industry has not only formed suburban belts; it has penetrated into the very heart of every big city, where in many cases there are certain other elements that cannot be changed. This view of Paris (right) shows the disorder near one of the most attractive sections of the city.

your-own-home" propaganda had, in a sense, an important social-economic aspect. The worker who bought a home — that is, who assumed long-term contractual obligations — lost his mobility and became land-tied.[2]

Transportation Facilities — Communication and transportation facilities also exert a decisive influence upon site selection.[3] The tremendous development of these factors today encourages industrial decentralization. Modern highway construction and cross-country trucking services have freed many industries from dependence upon railways.

Accessibility of Markets — The accessibility of markets has naturally always played a major part among the many factors determining the site of any industry. But its decisiveness has increased during the last few decades, owing to the economic and technical changes which have taken place in modern industry. (See p. 111, on London.)

Other Factors — Another basic factor is that of *tax rates*, which vary from city to city. Attracted by lower taxes, especially in recent years, many industries have moved to new localities. There has also been a tendency to move to sites just outside the limits of cities in order to escape their taxes.

Industry is also frequently attracted to particular sites because of the low prices of the land.

The cost of gas and electricity, especially the latter, is likewise important in the selection of industrial sites.

These factors, which have in some way determined the selection of industrial sites, have only rarely been considered from the standpoint of their relation to the locality or the region as a whole; in this sense, the private interests concerned have usually ignored the interests of the many.[4]

Under free competition, which operated without regard for what was to happen in the following decades, factories rose everywhere, and the owners of neighboring buildings had no choice but to move out if the newcomers were not to their liking or embarrassed their business. It is this policy of laissez-faire that has resulted in the complete absence of industrial zoning today.

Location of Business Centers — In the case of business or administrative districts, the evolutionary process has been similar and its consequences approximately the same.

Business districts have grown spontaneously out of the old urban centers, near harbors or central railroad terminals. Here transportation facilities have had a predominant influence upon the selection of sites; the accessibility of markets has been another decisive factor. At length lack of space and the absence of planning have given rise to new problems, whose solution is sought in the skyscraper. But the new office buildings rob each other of light, just as the industries which they represent compete with one another for sites and markets.

Administrative Centers — Districts devoted to government departments (national, state, or municipal) are generally characterized by the same disorder and absence of planning. Whether the city be Paris, London, or any large metropolitan center in the United States, similar conditions prevail. In many cases, antiquated public buildings, outgrown by the departments they house, are inadequate for the space needs of modern times. Often government offices are scattered for decades throughout neighboring "temporary" buildings, usually privately owned, while plans for new buildings await the day of their execution. When this finally does take place, it usually occurs in a piecemeal fashion, without

[2] From an observation made in the report on Detroit, sent to the C.I.A.M. by the American group in 1933.

[3] The strategic location of industries working for national defense decidedly should be influenced by the air-raid menace. In spite of this, industries working on defense programs have frequently spread haphazardly. Recently built aviation plants on the west coast of the United States, it has lately been decided, are to be moved to new locations inland that offer greater protection against enemy bombardments.

[4] "Location of industry is a means, not an end, and the subject can hardly be examined without first considering for what purposes industry adopts present locations, and for what, if any, purposes its locations can or should be modified. At present the location of British industry is decided according to individual business men's forecasts of future probability. . . ." (*Planning*, London, December 1, 1936, p. 3; issued by Political and Economic Planning.)

any correlation of the various buildings or any general plan for the whole district. (As an exception, the general layout of Washington, D. C., presented in this respect a happy combination of foresight and good planning.)

Summary — This unrestricted dispersion of factories and other places of work throughout the city has intensified disorder and affected the very development of the whole urban structure. In ideal circumstances, factories and their odor-smoke-noise nuisances would be confined to areas definitely established as industrial districts — as determined by *regional planning*. Instead, factories today pollute the air and disturb the quiet of many sections of the city. Furthermore, while the confinement of factories to industrial areas would drastically shorten trucking distances, the dispersion of industry throughout the city has turned its thoroughfares into freight yards and freight lines, retarding the flow of traffic and heightening the general confusion.

URBAN CHAOS FORCES INDUSTRIES TO LEAVE THE CITY

- *"Owing to high land values, increasing taxation, traffic congestion, and to the rapid and uncontrolled expansion of the city, industry is often forced to move away, bringing about a decentralization which is facilitated by modern technics."* *Town-Planning Chart*

Concentration of Industry — We have just indicated some of the factors which have stimulated the establishment of industries in cities, bringing to them great concentrations of factories of all kinds, scattered without any plan over an extensive area. One of these factors, notable in the case of London, is that of the accessibility of markets.

"It is common knowledge that the settling of new industries in the London area is one result of fundamental economic changes which have taken place since the war of 1914–1918. The demand from abroad for the products of Great Britain which used to be directed to the basic heavy industries has declined, while new demands, mainly for home consumption and directed largely to the products of light industries, have arisen. *It is not so necessary for light industries to be near the source of their raw materials or, since the coming of electricity, to settle near the coal fields.* To the extent that the market for retail consumption becomes a principal factor in the location of industry, London presents considerable advantages; for London itself *offers a market of eight to ten million consumers, or almost a quarter of the total in Great Britain. It is the center of the road and railway systems of the country; it is the greatest port in the world;* it stands closely opposite the continent of Europe; and it has a large and varied supply of labor. All these factors must tempt industry to settle within its borders, and represent a complex of economic influences hard to unravel." [5]

Industrial Areas — As a result of this industrial concentration in certain urban centers, these cities have developed with extraordinary rapidity, extending their sphere of influence over vast regions which have come to be known as industrial areas.[6]

Among these industrial areas are some which have far surpassed all predictions. This is especially true of the United States, because of the swift tempo and the unprecedented scale of its industrial growth.

Some American cities — as, for example, Detroit — are exclusively products of this growth. The "industrial area" of this city, as defined by the Bureau of the Census, comprises two counties in the state of Michigan (Wayne and Oakland).

The Detroit area manufactures a tremendous variety of goods, and is a production center of automobiles, adding machines, stoves, refrigerators, overalls, drugs and chemicals, electric irons, vacuum cleaners, cigars, oil burners, machinery of all kinds, engines, paints and varnishes, wire goods, brass, copper and other nonferrous products, airplanes, tires and rubber goods, soda ash, leather belting, plating, and other products.

Detroit's automobile plants are scattered all over the region. Four out of five of the annual production of four million cars in the

[5] From a report made by the C.I.A.M. group in England.

[6] As "industrial area," as established for the United States Census of Manufactures, is an area having as its nucleus an important manufacturing city and comprising the county in which the city is located, together with any adjoining counties in which there is a great development of manufacturing industry.

United States are manufactured within an area comprising Detroit and a seventy-five-mile radius around the city.[7]

Another industrial area of recent formation and on a similar scale is that of Los Angeles, whose economic background is suggested in the following statement:

"The economic well-being of Los Angeles County[8] rests upon:

A local market for four million people.
A billion-dollar manufacturing industry.
A billion-dollar harbor commerce.
A 300-million-dollar agricultural income.
A 300-million-dollar oil and petroleum refining industry.
A 200-million-dollar motion picture production.
Second largest metropolitan building industry in the United States.
Abundant cheap water power and natural gas.

"Manufacturing industry in Los Angeles County, in 1937, it is estimated, employed 140,000 people at wages and salaries upwards of 200 million dollars. This was entirely outside the production of motion pictures, which itself represented an outlay of wages, salaries, materials and supplies, etc., of more than 200 million dollars and engaged 30,000 persons." [9]

These industrial zones confine men, factories, and products within areas which are relatively limited and usually poorly distributed with respect to the rest of the country. In the United States, for example:

"Two thirds of the factory jobs are in an area only five per cent of the nation's total." [10]

Gradually, as these great industrial zones were formed, the cities which were supported by them and which in turn stimulated their development expanded without control and without planning, like the factories upon which their prosperity depended. This growth, like any other, has had its limits, its saturation point.

[7] From the report of the American group of the C.I.A.M., 1933.
[8] Ranking fifth largest in value of manufactured goods in the United States.
[9] *Dynamic Los Angeles County* (Los Angeles Chamber of Commerce, 1938). See also George W. Robbins and L. Deming Tilton, *Los Angeles* (Los Angeles, 1941), pp. 61, 75.
[10] Ralph L. Woods, *American Robots* (New York, 1939), p. 24.

The internal causes which produced this saturation point, or extreme degree of concentration, are known. With it there came confusion and disorder throughout the whole city structure. A frenzied real estate speculation created exaggerated land prices; taxes on land and buildings likewise increased. At the same time, traffic having swollen in volume, congestion aggravated the parking problem and that of transportation in general. This condition became most acute toward the central parts of cities, where, once the period of prosperity had passed, the situation grew untenable.

At length the factories established within the city found themselves confronted with insurmountable difficulties. Their expansion, which meant the acquisition of high-priced land, was rendered practically impossible. Taxation increased considerably, while transportation costs likewise mounted. And the competition of industries located outside the city, where land for expansion was plentiful, taxes lower, and the roads good, could no longer be withstood.

What has occurred as a consequence of this state of affairs might easily have been predicted: *industries are abandoning the congested sections of cities, seeking more favorable sites elsewhere.*

In the case of London, it was found [11] that this movement of decentralization reached such proportions that *the migration of population and industry to what was once the surrounding country was fast enough to form a town of 50,000 every four months.* Two hundred forty-three out of 627 factories in the northwest sector of London moved out from the central area during the last decade.

In the case of New York, the same tendency has existed for some time; it may be followed through frequent reports in the daily press, of which the following is a typical example:

"Many firms . . . are establishing new plants outside New York City to avoid high taxes, increased wage scales and traffic congestion. . . . A factory location agent said he had already located four new firms outside the city limits and estimated that 10,000 jobs and an annual $15,000,000 pay-roll had gone with them." [12]

[11] From a report by the C.I.A.M. group of England, 1937.
[12] *PM* (New York), September 6, 1940.

INDUSTRIAL AREAS. Clusters of factories cover enormous surfaces of land, entire regions. Motorized transportation has stimulated this development. American examples of these regions are the most striking, both because of the tempo at which these industrial areas have developed and because of their size. The vast *industrial area of Detroit* covers two counties. It has its nucleus in the city of that name, which is a typical product of industrial growth.

The schematic map shown below (designed by the Rapid Transit Commission of Detroit) shows the location of industries along the main lines of communication.

This map (above) designed by the American group of the C.I.A.M. (of which we reproduce only one section) shows part of this vast industrial area. As in nearly every city of its type, in Detroit industries are scattered all around the central districts, forming a belt which was once in the suburban area but has become part of the city proper. This extraordinary metropolis is the largest purely industrial center in the United States. It has automobile plants scattered without any plan over a vast region, and it has grown so haphazardly that its residential sections are all mixed up.

This vast decentralizing movement of industry is taking place in all cities which have gone beyond a certain degree of concentration. Generally speaking, its causes are the same everywhere. It originates in the intensification of urban chaos and is accelerated by the mobility born of modern technics, these two influences interacting in a centrifugal movement which had already begun before the coming of the depression in 1929.

For many years the location of industrial plants was governed chiefly by the fixed paths taken by the railroads. The construction of concrete highways, the development of flexible motor-truck hauling, and the growth of cheap electric power have enabled industry to seek economical sites removed from the congestion, high rents, high taxes, and high labor rate of large cities.[13]

Mobility, a New Factor — *The ties which previously held urban populations together in closely packed communities have been dissolved.* This has come about because of the presence of new factors, expressed in the *mobility of power, labor, and goods.*

Mobility of power. Electricity is a mobile power, and as such has more affinity with transportation than other forms of power. Electricity alone among the resources of energy can be used to change the present regional economic balance of a country through the widespread availability of cheap power for industrial purposes. *Mobile power is an instrument of planning,* waiting to be used effectively.

Mobility of labor. The motorization of transportation has increased the mobility of labor. "The American laborer is almost nomadic in the sense that he must follow the job wherever it leads him. The average stay for the laborer [in one place] is a matter of months." [14]

Mobility of goods. Commercial motor vehicles afford the quickest and most adaptable method of distributing light goods. The bus, the private car, and the electric railway have opened up large tracts of previously inaccessible country.

[13] From the report sent to the Fourth Congress of the C.I.A.M. by its American group.
[14] From a statement by Dr. R. W. Kelso, president of the Citizens' Housing and Planning Council of Detroit (Michigan Society of Architects, *Weekly Bulletin*, July 10, 1939, p. 6).

It is electric power and motorized transportation which, among other factors, have hastened the decentralizing movement of cities. These forces open new horizons on the future, whose boundless possibilities contain the eradication of evils created in previous periods of urban growth.

Unplanned Decentralization a Danger — During the last few years, however, a certain fallacious theory has gained credence among many people. It consists in the belief that all the evils of our cities are derived from the excessive concentration that has taken place. According to the partisans of this theory, the health of cities would be restored simply through complete decentralization. A beautifully romantic "back to nature" idea! But have those who believe this asked themselves what would be the consequences of *decentralization without control or planning?* Are they not aware that the present predicament of our cities was produced by concentration occurring under the same circumstances — that is, without direction or planning? They may object by saying that the two movements, concentration and decentralization, are entirely opposed. Granted — but the consequences may be just as catastrophic in the decentralization which they recommend, since planning is absent here, too.

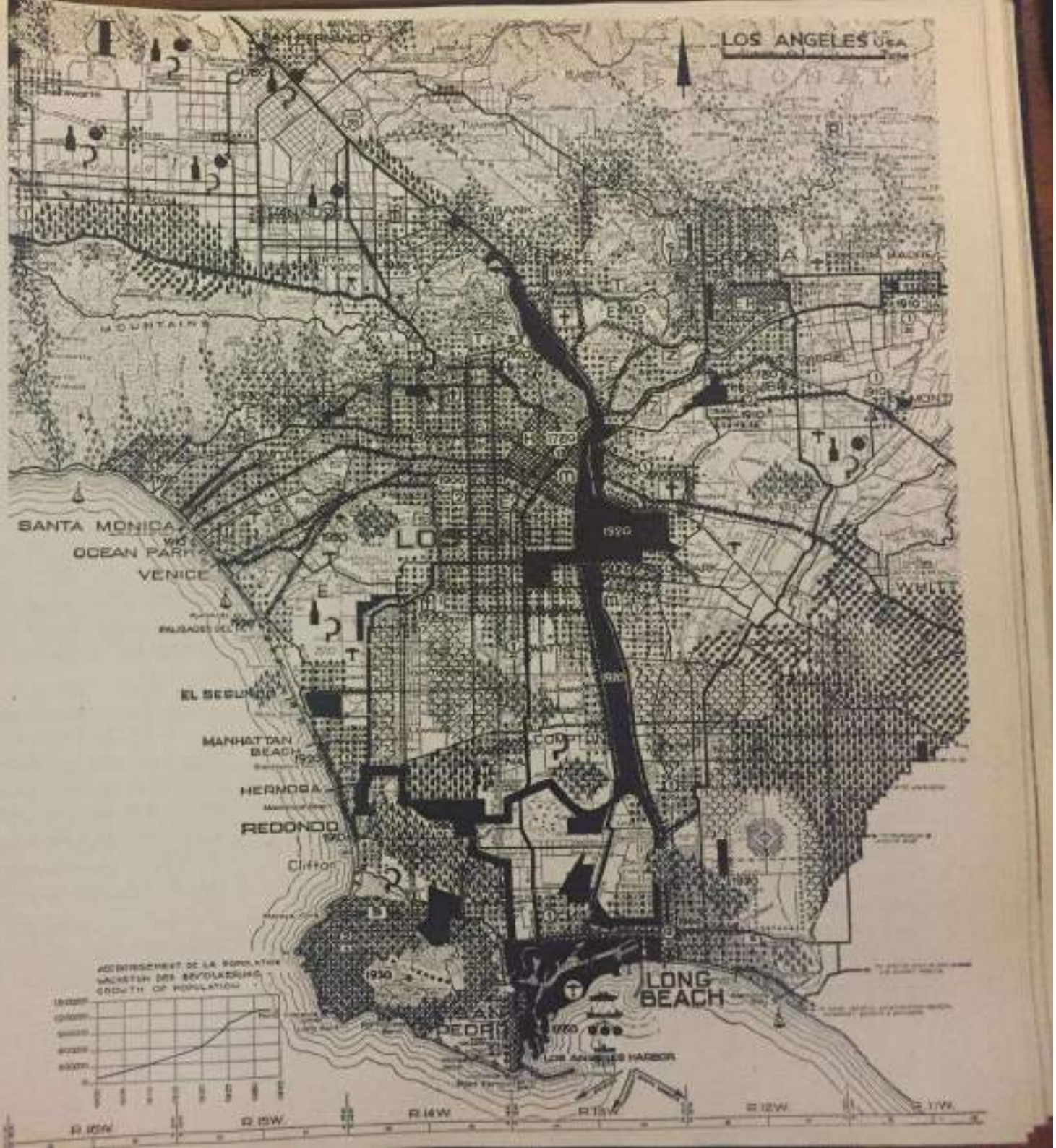
To see to what decentralization can ultimately bring cities, we have only to consider the "ghost towns" which resulted from mass evacuations due to the depression:

"Here and there, from Maine to Rhode Island, rose the spectre of ghost towns — idle factories, poor tenements and unemployment. Worried manufacturers ripped down empty, non-productive factories and sold the machinery for junk to avoid taxes." [15]

Such spectacles, like those of the Pennsylvania steel towns, which also turned into decaying carcasses during the years of the depression, ought to make us reflect upon the fate of large cities should they some day become the victims of a complete and unplanned decentralization.

[15] *New York Times*, November 26, 1939.

The spectacular growth of Los Angeles from a quiet Mexican town to a huge metropolitan district began about 1876, the time of the coming of the railroad. *Until after the first World War, Los Angeles was an agricultural region*; industries were not very numerous. In the twenties the whole region was rapidly transformed. Its expansion, like that of Detroit, is based on automobile transportation.



This map of Los Angeles was designed by the Western American group of the C.I.A.M. The scale used for the city in this map is the one employed for whole regions in Europe. *The tempo of industrial growth* in Los Angeles has been paralled. Its geographical location has favored its role as a distribution center. *The twenties* saw the rapid development in this region of the *petroleum fields* — major factor in the economic life of Los Angeles — and of the *motion picture industry* which accounts for about 90 per cent of film production. Since the beginning of the Second World War, Los Angeles shows signs of becoming the *center of aircraft production*, as Detroit is that of automobile production.

Rural Factories — It is curious to observe, in connection with this movement toward decentralization, that some believe they have found a solution to the problem of the distribution of industry in the formation of small rural industrial units, where farm work and factory work could both be carried on. Perhaps unconsciously, these people have reverted to an idea entertained by certain sociologists of the nineteenth century. The adoption of such a system as a formula applicable to all types of industries would incur incontestable dangers. These little rural-industrial communities might easily be dominated by a single enterprise, as in the case of "company towns," whose faults are only too well known.

Henry Ford defended this system of industrial dispersion as long ago as the 1920's, when there was still little talk of decentralization.

"In the production system towards which he [Mr. Ford] is working, parts for his cars will be built in thousands of rural communities, situated where there is power. The workers will have two strings to their bow, as Mr. Ford sees it. They will raise agricultural produce and thus be able to feed themselves, and they will bring money into these rural communities by working in the plants. . . ." [16]

This theory, which has gained its adherents, cannot be supported unless one considers in advance what would become of the large cities as a result of a mass exodus of their industries. In any case, it is only through the establishment of a comprehensive general plan that we can learn whether the creation of these small units would be useful to the whole system. It is also only through comprehensive planning of vast economic units that we can learn *what the most efficacious limits of this decentralization would be*, once it is incorporated within this plan.

AIR POLLUTION IN CITIES

The air of large cities has become unfit to breathe. While most city-dwellers are aware of this fact, it is doubtful whether many are informed as to the extent of air pollution and its possible consequences.

[16] *New York Times*, February 5, 1933.

Smoke, whether produced by industries or by domestic heating plants and kitchens, remains the chief cause of air pollution. If increasing electrification has partially corrected this condition in certain cities, the effects are nevertheless still noticeable everywhere.

Factories produce smoke, vapors, gases, dust, and waste products of all kinds. Instead of *planning the distribution of industries*, zoning them according to their nature and *situating them so that the prevailing winds may dissipate their smoke and gases, thereby reducing air pollution in residential districts*, factories are now scattered fortuitously throughout whole regions. The result is a general pollution of the air. No matter what the direction of the wind may be, dwellings, schools, offices, hospitals, parks, and playgrounds are all, in their turn, exposed to the nuisance of air pollution emanating from the factories in their midst.

The air pollution of the larger metropolitan areas has been estimated to be noticeable for distances of at least sixty to seventy miles down wind.

Spread over Cities, Smoke Reduces the Sun's Benefits — The densest smoke is that produced by industries using bituminous coal. Sometimes this smoke attains so great a density in highly industrialized regions that towns situated there disappear as under a cloud during certain hours of the day.

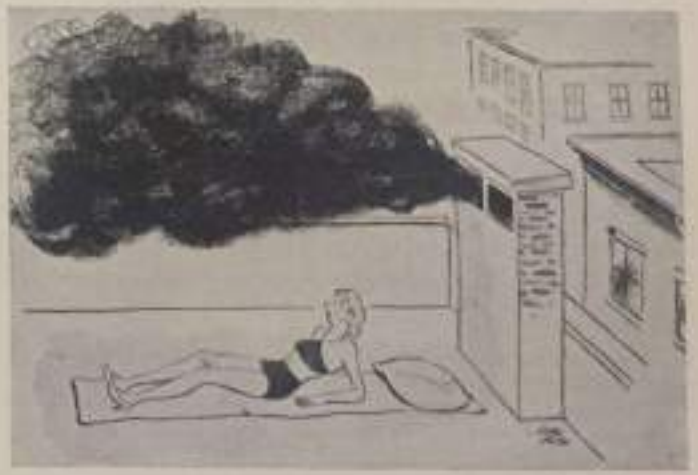
This dense atmosphere forms a barrier between sun and city. Acting like a filter, it prevents the sun's ultraviolet rays,[17] so necessary to the health of human beings, from penetrating to the earth. For these ultraviolet rays are largely absorbed by the dust, the humidity, and the gases with which this layer of vitiated air is filled. The significance of this fact becomes more pertinent if it be considered that factory smoke is produced in its largest quantities during the daytime, precisely during the hours when the city would benefit most by the sun's rays.

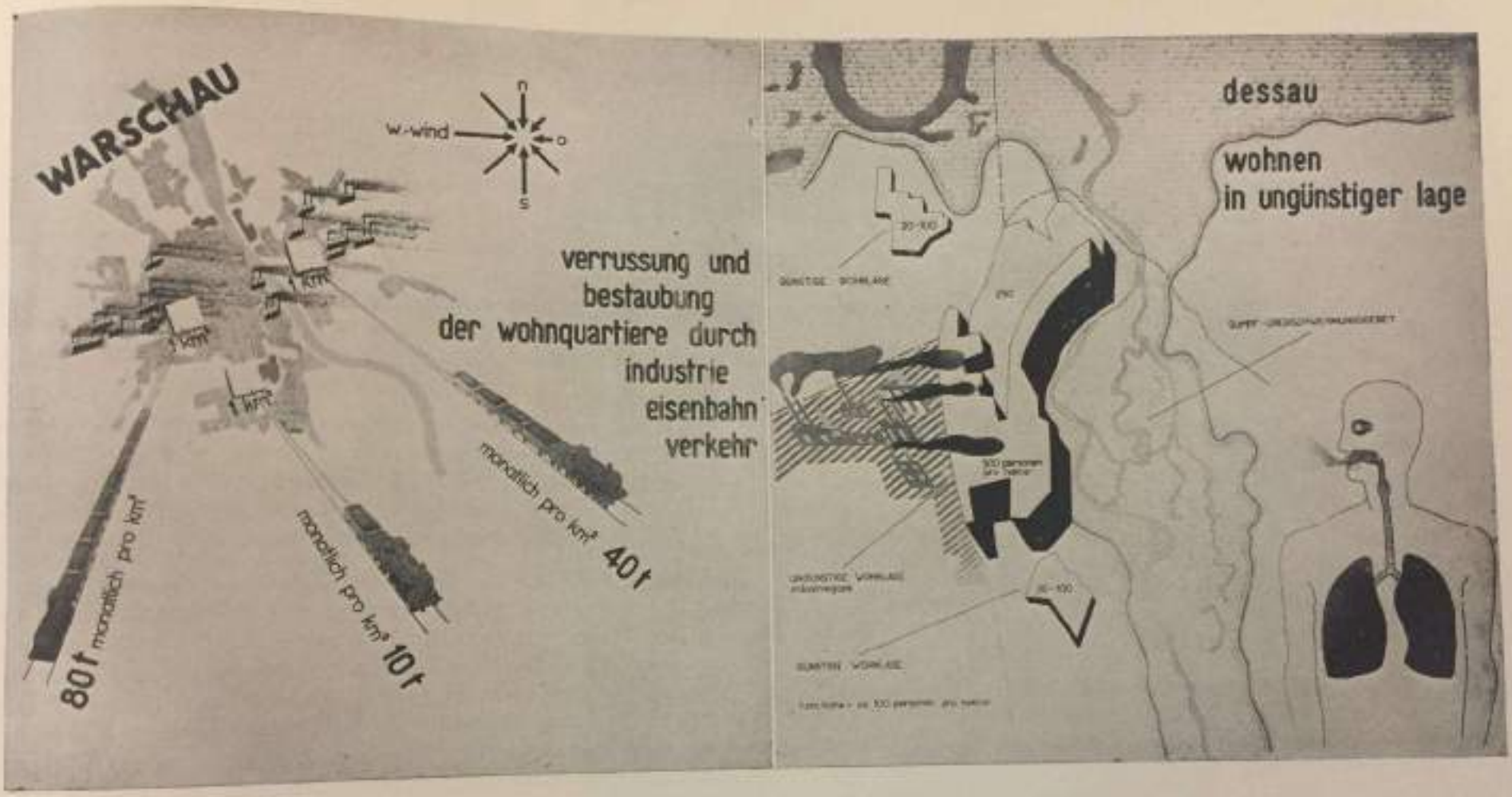
The fact that sunlight is considerably lessened by smoke all over cities and industrial regions is amply confirmed by the official reports of investigations in many localities. In New York City it is

[17] Ultraviolet rays amount to less than 2 per cent of the total solar radiation.

AIR POLLUTION. When industry spreads without plan, the dwellings near it, like these in Birmingham, England (right, above), are exposed to the nuisance of air pollution by smoke. *Soot fall* is measured by tons in many cities. The graph at the left shows the soot fall in New York City. The average monthly soot fall in some parts of Manhattan (see photograph above) exceeds 150 tons per square mile.

A soot bather on a Manhattan roof. . . . →





THE DIRECTION OF THE PREVAILING WINDS has not been taken into consideration when locating factories. As a result, these winds carry smoke and soot to near-by residential, commercial, or business areas. The graph at the left shows the number of tons of soot carried by western winds to different sections of the city of Warsaw. Tonnages are indicated by the number of cars on the trains — ten tons to each car. It will be seen that the greatest soot fall is due to the location of industries on the west side, where the prevailing winds come from. Something similar happens in the city of Dessau, Germany (right). A densely populated residential district (500 inhabitants to the hectare) is located between the low marshland bordering the river and an important industrial area. The prevailing winds carry the smoke from the factories to the dwellings, whose inhabitants suffer in consequence.

exposed for any length of time to air containing four parts of carbon monoxide to 10,000 parts of air.

Tests made from Manhattan skyscrapers reveal that the higher one is above the street the purer the air. Since the worst air is found along the street level, it is obvious that the pollution of the air caused by motorized traffic is not relieved by the present gridiron layout of streets. In New York and other large cities, especially, where endless rows of serried buildings form veritable canyons, these streets either retain the vitiated air or, with certain atmospheric currents, serve as channels for its distribution over great distances.

Here *space* is required again; for, whether the buildings be tall or low, ample spacing would endow them with better circulation of air. The situation would be further improved if the buildings were surrounded by trees, since the leaves of trees act as filters of the air, absorbing dust and organisms from the atmosphere.[21]

The most efficacious remedy for the present pollution of the air would be the immediate adoption of a plan for the zoning of urban functions, restricting industries to appropriate sites.

The extension of electrification would accomplish the rest.

INDUSTRIAL SLUMS

Though cities the world over have for many years been preoccupied with the problems of slum dwellings, too little has been said of those substandard factory buildings, ill-lighted, ill-ventilated, ill-heated — in short, ill-adapted to the health and well-being of the men and women whose daily labors they must house — which may appropriately be called industrial slums.

Great numbers of such factories, constructed in haste, have sprung up out of the disorder of today's cities. As the background of many suburbs and industrial communities, often they lend their drabness to the character of the whole town.

In these buildings, sometimes not without imposing façades, protection against exterior elements, such as heat, cold, humidity, rain, and wind, is frequently inadequate. In some, *foul air* and *poor lighting* contribute to the discomfort of the workers. In others the *noises of machines* are offensive, because of improper installation. For the same reason *vibrations* are transmitted throughout the whole shell of the structure.

To the discomforts produced by these shortcomings may be added the inconveniences and hazards caused by the absence or insufficiency of the most common necessities (first-aid facilities, washrooms and showers, toilets, cloakrooms, lunch rooms, and others), which all together would represent no more than the minimum conditions desired by self-respecting men and women.[22]

Such "industrial slums" are numerous, in some cases as numerous as the slum dwellings together with which they have sprung up and continue to spring up. Many of these substandard factories precede the construction of dwellings which are equally substandard. *And at length the whole district achieves a perfect unity — of wretchedness.*

Industrial buildings are too frequently erected on sites whose climatic or topographical features produce conditions unfavorable to the workers as well as to the occupants of other buildings in the vicinity.[23] These factories, temporary in character, quickly attract dwellings to their vicinity, since living near the factory still represents an economy. Often the dwellings themselves look as temporary as the industries they surround. And since both factories and dwellings remain for decades, the inhabitants, too, seem to lead a precarious existence. At length the whole area becomes one of those suburban deserts so characteristic of our cities.

It will be said that modern technics has made possible the erection of magnificent factories, that great industries in the more advanced countries present striking examples created during the last few decades; a few dozen names will then be mentioned. . . . But what does this amount to beside the thousands of factories that exist all

[21] "The foliage of the trees acts as a viscous impingement filter, removing dust and air-borne organisms from the atmosphere" ("Effect of Air Sanitation on Building Design," *Architectural Record*, July 1939, p. 75).

[22] The lack of safeguards against hazards in certain industries is not discussed here, since such special aspects of the problem do not enter into the scope of the present work.

[23] For the factors governing the proper location of industries, see pp. 144-148.

UNPLANNED INDUSTRIAL GROWTH HAS LED TO HAPHAZARD DWELLING AREAS. Slums have quickly developed in their midst. Shacks and box-towns are often to be found on waste land where refuse from near-by plants is piled. This is a common sight across the border lines of cities, where high taxation can be avoided. This map of the city of Charleroi (by the Belgian group of the C.I.A.M.) shows the extensive scattering of industry and low-class dwellings. Nearly all dwellings in this area are slums.

The view of Chicago opposite is taken in an industrial suburb near the Loop. It might equally belong to any big city.

over the world? The comparatively few exceptions only confirm the opportunities of modern technics and demonstrate the vastness of the field which awaits its application.

Although working conditions may be bad in countless offices and mercantile establishments, where proper lighting, ventilation, heating, and hygienic features are wanting, it is especially in factories that substandard conditions prevail.

Obviously if we are to act to eradicate slum dwellings from our midst, we must also feel ourselves constrained to face the problems of industrial slums — those substandard factories which house their occupants during a fourth, or a third, or longer periods, of their daily lives. To this end, *legislation aimed at the control of working conditions in relation to the general needs of the city should be reconsidered.*

In short, the significance of the multiplication of industrial slums must not be overlooked; in them *the chaotic development of industry has left its mark upon our cities.*

THE DISTANCES BETWEEN DWELLINGS AND PLACES OF WORK ARE LENGTHENED BY THE DISORDER OF CITIES

- *"The absence of a planned coördination of the locations of work-places with those of dwellings creates excessive traveling distances between the two."* — *Town-Planning Chart*

In large cities the journeys from homes to work-places are usually arduous. As a general rule, the larger the city the greater the disorder in its transportation system. Invariably this is caused by the fact that places of work have been distributed without regard for their functions or for their relation to dwellings. This situation has been further aggravated by the fragmentary organization of public transportation, often controlled by different private companies which have sought the satisfaction of their own immediate interests rather than the greater comfort of the inhabitants.

The daily transportation of huge masses of the population over great distances is a phenomenon characteristic of cities of the Machine Age.

From the economic and social standpoint, this represents enormous waste, needlessly consuming the physical energies of the people, sometimes to such a degree that their health is affected.

This journeying from dwelling to work and from work to dwelling may be likened to the oscillating movement of a pendulum, repeated daily on a vast scale. Since millions of people are affected, the least reduction in the time required by these journeys would have incalculable importance. An economy of but a few minutes each day would represent the saving of whole days by the end of the year.

It has been estimated, for example, that New Yorkers who live a half-hour subway ride from their jobs spend *one year out of thirty-three underground!*

The ordeal of traveling during rush hours is often prolonged without other cause than that produced by general neglect. An hour and a half in London, one hour in Berlin — these are ordinary journeys.

It has been said that it is not unusual for an outer-Londoner to spend "two wasted and unpleasant hours a day, and 10 per cent or more of his total income, in travelling between his suburb and his work place."

The following table[24] reveals home-to-work time consumption in the city of New York:

Time from Home to Work (for the principal income earner)	Percentage of All Reporting Families
Under 20 minutes	22
20 minutes — under 40	35
40 minutes — under 60	19
60 minutes and over	24

Almost one-fourth of this group must therefore lose more than two hours per day in travel.

[24] Compiled from the Real Property Inventory of New York City, 1934, prepared under the direction of the New York Housing Authority, United States Department of Commerce, and the mayor's advisory committee.

MAMMOTH INDUSTRIES. "On its *1,200 acres* (Rockfeller Center covers twelve acres), in its dozens of divisions, the Ford Plant at River Rouge (Detroit) stands as a complete and concise cross-section of modern U. S. industry." This plant alone "can produce enough power to light all the homes of Chicago; . . . it uses enough water to supply the homes of Detroit, Cincinnati, and Washington combined." In 1939 Ford made 945,000 cars, trucks, and tractors. Most of them were built at River Rouge (others at the seventeen Ford assembly plants all over the country). "At peak production time 85,000 men work at River Rouge. . . . These men eat lunch in some cranny near the spot they work. *Few leave the plant for lunch because the nearest entrance is usually too far away!*" (*Life*, August 19, 1940, p. 48.) New trends in planning do not favor the construction of this type of huge factory, especially in the immediate neighborhood of a big city.

"In a well-known suburban section, a study showed that 70 per cent of the married men required at least two hours of traveling per day to reach their work and return. In some areas this percentage is as high as 90. In terms of home life, this means that the father seldom sees the smaller children when they are awake." [35]

People resign themselves to these conditions, assuming that they are inevitable. In most cases, however, they could have been avoided. Merely the consideration of economic waste, if other factors seem unimportant, should have sufficed to require that the sites of places of work and those intended for dwelling should be appropriate to their functions and coördinated with the provisions of a master plan. The unification and reorganization of transportation systems could then have been accomplished far more easily than at present.

Although certain steps toward the unification and coördination of transportation systems have been taken in some cities, the complete solution of the problem will be unattainable as long as the locations of work-places remain dispersed, mobile, and unplanned.

The decentralization of industry and dwellings continues to take place without the guiding influence of a master plan. This outward movement of population and industry tends to expand the commuting area and to increase the number of commuters, thereby further aggravating the present situation.

Most offices and mercantile establishments have remained in the central districts, thus lengthening the distances to be traveled by those employees who, in great numbers, have gone to live in the surrounding country. In the case of London, for example, it has been found that the places of residence of clerks employed in central districts are distributed [36] as follows: 15 per cent live in the inner ring; 45 per cent live in the outer ring; 40 per cent live in various parts of Greater London (outside the county limits).

The area of Manhattan south of Fifty-ninth Street lost 278,000 residents in the eight years from 1924 to 1932, but it gained in this same period 459,000 daily visitors. Traffic congestion has become greater, even though dwelling congestion has decreased.

Between 1930 and 1940 there has been a slight increase of population in some parts of southern Manhattan. The number of visitors to this area has increased since 1924 by nearly a million.[37] Commuters come to lower Manhattan from the most distant points in the vast New York region, the greatest number coming from Long Island.

From the preceding observations and statistics may be drawn the following conclusion: that the problem of the distances between dwellings and places of work, which is one of the most serious results of the quick growth of the cities of the Machine Age, has reached a critical stage and that no large city has yet dared to solve it by approaching it from the standpoint of a master plan.

In particular, such a master plan should include a regrouping of industries, which are today widely dispersed. Without achieving this redistribution, together with a logical location of dwelling districts, the lines of transportation connecting places of work and dwellings will not lend themselves to rational planning.

Pendulum Traffic — Rush Hours

- *"Traffic is overtaxed during rush hours, on account of disorganized communications."* *Town-Planning Chart*

In any large city, try to board a subway or a motorbus between eight and nine in the morning. The general confusion, the lack of seats, the jostling, and the uncomfortable circumstances of the journey are almost identical in all big communities. And they are much the same whether the transportation lines lead to industrial districts, to office buildings, or to other places of work.

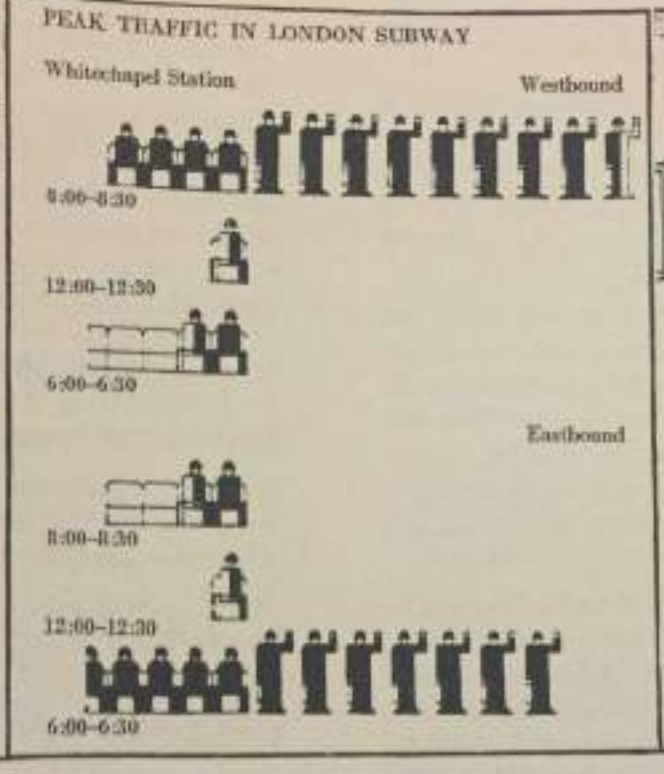
The people going to work, most of them without finding a place to sit down, are pressed one against the other like the proverbial canned sardine; even the room to open a newspaper is lacking. The number of men and women who spend hours every day hanging to

[35] *Homemaking, Home Furnishing and Information Services* (Washington, 1932), publication of the President's Conference on Home Building and Home Ownership, vol. X, chap. 3, p. 67.

[36] Data from *The New Survey of London Life and Labor*, vol. V, Industries (London, 1921), p. 138.

[37] Data from Regional Plan Association, *Regional Plan Information Bulletin*, no. 11, January 30, 1933, and *New York Times*, December 8 and 9, 1941.

"Something snapped in the brain of a Connecticut commuter when a subway guard tried to jam him into a car that had no room to receive him. . . ." (See anecdote on p. 126.)



The lack of sitting-space in the London subways during rush hours. (See p. 126.)

One man represents one thousand passengers passing Whitechapel Station east and west bound during a half-hour period.

"Oliver can't read his paper in any other position!" .. or a commuter relaxes at home on Sunday.

NUISANCES IN THE LIFE OF THE COMMUTER. Most people work where they can find a job and live where they can find a home suited to their needs and within their means. Very often these two places are distant from one another. Commuting is the result. The number of commuters that spend hours in train, bus, or subway has increased considerably in the last few decades owing to the suburban expansion of cities. During rush hours, since means of transportation are usually insufficient, people are obliged to stand in trains, subways, and buses. The resignation of straphangers is one of the most convincing evidences of what humanity will endure. . . .

subway straps amounts to millions. And the same scenes are repeated between five and six o'clock in the afternoon.

It has been said that the greatest miracle of our cities is that their inhabitants tolerate them. This tolerance, which proceeds from the despair and the resignation of those masses who believe themselves subject to the inevitable, is broken only by rare demonstrations of individual impatience. The following is an isolated but eloquent example.

"A Connecticut commuter lost his temper in the subway during the downtown morning rush and punched a platform guard. After four years of a sardine existence, he said, something snapped in his brain that morning when the guard tried to jam him into a car that had no room to receive him. The door started to close and hit him on the shoulder, whereupon he suddenly saw red and struck the platform operative. Every honest subway passenger on reading the story will say to himself, 'There, but for the grace of God, go I.'

"But there are details in our Connecticut commuter's statement in court that will bear further study. It appears that he gets up every morning at a quarter to seven, has his breakfast, and catches a train which brings him into Grand Central at eight-thirty. There he descends into the subway and enters upon the sardine ordeal which, after four long years, finally 'got' him the other day. *He said it was particularly hard being a sardine after all the freshness of the country!*" [28]

Many people travel as much as an hour and a half between their work and their homes in Connecticut, Long Island, or New Jersey, because those homes furnish more than adequate compensation. Millions of workers in Manhattan travel a shorter total distance to the outlying boroughs, but considerably longer subway distances and under most disagreeable conditions.

The infrequency of protest,[29] however, does not mean that the multitudes would not be concerned over these problems if they were shown the means of correcting them. *Already the straphanger is beginning to ask WHY?* Why can't they control this confusion? Why can't they coördinate our transportation lines? Why can't distances between home and factory be shortened? Must we go on suffering this ordeal?

In the very numbers of people which it affects each day, this is one of the most serious of urban problems. Its satisfactory solution could change the living conditions of millions, sparing them the waste of hours and energies which could be spent in useful activities.

Concentration of Working Populations in Business Centers — The following statistics on New York impressively indicate the magnitude of the problem:

Southern Manhattan (south of Sixty-first Street) comprises the most important business center in the world and the greatest concentration of office workers.

"On a typical business day of 1940 some 3,331,199 persons entered the section of Manhattan south of Sixty-first Street. Together with the area's residents, about 630,000, they made a daytime population in southern Manhattan of almost *four* millions." These four millions are distributed in an area of about ten square miles, roughly at a rate of 625 inhabitants to the acre." [30]

From this it will be seen that *more than six times the number of people who live in this area entered it daily in 1940.*

"As to the means of transportation used, rapid transit has registered the largest volume of increase, with motor vehicles pushing up and trolleys leading the railroad for a poor third." [31]

Subway Problems in Peak Hours — In London: "On the underground line, three out of four men have to stand on their way to work, between 8.00 and 8.30 A.M. . . .

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[28] *New York Times*, January 12, 1940.

[29] One hears of delegations of people from a certain part of the city demanding a new subway line or a motorbus line. If these are installed, they usually become as congested as the others within a few months. Then a new delegation must make further transportation demands.

[30] "The exact total of persons entering Manhattan below 59th Street on a typical business day in 1932 was 2,791,812 as compared with 2,332,850 persons [in 1924]." (Regional Plan Association, New York, *Regional Plan Information Bulletin*, no. 11, January 30, 1933, p. 5).

[31] Figures given by the Regional Plan Association of New York (*New York Times*, December 8 and 9, 1941).

"With the growth of peak hour traffic . . . and the financial impossibility of providing duplicate railways . . . some remedial measures are necessary. . . .

"To extend the hours for the issue of workmen's tickets would only shift the peak nearer to the peak of business traffic, which follows, and would create an even more acute problem of accommodation." [23]

BUSINESS DISTRICTS, DEVELOPING WITHOUT CONTROL, HAVE CAUSED THEIR OWN ENCIRCLEMENT

- *"Business districts could be expanded only through the costly action of purchasing and razing surrounding dwellings."*

Town-Planning Chart

Business districts, developed as we know them today, forming great centers of office buildings, are the characteristic expression of the large concentrated cities born in the nineteenth century. In Europe they are more or less scattered along the main arteries near the center of the city. They have shown their most spectacular growth in the cities of the United States, where their buildings have acquired imposing proportions.

Business districts in American cities have developed in two ways, by:

(a) *Surface extension* — the replacement of dwellings and small neighborhood shops, which are repeatedly driven farther away from the center of the city.

(b) *Vertical extension.* This may be the result of economic factors, growing out of the increase in land prices, stimulated by uncontrolled speculation; or it may occur because of the lengthy legal proceedings required for the evacuation of the densely populated dwellings near-by, or because of a desire to concentrate certain services, for technical reasons; or because of geographical factors which, in certain circumstances, hinder horizontal expansion; or simply as an exhibition of financial power.

This growth in height is a reflection of the development of the city as a whole. It is a "volcanic" manifestation of the process of urban concentration, now reversed owing to the effects of the depression and to the accentuation of the decentralizing movement.

This vertical growth created so much additional office space during the years of "prosperity" that the office buildings of most cities in the United States today show a substantial surplus of vacancies.[24] Many business districts are therefore subject to economic difficulties, the taxes on their buildings being too heavy in view of present circumstances.

An unprecedented increase in real estate values, affecting both land and buildings, took place in these districts during the prosperous years before 1929. The maintenance of these values, today artificial and without any real basis, has created obstacles to any replanning of these districts. If a new surface growth became necessary, it would be impeded by the old buildings,[25] usually slums, which surround them. Present land values would also make it economically impossible to create the open spaces required for the proper lighting of many of the offices in these buildings,[26] as well as for the parking spaces and other facilities that would be needed here.

The following percentages of land values in Manhattan, in comparison with those of other districts of New York City, confirm the preceding statements:

"Manhattan, with only 7 per cent of the city area, is seen to have 57.1 per cent of the land value and 51 per cent of the total taxable

[23] From the London Passenger Transport Board report, 1937.

[24] Some cities have even entertained the idea of new zoning laws permitting the transformation of areas now devoted to business into places for dwellings.

[25] These difficulties of expansion — together with the distance-factor involved in reaching the centers of certain large cities — have caused the business districts of some cities in the United States to break up into "downtown" and "uptown" business centers.

[26] New York was the first city in the United States to establish a zoning ordinance. This radical departure for the control of the height and bulk of buildings brought about a new type of architecture which changed the face of the city; but this ordinance is now twenty years old, and in many respects it is that many years out of date. (See *Building Skyward*, a folder published by the Regional Plan Association of New York.)

value. Residential value (land and buildings) accounts for 85 to 92 per cent of the total in all boroughs except Manhattan, where the concentration of business is so great that under 55 per cent remains for residence properties." [28]

[28] *Progress Report of the Mayor's Committee on City Planning* (New York, 1936), p. 66.

The phase of inaction and retrogression represented by the last decade (1930–1940) should be, and could be, brought to an end. Our business centers should return to the more propitious conditions that the application of a master plan demands.

PART EIGHT

THE EVOLUTION OF THE MEANS OF PRODUCTION HAS HAD A DECISIVE INFLUENCE UPON URBAN STRUCTURES

Even in a most abridged and fragmentary form, a general view of the evolution of production methods and the organization of work throughout different periods of history will aid us in understanding the significance of the revolution produced in cities through the introduction of the machine as an agent of production.

For thousands of years man availed himself of no other forces than those of his own muscles and those of certain animals. Most of the tools which he strove to fashion during this time were only extensions of his members that served to reduce his efforts and his fatigue.

Many of these implements, even the most simple, required centuries to achieve their ultimate form.

Man's spirit of enterprise and inquiry remains immutable down through the ages, and human knowledge becomes richer in spite of the retrogressive periods of civilization. Acquired knowledge is in itself man's most precious heritage.

The First Civilizations — Favorable conditions of climate and soil facilitated man in his labors and caused him to settle in certain regions (the alluvion of the Nile, the fertile lands of the Tigris, or those of the rivers of China).

In the earliest civilizations, wars of conquest, vast public works, and the insufficiency of mechanical devices stimulated *the development of slavery*.

Cities and their immediate surroundings constitute independent units, in the sense that they *are obliged to produce all the goods which they require*. Self-sufficient and with little communication with the outside world, their economic influence is likewise of narrow range. Agriculture, accomplished with the aid of a few elementary tools, is the main occupation. While manufacturing (cloth, furniture, kitchen utensils, tools, and other small articles) is generally confined to the home, in large cities like Babylon, for example, workshops employing slaves existed as early as the year 600 B.C.

As centuries pass, the technics of labor undergo both advances and reverses. New mechanical devices sometimes remain for centuries without application. Means of communication being absent, the knowledge of inventions spreads with difficulty.[1] New instruments gradually come into use, easing the laborious tasks of man. So in Greece, for example, the windlass and pulley replace inclined planes in the raising of heavy objects.

In all the big towns manufacturing is carried on by artisans in small workshops or in larger enterprises. Yet the size of factories, as in Athens, for example, had nothing in common with that of the factories of today. Among the most important may be mentioned that of the armorer Kephalos, employing a hundred and twenty men. Basic industries, like weaving, pottery-making, metallurgy, the manufacture of munitions, and shipbuilding, naturally show the highest development.

In Rome, where slaves were employed in ever-larger enterprises, *industry attains far greater dimensions*, coinciding with the growth of commerce during the Empire. Important economic changes finally brought the fall of the Roman Empire and radical changes in the whole work system.

Ups and Downs of Production — From the fourth century to the sixth *the great death of cities* takes place. This period is marked by the retrogression of towns to the village state (decentralization), owing to widespread insecurity, the invasions of the barbarians, and constant plagues.

The wealth of *feudal society* is based on *the possession of land*. Within its *closed economy* money diminishes in use. Towns remain very small until the tenth and eleventh centuries (see pp. 85–86, on recreation).

Birth of Our Urban Economic Structure — With the eleventh century, but especially during the twelfth and thirteenth centuries, the social structure changes in a manner that has repercussions upon the city.

Serfs leave their native villages to go to *the cities, which begin to free themselves*. Merchants, artisans, and others secure from their lord or their bishop, sometimes at the price of money and sometimes at the price of bloody struggles, *the emancipation of their communities*, which elect councils. "The air of cities sets you free," the peasants said, for they became so, according to the law (after "one year and one day"), if nobody reclaimed them. Free cities multiply, and *urban concentration begins*.

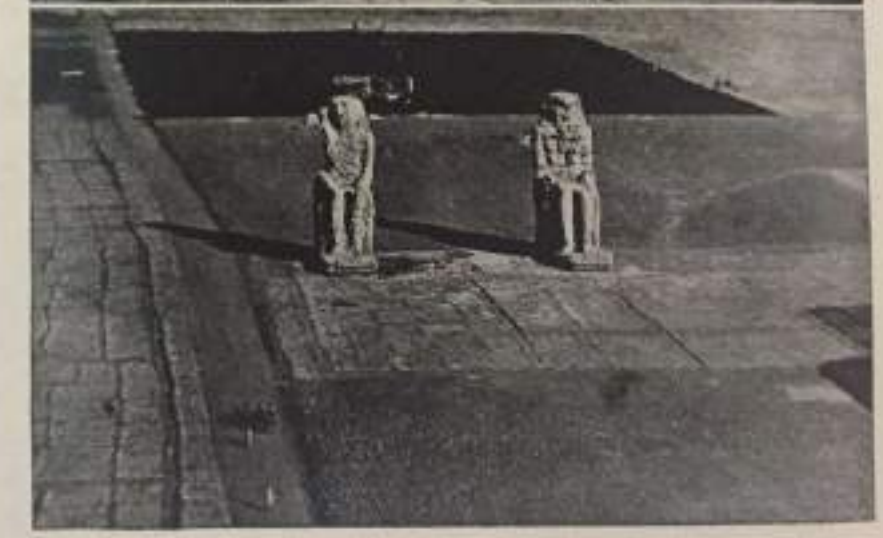
Dating from this phase, the organization of work in cities follows a direct line of evolution toward the economic system of our time. Commerce thrives, great *international merchants* linking the countries of western and central Europe. Markets, some under the tutelage of the church, through its bishoprics, are established for the exchange of the most distant products. At length trade achieves such scope that it has been possible to speak of "the world economy of the Middle Ages." This commercial progress stimulates industry and brings about *a new organization of work in cities*, based on the guilds.

The Guilds — The guild is an economic association, recognized by public authority, uniting merchants and producers and subjecting

[1] The magnetic compass, known to the Chinese in 1160 B.C., came into Europe via the Arabs in the twelfth century. (See Lewis Mumford, *Technics and Civilization*, New York: Harcourt, Brace and Co., 1934, p. 438.)

For thousands of years the inefficiency of mechanical devices, wars of conquest, and vast public works stimulated the development of slavery.

Many simple tools take centuries to achieve their ultimate forms.



Agriculture, accomplished with the aid of a few elementary tools, is the main occupation of vast populations.

all its members to a common discipline in the exercise of their affairs. Its hierarchy consists of *masters, journeymen,* and *apprentices,* the first usually being artisans or the heads of modest enterprises.

The apprentices were often engaged by contract, paying a certain sum to the guild and the cost of their maintenance to *the master under whose roof they lived.*

From the beginning the guilds tended to divide equally among the workers of each city all the work that was to be done. This limited the number of journeymen and apprentices in each workshop, sometimes even limiting the number of enterprises; it also served to impose the same working conditions in similar trades, thus regulating hours of labor, furloughs, and other details.

Industry in Large Cities — At the same time, working conditions in large cities had already changed, as had commerce itself. In Flanders and throughout all of northern France drapers shipped their products to foreign countries, to the Baltic region, and especially toward the Mediterranean.

Often the draper was manufacturer and merchant at the same time. His capital was sufficiently large to cover the purchase of the required raw materials, like flax and wool, to provide him with all the equipment he needed, and to permit him to sell the manufactured products himself. Moreover, he was in a position to employ a number of weavers, to whom he supplied raw materials and equipment, paying them wages for their labors. This does not yet represent the system of large-scale modern industry, with its hundreds of workers employed under the same roof, but it is an early example of numerous workmen being subject to the authority of one man.

Apparently the great masses of workers in the larger industrial cities of the Middle Ages led a precarious existence, subject to the misfortunes of economic crises and unemployment.

The Rise of Large States and Industrial Development — Beginning with the fourteenth century, *royal authority* steadily increases in power in western Europe. It subordinates both feudal lords and towns, assures itself a hold on the guilds, and at length *assumes control over the national economy.*

The intellectual and religious movements of the Renaissance and the Reformation coincide with a sudden upturn in economic activity. *Great scientific and geographic discoveries* open new fields of conquest, giving impetus to *an enormous commercial development.* Around 1500 this development is marked by the founding of large commercial organizations in Germany for the exploitation of Continental trade.

Toward the year 1503 fleets of ships laden with the most diverse products begin to arrive from America and other newly discovered lands. New sea and land routes become highways for newly found natural resources, for the growing traffic in slaves, and for all kinds of new manufactured products.

New Organization of Production — *This commercial expansion automatically requires that production be organized upon a different scale.* Its first effect is that of altering the status of many small independent artisans, reducing them to the conditions of the proletariat. The second effect (and the one which most profoundly influenced the structure of cities) is that of supplanting the organization of home production, in which masters and journeymen work under the same roof, by one in which *greater numbers of workers live outside the house of the master.*

Concentration of Industries in Cities — Simultaneously, political and economic forces contribute to the concentration that takes place in cities.

The policy of national unification, of which Louis XIV's minister Colbert (1619–1683) is the most typical champion, tends to exercise control over taxes and duties, the police, navigation, and labor regulation. This policy immediately affects industry through its "absolute protectionism, its close regulation, and its annoying surveillance." For Colbert sought to establish industry on a national basis.

The concentration of capital is both one of the causes and one of the results of the rise of great states. This concentration permitted and

Work in the towns and small cities of the early Middle Ages was conditioned by their limited size. In feudal society the governing classes organized production on a local scale.

During the twelfth and thirteenth centuries commerce develops rapidly as *free cities multiply*. The guilds uniting merchants and producers protect trading and establish its legislation. Every city has a commercial center. Mining, abandoned for centuries, makes great progress that forecasts its preponderant role in the future.

stimulated the creation of vaster enterprises than those of previous centuries, at the same time demanding more flexible methods of production, which ultimately caused *the decline of the old guilds*.

Two Production Systems — Beginning with the seventeenth century, the oldest industries, such as the textile industry, organize their production system on a new basis, which takes two principal forms: *the decentralized factory* (or home shop) and *the factory*.

The decentralized factory is, in fact, a prolongation of the production system of the Middle Ages. A few wealthy merchants buy large quantities of raw materials (wool, silk, flax, cotton, hemp, iron, and others), distributing them at the houses of workers who, *in their homes*, convert them into finished products, either with the aid of paid journeymen, of the members of their own families, or both. The merchants later collect the finished products for distribution to their trade. As might be expected, the influence of this system of production upon the urban structure was small, compared with that of the factory system.

The factory at this time consumes a considerable quantity of raw materials and, for its period, employs numerous workers. One factory in France, for example, toward the beginning of the seventeenth century, is described as being equipped with from two to three hundred looms and employing two or three thousand men and women.

Production methods in these factories are essentially the same as those used by the small artisans. Textile manufacturers, it may be observed, simply possess a greater number of looms, all of which are like those operated by the individual artisan. The factory, however, was responsible for one fundamental and drastic change in production methods. For, whether it was equipped with power-machines or not, it brought about *the breakdown of the production process into a number of specialized operations*, usually limiting the function of the worker to no more than one of these operations.

So organized, the factory requires a large investment of capital. As capitalists, the merchants in turn form a new class in society: *the bourgeoisie*.

In the labor and capital which they require, both the home industries (or decentralized factories) and the factories *already foreshadow modern industry*. It is the factory itself, however, which introduces the new system, consisting of *the concentration under one roof of equipment and workers*. With the advance of the Machine Age, industry accumulates an equipment which becomes constantly more costly and complex.

The Chaos of the Machine Age — In the second half of the eighteenth century, the most revolutionary technical discoveries succeed each other with a rapidity hitherto unknown.

Starting with the first years of the nineteenth century, these technical discoveries are given widespread application by the bourgeoisie, which has become the dominant class. This class gives rise to the capitalist system.

The early period of Machine Age development receives its impetus from the mines. The elements from which it derives its forces are coal, iron, and steam.

Mining towns, especially those built around coal and iron mines, become bustling centers of human activity. Villages once peaceful and rustic in character are transformed within a few decades into large cities. Impoverished workers from the country and the city, whose numbers have constantly grown with the elimination of small industries and home crafts, rush to these regions.

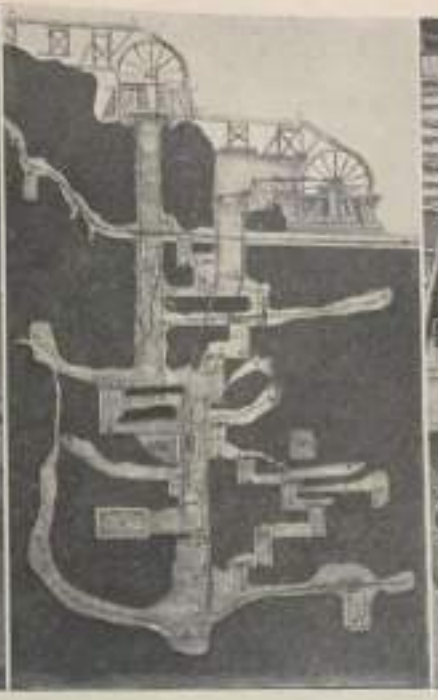
The use of coal as a source of mechanical power, the numerous adaptations of the steam engine, and improved methods of working iron are among the principal steps leading to the development of a new urban civilization.

This is the civilization of black smoke, of noise, of noxious gases, of crowded slums, and of an urban chaos such as the world had never known before.

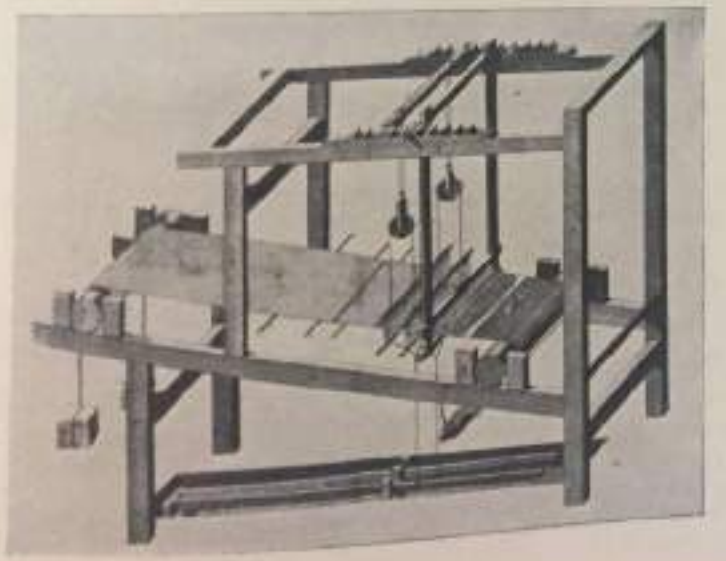
"Coal and iron were the pivots upon which the other functions of society revolved. . . .

"From the mine came the steam pump and presently the steam engine; ultimately the steam locomotive and so, by derivation, the steamboat. From the mine came the escalator, the elevator, . . .

Merchants form a new class in society: *the bourgeoisie*.



Working under the master's roof becomes rarer; factories develop.



TECHNICAL PROGRESS. The sixteenth, seventeenth, and eighteenth centuries saw the development and widespread utilization of machines moved by other power than that derived from the muscles of men or of animals. *Wind and water* come into general use as motive forces; windmills and watermills achieve their definitive forms. *The mining industries* (especially iron and coal), metallurgy, and *the textile and glass industries* are those which make the most marked progress.

the subway for urban transportation. The railroad likewise came directly from the mine." [3]

While the new machines multiply everywhere, the development of industry is characterized by the growth in size and numbers of its factories.

Steam Power and Its Effects — By its very nature, steam power tends to accentuate the concentration of masses of workers in large factories. A steam generator can drive many machines at a time. Concentration means a reduced overhead. A large factory is synonymous with a large business.

Steam depends upon coal, and coal upon mines. Since railroads were not yet extensively developed in the first half of the nineteenth century, the transportation of coal was slow, difficult, and costly. As the valleys of mining districts were most easily accessible to the railroads, they quickly filled with factories. These soon appear also in large cities — haphazardly, everywhere, but especially near rail terminals.

Wind and water, as used in the preceding centuries, are free motive forces; steam, being dependent upon coal, is actually bound to mines.

In contrast, wind and even water are intermittent forces, while steam can furnish a constant power.

Not even the blast of artillery has so transformed cities as the widespread use of steam power.

Increasing Need for Capital — Industrial production showed a tendency to become the exclusive privilege of huge enterprises that ceaselessly consumed and perfected materials and employed great numbers of workers — a system which required tremendous investments of capital. To this system has been given the name of *capitalism*.

Within a few decades western Europe is entirely transformed. Yet during a certain period of time both the old production system and the new factory system exist side by side.

[3] Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace, 1934), pp. 157–158.

An economist has translated this evolution into the following terms:

"Every day we see the disappearance of small work-places, the work taken away, home labor destroyed. Industry is becoming established in immense factories, which resemble barracks or convents, provided with huge quantities of materials and run by motors of incredible power. Hundreds and sometimes even thousands of workers are crowded in these dismal laboratories, where their work, subject to the command of the machine, is at the mercy of all the vicissitudes resulting from changes in supply and demand." [3]

With the perfecting of new inventions and their extensive application at this time, new labor methods and new production facilities bring to the nineteenth century *mass production*. This first appears in the textile, iron, steel, machinery, and armament industries.

New Production Methods Change Life in Cities — The new factories of this first machine period, run by steam and lighted by gas, could produce night and day without interruption. Their stacks smoking incessantly, entire regions were quickly blackened.

The diurnal cycle, which had ruled the life of cities ever since their birth, ceased to be respected. At this time the working day in England lasted sixteen hours. Entire cities became factories, whirring hives of production, without regard for working or living conditions, irrespective of the consequences. Increased production was the almighty goal, for only immediate profit counted.

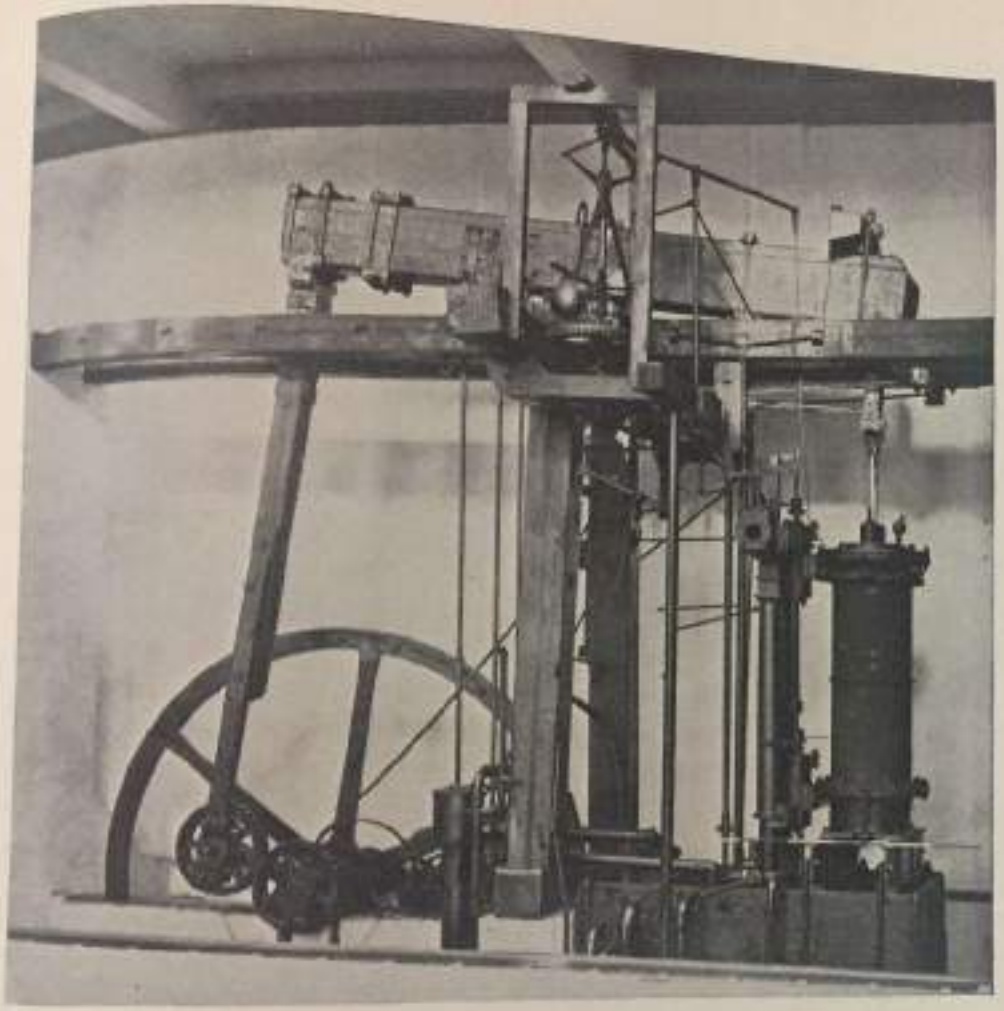
"The production of iron increased from 17,000 tons in 1740 to 2,100,000 tons in 1850.

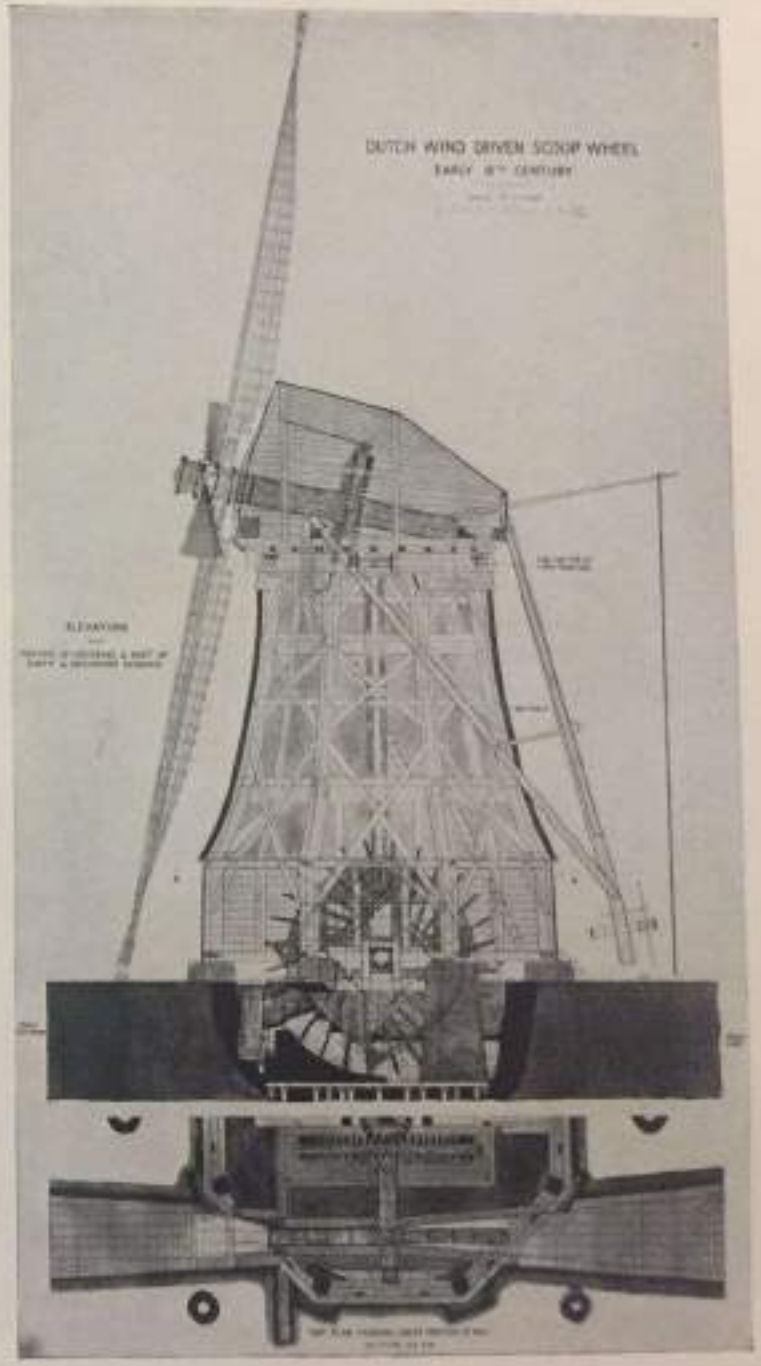
"In 1823 there were 10,000 steam-driven looms in Great Britain; in 1855, 400,000." [4]

Black Countries — Everything that humanized cities fled their borders, these bursting and spilling out amorphous suburbs shrouded in the smoke of entire regions. This is the "Black Country" of England, with its many counterparts — Pittsburgh, the

[3] Quoted by E. Coornaert and J. Saureau in *Travail et civilisation à travers les âges* (Paris: Bourrelier et Cie, 1938), p. 88.

[4] Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace, 1934), p. 208.





THE STEAM ENGINE, the cannon, and the automobile are the inventions that have most profoundly transformed urban patterns. Wind and water as sources of power had never provoked such a total divorce between urban and rural environments as coal and steam did. *Man's natural frame* was not really broken until cities were submerged under clouds of smoke. It is curious to compare these two machines. The precision of the Dutch wind-driven scoop wheel, in which with a perfectly evolved wood technique a definite form has been achieved, contrasts with the roughness and archaic character of Watt's engine, which marks the beginning of another era. Two cities characteristic of these two periods would present a parallel contrast. The one of the time of the windmill would surely be well scaled, and to a great degree harmonious. The other, of the period of Watt's engine, would be gloomy and chaotic and spread in all directions.

Ruhr, Lille. And, not confined to mining regions, these black areas are repeated, on a smaller scale, in all the cities of the world.

It is through the rapidity of its development, especially, that industrialism creates new problems: cities were not designed to receive the sudden influx of people which it brought; they were not prepared to lodge and to nourish so great a number of families at once. Neither governments nor industrialists had seriously thought of housing for the workers. And the latter, crowded together and ill-paid, found themselves in a material situation worse than that of the most disinherited workers since the Middle Ages.

Birth of the Modern Suburb — The overcrowding of the older parts of cities results in the creation of a new dwelling district — that of the suburb, closely associated with the factories.

In England workmen's houses in this period of industrial "prosperity" were frequently built beside open sewers and laid out in rows, grouped back to back. Even when built in the open country, they were clustered together. Living conditions became constantly worse, until in 1848 the Public Health Act, imposing certain regulations on dwellings, was formulated in an effort to correct the most outstanding abuses.

The Rural Exodus — *The nineteenth century* may be identified with *the rural exodus*, or the depopulation of the farms and the concentration of populations within cities (see p. 201, on the growth of cities). It is also at this time that women enter the category of workers.

Toward 1870 the volume of production increases at an unprecedented rate. *Western Europe becomes the factory of the world.*

- *"It is the uncontrolled and disorderly development of the Machine Age which has produced the chaos of our cities."*

  Town-Planning Chart

Industry Spreads and Concentrates — At the turn of the present century, cities throughout the entire world continue their industrial expansion with an accelerated rhythm.

This growth is merely a reflection of the constantly intensified development of the volume of production. But big industries are able to attain high production levels only through efficient organization. Industry has therefore shown the tendency, in the later stages of its development, to concentrate its forces in single corporations of ever greater magnitude. Simultaneously, the agents of production (both machines and men) have multiplied in individual industries everywhere during the present century.

". . . a combination of elements suddenly brought into existence in our social and economic world *huge business combinations* in the form of corporations of a hitherto undreamed-of size. . . .

"The United States Steel Corporation was merely the greatest among the new economic monsters. A conservative estimate in 1904 showed that 5300 formerly distinct plants had been combined into 318 trusts with a capital of $7,246,000,000. . . ." [4]

Modern industry requires so much capital that individual fortunes no longer suffice. It must therefore seek capital elsewhere. The function of furnishing the required capital is performed by banks, with their vast credit systems. While this method of financing industry appeared in the nineteenth century, in the twentieth, with the growth of large corporations, it has assumed tremendous proportions.

Monopoly — A general tendency toward monopoly has also taken place. Small competition is often absorbed or crushed. And capital representing various interests is frequently pooled so as to create powerful chains of industries to resist competition. These chains sometimes take on the character of *monopoly groups*, though the idea of competition usually persists among the various members.

This was "not merely a normal growth but concentration that comes from combination, consolidation, and other methods employed to secure monopolistic power." [5]

Vertical trusts are also formed, these striving to achieve self-sufficiency, while eliminating competition. But these trusts are con-

[4] James Truslow Adams, *The Epic of America* (New York: Blue Ribbon Books, 1931), p. 317.
[5] Quoted from the *Wall Street Journal* (1903) by Adams in *The Epic of America*, p. 317.

The end of the eighteenth century and the first decades of the nineteenth see a great industrial development. The textile industry in France establishes great silk-making centers. Important metallurgical plants appear. The Creusot (France), which became the great armament factory, was founded in 1787, with more than a thousand workers.

From the beginning England is at the head of the industrial movement. Smoke-stacks appear everywhere in open unspoilt country. In their vicinity small workers' dwellings aligned back to back, separated by open sewers, begin to multiply. . . . Vast slums are in the making: *the modern suburb has come into being!*

fronted with other trusts, and competition is renewed upon another level.

Banks tend more and more to become institutions international in character, their capital penetrating into all fields and dominating the whole world economy. Thus capital moves about from well-developed countries to those less well developed, in quest of new investment opportunities.

The war of 1914–1918 accelerated mass production and the industrial development of hitherto backward countries — a trend which continued in the period following that war.

The most intensive industrial growth of all time has occurred in the United States. In eastern Europe, in the Soviet Union, a country heretofore industrially backward, the expansion of industry has now reached tremendous proportions. The industrialization of Japan has also occurred within our own time. In short, western Europe has ceased to be *the factory of the world*, a position which it assumed in the nineteenth century.

The struggle for a new partition of the world is on. The most powerful trusts and the nations in which they are situated are intimately allied in this struggle, which is taking place on an entirely new scale.

From Coal to Electricity — *The technical progress* marked by the last few decades has brought sweeping changes in many fields. No longer are we in the age of coal, which today seems like a dying period, but rather in the age of electricity, which portends the birth of new forces.

Heavy industry no longer needs to be situated near mines or along the most economical means of communication with them. The new motive force of electricity can be obtained from numerous different sources and can be easily transmitted anywhere, without loss of energy and without great expense. Practically any region can now be industrialized.

Those countries which have been able to assert their hegemony because of their coal deposits today find competitors everywhere, for water power and even solar rays may now be utilized as new sources of electrical energy. And this energy may be transformed into light, movement, heat; it may be used for the transmission of sounds and images, the internal exploration of the body (X-rays), automatic control (the selenium cell), and other purposes.

Electricity is an agent whose applications have been discovered only through the investigations of modern technics.

The future of cities is closely identified with technical discovery and with economic reorientation.

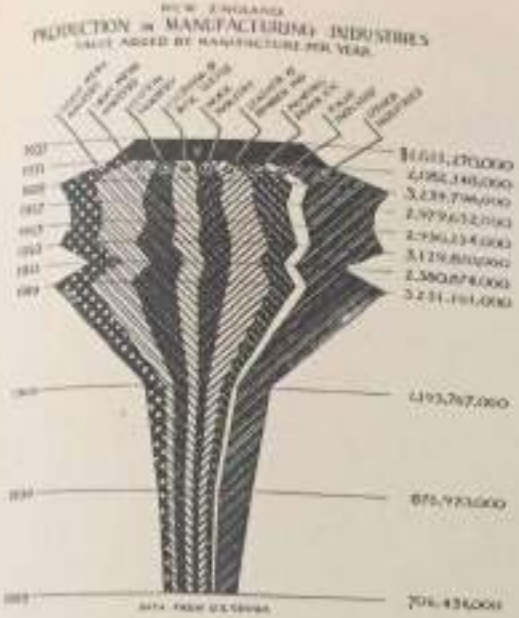
Mobility of Industry Increases Urban Mobility — *The first third of the twentieth century is marked by the following changes and innovations:*

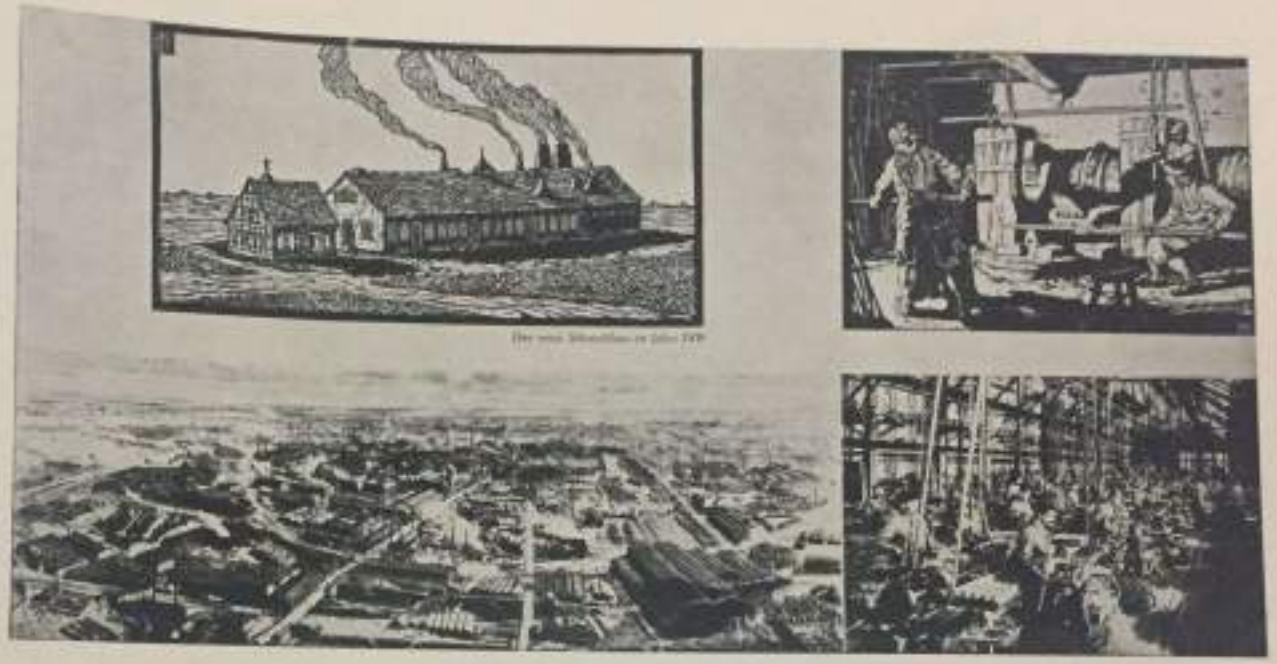
Continuation of intensive industrial development
Ascending production volumes through high-speed mass production
Exploitation of new sources of energy and power
Revolutionary changes in means of transportation:
(*a*) The automobile
(*b*) The airplane
} greater mobility for man and goods
New road systems to serve the new land transportation
New means of lighting and long-distance communication, creating new industries (telephone, telegraph, radio, and television)
New means of expression (the cinema, publicity)
A new building technique

Nearly all these factors tend to increase urban mobility.

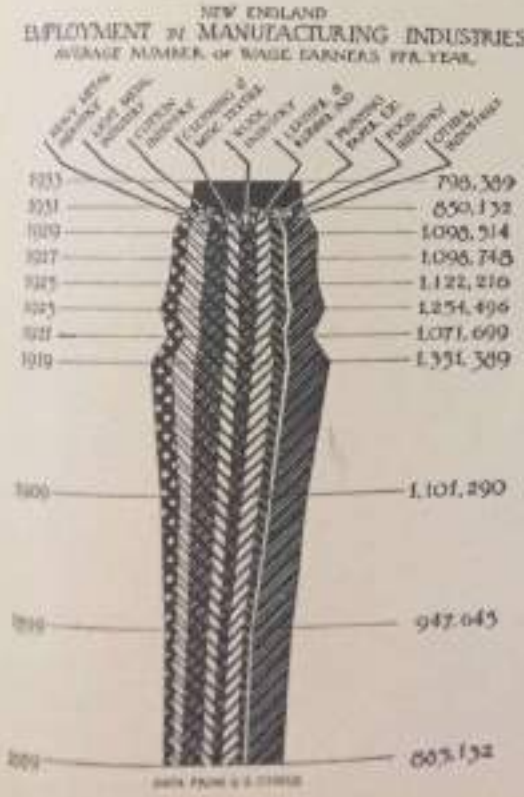
Consequences of Industrial Expansion — These technical advances, together with the economic changes of recent times, have already created new features in the urban structure — for example, large business districts, characteristic of our commercial civilization and most directly symbolized by the concentration of skyscraper office buildings in American cities.

Most of our large cities have grown out of the industrial expansion of the late nineteenth century. *In 1871 there were only 164 cities of 100,000 inhabitants or over.* This date marks the beginning of the most rapid growth of urban population in the world's history. *In 1930 there were 611 cities of 100,000 inhabitants or more*, about forty cities of a million or more inhabitants (80,000,000 in all), and four-

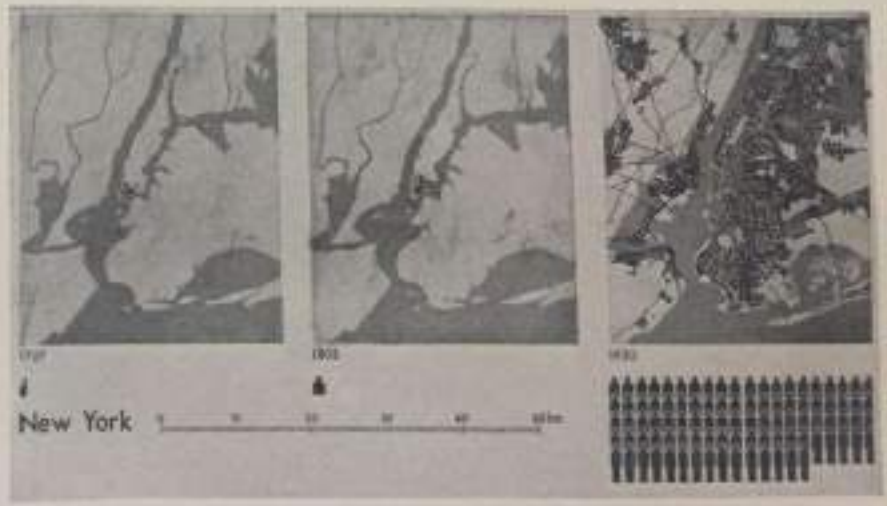




THE GROWTH OF CITIES PARALLELS THE CURVES OF INDUSTRIAL GROWTH and increasing production. In a hundred years a small workshop gives place to a vast industrial area. In the same period of time a small city is transformed into a huge metropolitan district. (Each figure on the map below = 100,000 inhabitants.)



Production increases faster than employment, machines demanding less muscular effort as they become more complex and more nearly perfect. Industry goes through periods of prosperity and inflation, followed by others of depression. Cities dominated by the business spirit of the times follow these ← ups and downs of production.



teen cities of over two million inhabitants (or a total of 50,000,000). *Over 10 per cent of the world's total population now lives in big cities.*[7]

[7] See Victor Dumas, "Tableau chronologique et essai d'une chronologie de l'histoire urbaine," *La Vie urbaine*, January 15–March 15, 1934.

In 1931 more than 80 per cent of the population of England lived in urban areas.[8]

[8] Recent statistics are sometimes misleading, because, owing to the outward movement of populations from city to suburb in the last years, only regional studies (which include larger areas) give a picture of what has really happened — that is how many inhabitants have really left the metropolitan areas. Only these figures give us the real populations of cities.

PART NINE

GENERAL MEASURES FOR THE REDISTRIBUTION OF WORK-PLACES IN CITIES

The pages immediately preceding have sought to suggest the state of disorder existing in the distribution of industries and other places of work, as well as the effects of this condition upon urban life.

The following pages indicate, also in a general manner,[1] what fundamental steps should be taken for the correction of this disorder, anticipating the future development of industrial districts on the basis of an organic plan associated with the planning of the other urban functions.

[1] In this chapter on the function of work in cities, only the outstanding aspects of the problems connected with this function are indicated. Industries being by their very nature so diversified, conditions vary considerably from one city to another. Consequently specific measures peculiar to the circumstances of each case are required, with the collaboration of specialists appropriate to the industries in question.

A Plan Is Necessary

- *"Industries should be classified according to their character and their needs, and should be distributed in special zones throughout the territory comprised of the city and its region.*

  "In delimiting these zones, it will be necessary to take into account the relationship of the different industries to each other and their relation to zones intended for other functions." Town-Planning Chart

In the preceding chapter we observed the unfortunate consequences of laissez-faire policies, the persistent cause of disorder in industrial districts. These policies, we indicated, always run counter to the establishment of any *master plan of industrial zoning.*

Such a solution of the problem has long been discussed. As long as business conditions remained satisfactory, however, the execution of this zoning plan could be no more than a utopian dream, for it was always opposed by influential economic forces.

But the radically different conditions ushered in during the last decade, mostly due to the economic crisis, have brought certain people to realize that only through the application of stern measures can a way be found out of the chaos of the present. So the tendency to face the issue directly has become increasingly noticeable in recent years:

"A couple of years ago those who talked about the need for guiding the location of industry were dismissed as wild theoreticians. Today the issue is one which practical business men and politicians are beginning seriously to face. . . ."[2]

To approach this issue properly, one must set out with a vision commanding a vast horizon, since the problem must be considered from a point inclusive of all its ramifications. *For one of the chief problems of town planning is involved here. Without the zoning of industries, the control of other urban functions becomes impossible.* Most of the malformations of the cities of today proceed from the poor distribution of industry. Its redistribution and its coördination with the other elements of a master plan are therefore indispensable.

How may this be accomplished? We suggest the following general line of action.

The first objective will be that of *removing the interference of laissez-faire policies,* which still hold sway everywhere.[3] To this end it will be necessary:

(*a*) *To determine the different economic units* or regions of each country and to delimit them. (This will depend upon the nature of the national economy.)

(*b*) *To analyze each of these units* in such a manner that future planning may be based on realities and on present experiences.[4]

(*c*) *To formulate a general classification of industries* according to their type (heavy or light), the nature of their production (chemical, textile, metallurgical, etc.), and their needs (power, raw materials, transportation, markets, facilities for the disposal of refuse and waste products, etc.). (This classification of industry should also include a survey of manual labor.)

(*d*) *To establish in a series of plans and surveys the locations of the industries* included in the foregoing classifications. These sites will comprise industrial districts clearly delimited and isolated from other zones in the region. The selection of these zones will in each region be governed by topographical conditions, the direction of the prevailing winds, the facilities for the disposal of waste, and other factors. Provision should be made for the expansion of these zones or for the creation of new ones. The plans and surveys will also establish the relationships between these and other zones, and will indicate the network of principal highways serving to connect them.

(*e*) *To promulgate,* upon the initiative of the state, the municipalities, or the governing bodies of the region, *the necessary laws and*

[2] From *Planning* (London), December 1, 1936, p. 1, issued by the Political and Economic Planning Association.

[3] The regions where industrial zoning is enforced by law are so rare that this generalization holds true.

[4] In the United States the National Planning Board, established July 30, 1933, was replaced by the National Resources Board and Advisory Committee, established in June 1934, then by the National Resources Committee, June 1935, which gave place to the National Resources Planning Board, July 1939. This board has, besides other functions, that of: "Listing for the President and Congress all proposed public works in order of their relative importance with respect to (*a*) the greatest good to the greatest number of people, (*b*) the emergency necessities of the Nation, and (*c*) the social, economic, and cultural advancement of the people of the United States." (*United States Government Manual,* 1940, p. 44.) Interesting analytical work of this type has been done by these committees and boards.

There are very few examples of *well-planned industrial developments*, where the buildings, as well as their arrangement and spacing, constitute a whole.

There is no reminiscence of the "black period" in such developments as this one of the Bat'a works in Czechoslovakia. The concrete or steel elements of these buildings, their big glass surfaces, and their simple forms compose an agreeable ensemble with the dwellings near-by, which are built on the same principle.

ordinances to assure the execution of these master plans for industrial zones and to guarantee their future development.

These provisions will also serve to restrain indirectly an unbridled competition which tends to accentuate waves of unemployment and to produce all kinds of irregularities in an economic life already marked by severe crises.[3] They will, moreover, make it possible to foresee the risks which might result from a bad distribution of industry — for example, the air-raid risk, greater wherever industry is excessively concentrated. They should be so formulated that natural sites may be protected against the damage and destruction caused in the past by industrial expansion. In addition, they should recognize the desirability of correlating the plans for industrial development with those for the various projected public works (housing, hospitals, schools, etc.), so that the public funds invested in these works will not be wasted.

These provisions are only a few among many which should tend to stimulate an industrial development related to a harmonious reorganization of the city and its entire region. For the principal aim of this reorganization should be the improvement of the living conditions and the resources of the inhabitants of a whole region or country, even though the change may involve the sacrifice of certain local interests.

In such a planned region, every industry would form part of a well-balanced whole, a closely knit economic unit. *Obviously, to create an organic and well-balanced unit out of the industrial regions developed in our time represents a grave problem, a long and difficult task.* For the scope of this problem gives it the sense of economic and social redevelopment. Decrying piecemeal measures, which can never satisfy more than the needs of isolated areas, arbitrarily selected, its proposals have the significance of national reconstruction.

But this is necessary and should be undertaken. And once laissez-faire policies are abandoned and this problem is analyzed in the light of reason, the errors of those policies will be only more apparent.

[3] Those measures which are outside the province of town planning itself are not dealt with here.

The future of cities depends upon this industrial redistribution, which calls for the collaboration of economist and town-planner.

Modern Construction Technics Possesses the Equipment Necessary for the Transformation of Work-Places — Examples of *good industrial buildings* are already sufficiently numerous to permit us to foresee the great possibilities assured in the application of modern methods of construction to buildings of this type.

We have only to compare certain industrial buildings of today with the best examples of several decades ago to observe an undeniable progress.

The application of new methods of construction and the use of new materials in the erection of some factories has increased their operating efficiency. It has been possible to prove that this efficiency may be translated not only into the actual production of the plant but also into the preservation of the energies and the general physical welfare of the employees.

The following are some of the factors[4] which have contributed to the transformation of places of work:

Steel or reinforced concrete frames, reducing the number of necessary supports to a minimum. Wood and brick are unable to give a similar freedom of planning.

With the use of these frames, *window space* is no longer limited by the construction of supporting walls.

Artificial or natural lighting can now be had as desired, and in recent years has found efficient forms.[5]

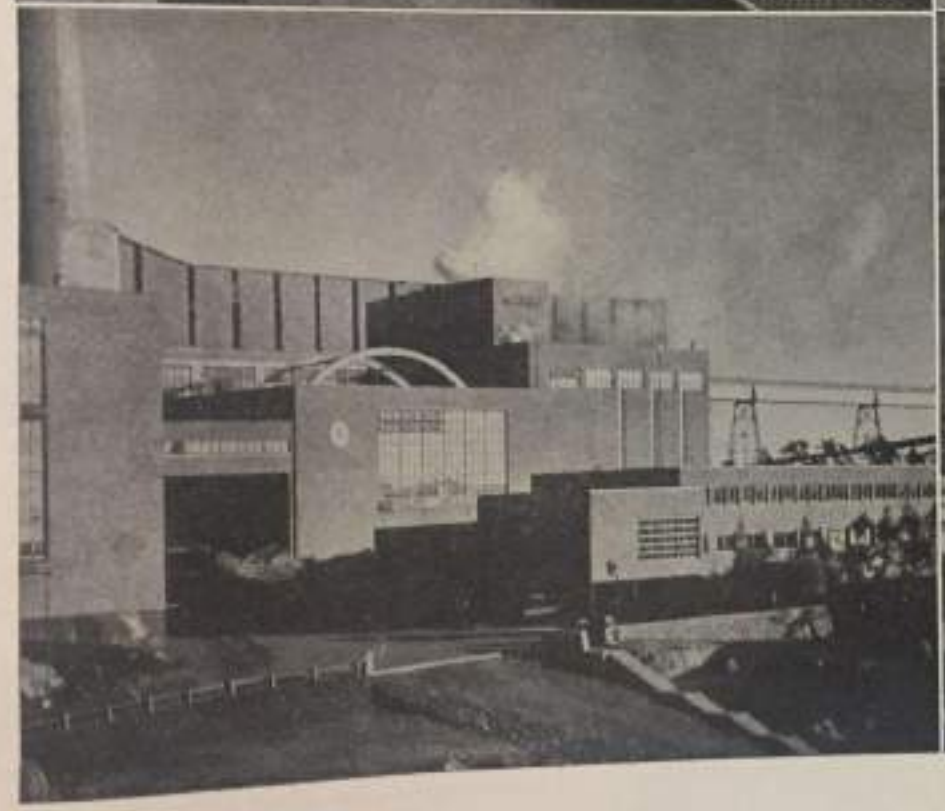
New covering materials afford *efficient insulation* against exterior elements, such as cold, heat, and rain.

Owing to the use of these materials and to *new heating and cooling systems*, any desired temperature can be maintained at will in factory or office.

[4] Only the most common are mentioned here, certain industries involving factors of a special nature which we cannot include.

[5] In the United States several plants of recent construction have been built without windows. Natural lighting has been advantageously replaced by artificial lights, which are less changeable. A.R.P. measures also advise this.

Upper left: A windowless plant in Ohio. Lower left: A factory in Sunila, Finland. Upper right: A factory in Rotterdam. Lower right: Interior of a modern plant in Detroit.



MODERN BUILDING TECHNICS permits the building of factories that can compete in perfection with the machines they shelter. These examples show factory buildings where concrete and steel result in light structures that allow a free disposition of interior space and of window surfaces.

Proper ventilation can be achieved by the use of mechanical devices of relative simplicity. *Air conditioning* has come into general use in certain industries.

To a great extent, modern machines tend to *eliminate noises and vibration.* These can also be reduced through proper installation and cushioning.

Smoke reduction can be accomplished to a substantial degree through methods assuring greater combustion. In certain industries complete electrification is both desirable and easily attained.

In short, modern building technics permits the construction of workplaces which will be able to conserve much energy, both human and material, that are still wasted today. While the consequences of this waste have hitherto usually been ignored, the point has been reached where we are not only aware of them but are also equipped to defeat them.

The general use of these methods and their application to ensembles of buildings (industrial zones or business districts), subject to new planning, are desirable. They should, in fact, become obligatory through new legislation, the essence of which would be that of appraising each factory as part of a production unit, whose efficiency would depend upon the application of a type of construction that fitted the case.

SKYSCRAPERS

Toward 1880 the largest American cities experienced a growth unequaled in tempo anywhere else in the world.

Around this date New York begins the construction of buildings of ten or twelve stories devoted exclusively to business offices. Not much later, in 1884, the first skyscraper, eighteen stories high, is built in Chicago. Skyscraper construction then assumes large-scale proportions in New York, Chicago, Minneapolis, especially after the turn of the century, spreading throughout these and other cities during the succeeding years, until building is finally retarded by the stock market crash of 1929.

Skyscrapers owe their existence to modern technics; for without the steel that composes their frames and the electricity that runs their elevators they could not have come into being.[8] Yet many other elements have been added to these structures: electrical devices of many kinds; large metal-framed windows; special wall coverings; systems for eliminating waste; freight elevators; escalators; telephone networks; ventilating, heating, and air-conditioning systems. All these being subject to the requirements of special conditions, they have brought about the development of a virtual *skyscraper industry.*

These organs of the skyscraper have become technically more perfect with each new building constructed. As may be observed in the following data on Rockefeller Center, however, their complexity has also increased in order to meet the needs of great numbers of people.

"Complete with everything but a mayor and a city hall, this 12-acre city within a city, whose 14 buildings encompass 5,000,000 square feet of rentable space, maintains an army of 2,400 employees.

"These employees care for the needs of the 26,000 persons that work in Rockefeller Center. An additional population of approximately 125,000 persons come to the center each day on business or pleasure. This total of 150,000 is surpassed by the population of only 56 cities in the entire United States.

"As many as 300,000 men, women and children have come to the center on Easter Sunday to see the spring flowers and shrubs. . . .

"The 200 elevators in Rockefeller Center require 300 operators and 50 mechanics. Those elevators handle approximately 270,000 passenger rides a day; it is estimated that, operating at full schedule, those in the central building (R.C.A.) alone cover a total of *1,500 miles!*" [9]

What is curious to observe is that while skyscrapers have been equipped and perfected during the last few decades as individual

[8] Elevators of the steam-driven type appear in New York around the fifties (first passenger elevator by Otis in 1857). Hydraulic types are introduced in the seventies. The *first elevator* (steam type) *in an office building* was installed in New York in 1869. The first successful electric elevator dates back to 1889 (Otis Brothers in New York).

[9] *New York Sunday Mirror*, July 28, 1940, and a report from Rockefeller Center, 1941.

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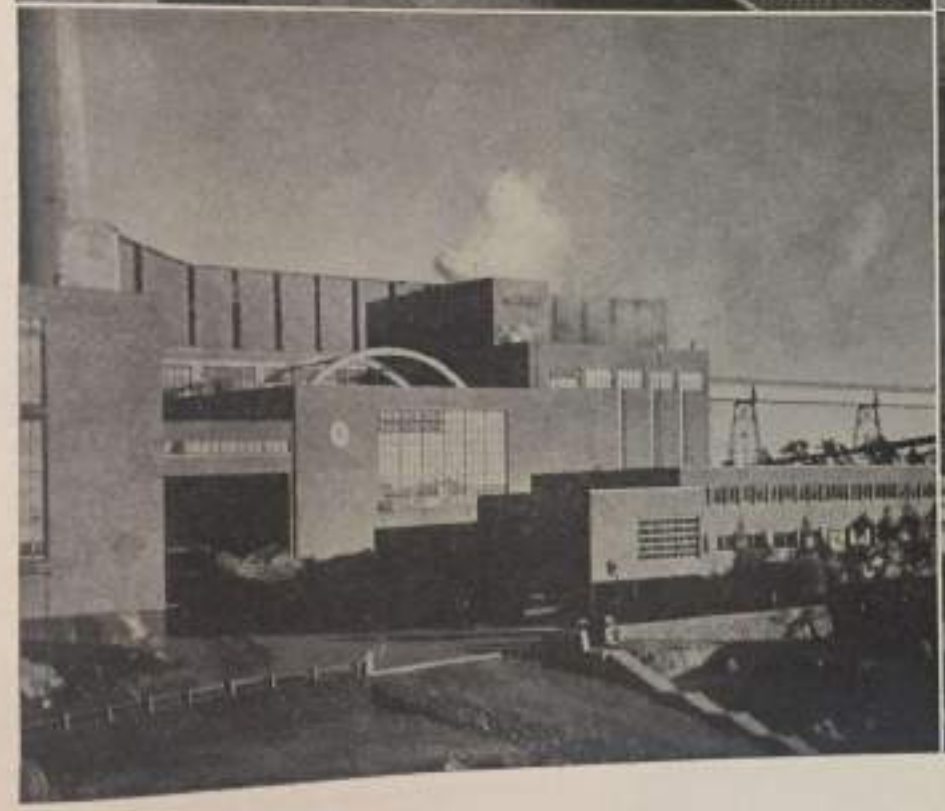

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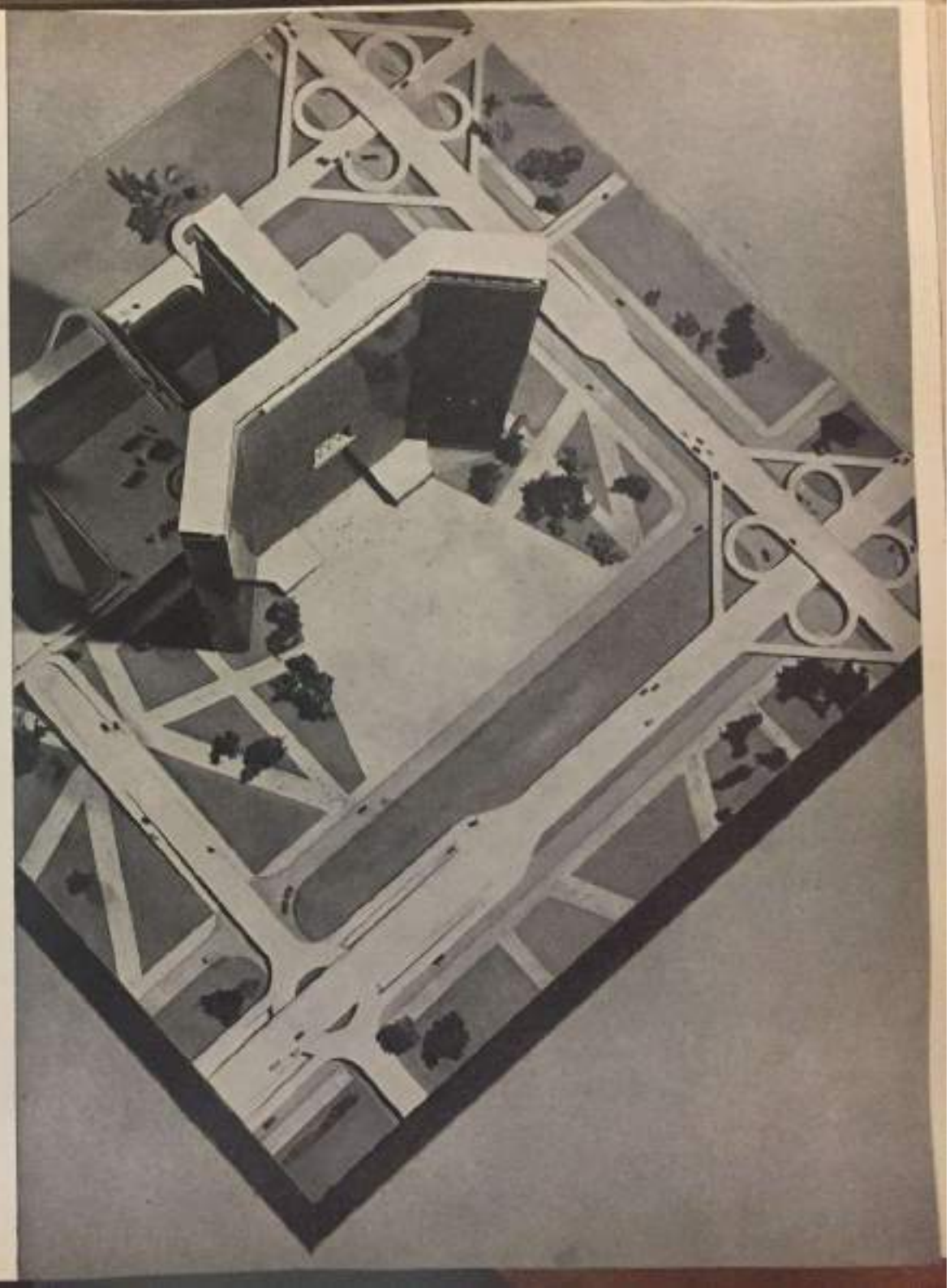

SKYSCRAPERS, PAST AND FUTURE. Skyscrapers have been constructed into areas of minimum size. In rush hours they pour thousands of people into congested narrow streets within a few minutes, disorganizing traffic in the surrounding thoroughfares. In the future, skyscrapers should be favorably situated on a terrain of sufficient area. The high concentration of population requires special arrangements for traffic and a considerable amount of parking space. This model shows how a building of this type, if not compressed into a small area, could fulfill its function without creating traffic problems. This skyscraper harmonizes in scale and in form with the landscaped areas and the parkway design that constitute its essential complements.

structures, their locations, from the standpoint of their mutual relationship, have never been controlled by planning. Their effects upon surrounding structures have also been ignored. They have mounted toward the sky from old street alignments and have contrived to continue their services downwards into basements of several stories. They have always been compressed within too little horizontal space, being surrounded by lower structures which decay in their shadows and do not allow sufficient room for parking or other needs.[10] In rush hours they pour thousands of people out into congested streets within a few minutes, disorganizing large areas of the surrounding districts. When all their effects upon the city are considered, it is little wonder that skyscrapers have finally provoked a movement of opposition which denies that they have any justification.

The plight of the skyscraper today should teach us the lesson that the technical possibilities at hand are far-reaching, but that the success of their application depends upon their proper treatment.

In the future, skyscrapers should be situated on a terrain of sufficient area, the whole of which would be planned with care. *Their concentration in height is justified only if counterbalanced by a liberation of the surrounding land.*

- *"Town-planning is a science based on three dimensions and not two. It is in admitting the element of height that efficacious provisions can be made for traffic needs and for the creation of open spaces for recreation or other purposes."* *Town-Planning Chart*

The vertical concentration of populations produced by skyscrapers requires special arrangements for traffic and a considerable amount of parking space.[11] In addition, it requires the laying out of isolating bands of lawn and trees to free the offices from the noises of vehicles.

[10] Rockefeller Center suggests a new approach, pointing the way toward the treatment of a group of buildings on a new basis. See Sigfried Giedion, *Space, Time and Architecture* (Cambridge: Harvard University Press, 1941), pp. 569–580.

[11] The 125,000 people who visit Rockefeller Center each day would cause approximately 15,600 automobiles to park here daily. The 25,000 employees would require parking space for 3,000 cars (counting eight men to each car, the ratio for New York City).

The skyscrapers themselves should be sufficiently widely spaced to afford light, air, and view.

THE LOCATION OF INDUSTRIAL ZONES IN RELATION TO OTHER URBAN ZONES

- *"The distances between dwellings and work-places should be direct and traversable in a minimum of time."* *Town-Planning Chart*

Once the industries are classified and their locations established according to the provisions of a master plan of the region, the task of connecting these industrial zones by direct routes to other urban districts will no longer present the difficulties of today.

This network of roads may be of extreme simplicity, for it is the absence of zoning which at present complicates the whole system. Thousands of people leaving places scattered throughout the city must be carried to places which are also scattered in all directions.

If dwellings were grouped in neighborhood units, the number of points of departure would be considerably reduced. Direct means of communication (express highways) could connect these points with those leading to the industrial zones, likewise limited. Assuming that these connecting routes are express highways, distance in itself will have much less importance than it has today in the ordinary type of street, with its sluggish movement of traffic and its frequent crossing stops.[12] Nevertheless, distances should be reduced to a minimum, in so far as this is possible; for in the sum total of daily journeys the smallest increase in distance eventually leads to a considerable loss of time.

The factors controlling these distances vary in each case. Each city should therefore seek its own scheme for the determination of its highway plan. But one condition which applies universally is that imposed by the necessity of isolating industrial zones from the other zones of the city.

[12] The Transportation Engineering Board of the City of Los Angeles "recommends, as in the public interest, the controlled use of express highways by rapid transit buses." These express buses would cover great distances on such highways, and would make stops at "specially provided berths convenient for transfer to distributing surface lines" (*A Transit Program for the Los Angeles Metropolitan Area*, Transportation Engineering Board, City of Los Angeles, 1939).

Industrial areas and those planned for other functions should be separated by open spaces (green bands). Heavy industries should be more definitely isolated from dwellings, office buildings, civic centers, and other nonindustrial areas than lighter industries.

These industrial areas should have direct means of communication with all the important centers in the city complex. Communication with the districts in which the working population lives must be especially easy. Direct communication can be established by means of parkways for light traffic and special highways for freight. If a constant flow of traffic can be maintained between the main focal points of the city and the industrial areas, the distance between them need not be extremely short.

Industry and Dwellings

- *"Industrial districts should be independent of residential districts (indeed, of other districts as well), and should be isolated by means of green bands."* *Town-Planning Chart*

These green bands, or isolating bands, will cause a certain increase in distances. Usually they will contain no structures of any kind, though there may be exceptions in some cases. It should often be possible, however, to plan them as parks or to devote part of their area to fields for sports or to allotment gardens.

The object of such zones will be that of serving as isolating elements, protecting the residential districts and other zones of the city from the nuisances and hazards caused by smoke, gases, and factory noises.

The width of these green bands or belts will therefore depend on various factors, and can be determined in each case only after an analysis of these factors.

The principal factors concern the character of the industries found in each zone; for, according to their nature and in consideration of the combustibles used, the need for proper isolation will be more or less great. As a general rule, heavy industries should have more isolation than light industries. The locations of those industries which are found to present actual hazards will require special study.

One factor which must be considered in planning these green bands is the direction of the prevailing winds of the region. These carry smoke, gases, and noise for great distances. Since the green bands will serve as filters and mufflers of noises, trees, properly placed throughout the band, will tend to lessen the nuisance.

Industrial Areas and Air-Raid Precautions — Finally, another point to be considered in favor of the creation of these buffer park spaces is the protection that they would afford against the air-raid menace by separating vital industries, primary objectives of attack, from dwellings. *In view of this menace, the mingling of industrial buildings with dwellings, such as is found today in all cities, should be definitely condemned.*

"There is a considerable measure of agreement between the generally accepted principles of planning and those of Air Raid Precautions in as much as large concentrations of populations or industries and crowded developments are bad from both points of view. . . .

"Large concentrations of industry should be avoided; in all cases they should be *well separated from residential areas by a belt of open space.*

"Interspersal of small parks, playing fields and allotments is sound planning and adds to safety.

"*Buffers of park land* or green belts, from 100 to 400 yards wide, according to circumstances, ought to be planned. . . .

"Trees are of great value as screens from observation from the air. . . ." [11]

Bombs may reinforce arguments for the decentralization of industry requiring a replanning of industrial areas. The decentralization of large industries and their dispersion in the form of small factories would seem to be the method of treatment guaranteeing the maximum of safety. These small factories could, in turn, be set up in sections independent of each other so as to localize damage. The whole should be camouflaged, as should also the outstanding landmarks in the vicinity. Parking areas should be subdivided and scattered, and their location coördinated with that of air-raid shelters.

Only Certain Small Industries Should Remain near Dwellings

- *"Certain small industries intimately related to urban life, and not the source of any of the inconveniences or nuisances mentioned, should remain within the interior of the city, serving its different residential districts."* *Town-Planning Chart*

Among such industries would be repair and service shops of all kinds and those enterprises engaged in provisioning the inhabitants.

While many of these small industries are basically in the nature of crafts, some are closely attached to dwellings and should be in-

[11] *A Summary of the Memorandum on the Civil Defense Act*, issued by the Town Planning Institute, London, September 4, 1939.

cluded among the services of the neighborhood units. In these small industries, the muffling of noises and vibrations and the elimination of smoke and gases (through electrification) should be obligatory. Even a minimum isolation of these activities from dwellings is desirable.

Conclusion — We have just examined the factors which make it advisable to isolate industrial zones from those devoted to other urban functions. Increasing electrification might ultimately modify these factors, removing certain nuisances, such as, for example, those caused today by the use of coal. But other factors, like the air-raid menace, unfortunately are only too pressing.

The Strategic Location of Industrial Zones

- *"It is necessary that industrial zones of importance should be contiguous to railroads, to navigable rivers or harbors, and to the principal transportation routes."* — *Town-Planning Chart*

All industrial zones should have easy access to means of transporting goods. With proper planning, journeys of unnecessary length, so common in the hauling of both raw materials and finished products today, will be reduced. Trucks bound for main factories will no longer be obliged, as they frequently are now, to cross the whole city, retarding traffic or snarling it altogether. The flow of materials and products to and from factories will be rapid and unimpeded, obviating the tremendous waste inherent in the time-losses of today.

To effect a transition from present conditions to the efficiency assured by rational planning, industries throughout the metropolitan region should occupy the strategic sites which are most appropriate to their functions. A modern network of commercial highways, with crossings at different levels, would contribute substantially to this reorganization of industrial zones.

Business Districts and the Rest of the City

- *"Business districts should enjoy favorable means of communication linking them to residential districts and to industrial zones."* — *Town-Planning Chart*

Most business districts are situated in the congested parts of the city. Consequently, communication between the business section and other parts of the city is usually carried on with great difficulty, through narrow streets, in a sluggish flow of traffic.

These links between the business district and the rest of the city are nevertheless of vital importance, and should be treated accordingly in any master plan of urban reorganization seeking to effect smoother means of communication.

To this end, express highways serving as channels for rapid transportation to and from these districts should be planned, so designed that the evacuation of great masses of the population in the business district may be accomplished within a minimum of time. The East River Drive and the West Side Express Highway, in New York City, *exemplify what can be done when certain limits of congestion are reached*. Projects of this nature should not, however, be postponed until congestion reaches extremes, when obviously the difficulties of their execution only increase and their cost becomes greater.

SUMMARY: PRESENT FACTORS OPPOSING AND FAVORING A GENERAL REORGANIZATION OF WORK IN CITIES

The measures which have just been presented as the most necessary steps toward the reorganization of work in cities will encounter certain obstacles, as in the case of each of the other urban functions. Considering here only the most outstanding, and those of universal application, we might list the following:

(*a*) *Laissez-faire policies*, which have become deep-seated in all phases of civic affairs and are often defended in the name of free competition. Those responsible for these policies, which seem to be consecrated by custom, will not listen to the theories or the counsels of technicians, and oppose in advance the adoption of any plan.

(*b*) *Free competition.* Having been considered as a basic principle fostering industrial development throughout the world, it is opposed to any form of submission to replanning on a widespread scale. To most industrialists, the very idea of such replanning suggests a *limitation of their power, which cannot be countenanced.*

Obviously such an attitude bases its reasoning on conditions which no longer hold true. It is a reflection of those periods of general

prosperity when a thriving youthful industry, in the midst of its rise, could not foresee the blind alleys into which, with the coming of depressions or economic crises, it would be led by the lack of planning.

(c) *The present system of allotment of land*, which has reached an arbitrary and excessive degree of subdivision. For the benefit of industry as well as for dwelling, *a consolidation of these lots so as to form useful land units* is now required. Once the industrial zones have been delimited, this consolidation should be made in accordance with the exigencies of the industries affected, as required by their individual character. Certain industries, for example, will require vast areas (see p. 123, on the Ford factory at River Rouge); others will need only small areas, with allowances for possible expansion. The street systems and parking spaces of these zones should conform to these needs. Green bands or buffer parks should be considered as an integral part of these land units.

These obstacles become much greater through the fact that they are representative of common practice, unaltered over a long period of time. To surmount them, one must also be sharply aware of the widespread misunderstanding of the actual situation that has been caused by the disorder existing in industrial districts and in zones of work in general. *Precise information* on these problems, supported by the necessary statistics, would be useful. For the waste entailed by this disorder would surprise not only the great masses of the people but also public authorities and the industrialists themselves.

These obstacles once seemed so great that only a decade ago it would hardly have been possible to discuss their removal. In these days, however, certain new factors have appeared which tend to modify their importance. The most outstanding of these are:

(a) *The economic crisis of our time*, which has profoundly changed the general situation in so far as it concerns the distribution of industries or the continuance of the policies of laissez-faire and of free competition. For these policies have become detrimental forces rather than privileges or advantages, even to private initiative. And in the present moment of disorientation, some directing agent, serving as a guiding and coördinating force, becomes increasingly indispensable.[14] *This does not imply a curtailment of individual liberties;* on the contrary, it might serve as a guarantee and a protection to all organized initiative. Such a guarantee has become necessary today.

(b) *The chaos* of our cities, which has become more evident as a result of the economic crisis of the last decade. A state of congestion in the various urban functions, which hinders a normal functioning of the city, has been developing for many years. Today this condition is evidenced by the decentralizing movement which menaces our whole urban economy. As has already been pointed out, factories and other work-places have begun to move to locations outside of cities.[15] The present moment is therefore a propitious one in which to *direct* this exodus to the advantage of the industrialist as well as to that of populations in general.

(c) *The air-raid menace.* This factor, too, makes urgent the adoption of a master plan for industrial zones, removing residential districts from vulnerable vital industries and redistributing industries in general so as to give them greater protection against the air-raid menace than they have today.

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[14] See note on p. 141.

[15] The movement "back to the city" produced by the intensification of production due to the National Defense Program is of an emergency type and, as such, is not referred to here.

PART TEN — TRANSPORTATION

In the industrial, business, recreational, and home life of all nations, the motorization of transportation has wrought great changes. The distribution of population has everywhere been affected by it. In urban centers, it first drew people to the heart of cities, and later distributed them toward the outskirts and the open spaces beyond.

NEW MEANS OF TRANSPORTATION CHANGE CITIES

The utilization of new motive forces in transportation has brought about far-reaching changes in urban living conditions.

These changes are of comparatively recent occurrence. Animal traction, dependent on muscular force, is as old as our cities and endured until our time. Then with one stroke it disappeared from our highways and streets, almost before our eyes.

Steam, electricity, and gasoline sped so quickly into our cities that within two decades we saw a complete transformation of our traffic problems, but without realizing its enormous consequences to our civilization.

Results of the motorization of transportation:

Speed has increased tenfold.
Traction power has multiplied at a vertiginous rate.
Distances between cities have been shortened, as have those between industries and their sources of raw materials.
The geography of the world has been transformed. Cities, whose roots are in the soil, have felt the consequences of this geographical transformation.

Interurban and Urban Transportation — The effects of the motorization of transportation upon cities may be indicated in two different spheres:

(*a*) *That of interurban transportation*
(*b*) *That of transportation within the urban zone*

The first development precedes the second by almost a hundred years, being introduced by the use of steam power in navigation and in the railroad. The combustion engine and the use of electricity as a means of traction follow toward the end of the nineteenth century and become general in the twentieth. Aviation has appeared and developed in the last few decades.

Through all these new means of transportation, *the interaction of one city upon another* — the exchange of products, inhabitants, and ideas — *has acquired a new rhythm.*

Centripetal and Centrifugal Forces — The rigid routes of the railroad began a hundred years ago to deposit men and goods at fixed points, there creating great concentrations of population and industry. The large rail terminals of our present cities are symbols of this *concentration.*

But the automobile and the highway systems whose construction it encouraged have tended to break up the rigidity imposed by the railroad. For automobiles, which made possible the transportation of men to the very thresholds of their dwellings, have been largely responsible for a movement contrary to that caused by the railroad — that of *the decentralization of cities.*

The static cities of former times have now become mobile. And this mobility is identified with modern urbanism not only in its physical sense but also in a spiritual sense.

The following pages will consider the changes produced by new means of transportation within the old urban structure, whose rigid and traditional layout is still based on the traffic needs of horse-drawn vehicles. The sum of the consequences of these changes may be considered as a terrific impact between the old street system and the new vehicles introduced into that system.

This chapter further indicates the appearance of the elements of a new street system and reveals the principles whose development would permit the planning of streets according to the exigencies of modern transportation needs.

The Motorization of Transportation —For thousands of years men have traveled by water and land routes. Augmenting their own muscular strength by that of animals, or propelled by currents of water or wind, they have transported themselves and their products from one town to another.

Of means of locomotion, for centuries they had no other choice than journeying

afoot or on horseback
by horse-drawn vehicle
by rowboat or sailing ship

In the last hundred years, however, men have developed the steam-

after 1500 the flow of new products and the opening of new markets transforms the cities of western Europe. The development of the American continent follows. Below: The world known to Europeans in 1550. For centuries men have endeavoured to shorten the distance separating the two continents, but the most revolutionary changes have taken place since the beginning of the nineteenth century. During the last hundred years the *barrier of the Atlantic* has been *reduced by four-fifths.*

The *Sirius* was the first steam vessel to make repeated voyages across the Atlantic. This was in 1837, and the journey required twenty-five days. In the 1930's the S.S. *Normandie* accomplished the crossing in five days. The Transatlantic Clipper requires less than one day. This regular air service between New York and Lisbon was established in 1939.

ship, the railroad, the automobile, and the airplane. To the last few decades belongs the evolution of more perfect forms of these new means of locomotion, with the result that the graph of their speed rates mounts precipitously.

Natural barriers obstructing the movement of men and their products have been conquered by modern technics.[1]

DISTANCES REDUCED

The Water Lanes — For centuries the ocean represents the unknown. Towns on one side remain isolated from those on the other; civilizations develop without direct contact with each other; and the exchange of products and ideas between countries on the two sides is delayed almost until modern times.

In 1819 the Atlantic is crossed for the first time by a steamship, between New York and Liverpool.

In 1837 the *Sirius* is the first steam vessel to make repeated voyages across the Atlantic.

One hundred years ago the voyage from New York to Liverpool took *twenty-five days*;[2] recently it was accomplished in five days (by the *Normandie*).

The barrier of the Atlantic has been reduced to one-fifth of its width of a hundred years ago. The map on page 157 shows the shrinkage of the Atlantic in one century.[3]

Paris was at about the same *time-distance* from New York in 1939 that it was from Marseilles in 1850.

The Skyways — Within a few years of our own epoch, hours, not days, have come to measure great distances.

In 1903 Orville and Wilbur Wright construct the first airplane capable of carrying people. Further discoveries in airplane construction follow in quick succession. Still in its experimental phase in 1910, aviation shows an astonishing evolution between that year and the present.

In 1927 Lindbergh achieves his epochal crossing of the Atlantic by plane, traveling from New York to Paris in thirty-three hours.

Air lines operating on regular schedules have been introduced in all parts of the world since 1930. With the establishment of definite air routes and the multiplication of airports in all latitudes, commercial transportation by air has acquired universal significance. A network of air lines unites all big cities today.

The year 1939 marks the establishment of regular air service between New York and Lisbon, a crossing which requires only twenty-three hours. The width of the Atlantic has again been reduced by four-fifths.

The Railroad and the Growth of Cities — *The first locomotives* were constructed in England to haul wagon-loads of coal at the collieries.

The year 1825 marks the use of the first passenger train, which operated between Stockton and Darlington, in England.[4]

In 1830 Europe had 152 miles of rail lines; the United States, 53 miles.

Twenty years later, in 1850, Europe had 14,964 miles of railroads; the United States, 8,591.

It is at this time that the greatest concentrations of population begin to take place in cities everywhere.

In 1860–1863 London builds its subway, the first construction of this sort.[5]

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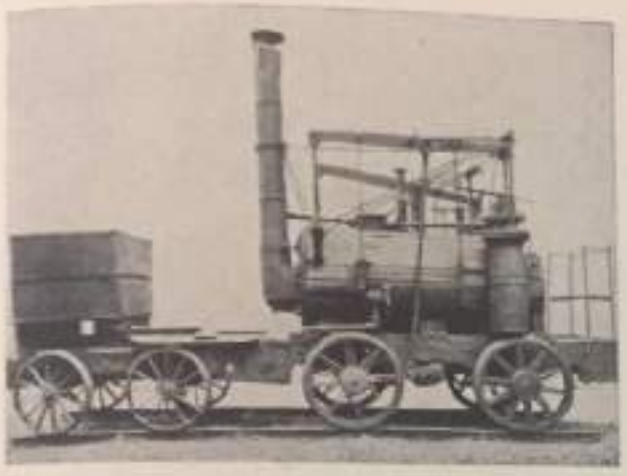
[1] The popularization of travel as we know it today has taken place within the past twenty years, or since the end of the war of 1914–1918.

[2] *Christopher Columbus* took *two months and nine days* to cross the Atlantic in 1492.

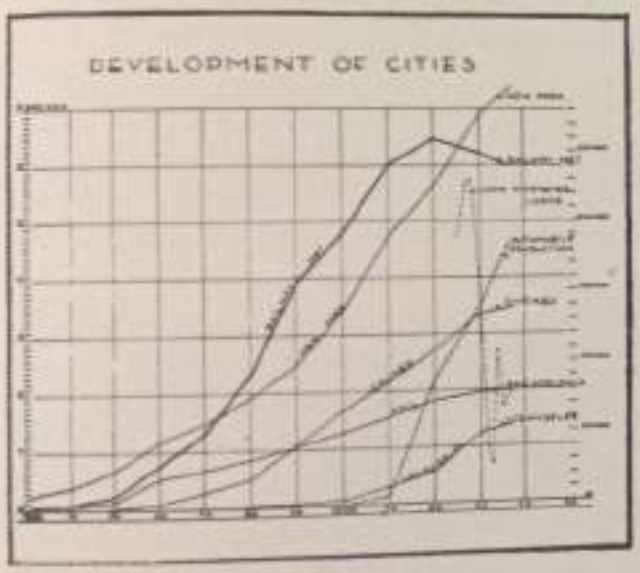
[3] *Life*, October 23, 1939.

[4] In 1823 the English Parliament authorized the construction of a railroad between Liverpool and Manchester. It was built in 1829.

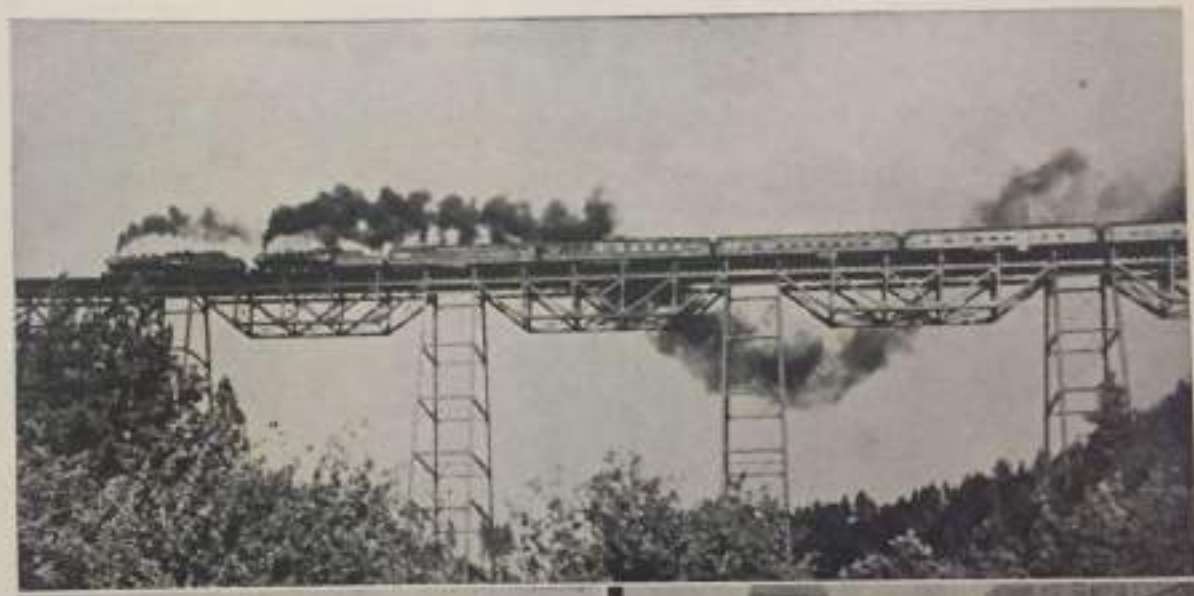
[5] 1878 — New York builds its first elevated railways.
1879 — The electric railroad is introduced.
1880 — Berlin introduces the electric tramway.
1888 — The Paris-Constantinople express is established, and construction of the Bagdad railway is begun.



England used the first locomotives in the coal mines. Engineers had to solve many difficult problems before transcontinental lines could be established. Big railway terminals symbolize today the period of great concentration of populations in the central areas of cities.



THE RAILROADS HAVE PRODUCED GREAT CHANGES IN URBAN DEVELOPMENT. The rapid extension of railway lines can be expressed by an upward curve that follows very closely that of the growth of urban populations for nearly a century. This changes when automobile transportation becomes predominant.



In 1869 the Union Pacific Railway is completed in the United States, joining the Atlantic and the Pacific. Cities take on a sudden growth in the interior of the American continent.

1871 — Urban populations show an amazing growth throughout the world. *The movement of concentration is at its height.*

1889 — Europe has *136,863.57 miles* of railroads; the United States, *161,360.71*.[6] Cities now exhibit a spectacular growth. During a hundred years the graphs showing the growth of cities and the extension of railroads follow corresponding upward curves.

Transportation over Inland Routes — Rivers are man's first highways, convenient for the transportation of both passengers and goods. In functioning as natural channels of commerce, their shores become strategic sites for cities.

In imitation of the people of the East, the Romans built the most extensive road system of ancient times. But during the Middle Ages these roads fell into ruin.[7]

After the year 1000, rivers become the most heavily traveled routes in Europe. And during five centuries, from about 1200 to the inception of the railroad, inland water routes are increasingly favored. River transport owners form one of the greatest corporations in European commerce.

A marked increase in transportation takes place with the growth of commerce in the eleventh century. Yet after the Hundred Years' War and the wars of religion many roads in Europe again fall into a state of abandonment.[8]

Up to the Renaissance the horse remains a luxury — the mount of the rich man, of the soldier, and of the courier.[9] In France several hundred wealthy gentlemen own immense stables, while a few thousand members of the bourgeoisie possess the means of harnessing a carriage; but the great masses of the people go afoot.[10] Beginning with the Renaissance the use of the horse becomes far more widespread.

In the time of Richelieu, who inaugurated the "Royal Mail" in 1622, coach lines multiply in number, exceeding passenger transportation by water routes.

Between 1600 and 1700 street traffic grows considerably. Accidents and the noise of traffic are frequently mentioned in memoirs of the time.

In 1660 the first regular transportation of passengers is begun by stagecoach between London and Oxford.

Toward the beginning of the eighteenth century public vehicles become not only more abundant but sufficiently varied in type to permit the traveler to make a selection subject either to his whim or to his purse.

During almost an entire century the constantly growing railroad traffic absorbs much of the traffic of the highways.[11]

Around 1930 the construction of great transcontinental motor highways, linking important centers, is undertaken in Europe.

Parkways multiply in the United States in the decade 1930–1940; this nation today owns the finest examples in the world.

With the construction in American cities of speedways like the Outer Drive in Chicago, and the West Side Express Highway and the East River Drive in New York, the modern highway flows straight down to the heart of the city.[12]

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[6] In 1831 railways in the United States "began a moderate development along the Atlantic seaboard. By 1850 city after city in the Northeast had been linked together by iron rails, and the trend was westward to the Mississippi. Within three years eastern railroads reached Chicago, in 1855 St. Louis." (Ralph L. Woods, *America Reborn*, New York, 1939, p. 6.) For other figures, see Victor Dumas, "Tableau chronologique," *La Vie urbaine*, January 15–March 15, 1934.

[7] Valiant travelers of the Middle Ages made their journeys afoot, averaging fifteen to twenty miles a day.

[8] The free movement of traffic was further encumbered by persisting practices of the feudal system — arbitrary land divisions, exactions of tolls, and the exercise of local privileges that served as barriers to travel.

[9] Not until about the year 700 are the saddle and stirrup (used by the Chinese for two thousand years) known to the peoples of western countries. The horseshoe dates from the same time.

[10] See M. Ginot and A. Vaïsse, *Les Voyages* (Paris: Bourrelier, 1935), p. 22.

[11] One must wait until the year 1840 for the construction (under King Louis-Philippe) of a suitable road system uniting all the towns of France.

In England the engineer McAdam created the modern road surface, smooth and elastic (c. 1820). This type of road, affording easier traction, brought about an increase in the speed of vehicles.

[12] As early as 1922 the city of Chicago constructed elevated streets (Michigan Avenue, South Water Street) and express highways in order to cope with its traffic difficulties.

SYSTEMS OF ROUTES of travel were built and destroyed in the course of time as empires appeared and vanished. The Romans built the most extensive routes of the ancient world (below), and upon them their military and economic power greatly depended.

Rivers were man's first highways, the main link between cities.

The ancient chariot with two wheels was employed for many centuries without much change.

Around the year 1000 the introduction of the horse collar revolutionizes the harness and affords greater traction power.

Modern highway systems have now become a necessary part of national defense.

The Increase in Speed — The chariot of the ancients had two wheels. The chariot with four wheels, through the invention of the pivoting front axle, becomes the carriage, *but not before the end of the sixteenth century.*

For three hundred years carriage-builders try to improve their vehicles. Progress is not rapid, however, as is revealed by the following approximate figures on the increase made in the speeds of public conveyances in France throughout different periods:

In 1700 a diligence travels two miles per hour, forty miles per day.

In 1805 the coach lines, "Messageries Impériales," travel three miles per hour, fifty miles per day.

In 1847 the coach lines, "Messageries Nationales," travel six miles per hour, fifty-six miles per day.

In the following decades roads are greatly improved, new types of paving being used (about 1860 asphalt paving is introduced). The so-called "Malles-poste" coaches travel at nine to twelve miles per hour, seventy-five miles per day.

Nevertheless, the *general advance in speed was slow.* The journey from Paris to Marseilles took thirteen days in 1700 and six and a half days a hundred and fifty years later.

Not so with power-driven vehicles. The railroads, for example, increase their speed of a little more than four miles per hour in 1828 to about eighty miles per hour in 1933.

Automobiles using gasoline engines appear about 1883 (Daimler).[13]

Today motorized highway transportation has become general. There are approximately 135,000 buses of all types in the United States.[14] About three billion revenue passengers are carried annually, 750,000,000 of whom are inter-city and long-haul riders, while the rest represent local traffic.

[13] The automobile is not a one-man invention. Types using steam engines, like Cugnot's, date from 1769.

[14] *New York Times*, October 15, 1939. — Today, according to *Facts and Figures* (1941), published by the Automobile Manufacturers' Association, there are 111,387.

These few figures on the progress of speed in transportation give but a fragmentary history of the subject. Perhaps they will suggest, however, the revolutionary changes which have taken place in the interrelation of cities during recent years. The process continues, at a constantly heightened tempo.

TRANSPORTATION WITHIN CITIES: THE STREETS

- *"The street systems found in most cities and their suburbs today are a heritage of past eras (the Middle Ages, in many European cities, and later periods in America), when they were designed for the use of pedestrians and horse-drawn vehicles; as such, in spite of successive alterations, they no longer fulfill the requirements of modern types of vehicles (automobiles, buses, trucks) or modern traffic volume."*

Town-Planning Chart

Urban street systems, whether developed spontaneously or planned with forethought, have usually conformed to the needs or circumstances of the periods of their origin — the defense needs of the city and the processes of land speculation, as well as the means of locomotion.

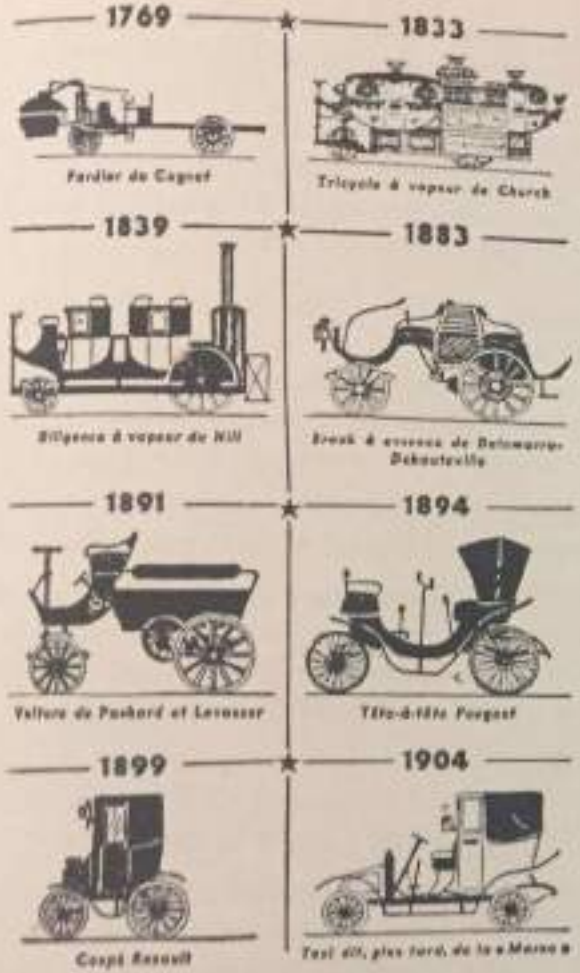
As a channel of traffic, the street should assure easy movement to both pedestrians and vehicles, without one's interfering with the other. This was achieved, more or less, as long as vehicles were drawn by horses and were few in number, a condition which lasted for centuries.

Slow Progress in Street Improvement — Serious traffic problems were unknown to the Middle Ages.[15] Though streets were narrow and still unpaved and muddy, they served the needs of the times.

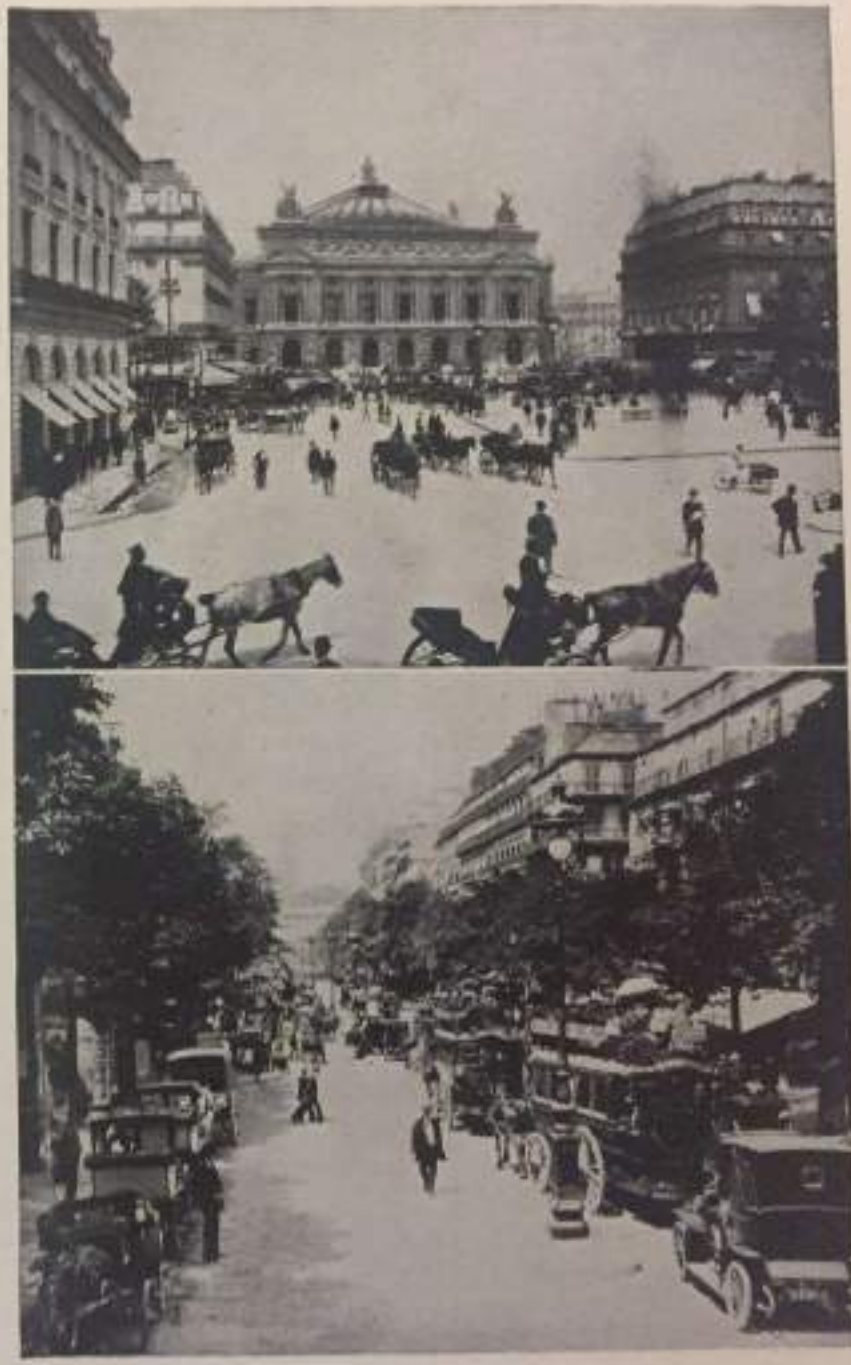
In 1185 King Philippe-Auguste of France "orders that all streets and roads of the city of Paris be carefully paved with large and strong cobblestones."[16] The same king also introduces lighting in the streets of Paris, an improvement which is later temporarily abandoned.

[15] "Quatre boeufs attelés, d'un pas tranquille et lent,
Promenaient dans Paris le monarque indolent."
(From Boileau's *Le Lutrin*. This is the Paris of Merovingian times.)

[16] *Chronique de Saint-Denis.*



AUTOMOBILES take more than one hundred years to achieve definite form and to become objects of general use. The first models were propelled by steam. Their shapes imitated those of carriages.



In these views of Paris (right), which date only from 1910, few automobiles are to be seen among the numerous horse-drawn vehicles. Pedestrians could then cross these streets without much difficulty.

The autogiro (left) can alight on small roof surfaces. Philadelphia established a service using these planes in 1939, to connect the central post office with an airfield six miles away. This new element may soon produce further changes in urban patterns.

In general, however, streets show little change in character for several centuries.

Development of Present-Day Streets — In 1670 Paris, which then had 550,000 inhabitants, again proceeded to pave, clean, and light its streets. Carriages for public use, predecessors of motor-buses, appear in the streets at this time.

Public lighting then becomes more general, Hamburg adopting it in 1675, Berlin in 1685, and Vienna in 1687.

During the seventeenth and eighteenth centuries, as horse-drawn vehicles increase considerably, streets are widened and straightened. In spite of the growing traffic, however, pedestrians move about with no difficulty, for the movement of vehicles is not much faster than that of the pedestrians themselves.

In the nineteenth century the razing of fortified zones makes room for new boulevards, and new streets are cut through the old districts.

Vienna begins to raze its fortifications in 1858 and creates the Ringstrasse.

Some of the new boulevards and streets are specially designed from the standpoint of military strategy, so that they may be commanded by artillery in case of street rioting. They are often referred to as "cannon-shot boulevards." [17] (See the work of Haussmann in Paris, 1853–1869.)

These improvements compensate only partially for the problems caused by the growing volume of traffic. Fortunately, however, speed has not yet entered into these problems, since the speed of vehicles in these times remains approximately the same.

In 1823 sidewalks are introduced in European cities. As traffic congestion grows, streets assume their present general appearance.

Changes in streets, it is evident from the length of time it takes them to occur, are slow. Street widths, for example, have often remained unchanged for centuries. And the improvements of later years, though considerable, have nearly always clung tenaciously to the framework of the old street system, that of horse-drawn vehicles.

[17] See S. Giedion, *Space, Time and Architecture*, pp. 465–501.

Such improvements would have fulfilled their purpose completely if the demands made upon them had remained the same. But new demands were made upon the old street system. And in spite of the improvements that had been made, *a real crisis in urban traffic problems began when motorized vehicles brought their new speeds to cities*, thereby completely disorganizing the traffic situation. The traditional old street pattern at once became obsolete.

The Coming of Motorized Traffic — The automobile makes its appearance at the end of the nineteenth century, around 1885. During more than a decade it is little more than an object of curiosity, just another of the period's countless inventions. Even in 1900 it is a rare experience to encounter an automobile in the street.

In 1910 horse-drawn vehicles still outnumber automobiles, and urban traffic problems remain almost the same as in preceding years.

Though the war of 1914–1918 retarded the increase of automobiles in the cities of Europe, the same period was marked by tremendous advances in the automobile industry of the United States, notably as a result of the progress made in mass production.

At this point the automobile has not long to wait to make its influence felt. For with the conclusion of the war of 1914–1918, the evolution of transportation in cities quickly gains in momentum.

During several years more, however, the horse-drawn vehicle and the automobile strive to exist together, moving side by side in the streets. But, the difference between their speeds being too great, this simultaneous existence becomes increasingly difficult. As long as horse-drawn vehicles occupy the streets, automobiles are forced to make their speed conform to that of animal traction. The problem of congestion therefore occurs with growing frequency.

Between 1915 and 1930 — the earlier years of this period affecting principally the cities of the United States — automobiles invade the streets by millions. With the passing of each year, the motorcar replaces a mounting number of horse-drawn vehicles, until these at length become no more than museum pieces. From this moment on, all the cities of the world are confronted by a situation which is rapidly paralyzing their physical structures.

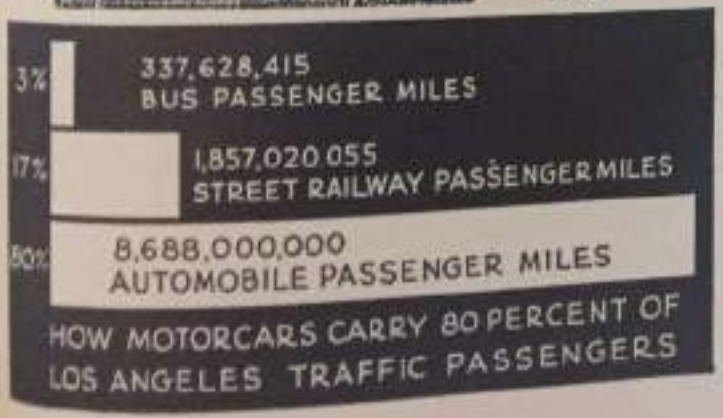
AUTOMOBILES AND URBAN PATTERNS. Although our cities have not been laid out to comply with the requirements of motorized transportation, automobiles have encouraged certain forms of haphazard expansion, such as the so-called "ribbon developments." Linear growth has to a great extent taken the place of a square pattern. The expansion of Los Angeles is based on the automobile, which makes up 80 per cent of its transportation. As a consequence, the city has 4,974 miles of streets for a population of 1,504,277 inhabitants, as compared to New York, which has 5,494 miles of streets for 7,454,995 inhabitants.

OLD

Central shopping area of Los Angeles, shaped by old transportation methods

Newest shopping district along Wilshire Boulevard, shaped by motor transport

NEW



Again it should be pointed out that the significance of the present plight of cities can be understood only if one realizes that their street systems were based on the speed and space needs of animal traction *and that they were superseded almost overnight not only because of the tremendous volume of traffic but because of unprecedented possibilities of speed.*

A Revolutionary Transformation — The following figures suggest the tempo at which this change took place in the United States, where the transformation was revolutionary in character:

Year	Total Cars Produced	Total Cars Registered
1900	4,192	8,000
1910	187,000	468,500
1920	2,227,349	9,231,941
1930	3,355,986	26,545,281
1940	4,469,354	32,025,365

The year 1929 brought the peak of production, with 5,621,045 motor vehicles, representing a value of $3,576,621,881.[18] A total of eighty-one million motor vehicles has been produced in forty-one years!

Three-quarters of all the motor vehicles in the world are in the United States. As a consequence, special characteristics and special problems have developed in the cities of this country.

The Ratio of Cars to Inhabitants — The foregoing report is more significant than the statistics of total registration reveal. For the degree of motorization of transportation which it expresses has a direct relation to the degree of traffic congestion, the number of accidents, and other consequences of the conflict between the traditional street systems and motor traffic.

A little more than *twenty-five years ago* the United States had a registration of about *a million motor cars*. Approximately *one person out of ninety-five* was an automobile owner. Today upwards of twenty-eight million cars and trucks travel the streets and highways of the United States, representing approximately *one motor vehicle for every five persons.*

In the same period the population has increased 35 per cent. Meanwhile, automobile registrations have grown 2,800 per cent and traffic more than 5,000 per cent![19]

The expansive character of cities, the vastness of cross-country distances, and mass production permitting mass-consumption prices — these are, in a sense, both causes and consequences of the rapid growth of motor traffic in the United States. As compared with other countries of the world, traffic congestion, the need for parking space, and accident rates have reached a climax in this country.

Cars and Men in Cities — Against the general figures just presented for all of the United States, the ratios of cars to men within one city, New York, are as follows.

In 1936 the New York region contained one motor vehicle to every 6.1 persons.

At the same time, New York City showed a ratio of 8.5 persons to a car; its environs, 4.3.[20]

Several factors tended to decrease the desirability and the necessity of owning and operating a car — namely, congestion, the inadequacy of parking space, the lack of highway facilities within the central areas of the region, and the availability of taxicabs and fast subway transportation.

Since 1928 the ratio has not changed as drastically as in preceding years. And little further reduction can be expected if the whole street system is not soon revised.

Statistics for the year 1939 show that one of the richest markets for the cars that poured out of the factories of Detroit was the city of Detroit itself. *Sixty-six per cent of Detroiters own automobiles.* And 68 per cent of all cars bought in Detroit are new automobiles.

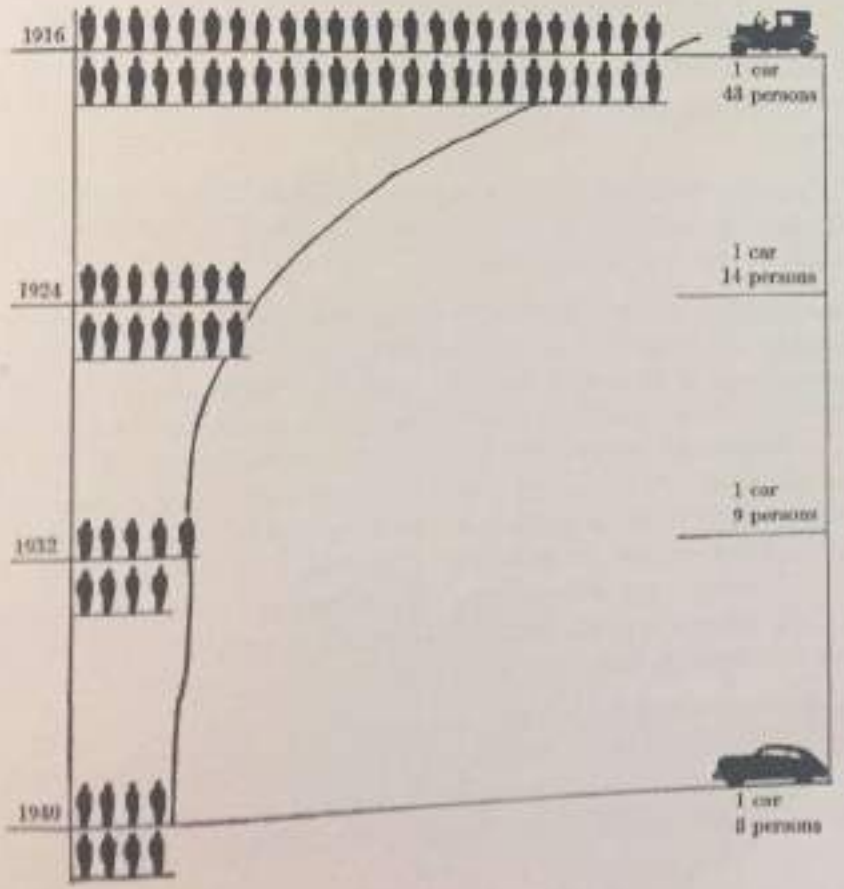
[18] *From Facts and Figures* (1938), issued by the National Automobile Chamber of Commerce, and *Facts and Figures* (1941), issued by the Automobile Manufacturers' Association.

[19] See Dudley M. Diggs, "America's Fatal Streets" (mimeographed, 2 pp.), issued by the Harvard University Bureau for Street Traffic Research, March 1938.

In England one person out of twenty-three owns an automobile; in France, one out of twenty-two; in Germany, one out of sixty-eight; in Italy, one out of 189; in Japan, one out of 560.

[20] Based on data compiled by the Regional Plan Association of New York, *Regional Plan Information Bulletin*, no. 41, March 21, 1938.

THE RATIO OF AUTOMOBILES TO INHABITANTS. Automobiles by hundreds of thousands, the result of mass production, have invaded the streets of our cities. "During the last twenty-five years population (in the United States) has increased only 35 per cent; meanwhile, automobile registrations have increased 2,200 per cent and traffic has grown more than 5,000 per cent." (Dudley M. Diggs, "America's Fatal Streets.") The ratio of automobiles to inhabitants in our cities is a factor that the town planner must consider. The graph below shows the increase of automobiles in relation to the population of New York City. The tendency toward stabilization in late years has been attributed to the difficulty of operating a car in the congested streets and to the want of parking space in control areas. If conditions do not change, a saturation point may soon be reached.



Automobile production for the week ending October 1939 climbed to 76,095 units, compared to 33,165 units for the same period in the previous year. And Detroit, during this same week, bought 1,250 units as against 422 one year before.

Detroit and Los Angeles are perhaps the two cities which have been most affected by the popular use of the automobile.

In Los Angeles the ratio of population to car registration is *1.39 men per car.*

TRAFFIC NEEDS HAVE OUTGROWN PRESENT STREET SYSTEMS

- *"The streets of present urban street systems fail to exhibit any differentiation among themselves according to their possible functions — a circumstance which excludes an efficacious approach to the modern traffic problem.*

  The solution of this problem is unattainable through present corrective measures (street widening, traffic restrictions, or others), but can be solved only within the scope of new city planning."

  Town-Planning Chart

The streets we see in the cities of today cannot be identified with any particular function. Whether they are arteries of heavy traffic, residential streets, or those of commercial and industrial districts, they are essentially alike. Transversally they present but slight variations, and the distances between their cross streets are always those which corresponded to the needs of horse-drawn vehicles.

To all these streets may be applied a universal description: in the middle, a pavement for vehicles; at both sides of the pavement, sidewalks for pedestrians; and, lining the sidewalks, buildings or small gardens in front of buildings.

The districts of recent construction usually prolong the old street system. While the newer streets are sometimes wider, they preserve all the shortcomings of the older ones — the same absence of functional identity, the same insufficiency of parking space, the same outmoded cross-street system.

If we examine the street system of any city, we shall observe the following paradox:

The streets of the central districts, where traffic is most congested, usually are the narrowest of all.

It is also these districts and adjacent areas which exhibit the greatest degree of lot crowding, a circumstance which naturally intensifies the parking problem.

Beyond the central districts it will be observed that many streets, especially the main arteries, become wider. Here traffic congestion decreases.

Compare the two graphs presented on page 169.

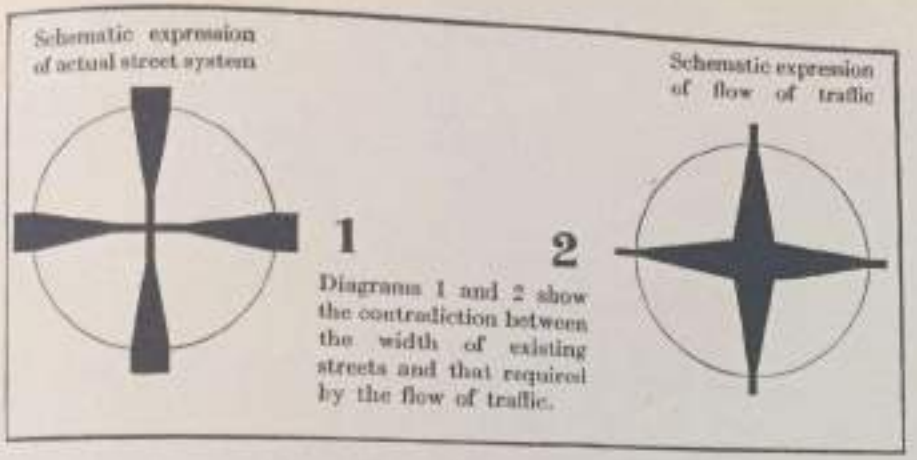
"2" shows the *volume of traffic* in different principal streets. This volume or traffic flow (the number of vehicles per hour or per day) is indicated by the width of the bands superimposed on the direction of the vehicles.

"1" shows the *width of the streets*, on a scale proportional to that of "2."

The paradox is obvious if one graph be imagined as superimposed upon the other. It will readily be seen that the greatest traffic congestion occurs in the central districts.

Approaching the problem only from this angle, without realizing that the whole street system should be revised, most municipalities have occupied themselves solely with the widening of the narrow streets of their central districts. In recent years many official technical departments have brought out street-widening plans for the old districts. Some cities have even transformed numerous old streets, after costly condemnation proceedings, only to replace the old buildings with "remodeled" structures which are often as expensive as they are obstructive. These superficial improvements do not alter the plan of the street: for façade parallels façade, as before, and the street is merely a little wider.

Improvements of this nature are usually of almost prohibitive expense, especially when it is considered that they do not solve the traffic problem. The space gained through widening is quickly absorbed by greater volumes of traffic. The number of street crossings



Diagrams 1 and 2 show the contradiction between the width of existing streets and that required by the flow of traffic.

The diagram above suggests the gravity of the situation. In a great number of cities, the width of streets not only does not correspond to traffic needs but the relationship is *reversed*. The following *paradox results: where the traffic is greatest, the streets are narrowest.* (See opposite page.)

THE PATTERN OF OUR STREETS, based on horse-drawn traffic, does not meet the traffic needs of today. There is no relationship between the old street system (the container) and the automobiles (the contents) suddenly introduced into that system. Yet in many cities narrow old streets are still being "adapted" to the requirements of motorized traffic. In the narrow streets of Paris, and in most old cities, problems like the one shown at the right (above) result. Town planners in the past tried to solve these problems by widening old streets. These costly changes have not solved the traffic problem. Typical of this type of project is the map at the right (below), which shows a section of the old city of Basel. Sections marked in black show where buildings are to be demolished and streets widened.

having remained unchanged, congestion actually increases at these crossings because of the higher number of vehicles carried in the widened street.

Such widening projects usually include no provision for additional parking space.

In short, the money expended on these projects is very often wasted. For street widening cannot bring about a complete solution of the traffic problem, unless it is part of a general plan based on new principles and conceived on the scale of the whole urban zone.

American cities have usually adopted regular street systems. In most cases, these streets have been laid out without any functional differentiation. The same cross sections are repeated at equal distances, measured by the speed of horse-traction, and subject to the dimensions of the most easily sold lots. Each street crossing being too close to the next, the speeds of modern motorized vehicles are inevitably retarded at successive crossings.

American Streets — Seemingly endless streets are common in American cities. Straight as a rail, they lose themselves in the distance, sometimes crossing plains or mountains, scarcely adapting themselves to the topography. (San Francisco presents an example.) Only the artificial barriers set up by man, in the form of city or other political limits, stop them, thereby succeeding where the mountains fail.

Often the laying out of streets precedes actual building by a long period of time.[21] (In Europe the contrary is frequently true.) Thus it is common to see, on the outskirts of American cities, large areas of vacant land marked by real estate development — the phenomenon known as the *subdivision*. Here lots for future building sites are already mathematically plotted out, pavements and sidewalks laid, sewers and water mains installed, and street lamps erected, in anticipation of future inhabitants. Another stage has been set for the outward movement of population.[22]

[21] See p. 52, on Detroit.
[22] See Detroit, Plan III, city and region, p. 47, and Los Angeles, Plan I, p. 115.

Linear Growth — Elsewhere thoroughfares in long straight lines traverse entire regions, mile upon mile. Several lanes of slowly moving traffic occupy the road surface on holidays, extending as far as the eye can see. These streets or highways (for they are scarcely either) are flanked by billboards, gas stations, refreshment stands, and other heterogeneous structures cutting off the view of the countryside — a countryside which frequently seems to have been abandoned by man, and yet is marked by the refuse and the disorder of his passing.

These tentacles of American cities have neither antecedents nor parallels.

It should be observed, however, that it is in the cities of the United States that this chaotic state has given rise to the adoption of the first efficacious remedies. Parkways, protected by law against building of any sort, are being constructed in increasing numbers in the open country beyond the cities, and now sometimes penetrate within the city. The highway is appearing on a new scale, based on the needs of the automobile.

WHAT ARE THE CAUSES OF TRAFFIC CONGESTION?

Want of Space

● "*The insufficient width of streets causes congestion.*"
Town-Planning Chart

Automobiles are responsible for the space problems of present-day streets. Estimates indicate that *a pedestrian* requires a surface of ten square feet. *A parked automobile* occupies a surface of *a hundred square feet* (or the space required by ten men). *An automobile moving slowly* requires *two hundred square feet* (or the space required by twenty men); at *an average speed of fifteen to twenty miles an hour*, it needs *three hundred to four hundred square feet* (or the space required by thirty or forty men).

In consideration of these space requirements, the following statistics on London [23] reveal the magnitude of the space problem caused by motorized traffic in a large city.

[23] Furnished by the M.A.R.S. group (Modern Architectural Research Society) of the C.I.A.M., England, in 1938.

THIS CHAOTIC STREET PATTERN is that of a central section of London. It reproduces one-sixteenth of the total traffic map of the city designed by the English group of the C.I.A.M.

A look at this map should be sufficient to show that no such arbitrary and unclassified network of highways and railways can possibly satisfy the requirements of motorized transportation. But, if any doubt remains, the photographic documents on the next page will reinforce this statement.

"Census of vehicles taken in 119 different points in the London area on July 13, 1937:

"Total number 2,397,014.

"The previous year (1936) this total was 2,306,396. *The increase is 90,618.*

"4,214,955,963 journeys were made on the London Passenger Transport Board system in 1936. The total car miles run by the Board's passenger vehicles was 550,142,031 miles. . . .

"There were *six times* as many private cars on the road in 1938 as there were in 1920.

"There were double as many vehicles passing Hyde Park corner in 1938 as there were in 1920.

"*But the width of the streets has remained the same.*"

And here are the results:

"The congestion of some of the most important central London thoroughfares has now reached the point when the quickest form of surface travel is often to get out and walk along the pavement, leaving behind the masses of costly, high-powered, up-to-date vehicles hopelessly jammed in the obsolete streets." [24]

Parking Aggravates the Traffic Problem — The lack of space for parking has created another serious problem. The already insufficient pavement surfaces of many streets are considerably reduced by the vehicles parked along the curbs. The traffic flow is further impeded by the slow movement of vehicles seeking parking space and by the maneuvers which the motorist must make when this space has been found.

The absence of sufficient parking space has brought about a situation in which the city motorist *can no longer drive up to the place where he wishes to go*, but only as far as the first parking space near his destination. Whether he is going to an office in the center of the city, or to a factory in an industrial district, or to a market or a school or a friend's house, the same experience often confronts him — he must drive on to the nearest open curb space, sometimes far from his destination, and then walk the rest of the way. Both the convenience and the time-economy which the automobile should assure are therefore defeated.

In this sense, too, the street of today has handicapped man's movements and reduced traffic mobility.

In American cities, where the per capita ratio of automobiles is greatest, the parking problem has become so serious that many people have relinquished the use of the automobile for ordinary weekday purposes, driving only on special occasions, during weekends or vacations. In the meantime, thousands of cars remain idle in garages throughout the city, often for the duration of the week.

As a result of this abnormal situation, markets, stores, theaters, and other buildings attracting great numbers of people have been erected in *the open country* near the city, bordering a highway, where the available space affords ample parking facilities directly at the entrance to the building.[25] These enterprises have been successful; for lower taxes on the buildings in these locations, as well as lower land prices, make possible a reduction in the prices of the goods sold there. Their success has encouraged other businesses to follow. Though the distance to them is greater, it can be traveled entirely by motor, at a saving of considerable time.

Los Angeles — The following data on the lack of parking space in the city of Los Angeles indicates the seriousness of the problem in urban centers where the degree of motorization is high.[26]

"Parking at present forms one of the worst complications toward the solution of traffic problems.

"The total curb parking space in the central business district is less than *3,000* machines.

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[24] From *Planning*, issued by the Political and Economic Planning Association (London), June 14, 1938, p. 2.

[25] In some cases, within the city, too, the automobile has encouraged certain enterprises to change their location. The shopping center of Los Angeles, for example, once occupied a small concentrated area of the city. Today it stretches out in linear form.

[26] Ed Ainsworth, *Out of the Noose* (Los Angeles, 1938); published by the Automobile Club of Southern California.

CONGESTION IN THE THOROUGHFARES OF CENTRAL LONDON. Vehicles jammed in an obsolete street system. Traffic control handicapped. The quickest form of surface travel in these streets is walking.

"The total off-street parking facilities in the same area (including parking lots and public garages) is only *22,802* vehicles.

"This gives a total of 25,802 automobiles which can be parked at one time, — a veritable drop in the bucket when contrasted with the 1,000,000 machines in the county.

"*As it is now, 50% of the ground space in downtown Los Angeles is devoted to parking lots.*

"This situation assumes more importance as surveys disclose the ratio of time a car in the city is in use compared to the time it is parked is of 1 to 11. In other words, the ordinary machine is being driven only about 2 hours of the 24 and *during the other 22 hours has to repose somewhere.*"

Frequency of Crossings

- "*Distances between cross-streets are too short, and do not correspond to the speeds of motorized traffic.*" *Town-Planning Chart*

Only a few years ago the widening of streets was considered an effective means of correcting traffic congestion. Since many streets have now been widened and congestion has continued, obviously street width cannot be the sole controlling factor.

While it is true that wider streets can carry more traffic, it is also true that the cause of congestion is not only the lack of street space but also *the frequency of crossings*. The latter, in fact, is probably the principal contributing factor. The distances between crossings being too short, vehicles are required to slow down or stop at so many crossings that a regular flow of traffic is impossible.

The layout of our street systems thus creates traffic channels in which vehicles are unable to move freely but *at best can progress only by spasmodic leaps from stop-light to stop-light.* Seen from above, such streets reveal numbers of automobiles and buses stopped and clogged together at intervals of three or four blocks, each mass separated from the next by large spaces of unoccupied pavement. When these masses are again set in motion by the changing traffic light, each seems to leap in pursuit of the preceding one, only to be stopped once more in a block or two.

SPEED BECOMES A USELESS CONQUEST

- "*The lack of space in our streets and the frequency of crossings make almost useless the new possibilities of locomotion.*"

Town-Planning Chart

The constantly growing number of vehicles which join this spasmodic movement of traffic results in a complete standstill. As long as the masses of vehicles retarded at street crossings are separated by vacant stretches of pavement, some movement is still possible when the crossing lights change. But when the space has been filled by other vehicles, the whole line of traffic stops. Our so-called traffic "flow" is steadily approaching a state of actual paralysis.

An example of this paralysis is New York's Fifth Avenue, between Thirty-fourth and Forty-fourth streets, where the late afternoon rush-hour traffic in 1924 had been reduced to a speed of *five miles an hour*, according to the Regional Plan Association of New York. This rate of speed has since been further slackened to *between two and a half and three miles an hour.*

Such a paralysis of city traffic also represents waste, for the loss of time may easily be translated into a material loss:

"The cost of time lost on account of congestion has been variously estimated, but . . . one cent a car-minute appears to be a conservative figure. Some authorities say *two or three cents a minute* for passenger cars and up to *five cents a minute* for trucks.[27]"

On the basis of the preceding statements it may be observed that existing street systems have made almost useless, in our crowded cities, the high speeds in locomotion brought by the automobile. In congested streets these speeds have been so far reduced that they are actually lower than those attained years ago in the same streets by horse-drawn vehicles! (See illustrations on p. 177.)

From 1910 to 1937 the motorization of traffic in Los Angeles grew as follows:

	City Population		County Motor Vehicles
1910	319,000	1910	16,361
1937	1,500,000	1937	1,074,025

[27] M. R. Davie, *Problems of City Life* (New York, 1932), p. 73, italics mine.

THE WANT OF PARKING SPACE constitutes the *motorist's nightmare*. As it is now, 50 per cent of the ground space in downtown Los Angeles is devoted to parking lots. Yet the need for parking space is still the most serious problem in that area. This crisis has become so acute that business is leaving cities; stores, movies, and markets are appearing in the open country.

The result of this degree of motorization of traffic carried in a traditional street system may be observed in the following comparison:[28]

In the horse-and-buggy period, it took 10 minutes and 21 seconds to travel from First to Tenth Street on Broadway [Los Angeles]. NOW it takes 14 minutes and 12 seconds by automobile to cover the same distance.

In cities, speed has become a useless conquest.

The congestion which has begun in all our cities is constantly spreading from central districts out to suburban areas. Everywhere the principal traffic arteries are clogged with vehicles, as though some kind of arteriosclerosis had attacked the structure of the city.

Further proof of the defectiveness of present street systems may be found in the fact that, while the main traffic arteries are congested, other streets remain empty. On some of these, parking is permitted; others are converted into "play-streets" for children. An air view of any given district suggests the necessity of some differentiation of streets, so that they may be devoted to various uses based on their functions and on the needs of the district.

THE VICTIMS OF TRAFFIC DISORDER

- *"Traffic congestion, which is the cause of thousands of accidents, is becoming increasingly hazardous to everyone."*

Town-Planning Chart

New speeds in antiquated streets are a perfect formula for death and injury.

Signs in profusion caution motorists; notices at many crossings warn against hazards; severe fines are constantly threatened. All these measures, and many more, are powerless before the increased motor traffic of recent years. And no substantial and lasting reduction[29] of traffic casualties can be achieved as long as cities retain their present networks of old-fashioned street layouts, with their frequent crossings and their failure to separate vehicles from pedestrians.

That the annual traffic toll of the United States runs into millions of injuries and thousands of deaths should suggest that the traffic problem challenges solution, despite its magnitude.

Deaths by automobile accidents in the entire United States in 1940 have been estimated at 34,500.

There had been 39,643 in 1937; 32,582 in 1938; and 32,386 in 1939.

In England there were in 1937: *226,355 injured, 6,590 killed.* In 1938: *226,854 injured, 6,595 killed.*

These figures (it is surprising to note their stability) include accidents that have taken place in all parts of the country, both urban and rural.

It is striking to compare casualties caused by motor accidents with those resulting from recent air raids:

"... while Great Britain's air-raid casualties from January 1, 1940, to June 30, 1941, totaled 41,900 killed and 52,678 hospitalized, peacetime traffic accidents for the same eighteen-month period in the United States cost 51,760 persons killed and more than 1,500,000 injured."[30]

As to *urban accidents* exclusively, we find that in London during the decade of 1927–1937, in which traffic increased by 3 per cent, the total number of *people killed* by traffic accidents was 13,743.[31] In 1937 the injuries were 56,261 (or one-fourth of the total figure for all of England).

The following data for the county of Los Angeles are typical of the tragic results of increasing congestion within the gridiron pattern of present street systems:

"In the period from 1931 to 1936, there were *5,383 persons killed* in Los Angeles County and *145,258 were injured.* In 1937, 1,033 more persons were killed.

---

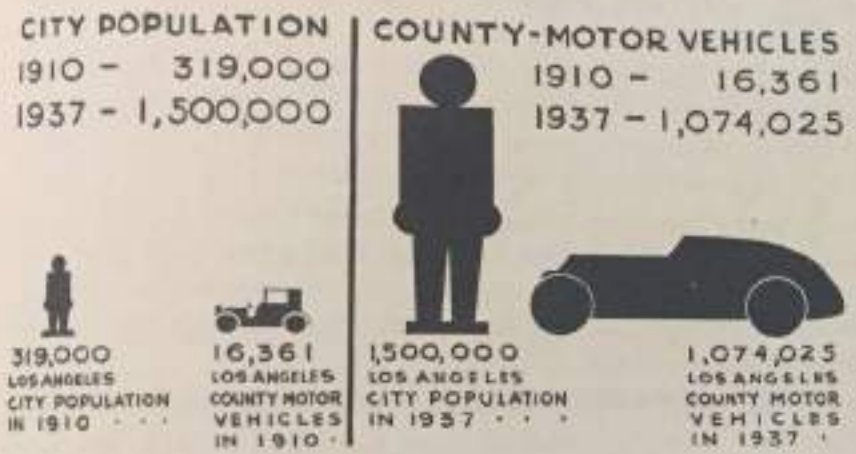
[28] Made by the Automobile Club of Southern California.

[29] Sometimes accident figures seem to remain stable or to decrease, but suddenly they resume their upward curve. Even when the figures show a slight reduction, they are still so high that it would seem shockingly neglectful to strive for no more than their stabilization.

[30] Data furnished by the Idaho Department of Law Enforcement; quoted from the *New York Times*, August 5, 1941, p. 18.

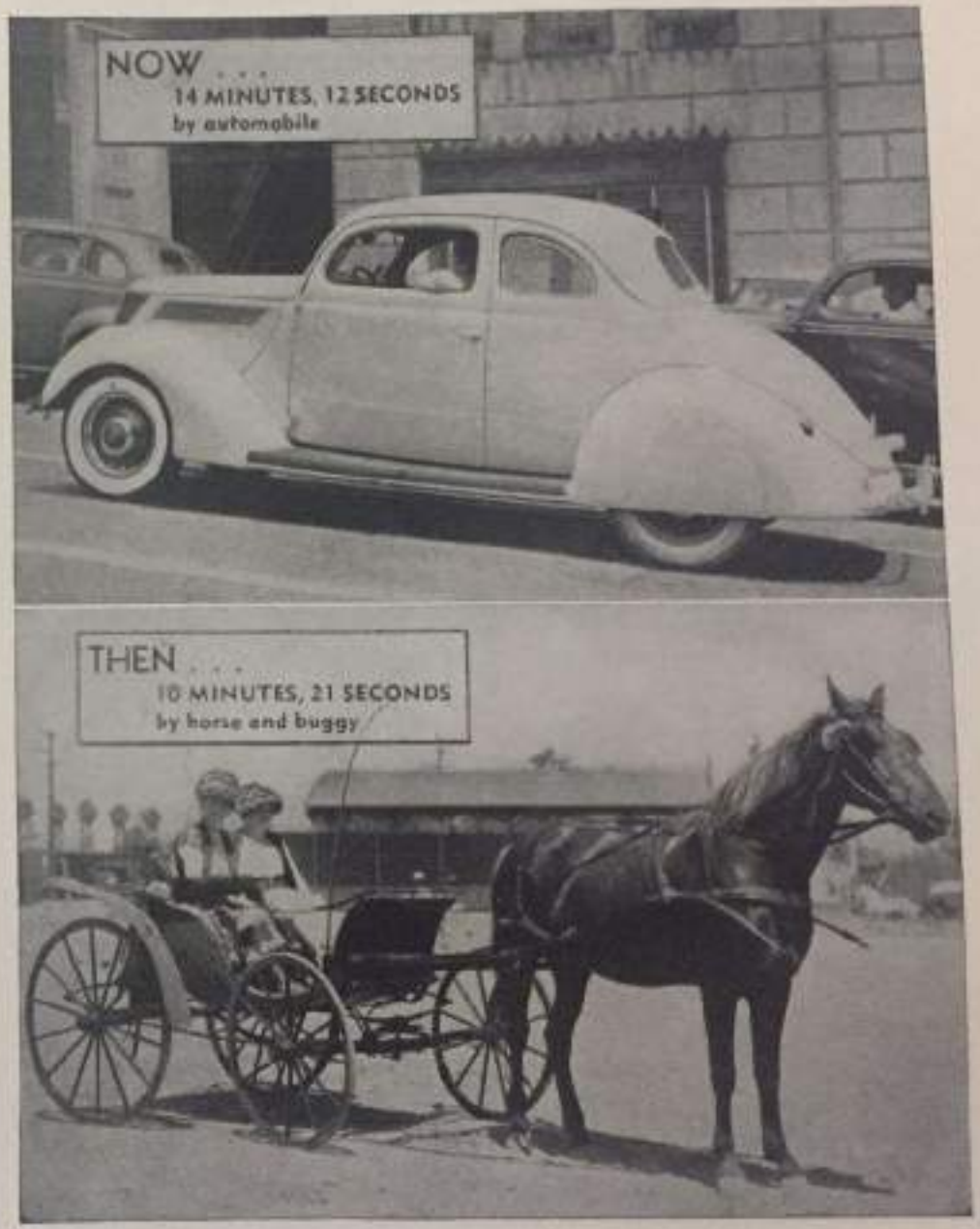
[31] *Annual Report of the Commissioners of the Metropolitan Police* (London, 1937).

Growth of population and increase in the number of automobiles in Los Angeles, city and county, from 1910 to 1937.



OUR MASTERY OF SPEED HAS BECOME USELESS IN OUR CITIES. Their main arteries are often clogged with vehicles, as though "*some kind of arteriosclerosis had attacked the city structure.*" In some cases horses moved faster sixty years ago than automobiles do now. The pictures at the right were shown by the Automobile Club of Southern California to illustrate this statement.

LOS ANGELES, FROM FIRST TO TENTH ON BROADWAY



"The 150,641 men, women and children killed or injured in the six year period (1931–1936) would form a greater population than that of Los Angeles in 1905, which was 150,000 inhabitants." [32]

Observe that 1,033 were killed in Los Angeles and 1,057 in London in the year 1937. Although the population of Los Angeles is much smaller, the greater number of automobiles per capita accounts for its high death rate.

According to a report in the *New York Times* of May 24, 1940, the accident rate was likewise increasing in New York City:

In the first four months of 1940, 312 persons were killed, as against 272 in the same period of 1939. During the first four months of 1940, 8,048 were injured in New York City.

Pedestrians are the principal victims, accounting for the highest percentages of casualties.

In London, "pedestrian casualties amount to *58.8 per cent. 18.4 per cent* of pedestrian casualties relate to *children between 5 and 10 years old*, 42 per cent to persons of 65 years old and over." [33]

It is especially among children and the aged that the disorder and chaos of cities exact this toll of death and injury. Like an epidemic, automobile traffic strikes down thousands of victims among children in all the large cities of the world.

"A sharp increase in the number of children killed in highway accidents in the city in the last ten months brought an appeal yesterday from Mayor La Guardia to parents for more help in accident prevention. . . . There were 124 deaths in the ten months ending October 31 as compared with 106 for the corresponding period in 1938." [34]

Conclusion — That authorities have done much to alleviate the traffic situation cannot be denied. Without their regulations, the accident toll would be considerably greater.

Yet it is not enough to say, after every annual report, "The increase is small," or "A slight decrease is noticeable," or "The figures have come to a standstill," with the conclusion that the usual small-scale measures will improve the situation.

New and untried measures must be taken — drastic measures, wherever necessary, regardless of the difficulties or of the opposing factors.

Traffic Control — *Methods used to cope with the growth of automobile traffic have proved powerless to solve congestion and its consequences.*

Street lighting, traffic signals, "safety islands," signs and markings of all kinds, traffic legislation, and whole battalions of police — these and many other expedients have been employed in all countries to help ease the burden of traffic problems.

In some years these measures have seemed productive of results, since accidents were reduced. On the whole, however, they were like patches on a crumbling system. *Like all compromise measures, they were universally adopted because they did not interfere with the structure of the city itself.*

Streets could continue as they were; intersections needed no great modification. Yet, as accident rates increased everywhere in an alarming manner, *something had to be done.* So every community of the least importance put signal lights at its "busy" corners. Signs, bells, and other devices followed in quick succession as the increase in traffic made them seem necessary.

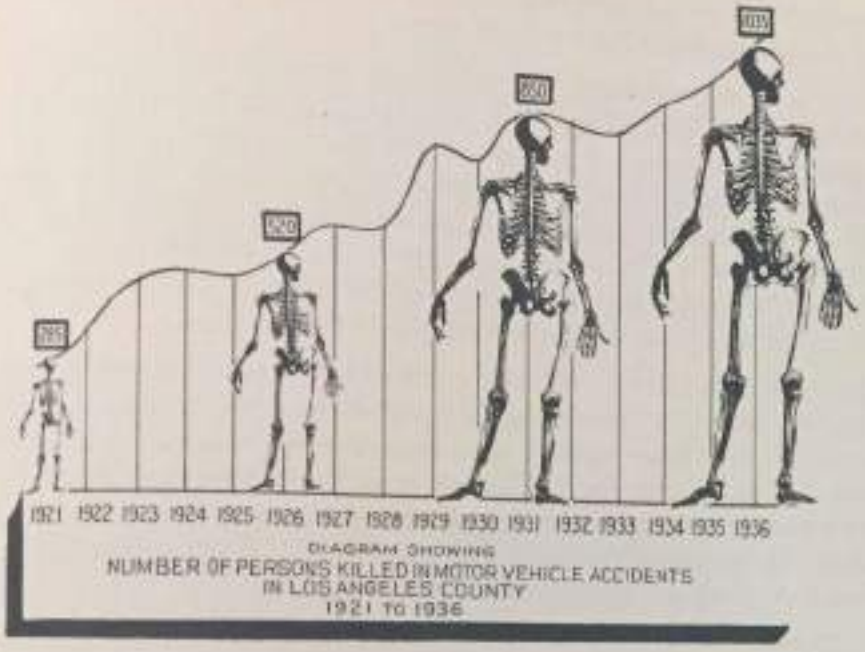
But traffic control became far more difficult as time passed and traffic grew. Today traffic control costs millions and is steadily becoming more expensive. And while accident prevention costs rise and accidents themselves increase, the conviction is growing that something totally different must be done.

Some Academic Formulas and Their Consequences

- *"A certain type of city planning, conceived in 'the grand manner' and striving mainly toward monumental effects in its layout of buildings, avenues, and squares, often complicates the traffic situation."* — *Town-Planning Chart*

Academic teachings have frequently been responsible for the creation of sections in our cities — sometimes consisting of groups of

[32] Ed Ainsworth, *Out of the Noose* (Los Angeles, 1938), published by the Automobile Club of Southern California.
[33] *Annual Report of the Metropolitan Police* (London, 1937).
[34] *New York Times*, November 20, 1939.



METHODS OF TRAFFIC CONTROL. The methods used to cope with the growth of automobile traffic in most cities have proved insufficient. Every city today has its traffic signals, "safety islands," signs and markings of all kinds, traffic legislation, printed regulations for pedestrians, and whole battalions of police. Without these measures, no doubt, the accident toll would be greater, but, as the number of automobiles has continued to increase, casualty figures have, as a rule, increased also. The diagram above shows the accident toll resulting from increasing congestion in the County of Los Angeles.

public buildings and monuments situated in elaborately designed squares and avenues — whose planning has been inspired solely by the desire to achieve magnificence, in what has come to be known as "the grand manner." Here diagonals and radials combine to produce optic axes with imposing vistas.

While such projects have their esthetic effect on paper, if not always in execution, it should be observed that they rarely function *structurally* in the life and movement of the city. Conceived only as isolated plans, irrespective of those of adjacent areas of the city, almost invariably they interfere with the flow of traffic in their midst or tend to complicate traffic problems in general.

In these projects inspired by the "Beaux-Arts" schools, obviously, too little attention is given to the changes that have taken place in cities in recent times. For the most part, traffic conditions, present and future, in the areas planned for "beautification" are overlooked. *Practical effects are sacrificed to so-called "esthetic effects."*

This method of treatment, which is unanalytical in its approach and therefore oblivious of future consequences, has already magnified the traffic problems of many cities, even in those cases where the plans "looked well on paper." Only one conclusion can be drawn from these unfortunate experiences: *that modern city planning is confronted with so many grave problems that these extraneous and wholly avoidable sources of difficulty should not be allowed to increase them.*

Railroads Often Cut Up Cities, Impeding Traffic

- *"Railroad lines are often obstacles to urban development. Encircling certain districts, they separate them from other parts of the city with which they should have direct contact and easy communication."*

  Town-Planning Chart

Railroad lines in most cities have been laid out without regard for possible future urban expansion and its directions. Since even immediate phases of future growth have at times not been foreseen, the routes followed by some railroads today constitute definite obstacles to the planned development of a city.

As cities grow outward, absorbing the surrounding suburbs, the routes of some railroads are eventually found to be situated within densely built areas. Here they sever street systems which, under normal circumstances, should connect one district with another. As a result, either grade crossings become too numerous or many streets become "dead ends," stopping at the railroad cuts. And those streets which continue to cross the railroad must be protected by gates, at which there are frequent traffic tie-ups.

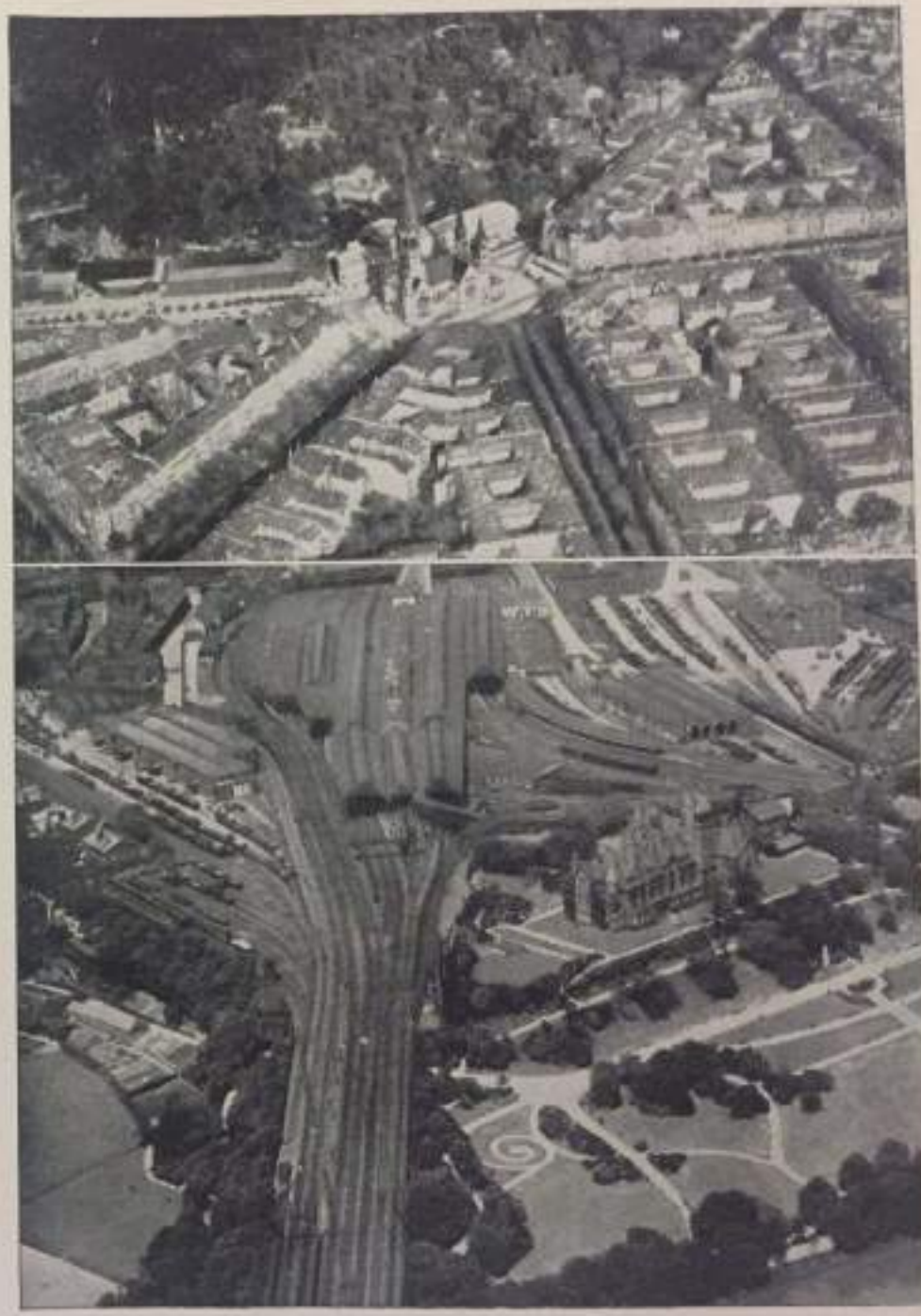
Railroad lines have sometimes so blocked the development of certain districts that their expansion either has been retarded or has been forced to take another direction, in order to avoid a multiplication of grade crossings. This need not have happened if the railroad had been cut through less promising areas of development, or, better, if its course had originally been studied and planned in relation to the organic structure of the whole city.

In the same way, intervening railroad lines separate residential districts from areas of open land which might have served as sites for recreation centers if these lines had passed elsewhere.

When poorly located, rail terminals and railroad yards, which occupy vast acreages (3.5 per cent of the total urban area is common in American cities; see p. 82), also complicate certain local traffic problems. The location of these or other static elements should not be permitted to impede urban mobility.

All these cases in which the railroad has proved to be an obstruction to urban development may be reduced to the usual cause of urban ills: *the lack of planning.* Railroads have traced through cities those routes which have seemed the most convenient, the most economical, and the most profitable to their owners, regardless of the consequences to the city as a whole. *Planless*, the cities themselves have had no alternatives to offer.

TRAFFIC CONGESTION INCREASED BY BAD PLANNING. Traffic congestion has often been aggravated by planning street intersections that tend to concentrate a great number of vehicles in an area not equipped to contain them. The view of the Kaiser Wilhelm Church in Berlin (right, above), where several important *avenues converge toward a monument*, is typical of this type of bad planning, still favored by many schools of architecture. When railroad lines cut across important highways, grade crossings either have to be eliminated at high cost or else protected by gates, whose lowering causes frequent tie-ups. The graph below was designed by the Dutch group of the C.I.A.M. to give visual form to this problem. The park at the lower right in the English city of Preston might have been an attractive recreation area, but railroad lines and yards have prevented the recreational use of this space.



PART ELEVEN

A NEW URBAN STREET SYSTEM IS REQUIRED

• *"For the purpose of providing a new street system corresponding to modern traffic needs, it is necessary that accurate statistics be available for the rational determination of street-dimension requirements."*
Town-Planning Chart

From the preceding pages, the exposition of whose details only confirms our daily experiences, it should be obvious that the street systems of today do not permit the utilization of the technical advances made in motorized transportation. Instead, they thwart them, simultaneously breeding the chaos and confusion which we know only too well.

Now modern means of transportation cannot be made to conform to our old-fashioned street systems. And certainly no one would suggest that we revert to old-fashioned means of locomotion — to the horse and buggy, for example — in order to make the vehicle conform to the street. Only one logical solution remains: *The street system itself must be modernized.*

But what ought to be done? How may the chaos of urban traffic be reduced or eliminated? What are the traffic needs of today and those of tomorrow?

Without leaping to conclusions, we ought to begin with the most fundamental information at our disposal. We should begin with a study of the street, of the street's contents, of the flow of its traffic and the types of vehicles that are used on it. Much of this information is accessible now. Accurate statistics on traffic volume already exist in most large cities. On the number of traffic accidents many cities compile annual or semiannual reports. In some cases these statistics must be brought up to date, but the vast researches of recent years have provided a constantly expanding documentation on the subject. Moreover, many statistics span several decades, already making it possible to establish comparisons and to anticipate the trends of the immediate future.

These researches are of prime importance, but they will be entirely inconsequential unless the radical reforms which they indirectly demand are made. The statistics that we are to examine will therefore serve as basic figures, or points of departure, for estimates telling us:

1. What *number of vehicles* and *what types of vehicles* pass at the principal street crossings within a given period of time, both in rush hours and during the whole of an average day.

2. What *the origins* and *the destinations* of the vehicles passing these crossings are. (These data, collected at strategic points, would in the aggregate permit us to estimate the *total volume of traffic* concentrated at the most congested intersections and moving along the most important thoroughfares. From this information we could deduce the actual needs of the principal streets; we should be able to estimate the widths required, to classify the different types of vehicles they carry, and to establish new systems of street intersection, based upon this classification.)

3. What number of vehicles occupy *existing parking areas*. (This, together with figures on the city's total car registration — both present registration and that anticipated for the immediate future — would constitute a basis for calculating the amount of additional parking space required and its best location.)

Though these statistics may show substantial changes in the course of coming years, this does not minimize the importance which we have just assigned to them. Furthermore, their future trends can often be predicted. For example, the changes that a regional plan, once carried out, would produce in the principal thoroughfares and in their traffic volumes could be calculated with reasonable accuracy. It can likewise be foreseen that a new street system, offering driving and parking facilities commensurate with actual needs, would increase the number of drivers and consequently the ratio of cars to men. To a certain extent, this increase might also be estimated.

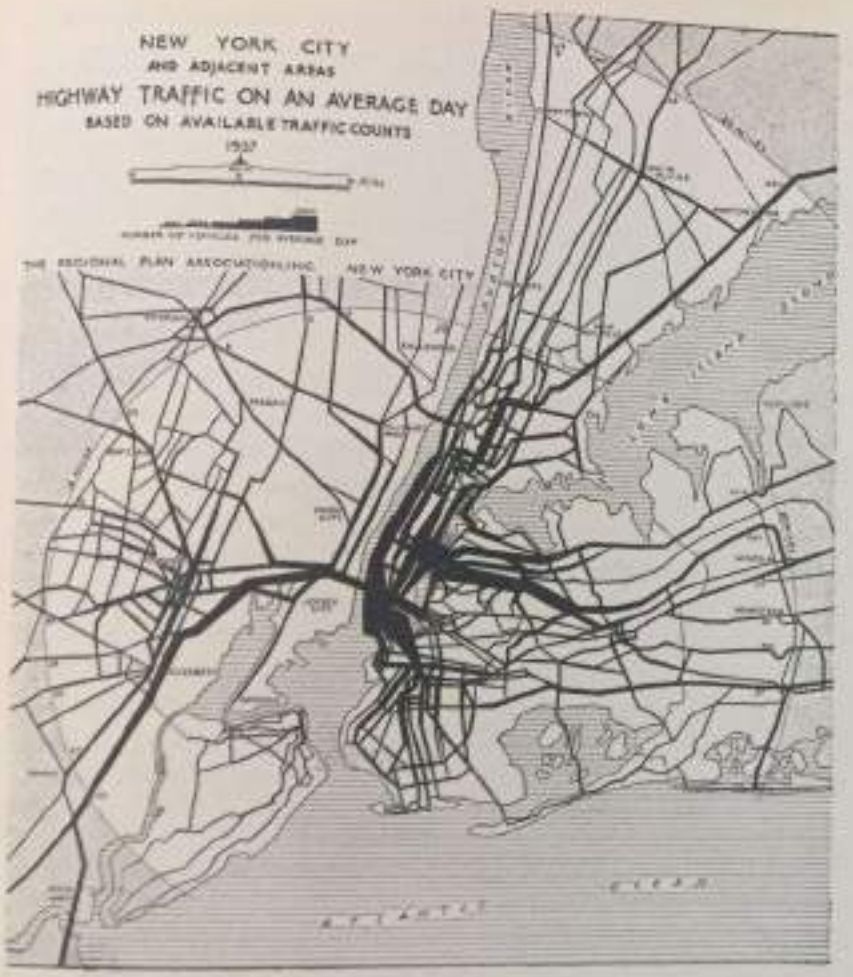
The vehicular counts assembled in these statistical researches can be graphically presented in the form of flow maps. These illustrate the network of through-traffic streets and indicate, by bands of different widths tracing the direction of the streets, the volume of traffic found in them. Examining such maps, we can determine the actual state of the traffic problem and localize the nerve centers of maximum traffic volume.

Theoretically, to avoid all congestion, a highway or street should be designed for the maximum volume it is expected to carry at any one time. The peak-hour count is the most useful for this estimate. The average-day counts, however, also give needful information, since it is important to know the total number of vehicles carried if we must estimate the real use of a highway, its economical justification.

The intersections of major highways constitute focal points that must each be studied very carefully.

At all congested focal points a classification of traffic according to different types of vehicles with different speed limits should be made.

A complete study of these focal points, taking into consideration the fact that they form part of the traffic system as a whole and that this system is interrelated with other urban functions, would make possible the solution of all local traffic problems.



HIGHWAY TRAFFIC ON AN AVERAGE DAY. This map of New York covers only the central area. Widths indicate traffic volumes. Observe the two major focal points of traffic — downtown and central Manhattan, with secondary centers in Newark and Brooklyn. The Boston Post Road carries 20,000 vehicles on an average day (maximum width on the map). In all these congested focal points a classification of traffic according to different types of vehicles with different speed limits should be made. . . . New and better engineering methods can help to solve the most difficult cases. See for example, the San Francisco-Oakland Bay Bridge in San Francisco (right).

EVERY STREET SHOULD BE CLASSIFIED ACCORDING TO ITS FUNCTION

In streets as they are today, *through traffic* has its possible speed cut by the frequent crossings used for *the distribution of local* (or district) *traffic*.

Light vehicles capable of high speeds are retarded by the slower speeds of *heavy vehicles* (buses and trucks), whose bulkiness also contributes to the obstruction of traffic.

Pedestrians crossing streets at every corner, and using the same traffic level, oblige all traffic to stop, irrespective of type or destination.

Vehicles today are of so many different types and possibilities of speed that *they must be classified and separated*. Furthermore, an automobile moving at forty miles an hour and a pedestrian at four miles need a barrier between them.

Moreover, if modern cities are to be planned as such, the different urban functions must be distributed according to a zoning plan, each function being located in the area to which it is assigned by the plan. The street systems establishing the necessary contacts between these areas must be adapted to those functions. Each street therefore must be laid out according to its specific needs.

For these reasons,

- *"Streets ought to be classified according to their functions, as residential streets, business streets, industrial streets, and so on.*

  "The speeds anticipated in each street will depend upon the function of the street and upon the nature of the vehicles it carries. These speeds are therefore also factors of classification, determining the features of those thoroughfares intended for fast-moving traffic and those intended for trucking and other slow traffic, and differentiating these from tributary or secondary streets.

  "Speed and safety often demand the use of crossings at different levels, whose construction is facilitated by modern technics."

  Town-Planning Chart

The thoroughfares composing an urban street system compose two general groups:

(*a*) *Through-traffic streets*, whose direction and capacity are defined by the plan of the region and by its various topographical features. These streets usually link distant strategic points and constitute the basic street system.

(*b*) *Secondary, or distributing, streets* in the different districts of the interior of the city are determined by the specific needs of each district. Their location, their direction, and the amount and character of their traffic will be decided by the disposition of the buildings and open spaces.

All sections of the city, no matter what their particular character or function, require parking space as well as distributing streets uniting the vital parts of the district and establishing contacts with through-traffic streets. Distributing streets will differ in type according to the functions of the districts they serve. Their dimensions, which are essentially determined by their special uses, will be based on traffic and pedestrian needs. For example, the road surface intended for trucking will necessarily be wider in industrial districts than in residential sections. Commercial districts in which there are large department stores will require extra parking space; the same will be true of theater districts, recreation centers, and other places attracting great numbers of people. The streets of such districts should also facilitate the movements of crowds.

Streets in residential sections should link the dwellings and community services that form neighborhood units. These streets should also provide the necessary connections with parking grounds, with high-speed motor highways, and with main arteries devoted to trucking. These connections, however, should be confined to the strictly necessary minimum, lest they interfere with highway traffic.

In the case of streets in the commercial and financial districts at the center of the city, the tidal movements of traffic which take place daily in these districts must be considered. Many vehicles are driven in at the beginning of the working day, remain parked all day, and leave in great numbers at the same time in the evening. With the present street system, this results in congestion. Special arrangements must therefore be made to care for this situation. Ample parking spaces should be provided, with direct access to ex-

A MODERN TRAFFIC SOLUTION APPLIED IN THE HEART OF AN OLD CITY. One of the most congested spots of Stockholm, where only a modern construction, with different levels for different types of traffic, could provide an unimpeded flow of traffic. These new clover forms fit into the topography of the site, meet its needs, and do not in any way interfere with what may be of interest in the architecture of this historic district.

These views show the same spot before and after.

press highways. All trucking should have its own approaches, separate from the routes of passenger vehicles, to commercial buildings.

The main highway system should serve as a channel for the through traffic received from the distributing streets and roads of the region. It should permit higher speeds, shorten the distances between different districts, and facilitate the flow of traffic in and out of the city. It should be duplicated by a similar system reserved for the use of commercial vehicles.

No urban street system can function efficiently unless certain streets and highways are reserved for certain speeds. The great traffic arteries of the main street system can serve their purpose only if they are wide enough to accommodate a given number of traffic lanes (a number to be determined by the needs of each case) and only if grade crossings are eliminated. The latter can be accomplished by means of overpasses and underpasses and similar constructions which will assure *a steady flow of traffic*. These crossings at different elevations would also permit the segregation of light vehicles, trucks, buses, and pedestrians, thereby further assuring an uninterrupted traffic flow and reducing accident possibilities.

The cost of such constructions should not be prohibitive, in consideration of the hazards eliminated, the time saved, and the other advantages of their use.

Until the last two decades all measures tending toward the restriction of traffic could be reduced to the creation of one-way streets and the exclusion of trucks from boulevards and certain streets in residential sections. A few pedestrian tunnels were also constructed. But it is only in the last ten years that effective measures have been taken — in some localities — toward the segregation of vehicles of different speeds. Now express highways are beginning to penetrate to the heart of the city.

American cities have gone further than all others in highway construction, their traffic problems being more acute. The scale upon which their solutions have been achieved proclaim a new urban rhythm.

Busy Thoroughfares Should Be Isolated from Near-by Buildings

● *"Buildings of all kinds, but especially dwellings, should be isolated from heavy traffic by green bands."* *Town-Planning Chart*

Earlier in this work we commented on the desirability of screening or isolating highways from dwellings. But the noises, dust, and noxious gases produced by motorized vehicles are offensive and disturbing in the case of other structures as well — office buildings, libraries, museums, hospitals, and schools. This separation is therefore desirable in the case of most buildings.

Landscaped bands of green, of a width to be determined by the circumstances of each case, should be left free of all construction on both sides of main traffic routes. Trees planted in these bands will enhance their isolating quality, serving as screens that are especially efficacious against dust. This means that the parkway principle ought to be applied to all through-traffic routes in the urban area.

The isolation of highways in this manner would also have the tributary function of serving as a protection against some of the dangers resulting from air raids. Arterial highways are military objectives and should therefore be separated from buildings. Buildings situated near strategic crossroads would obviously be greatly endangered in case of air raids.

Opposed to the principle of isolating green bands, which mean space along the highway, is that of *ribbon developments*, narrow bands of built-up areas flanking highways. These developments, inspired by unscrupulous speculation, have multiplied in every country until proper legislation on highways has come to prevent their further extension. All nations which have recently established modern highway systems, such as Germany, the United States, and England, have passed laws prohibiting the continuance of ribbon developments.

The good effects of these laws are evident, and should make both the authorities and the general public admit the desirability of extending such controlling policies, so as to reduce traffic problems in the city as a whole.

DWELLINGS SHOULD BE ISOLATED FROM ROADS CARRYING THROUGH TRAFFIC. Until recently the contrary has too often been the case. Buildings have lined every important road. Speculators have been, and are still, allowed to purchase ribbons of land along the sides of roads, which they subdivide and sell or develop in their own way. These developments are known from their shape as RIBBON DEVELOPMENTS. This view of a road in Sanderstead, England (upper right), presents a *typical example of what should be avoided.*

Every important thoroughfare inside or outside city areas should be of the parkway type — that is, separated from buildings by green bands. Air-raid precautions also make this system advisable. The lower photograph shows dwelling blocks in Baku (U.S.S.R.), where a green band separates buildings from the main highway.

Pedestrian Lanes

- *"In the proposed network of restricted streets, provision should be made for pedestrian lanes, designed for the convenience of the pedestrian and therefore not necessarily following the same directions as vehicular routes."* *Town-Planning Chart*

Walking being one of man's natural functions, the possibility of going from one place to another afoot should not be eliminated from the modern city. As La Bruyère said as long ago as the seventeenth century, when riding had not yet become the ubiquitous habit that it is today, "It never occurred to our ancestors to deny themselves the necessary in order to have the superfluous, or to prefer the ostentatious to useful things. . . . They did not rush from a bad dinner to take to their carriages; they were convinced that man had legs for the purpose of walking, and they walked."

Because the cities of today have attained their present state without consideration for the most elemental human needs, pedestrians are the principal victims of traffic disorder. The difference between the speed of motorized traffic and that of pedestrians (about forty as against four miles per hour) requires the use of *two basic scales in planning*.

Distances can easily be differentiated. Those which can be covered by people on foot have certain limits; those which demand motorized transportation are totally different and new. The intermediate scale may be eliminated as obsolete.

Motorized transportation has limits of application, and certain distances, like that from the dwelling to the school or to other near-by community services in the neighborhood unit (once the city has been organized on this basis), can and should be made on foot.

Urban traffic should not be uselessly complicated by unnecessary trips in automobiles. That many people shun walking in our cities today is only a natural reaction to the conditions under which city walking takes place. Pedestrians are exposed to the dangers of the street, to its dust and noises, and to the hazards of corner crossings. All this makes walking in the streets an ordeal instead of a pleasure. Consequently the city-dweller usually confines his walking to the most essential steps. He walks from his office to the subway or to the bus, or he walks to save time when the street is congested with slow-moving traffic.

Sidewalks are deserted in certain districts of cities of great expanse, where distances are too great for walking.

If pedestrian lanes were separated and isolated from traffic lanes in a network of restricted streets and highways, walking conditions in the city would change entirely. Crosswalks for pedestrians would no longer exist at grade, and present crossing hazards would thereby be eliminated. Contacts between pedestrians and vehicles would take place only at necessary points, as at parking grounds. Pedestrians would be able to walk freely among parks and athletic fields, or in front of shop windows, which they could examine at ease, without being disturbed by noise and dust.

Street crossings for pedestrians would always be at levels different from those used by vehicular traffic and would consist of the following types:

(*a*) *Pedestrian crossings at ground level*, when vehicular routes are elevated or below ground level (either underground or in depressed cuts).

(*b*) *Elevated or underground crossings*, when vehicular routes are at ground level.

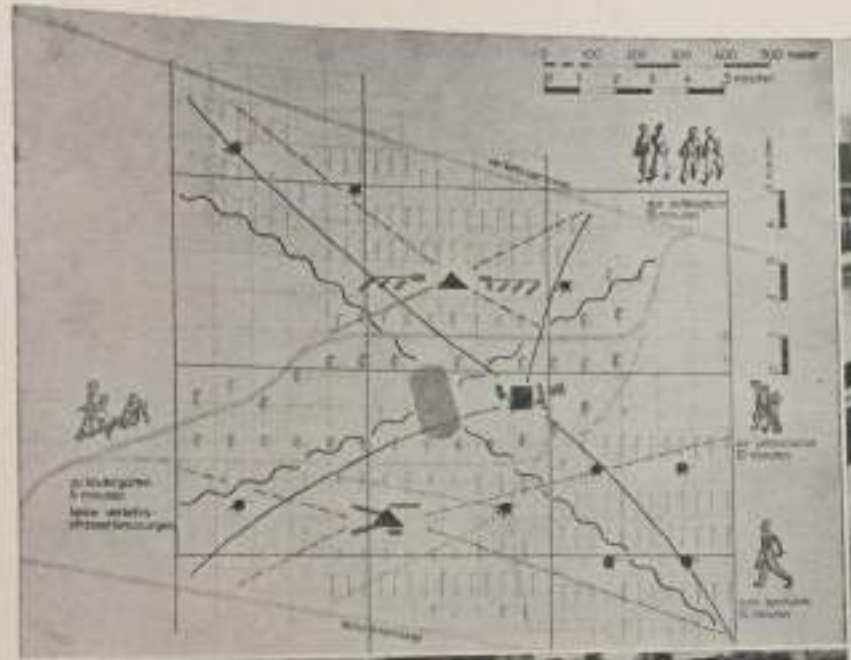
The selection of the most suitable type of pedestrian crossing will be determined by local conditions: the topography of the region, the nature of the soil, the plan of the district and its functions, economic factors, and others.

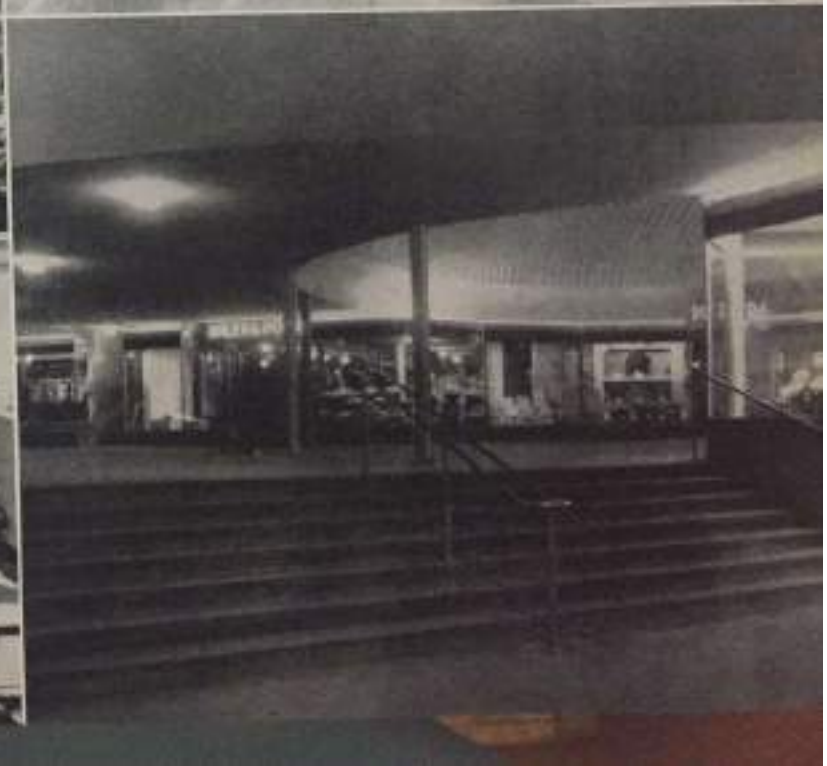
Summary

- *"The universal use of motorized transportation, bringing speeds unknown only a few years ago, has violently agitated the whole urban structure, fundamentally affecting its living conditions. A new street system, designed for modern means of transportation, is therefore required."* *Town-Planning Chart*

The impact of motorized transportation upon the civic structure and its life is so profound that the compromise measures and small-scale reforms adopted in most cities are insufficient to counteract its effects.

PEDESTRIAN LANES. The difference between the speed of motorized traffic and that of pedestrians requires that, for the sake both of the driver and of the man on foot, their paths be separated. Within the neighborhood units all distances (like those in the plan at the upper left) could be covered by people on foot. Whenever pedestrian paths must cross important highways, ground-level crossings should be eliminated. Instead, elevated or underground crossings should be built, with vehicular routes at ground level.





On the far right, above, is a view of Chicago; the one below is of Stockholm. If vehicles follow elevated or depressed highways, pedestrians can cross at ground level. This is illustrated by the model of the "Ville Radieuse" in the lower left.

Daring highway constructions have appeared lately in some American cities. These constructions announce *a new urban scale*. In this view of the eastern side of Manhattan the foreground shows the approaches to the Triborough Bridge (1936) and the East River Drive (1939). The park area and the stadium on Randall's Island complete the modern side of this picture. The rest of it presents a *striking contrast*: East Harlem is still a mass of blighted tenements, their small scale corresponding to the old horse-and-buggy street pattern that still prevails in that district. The new flowing patterns of the highways and their landscaped areas do not belong to that period but to ours; *they predict a new city*.

The three examples on this page show the great possibilities that are being developed in modern highways. The speed of the automobile has suggested the wide curves of these flowing patterns. The use of different levels, eliminating grade crossings, is becoming more general. In some sections of the East River Drive in New York (above, left) superposed highways are covered by terraces for pedestrian use. The view below shows a German highway; built mainly for military purposes, it is without landscaping. On the right, the traffic crossover of Northern Boulevard on Long Island supplies a good example of parkway intersection, landscaped surroundings, and parking areas planned as one unit.

The general disorder resulting from the chaotic traffic situation in central districts has become so acute that it has accelerated the decentralizing movement of urban populations.

In most cities a complete alteration of the street network should be considered, for to try to adapt the existing street pattern to the needs of today would involve a serious loss of time and money.

New highways designed to conform to the needs of modern motor traffic have appeared in some cities and are now multiplying in number. Their construction ought to be coördinated with a master plan affecting other urban functions as well.[1]

If a new network of streets planned for motorized traffic should require the condemnation of buildings and land, this loss could be amply regained through the elimination of the original streets, today far too numerous; for these would be useless in the new network. In most cases the new street system would permit an economy of road surface.[2]

The chief obstacle to a drastic revision of the present street system is found in the fact that the streets are identified with the division of land into lots and with urban land property in its present subdivided state.

For decades, and in some places even for centuries, urban land has been divided into lots, with the idea of giving the building on each lot a "street front," or a façade directly on the street. These lots, in shape and size, are consequently bound to the present street system and depend upon its continuance.

Any drastic revision of the present network of streets will therefore encounter serious obstacles unless it is recognized that in most cases the situation demands a regrouping, or consolidation, of present lots. Without eliminating private property rights, this consolidation would remove the arbitrary property limits of today (as it would in the establishment of dwelling units; see pp. 72–76) and thus permit the development of a new network of streets.

With these difficulties solved, the new street network would make possible other simplifications. For:

- *"by means of efficient traffic organization and a proper coördination of different urban elements, traffic could be reduced and concentrated within the great arteries."* *Town-Planning Chart*

Within the framework of a rational parkway system, the automobile might stimulate a total reorganization of life, if properly directed. New speed limits and new road technics permit a complete separation of dwelling and working areas and the establishment of direct means of communication that save time even though distances are greater. By the establishment of other direct routes of communication, today nonexistent, dwellings can likewise be brought closer to recreation areas, to sea or mountain resorts, or to cultural or political centers. In short, planning for human welfare, upon the new scale established by motorized transportation,[3] is an unexplored field of illimitable possibilities for the near future.

- *"One might summarize the analysis of urban functions, as presented in the preceding pages, by saying that the living conditions found in most cities today do not correspond to the most elementary biological and psychological needs of great masses of their populations.*

  "Since the beginning of the Machine Age, these conditions have been an expression of the ceaseless growth of private interests."

  Town-Planning Chart

[1] It is to be regretted that some cities are considering the adoption of a complete highway network, simply superimposing this network on the old unplanned urban structure.

[2] The street surface of most cities of today varies between 30 and 35 per cent of the total area of the city.

[3] Instead of simply "planning for a transport age," which has become a catchword.

PART TWELVE

A TOTAL VIEW OF THE CITY

Having analyzed the four primary functions of cities, examining their present conditions and presenting proposals for their amelioration, we feel the need of a wider view encompassing the city as a whole—that is, the city and its surroundings—in order to comprehend both the interrelationships of urban functions and those of city and region.

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THE SIZE AND GROWTH OF CITIES

Airplane views of cities show us their extent and their form. By examining the latter, it is often easy to discern the phases of their growth, the traces of departed historical periods.

The range of such a view enables us to observe the geography of the site, which usually exerts a strong influence upon the formation of the city. It also reveals other features of the surrounding country which have influenced the plan of the city.

Large cities seen from an altitude of several hundred feet do not present, as a whole, an *orderly façade.*

Their vastness is their most striking feature; whatever quality they possess is lost in sheer quantity. Areas that give evidence of planning occupy but a small surface. Disorder predominates. Buildings are piled up near the center and scattered haphazardly toward the outskirts. The few green spots and other places of beauty, known to the tourist, seem hidden in a maze of grey and shapeless masses that stretch toward the surrounding country in tentacular form. The very borders of the city are undefined, junk and refuse belts merging with the countryside.

If on beholding this sight we pause to contemplate modern cities and consider what they could have been if planned, we must admit in the end that, in spite of their magnificent vitality, *they represent one of man's greatest failures.*

Confronted with these total views of our large cities, one is prompted to ask, For whom have they been built? It is difficult to feel that man is there, difficult to find a human scale in these overbuilt expansions, boundless and unshapely. And if the human scale is absent, one feels constrained to ask, what *is* the scale of our great cities? And how does one compare with another in size?

The Scale of Cities Compared — For the purpose of answering these questions, we present silhouettes of several cities on the same scale.[1] (See pp. 198–199.)

In the drawing of these silhouettes, no attention has been given to the official or administrative limits of cities, which are in no sense their actual limits. The limits recognized by these plans enclose all built-up areas representing certain densities to the acre.

A comparison of these silhouettes will reveal the difference in area between the *large cities*, many of which have a million inhabitants, and the *super-cities* or *metropolitan communities*, in which there are several millions of inhabitants spread over vast areas, where different interdependent urban clusters are linked together. This type of urban development is a product of our time.

"Suburban transportation has helped to disperse the population of cities. Indeed, the boundary line of the city becomes more shadowy in a social and economic sense. . . . In short, a new type of population grouping is appearing: not the city, but the *metropolitan community*, a constellation of smaller groups dominated by a metropolitan center. . . ."[2]

A *metropolitan district* is officially defined as being formed by a central city or cities, plus all the adjacent and contiguous civil divisions having a density of at least 150 inhabitants per square mile.

It is interesting to note the difference in size between some *American cities* of recent growth (like Detroit and especially Los Angeles) and *European cities* of similar populations. The expansion of these American cities has been stimulated by automobile facilities that are nonexistent in Europe. Distances in American cities are consequently greater; the same populations cover much larger areas.

The Growth of Cities — A comparative table showing the population growth of several cities during the last hundred years will assist us in understanding the factors which have produced this urban expansion (see p. 201).

[1] One general scale, the same for every city, was used in the analytical maps drawn by the C.I.A.M. The map for a city like London was several yards in size; on the same scale, the map for a city like Zurich was naturally many times smaller. Obviously, the format of this book does not permit the reproduction of these maps in the original metric scale of 1:10,000.

[2] From the official summary of *Recent Social Trends in the United States* (New York, 1933) issued by President Hoover's research committee, as reported in the *New York Times*, January 3, 1933.

Observing those decades which have shown the most precipitous rise in population, it may be affirmed that:

- *"The growth of cities has been caused by the spreading use of the machine — the passage from the manual labor of artisans to big industry."*
  Town-Planning Chart

In a general way, the rise of these population curves indicates the absorption of rural populations and the annexation of suburban districts, stimulated by the concentration and expansion of big industry within the city or in its vicinity. It is natural that times of economic crisis, or of wars or revolutions, should usually affect the direction of these curves.

It is of interest to observe the relationship between population curves and those representing the growth of the area of the city — a relationship which expresses the degree of concentration or dispersion of the population. Curves expressing the growth of the total population of cities do not reveal the whole process, for population movements also take place within the city's limits or from cities to their outskirts and suburbs.

Internal Process of Urban Growth — Population movements which take place in different districts of a city are described by curves that usually take the form of the letter "S." These districts increase in population until a maximum (saturation point) is reached, after which there is a decline. In any city there is, as a rule, a constantly enlarging area which is undergoing such a decline in population. This is partly due to the fact that the dwellings in the older districts become obsolete, their onetime advantages being surpassed by those found in newer homes. In late years the net increase in urban population for a city as a whole has been maintained by the increase which takes place within areas recently annexed.

To a varying degree, this shift in population is found in every modern city, but it is most marked in the cities of the United States, where transportation facilities are greater and the outward movement more strongly accentuated.

Close study of the Cleveland census figures, corroborated by those of Boston and St. Louis, shows that *cities go through a process of growth and decay.*

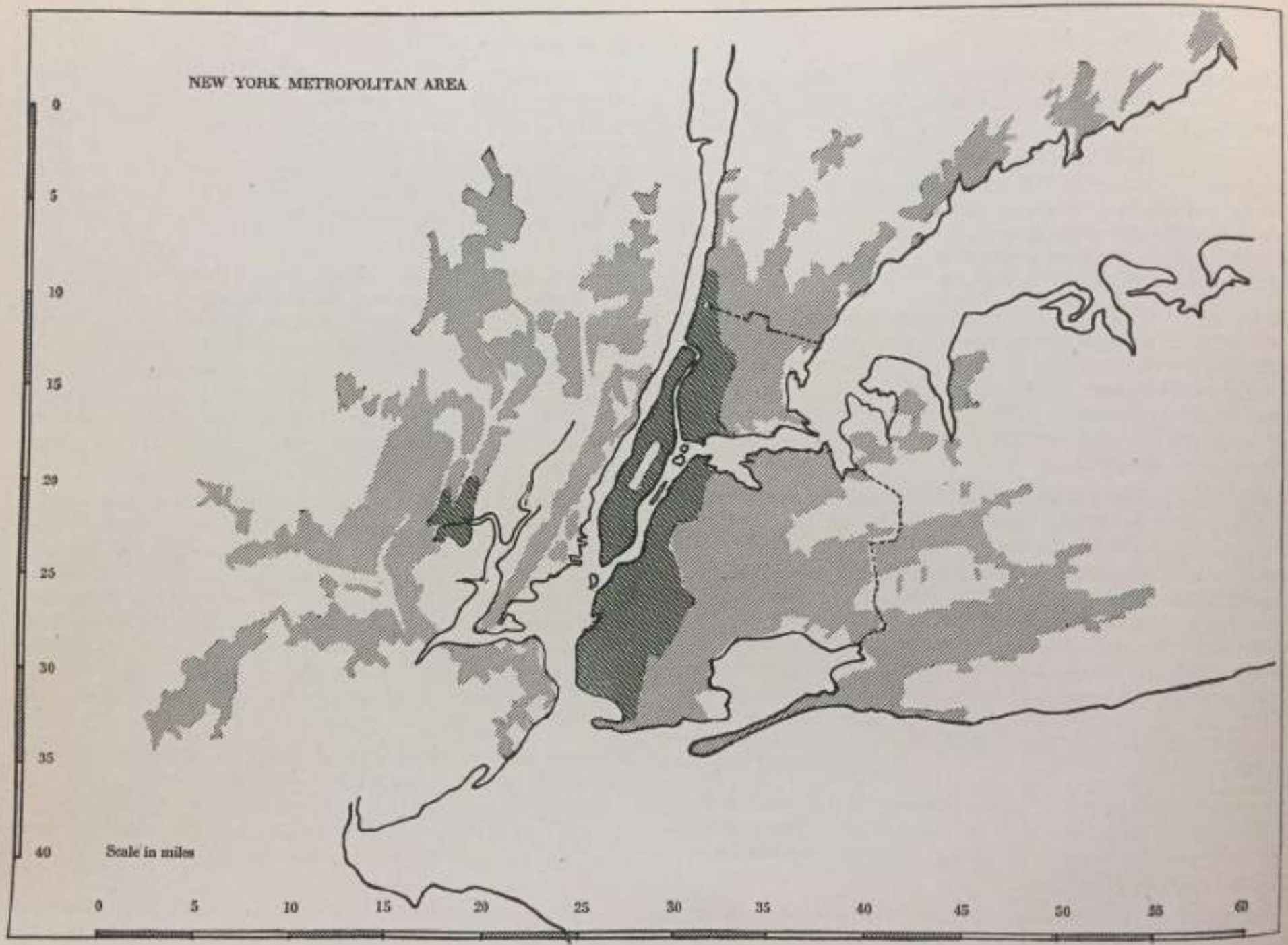
As the original city areas become populous, their inhabitants begin to migrate to near-by outlying areas. This territory is then annexed to the city; it in turn becomes populous, and the process continues. The original areas meanwhile become less suitable for residential purposes and are increasingly used for commercial and industrial establishments. The district once occupied by fine old homes is invaded by business, and its dwellings become cheap rooming houses.

At this point the district is of little value for residential purposes, and business has not yet sufficiently developed to expand there. Residential values decline, but prices are generally kept up by the hope that business will some day pay more for this centrally located property. In short, *the district is blighted.* Finally the dwellings are razed, and their sites are used for new hotels, office buildings, and commercial houses. The inhabitants move out to newer and more spacious areas, thereby hastening the necessity for further annexations.

This entire process is dependent upon the convenience of transportation between the central part of the city and its outskirts or suburbs. In the evolution of the cities of today, it was stimulated by the introduction of the electric streetcar, and has been decidedly accelerated more recently by the development of the automobile. But the outward movement of the population adds substantially to the total cost of transportation and other public services by creating large, thinly populated areas through which expensive service facilities must pass in order to reach the people living in the outskirts of the city.

Between 1910 and 1920 the population of the city of Cleveland increased 41 per cent over its 1900 population; between 1920 and 1930, 12 per cent. At the same time, the population of Cuyahoga County, outside Cleveland, increased 11 per cent between 1910 and 1920, and 119 per cent between 1920 and 1930.[3]

[3] In the 1940 census the cities of Cleveland, Boston, and St. Louis show losses of population.


NEW YORK METROPOLITAN AREA
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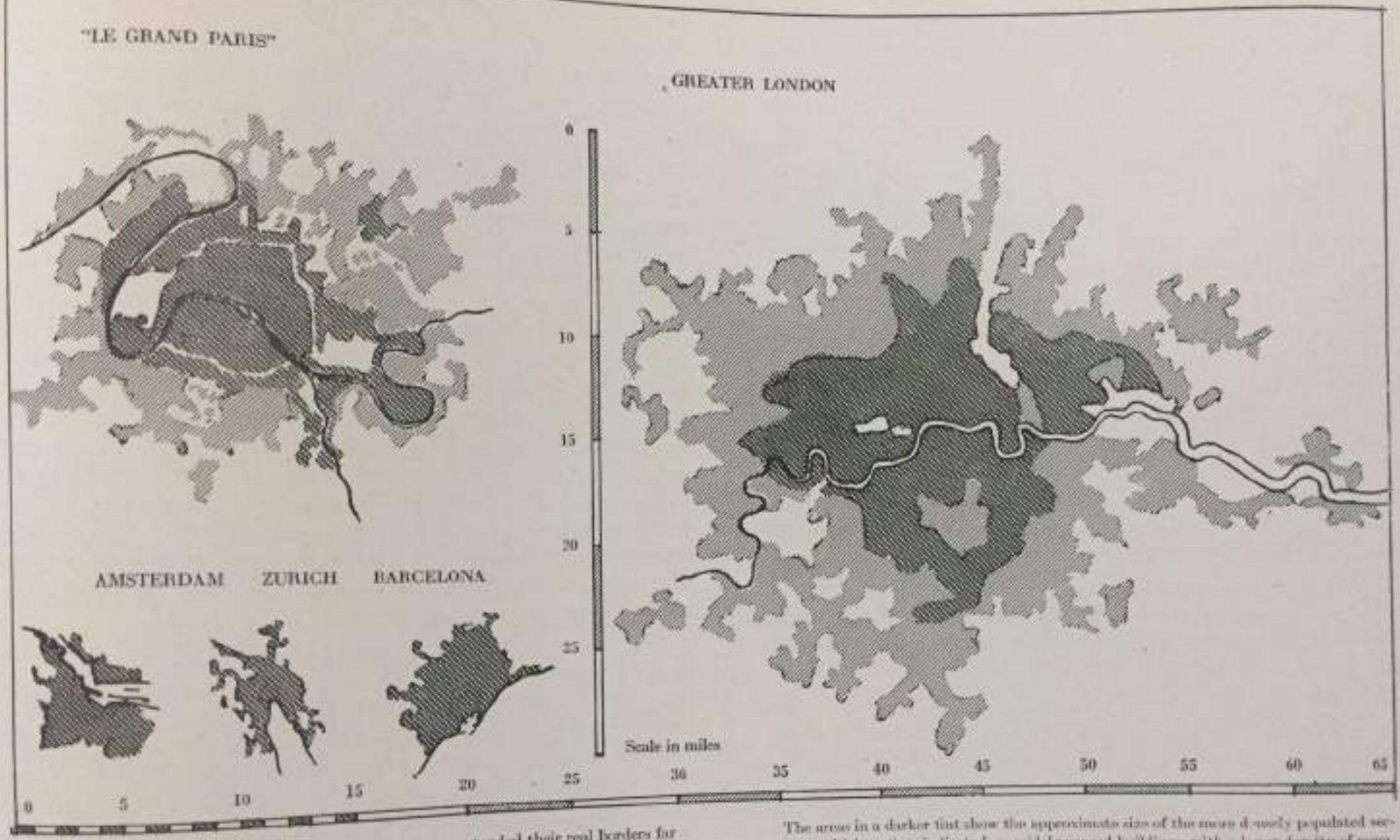
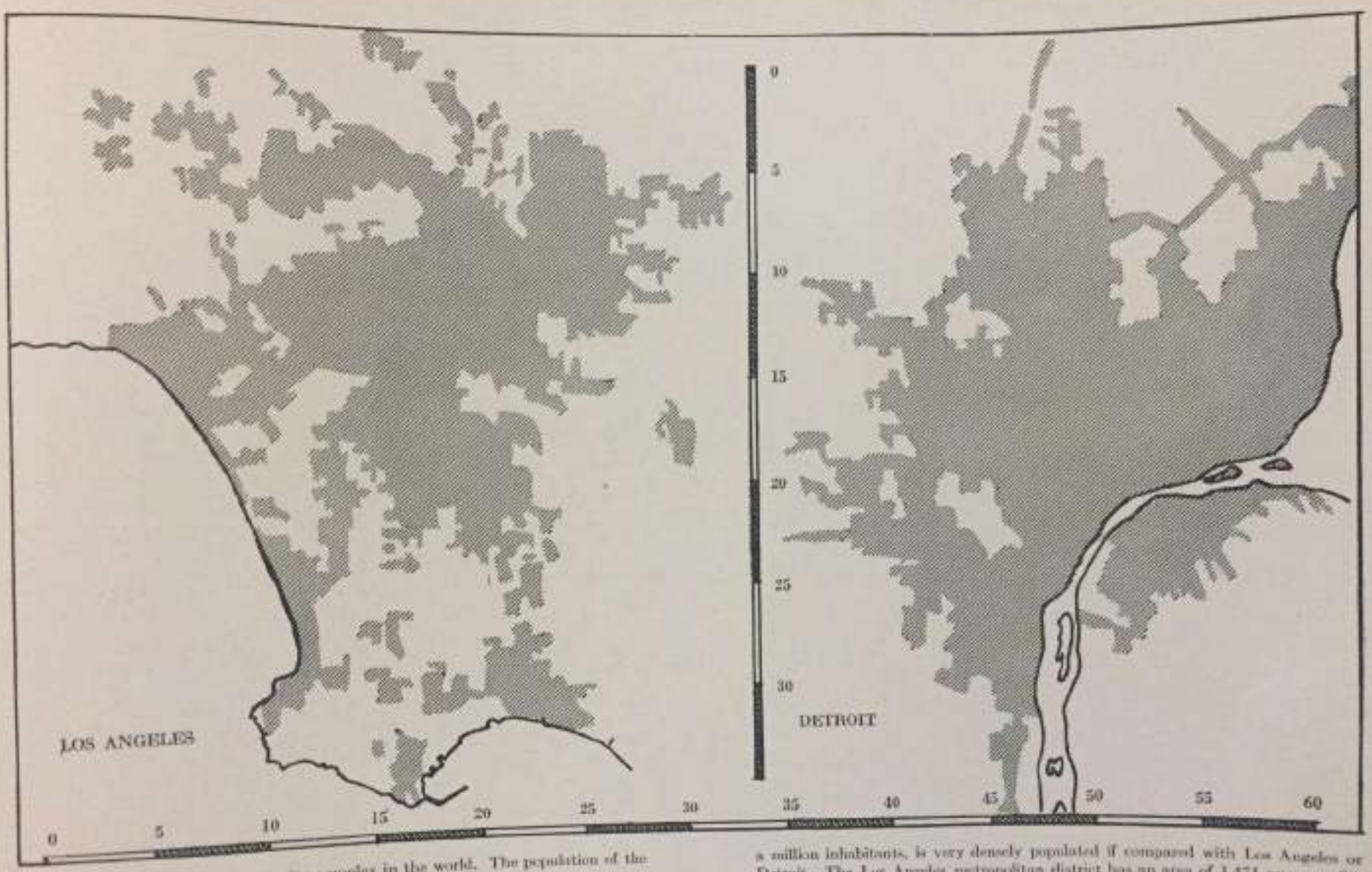


THE SIZE OF CITIES COMPARED. Big cities have extended their real borders far beyond their official administrative limits. National and international factors of far-reaching influence have led to the development of these vast built-up areas known as *metropolitan districts*. The silhouettes reproduced on these pages are on the same scale, so that a comparison of sizes can be made. To a certain extent they are conventionalized, because the cities of today are constantly changing their contours and developing suburban tentacles. (In Los Angeles, for example, industries have expanded rapidly in the last few years. The space used by the aviation industry and shipbuilding has quadrupled, and within a year of stepped-up defense effort about 125,000 workers in war industries have swelled the population of the "valley," the "harbor," and the "beach" districts.) The areas in a darker tint show the approximate size of the more densely populated sections. Lighter tints indicate low, widely spaced buildings, with a lower density of population. The enormous expanse of these sparsely populated areas is typical of American cities like Los Angeles and Detroit, where the effects of automobile transportation on urban expansion are especially noticeable.

The following figures are revealing. *Greater New York* comprises a commuting area that can be shown by drawing a circle with a radius of fifty miles, using City Hall, Manhattan, as a center. According to the Regional Plan Association of New York, this area encompasses the largest population of any urban region in the world. Within this region of 5,528 square miles and 497 municipalities, there were 12,368,350 inhabitants in 1940.



London has become the greatest city complex in the world. The population of the area under the London Passenger Transport Board (1,986 square miles) was over 9,700,000 in 1937. *Le grand Paris* comprises an area that can be roughly indicated by drawing a circle with a radius of twenty-one miles, taking the cathedral of Notre Dame as a center, "a territory of about 500 square kilometers . . . and 6,000,000 inhabitants" (see p. 50). Compare these super cities with *three average European cities*, Amsterdam, Zurich, and Barcelona, here reproduced on the same scale. (It is interesting to observe, by the way, that the scale of the medieval center of Zurich permits life to continue practically undisturbed in spite of the fact that the gasoline shortage has almost eliminated mechanized transportation.) Barcelona, with over a million inhabitants, is very densely populated if compared with Los Angeles or Detroit. The Los Angeles metropolitan district has an area of 1,474 square miles and a population of 2,904,591 inhabitants, of whom 1,504,277 live in central cities and 1,400,314 outside of central cities. That is, *48.2 per cent of the population live outside the central area*. The density of population is very low in the city of Los Angeles (3,400 per square mile); it is relatively higher in the metropolitan district outside the city than in the city proper. The Detroit region has similar characteristics. It has an area of 3,250 square miles and a population of 2,479,002. The population of the city proper is 1,623,452, and 29.5 per cent of the total population live outside the city.

In Cleveland this constantly increasing rate of growth outside the corporate limits of the city has resulted in the formation of satellite cities, eleven of which now surround the city and confine it within rather restricted bounds. This condition, which also exists in Boston and St. Louis, effectually prevents further annexations.[4]

The Trend Away from Cities — The year 1930 marked a new trend in the movement of populations; for it was the first year in which *the number of people moving to rural communities in the United States exceeded the number of those going to cities to seek a livelihood.* The acuteness of the economic crisis at this time was undoubtedly the cause, cities having ceased to present their customary opportunities for employment.

Numerous indications point to the fact that this movement away from the city probably began as far back as 1920.

In spite of the movement from city to suburb, up to 1930 the general population trend in the United States was from the country to the city, the jobs provided by the expansion of industry and commerce being the attraction. With the disappearance of many of these jobs in the year 1930, the unemployed hordes in the large cities sought work in the country.

This trend was most apparent in the newer industrial cities, whose quickly accumulated populations had come, during the previous twenty years, from farms and small rural communities, attracted first by wartime production and then by the expansion of industry into new fields.[5]

The first data published on the 1940 census in the United States indicates the continuation of the "trend away from the large cities, instead of towards them as in the past, a tendency of manufacturing industry to decentralize, and other factors which, if continued, will ultimately have profound effects upon the economic and social structure of the nation. . . ."

In the last decade (1930–1940) population has decreased in cities like Philadelphia, Pittsburgh, St. Louis, Cleveland, and Boston. Suburban areas have in general gained at the expense of cities.[6]

In the New York region "the urban to suburban movement has continued in the past decade, but with less momentum than formerly; in fact, *the beginning of a back-to-the-city movement can be traced.*"[7]

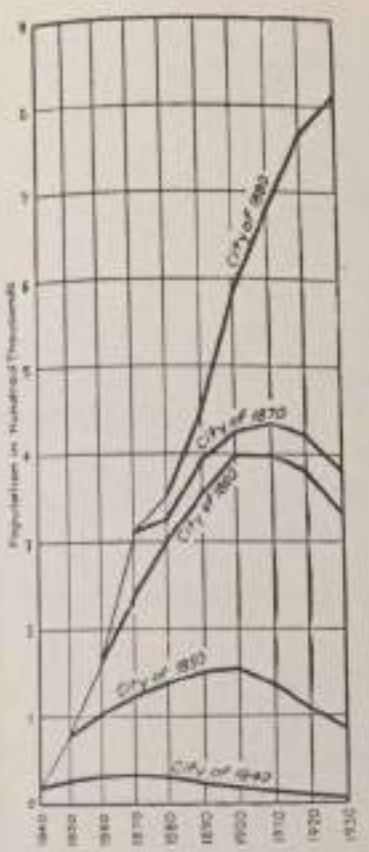
City and Region Form a Unit — The age-long interrelationship of cities and the regions that surround them has been intensified in recent times. Great urban centers have extended their spheres of influence to unprecedented limits. The road and rail systems of the region, which daily move thousands of commuters and distribute raw materials and manufactured goods over its entire surface, compose *a great arterial network of communication.* This may permit us to delimit the radius of the direct influence of a metropolis in a comparatively accurate manner.

In a city like Detroit, for example, local wholesale houses furnish in their fields the predominating influence throughout an area whose radius reaches a hundred and seventy-five miles from the city. Many of the city's jobbing houses extend their sales into a larger territory, reaching three hundred and fifty miles north, two hundred miles west, and about a hundred and seventy-five miles to the south. The entire trading territory is easily accessible via rail lines and motorbus service.[8]

From a study of similar areas, one may draw the conclusion that the present differentiation between "town" and "country" is of an arbitrary nature. For *city and country have become more and more interdependent elements* of a geographic, economic, social, and political whole or unit, which may be generally designated an *economic region*, with a distinction made between *rural and metropolitan regions* according to their predominating character.

The scale of modern cities demands that these vast areas be planned as a whole, as an interrelated unit. To such planning has been given the name *regional planning.*

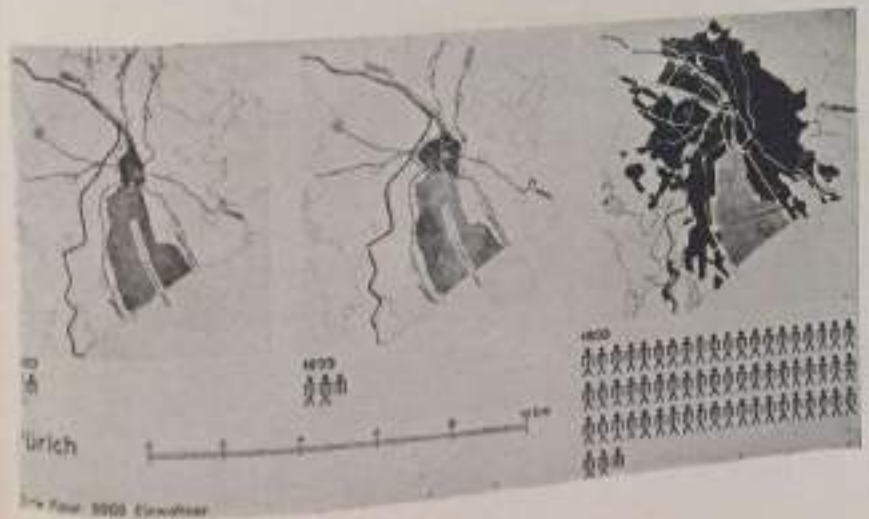
[4] Data from the report sent to the Fourth Congress by the American group of the C.I.A.M.
[5] From data in "American Migration: Significant Changes in Place of Residence," in *The Index*, published by the New York Trust Company, November 1922.
[6] From articles entitled "Lag in City Growth" and "Census Studies Reveal Great Social Changes," *New York Times*, July 11 and August 13, 1940.
[7] Regional Plan Association, *Regional Plan Information Bulletin*, no. 55, July 14, 1941, p. 2.
[8] From the report sent to the Fourth Congress by the American group of the C.I.A.M.

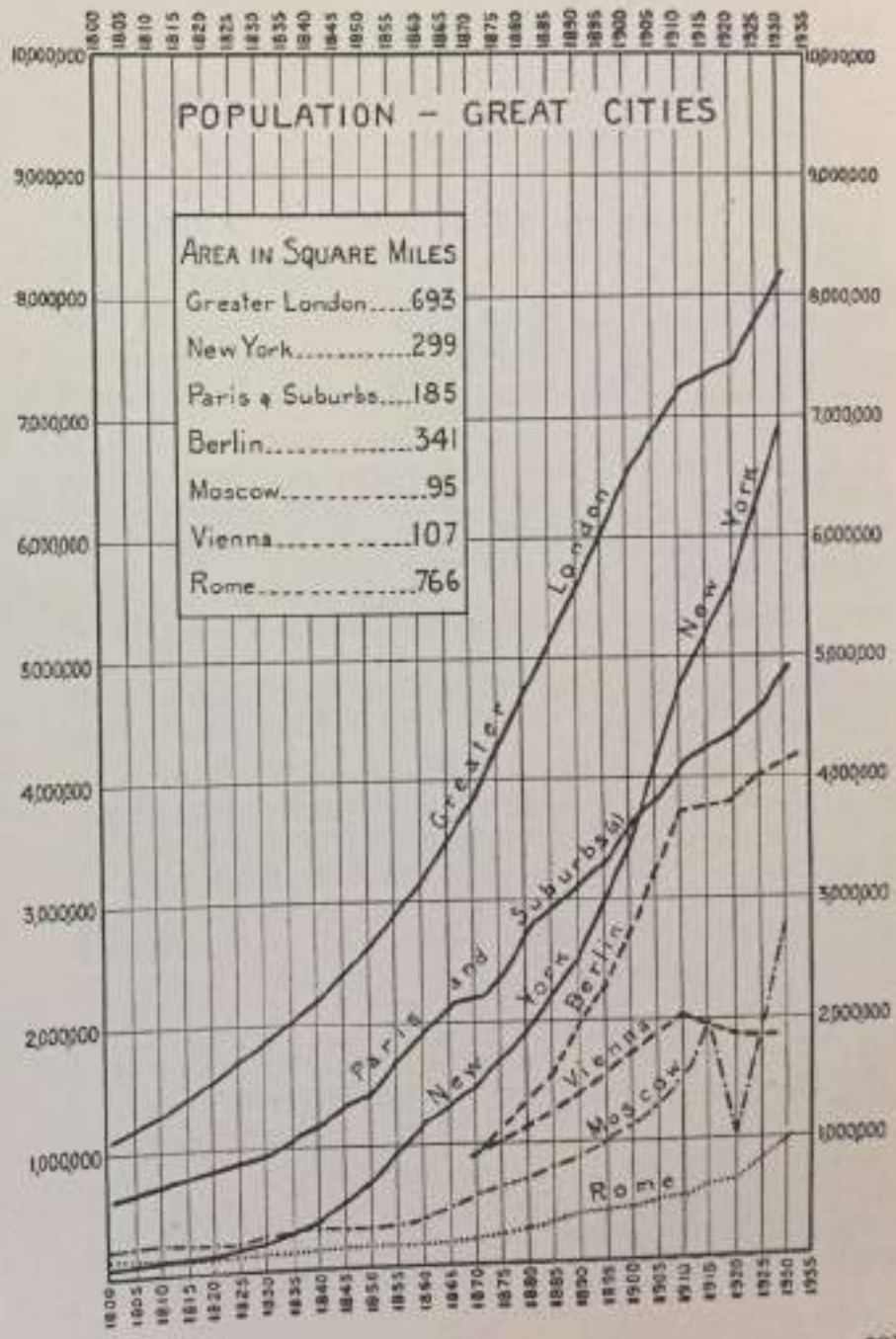


POPULATION GROWTH IN BIG CITIES. Examining the population curves in the graph at the right, we see that cities experienced their greatest increases in population when mechanization of the means of production and increasing facilities of transportation stimulated vast movements of people from the agricultural areas to those in which industry and commerce developed and prospered. As a rule, these curves are similar in all big cities, except when the loss of a war or the difficulties developing after a revolutionary period have profoundly affected the economy of a country as a whole. →

← *If they are considered by sections or districts it will be seen that cities undergo an internal process of growth and decay.* This process is particularly noticeable in cities of the United States. S-shaped curves on this graph of the city of St. Louis express the constant shift of populations from central districts to outer ones of more recent construction. This movement to the suburbs has caused the decline of one "city" after another and the spread of blight from the heart of the old city to the outer zones. (See p. 197.)

These maps of the city of Zurich (below), designed by the Swiss group of the C.I.A.M., show clearly both the growth of the population of the city and its expansion.





Basic Factors in Urban Development — The development of cities and regions is conditioned by the following factors:

- (*a*) *"Their geographical and topographical situation (climate, land and waters, natural communications within the region and those with the exterior)."* *Town-Planning Chart*

These natural features are constant — permanent elements of the city itself. Social and political events cannot change them. Modern technics, which gives man a mastery over certain natural forces, is able to make only minor modifications upon their original state, such as changes in the courses of streams and rivers, the construction of bridges, dams, and canals, and superficial topographical alterations.

The constant features of cities are often those which have caused or influenced their creation. The presence of mines, harbors, or strategic land routes generally determines their commercial, industrial, and cultural progress.

- (*b*) *"Their economic situation (natural resources: soil and subsoil, raw materials, sources of energy, flora and fauna; technical means: industrial and agricultural production, the economic system, and the distribution of wealth)."* *Town-Planning Chart*

Cities, as we have just said, cannot be separated from the region they influence; for the region, together with the urban clusters it contains, constitutes a whole, a *unit*. The natural resources of the region and its economic structure shape its urban centers. Lands rich in the raw materials required for certain industries or the existence of favorable facilities for the transportation of these raw materials have given to many cities their special physiognomy.

- (*c*) *"Their political and social situation (the social structure of the population, the political regime, and the administrative system)."* *Town-Planning Chart*

It is obvious that both the city and the countryside are no better than the society which has produced them. All the personal knowledge and technical equipment of the town planner will never change this fact: *that the city is a projection of the society which has created and shaped it.* In this sense the structure of every city is a reflection of its social structure. And bad housing conditions or other disorders in the city's functions are counterparts of faults in the social structure out of which the city has grown.

- *"All of these essential factors together constitute the only true basis for the scientific planning of any region. They are:*

  (*a*) *interdependent, the one reacting upon the other;*

  (*b*) *subject to continuous fluctuations, due to scientific and technical progress, and to social, political, and economic changes. Whether these fluctuations are forward or backward, from the human viewpoint, depends upon the measure in which man's aspirations toward the improvement of his material and spiritual well-being are able to assert themselves."*[9] *Town-Planning Chart*

The Foregoing Factors Have Changed in Different Periods of History

- *"Down through history, the character of cities has been determined by special circumstances, such as those having to do with: military defenses, scientific discoveries, administrative systems, the progressive development of the means of production and of locomotion.*

  "The basic factors governing the development of cities are therefore subject to continual changes." *Town-Planning Chart*

Those factors which have shaped cities and depend upon men, upon their knowledge and their organization, have, as we have said, changed in the course of time. Cities have not been able to escape the effects of the most far-reaching changes. They have consequently registered the ups and downs of each period. Certain factors, such as changes in the means of production and of locomotion, have already been considered. Others, such as military defense systems, have had as great an influence. Warfare and its technics have dictated, and unfortunately still dictate, new urban formulas.[10] Scientific discoveries modify all technics, those of peace and those

[9] A report on the planning of rural areas ("Planification urbaniseee humaniste") was sent by E. Weissmann (Jugoslavian delegate of the C.I.A.M.) to the Fifteenth International Congress of Architects, which was to have been held in Washington, D. C., in 1939, but was postponed because of the war.

[10] See pp. 204-205.

of war, and cities have often been profoundly changed, either directly or indirectly, by discoveries of the most various kinds. Administrative systems of progressive and regressive types have succeeded one another and have in their turn left their mark upon cities. Each city, even the shapeless city, is of a definite type, which carries a fixed date. Each type is a result of a combination of circumstances and controlling factors, and upon these the size and growth of cities also depend.

WHAT IS THE BEST SIZE FOR A CITY?

Having briefly examined the different sizes of cities, their growth, and the factors which control their development, we may ask ourselves whether our large cities of today are not really out of human scale, whether anything can justify their excessive growth and compensate for the problems it has bred.

In the preceding chapters our examples for the most part have been taken from the biggest cities. This has not been done without motive. As a rule, small cities copy bigger ones, like children trying to imitate their elders. Partly on account of this imitation, their smaller problems have a tendency to become more complicated. Their illnesses are often the same as those of big cities, but, as the more advanced phase has not yet appeared, the diagnosis is not always so clear.

The following quotations [11] from a report on the city of Bridgeport, Connecticut, apply to many cities in America.

"Industry is allowed to sprawl throughout the city, cutting it off from the shore, creating unfavorable conditions along the river, . . . and being located in areas which might much more profitably be kept for housing or recreation. . . .

"In Bridgeport the original street pattern on a horse and buggy scale has been little altered for modern transportation. . . .

"These maladjustments are throwing the city out of equilibrium. People are moving out to avoid the traffic tie-ups. . . ." [12]

[11] "Study for the Reconstruction of Bridgeport," by the Yale Graduate Group in Architecture, 1939-40 (see *New Directions, 1940*, James Laughlin, Norfolk, Conn., p. 300).

[12] There are 147,121 inhabitants in the city proper and 69,500 outside of the central city.

These and similar statements prove that some small cities already present grave problems, the dominant ones in each case depending on circumstances. For example, the effects of traffic congestion are more acute in a few small American cities than in some of the big cities of Europe. On the other hand, certain medium-sized European cities (such as Rouen, Lille, or Nice) exhibit worse slum problems than many large American metropolitan centers.

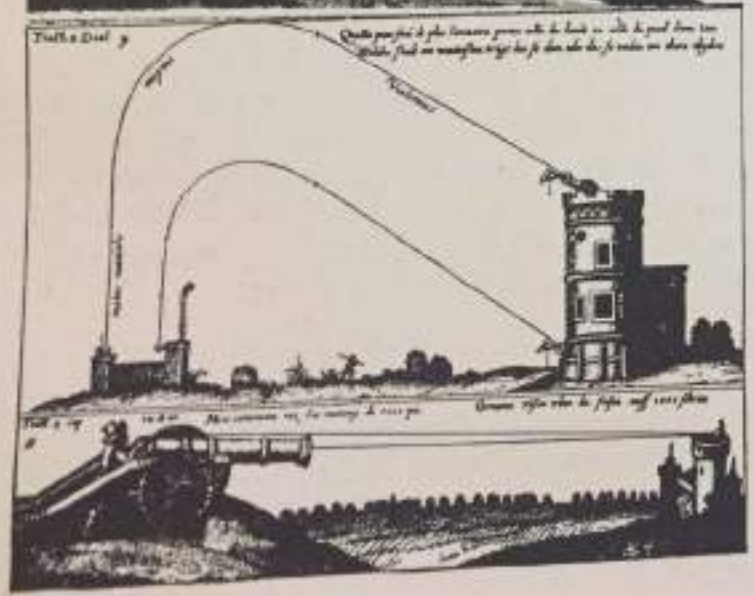
Among the cities analyzed by the C.I.A.M., the city of medium size predominated. Yet in formulating our town-planning chart we found that our observations on cities, as well as our statements of their requirements, could be generally applied to present-day cities of any size. The problems may differ in scale, in proportion to the size of the city, but, considering small cities as a whole, we find that *the problems themselves are all there.*

No matter what their size, all the cities of modern civilized lands (and here *civilized* is synonymous with *mechanized*) have felt the impact of the Industrial Revolution in some way. *The same causes have produced approximately the same effects everywhere.*

If big cities are confronted with vaster problems, they are also economically better equipped to solve them, their revenues from taxes being greater.

Many people advance the argument that "since big cities are such an unending mass of problems, perhaps the simplest solution would be to abandon them altogether." Perhaps they are right; on the other hand, it must be considered that big cities, as compared with small towns, have deeper roots, that they figure far more vitally in the life of a nation and in the world as a whole. Smaller cities would perhaps be easier to abandon. While lines of all sorts converge upon big cities, the small town often remains by the wayside.

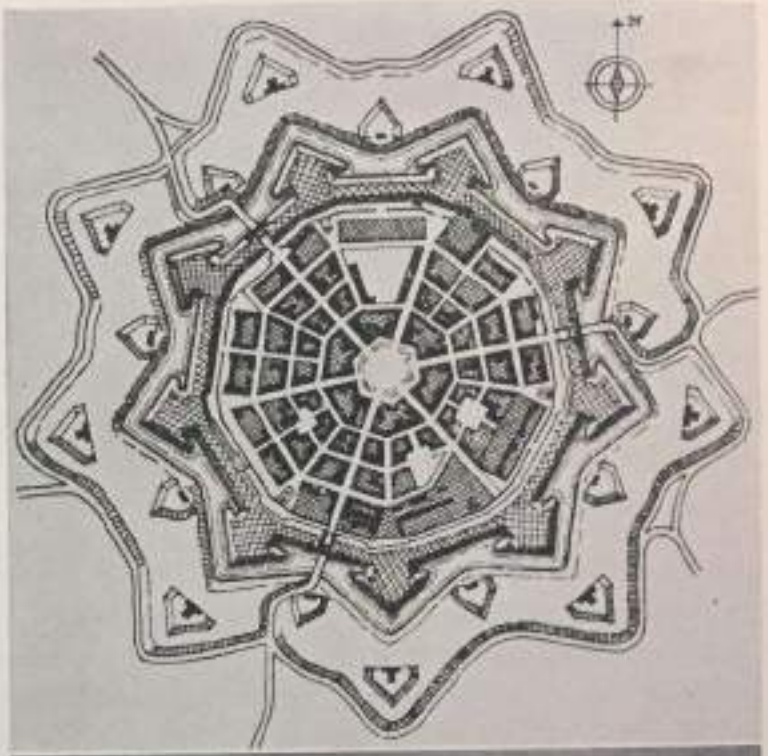
It is true that the larger cities, in their present form, constitute an indisputable error. They no longer function as a unit but as several units *piled* together. They are clusters of cities. Town planners of the last few decades have studied large cities divided into small semi-isolated units which are complete cities in themselves. Some have come to the conclusion that the town unit of 50,000



MEANS OF WARFARE, like the tools made by man, remained dependent on muscular force and practically unchanged for many centuries. Cities established belts fortified against them in which brick and stone walls offered sufficient protection. *Old urban patterns remained unchanged during long periods.*

Artillery did not seem a very formidable weapon in its beginnings, but as time passed it had a decisive influence on urban patterns. In 1567 Pietro Cataneo in Italy invented a many-angled plan with a central citadel; Palmanuova was planned according to his theories. Although most of these plans were never carried out, nonetheless they served as models for the changes that artillery imposed on cities all *over* the world. Between 1633 and 1707 Vauban, military engineer in France, built thirty-three new fortresses and *remodeled three hundred cities*, applying his system of fortified belts, which the greater number of important European cities copied during the next hundred years. As artillery becomes more powerful and armies are better equipped, frontier fortifications take the place of fortified belts. *Fortress cities decline, and suburban expansion makes the old fortifications useless.*

In the nineteenth century military mechanization makes great progress. Alfred Krupp in Essen, Germany, begins to manufacture his guns in 1846; Schneider takes over Le Creusot in France in 1837; and these factories soon produce heavy artillery that makes the old systems of fortification useless. As a consequence, cities begin to demolish them — Vienna in 1858. The process is long and costly, and Paris preserves some of its fortifications until 1920.

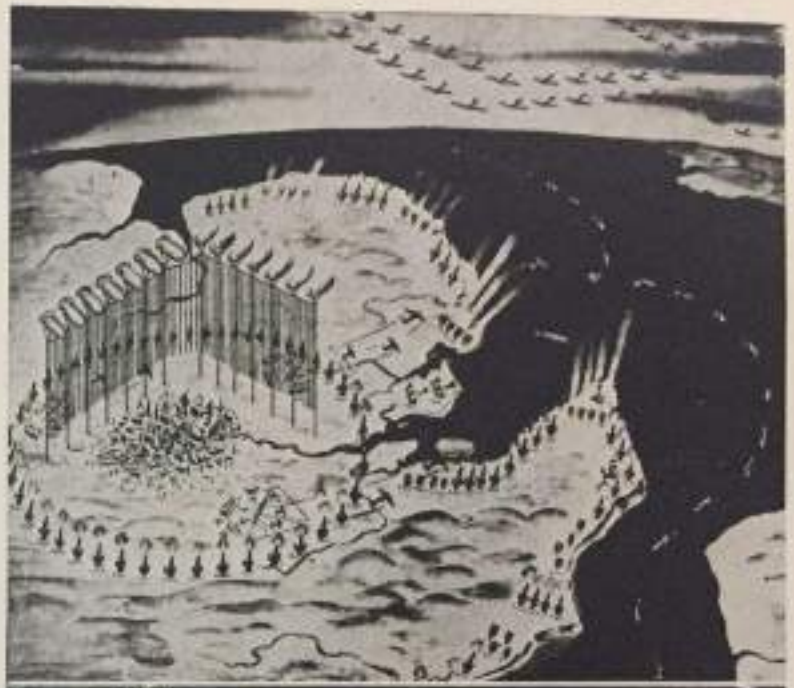


The Maginot Line seemed the answer to the heavy artillery that the first World War produced. But the new bombers are a fresh menace to cities not unlike the one that led to their rebuilding by Vauban. The bombardment of the Dutch city of Rotterdam on May 14, 1940, is a proof of the destructive force of the new weapon against an undefended city:

"The city was subjected to a hail of heavy bombs (for three hours).... Over an area of nearly two square miles, only three buildings were left standing.... The rest was rubble. There was not so much as a wall left to mark the position of the destroyed blocks. Thirteen hundred lorries took part in the salvage, and the rubbish was used to fill up the River Schie, which flows through Rotterdam." (*Illustrated London News.*)

Later experience in other cities shows that means of defense are becoming more efficient, and the first types of shelters seem old and outmoded.

Defense of cities, like other problems connected with them, *has been revolutionized by the new machines*. Here also the shortening of distances has imposed a *new planning scale* (as can be observed in the maps to the right) which cannot be overlooked.



inhabitants is on the whole the most desirable, as it has been calculated that this population is the smallest that can support economically the various functions of a modern civic structure.[18]

[18] The studies of some C.I.A.M. groups, as well as those of leading German and Russian architects, agree on this figure. (See note on "borough unit" on p. 72.)

In spite of these arguments, it is a delicate matter to determine general rules fixing the sizes of cities. Each particular case demands a complete study of local circumstances; these, in turn, will suggest a scale or size which, if properly conceived, will not lead to the inhuman qualities of many of the cities of today.

PART THIRTEEN

MAIN BARRIERS TO LARGE-SCALE PLANNING

In considering the different urban functions, we have in each case examined the obstacles to a reorganization of these functions. *Certain obstacles are far-reaching, affecting the whole city*; their removal is necessary if modern planning is to accomplish its great task.

URBAN DEVELOPMENT IS WANTING IN CONTROL

- *"Although cities are constantly changing, it may be stated as a general fact that their changes are not anticipated and that their development suffers because of the absence of control and the failure to apply the principles recognized by contemporary town planning."*

Town-Planning Chart

Cities have always been subject to a constant process of change, but the tempo of this change has been considerably augmented since the beginning of the Machine Age. *The cities of our time have become mobile.*

That public authorities lack the vision to foresee these changes is not a failing of our time alone. It is characteristic of the past hundred years.

Sometimes these changes seem to have been ignored with intention. Whether they have been or not, the consequences of ignoring them *are becoming more serious* because of the rapidity of their occurrence today.

Urban mobility has been accelerated by modern technics whose new instruments and processes herald the continued stimulation of this mobility. Among the actual trends that may influence urban developments of the future are:

1. Facilitation of the selection of industrial sites (through the minimizing of climatic factors, easier access to raw materials, and new sources of power).

2. Improved facilities for the provisioning of cities.

3. Increased facilities for the transportation of people and goods, due to the automobile, new highways, and the airplane.

4. New means of telecommunication (telephone, telegraph, radio).

5. The possibilities in the use of new methods of building (lightweight constructions of a provisional character, through the employment of modern structural materials; the probability of mass production of such materials and their application to different phases of construction in the near future).[1]

6. Changes which may occur through the menace of air raids.

7. Limits of obsolescence of buildings of all types.

Today, more than ever before, the increasing mobility of cities demands provision for the future. Such provision should be based on facts established through contemporary methods of investigation applied to urban problems. *These findings and the general principles of modern town planning should no longer be ignored.* Popular interest should be stimulated by their wide dissemination, and a critical approach, which has already begun to appear, though in a timid form, should be encouraged.

Familiarized with the gravity of the present plight of cities and stimulated by criticism resulting from the dissemination of this knowledge, it should be possible for the authorities responsible for the execution of urban reforms to direct future improvements along the lines of planning which foresees all the factors involved.

In order that they may be adapted to the present state of urban mobility, plans concerned with the development of cities and the regions that surround them should exhibit a *maximum of flexibility*, permitting modifications from time to time whenever changing circumstances require them.

These plans should therefore take into account the time factor, in the sense that they should establish periods of time in which various phases of the program would take place, these phases being synchronized with anticipated changes.

Civic Forces Are Not Coördinated for Civic Improvement

- *"In most cities there is apparent a disastrous rupture between their economic resources and the administrative and social responsibility of the municipality."*

Town-Planning Chart

[1] See "Industrialization of Housing," by K. Lönberg-Holm and C. Theodore Larson, in *Technical America*, March 1938.

This rupture serves as a hindrance to all comprehensive planning whose aim is a program satisfying the collective needs of the community. In order to put such a program into execution, *a close collaboration* between the forces in control of the economic resources, on the one hand, and the public authorities commanding the necessary power and protecting the interests of the community, on the other, is *indispensable.*

Present-day urban reforms (intended, so it is said, for the improvement of our cities) have in most cases been approached from the standpoint of economic feasibility and material advantage rather than from the standpoint of human benefits. The reforms most quickly executed have not been those most urgently required for the well-being of the population in general, but often those which have looked like "paying propositions" to the enterprises concerned (banks, construction companies, large business and industrial firms, transport lines, and others).

Slum clearance, the creation of fields for sports, the building of schools and hospitals — as a rule, these are not good business investments. Plans for projects of this nature, which nevertheless would contribute to the health of the people affected, usually end by reposing in municipal archives for long periods of time. . . . *To have the possibility of immediate attention, a project must above all be one that "pays."*

The well-being of the people, their physical and cultural betterment, are still in many cities subject to the caprices of a few charitable benefactors who are eager to perpetuate their names in the memory of future generations. And when a city is not blessed with one of these rare philanthropists, it often must go without schools, libraries, or public parks.

But the dignity of the citizen deserves that urban improvements be made on a simply human basis, unlike that which has inspired previous action.

Neither business nor well-meaning charity nor politics and party interests ought to be concerned where the well-being and the health of great populations are at stake.

THE PRESENT PARTITION OF URBAN LAND RAISES THE MAIN OBSTACLE TO ANY EXTENSIVE REPLANNING SCHEME

- *"The magnitude of the work to be undertaken in the urgent reconstruction of cities, on the one hand, and the excessive partition of urban land, on the other, represent two antagonistic realities.*

  "This sharp contradiction creates a most serious problem in our time:

  "That of the pressing need to establish the disposition of the land upon a basis satisfactory to the needs of the many as well as those of the individual.

  "In case of conflict, private interest should be subordinated to public interest." *Town-Planning Chart*

In analyzing each urban function, it was maintained that *the principal obstacle* to an efficacious reorganization of the function in question was, directly or indirectly, *the present division of urban land into comparatively small lots and the difficulty of adapting new planning formulas to this division.*

In presenting solutions that would tend to correct the problems of our cities, we have repeatedly emphasized the necessity of *resorting to new means of approach.*

Considered in the light of its new requirements and of the possibilities of modern technics, the city appears on a new scale. Its identifying characteristics are the neighborhood unit, the new street network, the industrial and business units, the new recreation system, and the civic center.

The magnitude of these proposed innovations far surpasses everything which has been undertaken in the reconstruction of cities up to the present. The obstacles which these innovations encounter are a consequence of inaction, of laissez-faire policies, and of the lack of courage to appraise the actual gravity of the situation.

The persistence of this policy of inaction, which is so generally accepted that it has become traditional, is to some a sign of wisdom and common sense. But it has too often brought the cities of our time into a state in which there are portents of disintegration.

The experiences of the last few decades prove that partial or temporary solutions or compromises represent a useless waste, the burden of which city budgets can, and should, no longer bear.

That city finances, in their present course, are traveling the road to certain bankruptcy seems apparent, especially in those cities whose development has been most fundamentally affected by the Machine Age.

If old cities must give way to new ones, *a redistribution of the land* in urban areas *becomes inevitable.*

A more rational distribution of urban land means *the alteration of the shape and size of parcels.* This alteration must tend to make the resulting parcels adaptable to the needs of modern town planning — or to *the new town-planning scale.*

This new scale requires bigger units or parcels of land; in short, it demands *the regrouping of the present lots* or *a consolidation of lots.*[18]

Town planners can only clothe an existing *economic pattern.* As it is today, this economic pattern, especially in densely built areas, is in opposition to modern planning in its most elementary principles. Consequently, modern planning cannot be successfully carried out until this pattern has been altered.

As a result of this contradiction, which opposes the satisfaction of modern needs and paralyzes the application of modern technics, *urban land is becoming more and more frozen,* more immobile, more static, at the very time when cities require greater mobility.

The old basis of speculation no longer operates as in the past; it is constantly shifting to new areas. In the city proper, new factors must be admitted to stimulate replanning, in order to make land active by adapting its patterns to the planning requirements of today.[1]

Three Views on This Problem — Only those people who expect a new period of prosperity, like that which succeeded the war of 1914–1918, can make themselves believe that cities, in view of their present plight, will be able to maintain their present structure.

It has not even occurred to most people to question the condition of our cities. A conscious minority, however, familiar with the gravity of the situation and recognizing its eventualities in the near future, might well ask themselves the question:

Can — and should — our cities survive?

In reaction to this question, one of the following three attitudes may be adopted:

(*a*) The position of those who believe that cities can and should maintain their present structure; that their present crisis is but superficial and temporary; and that, once it has been surmounted, the prosperous days of the decade 1920–1930 will return.

(*b*) The attitude of those who think that our cities will not be able to withstand their increasing indebtedness and that it will inevitably lead them to total ruin — in short, that they will have to disappear.

(*c*) The attitude of those who believe in the efficacy of certain drastic measures, whose application will change the entire structure of cities, and who believe that through these measures *our cities can and should be saved.*

The most general and convenient attitude is the one embraced by those who believe in the preservation of the present urban structure. We assume, however, that the facts presented in the preceding pages suggest that nothing is to be gained by hiding one's head in the sand.

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[18] "All the customs and legal procedures facilitated the breaking up processes [for sale to multitudes of owners], and did nothing to facilitate the regrouping of parcels into larger tracts" (Federal Housing Administration, *A Handbook on Urban Redevelopment for Cities in the United States,* Washington, 1941, p. 1).

"Until the Nation as a whole recognizes that land is a public utility instead of a speculative commodity, not much prospect exists either of obtaining adequate housing for the population or for reconstructing cities to make them fit for human living" (*Our Cities,* report of the Urbanism Committee to the National Resources Committee, Washington, 1937, p. 48; this report is the first major national study of cities in the United States and constitutes a most valuable document).

See also *Urban Planning and Land Policies,* vol. II of the Supplementary Report of the Urbanism Committee to the National Resources Committee (Washington, 1939), pp. 217, 224.

[1] In 1931 the C.I.A.M. studied the rational size and shape of parcels (*Rationelle Bebauungsweisen,* Stuttgart, 1931). This and further studies, like those of the Fifth Congress (*Logis et loisirs,* Paris, 1938, pp. 24–27), showed that the main problems of city planning are to be found in the reorganization of urban land.

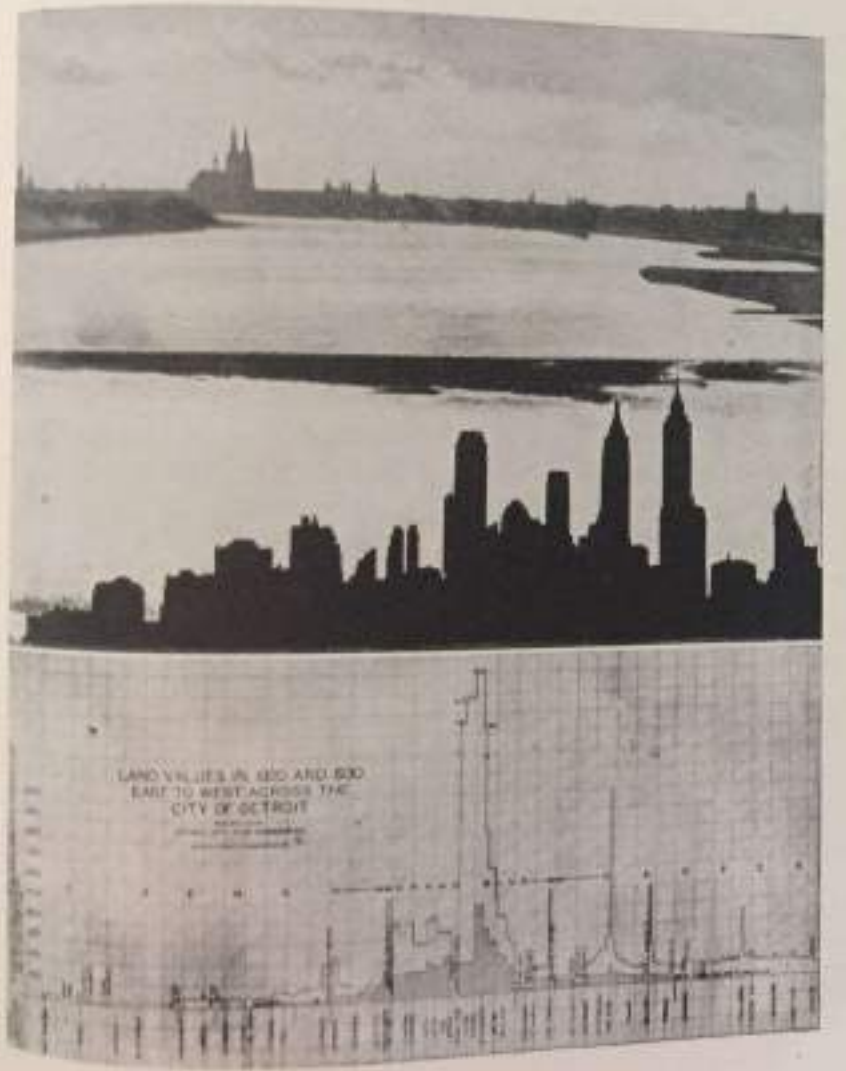
The persistent subdivision of urban land on a speculative basis has fixed the patterns of our cities. This speculative policy has even affected the external characteristics of urban centers, as can be seen by comparing the two skylines and the diagram reproduced below. Reading down, these are:

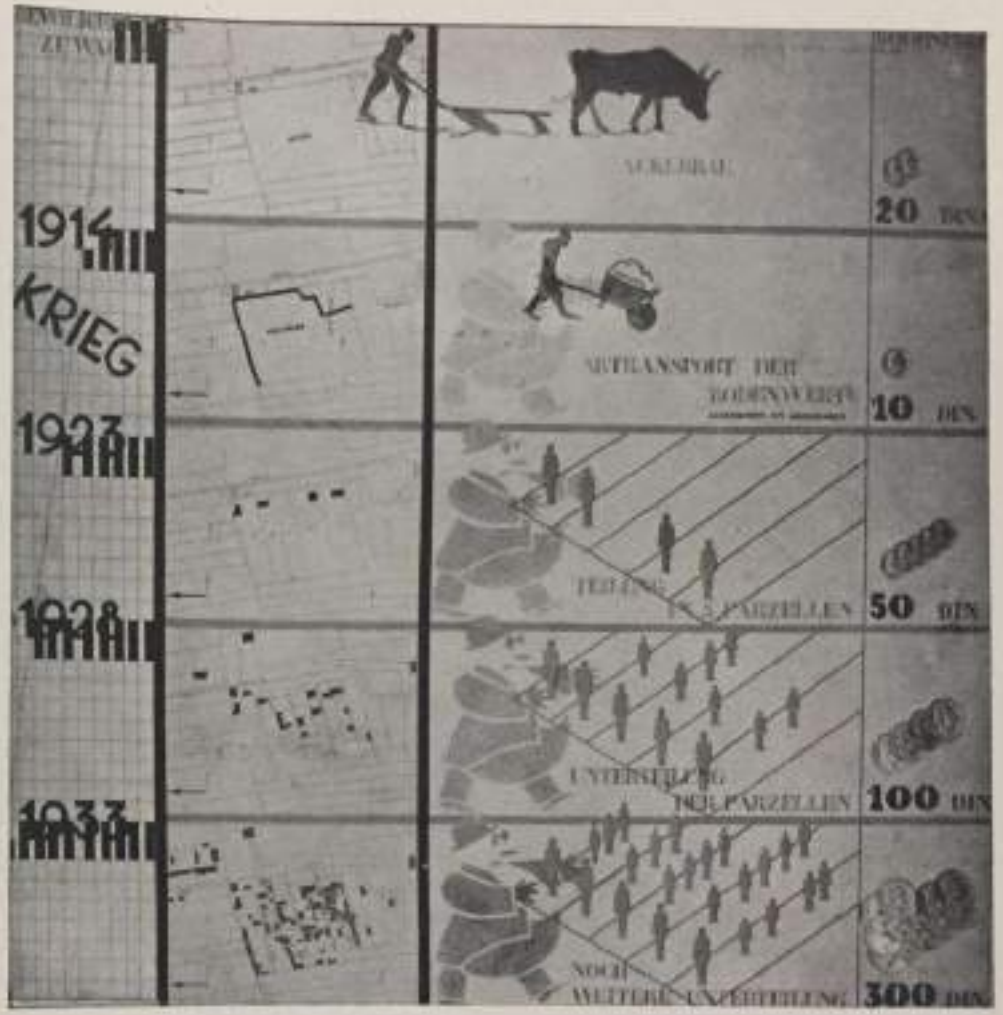
A. The skyline of Cologne. This city has to a certain extent preserved its medieval silhouette.

B. The well-known skyline of Manhattan. Here, as in all other business centers, high buildings mean high land values.

C. Not a skyline but a graphic expression of the different values of lots on a central artery in Detroit.

The parallel between B and C is striking; the inflation of these land values and the arbitrary differences between them are worth considering and need readjusting.





During the last few decades, cities both large and small have been subjected to the most unscrupulous ups and downs of speculation. The graph above was designed by the C.I.A.M. (Yugoslavian group) to show the evolution of a suburban property near the city of Zagreb, Yugoslavia. The agricultural value of the land (estimated at twenty dinars the unit in 1914) went down to ten dinars when the war began and this land was filled in for later building purposes. During the post-war boom, the city (then part of a new political system) expanded, and the subdivision of the land into building lots began. The price per unit mounted immediately to five times that of the preceding period and to two and one-half times its agricultural value. As subdivisions continued, this last price was doubled; in five years it had a value ten times greater than its pre-war value. After the next five years the value of the land became thirty times what it was in 1914. During this last period the land, which as a damp lowland presented bad dwelling conditions, finally became the site of *a suburban slum*. This is the history of a small property; when similar principles are applied to "big developments," speculative gains know no limits.

The opinion of those whom we might call the most pessimistic, of those who believe in the inevitable disappearance of the city, is based on self-evident truths disclosed by any analysis of present conditions. Their arguments seem convincing, but they stop at this point. What they fail to consider is the results of such a disappearance. History has its precedents of cities that have disappeared, but in the past the death of cities has always coincided with the passing of the civilizations which have produced or developed them.

The third attitude, which maintains that cities can and should be saved, is the conclusion reached by the International Congresses of Modern Architecture after analyzing and weighing the gravity of urban problems as exhibited by most of the cities of the world today.

It remains for us, then, to seek to define the measures needed for the introduction of the reforms which — according to our view — would permit cities to survive their present vicissitudes and to experience a revival adapted to the rhythm of modern life.

WHY OUR CITIES SHOULD BE SAVED

Chaotic as they are today, our cities are products of our civilization. In spite of their baser elements, many are still the citadels of our culture. Their roots reach far into the past. Even today *their sites are significant not only in a functional sense but in a spiritual sense as well.* To replace them would involve a colossal undertaking. Occupying strategic geographic sites, they are the focal points of tremendous networks of communication and transportation, which modern technics constantly extends. Even though they are emptying and overflowing into the country, all roads still converge upon them.

Past concentrations of population have produced such an unprecedented state of chaos that this decentralization, or dispersion into the country, is both natural and logical. But it does not necessarily mean the death of the city. The scale of our cities may change; they may break up into pieces, in the sense that vast suburban zones, developed in these last few decades like parasites, may be segregated from the city proper, giving place to open areas or green bands. Such a reduction of the area of the city or its limitation to essential elements does not constitute a disappearance of the city. It is rather something like the process of eliminating surplus fat in the human body, with consequent gains in health. With these changes, the city would be reduced to its essential elements united by a system of networks (streets and highways, telephone and lighting services, and others) to form a vital nucleus corresponding to the vital needs of the country and region.

Undoubtedly the changes required in our urban structures involve great difficulties, but they are necessary. And, fortunately, we have never before in history possessed so many possibilities for their achievement, from the technical standpoint, as we do today. The surgical operation is a delicate one, but clean instruments are at hand.

A number of those who champion the idea of the ultimate disappearance of cities envisage vast expanses of the countryside with a low density of population, somewhat resembling a spread-out garden city. A labyrinthian and interminable network of roads would link widely separated farms, among which would be found stores, theaters, schools, and other buildings. Such an arrangement, however, would sacrifice the rural atmosphere without reproducing the city itself, and would result in a neither-city-nor-country formula (see pp. 60–62).[3] And civic dignity, the expression of the human will throughout all the ages of history, would exist nowhere.

No, the lesson of the past tells us that Troy was rebuilt on Troy, Rome on Rome, Paris on Paris. So New York can and should be rebuilt on New York. Manhattan returned to the Indians, its skyscrapers in ruins?[4] This seems a too-fantastic conception of "the world of tomorrow," provided one assumes that our civilization will go on in spite of the devious processes of its evolution, and that we shall not return to the Dark Ages.

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[3] H. G. Wells wrote on this subject in his *Anticipations* in 1900. Since then the drawbacks of such a plan have become very evident.

[4] Looking out over Manhattan from the top of a skyscraper, an American architect once asked Mr. H. G. Wells, "What do you think of the architecture of New York?" Mr. Wells replied, "It will make a magnificent ruin."

NEW TOWNS NEAR HIGHWAYS. The first step in the rehabilitation of our big cities is to free them of congestion by siphoning out part of the population. This means that we must create a "pull" toward newly erected industries situated outside of cities and near superhighways, and that we must establish new dwelling quarters near these industrial establishments. *This type of town is independent and self-contained; it is not a satellite community.* Several town units of varying size (possibly up to 50,000 inhabitants per unit) might form larger communities, though each would preserve its independence and should be separated from the others by green belts. To prevent speculation, the land should be owned by the community. It has been calculated that the financial burdens of a family in such towns would be half those in large existing towns. The old towns, free of congestion and with a planned assembling of land controlled by the community, could then be properly rehabilitated. The illustration at the upper left shows a plan for the location of towns of from 5,000 to 8,000 inhabitants, built around small industries and surrounded by farm belts, along a federal superhighway about twenty miles west of Boston. The illustration at the upper right shows a model of one of these towns of 5,000 people with industrial plants (lower right) and a community center (center). The diameter of this settlement is about three-quarters of a mile, so that all points can be reached by footpaths without the need of crossing roadways.

In short, we believe in the necessity and the possibility of a complete transformation of our cities. The signs of the times portend such transformations; their enormous cost may become a minor factor. *We believe also that there are rooted in our cities certain elements which are the expression of something on a plane higher than the maneuvers of speculation and of individual gain.* Around these living and eternal elements we believe that the new cities of tomorrow will rise, like symbols of the spirit of man, out of the disintegrating cities of today. *Our civilization will have experienced a profound change, but the continuity of the spirit and its heritage will be saved.*

PART FOURTEEN

PLANNED ACTION CAN SAVE OUR CITIES

"We may be entering upon an age of city rebuilding of extraordinary wonder and beauty."
— H. G. Wells, *Outline of History*

WHERE SHOULD PLANNED ACTION BEGIN?

From the analytical studies made by the C.I.A.M., we believe that the regrouping of urban land, permitting the application of new principles of modern town planning, is indispensable to all change in the basic structure of our cities.

We emphasize our previous assertions that this regrouping in no way signifies a loss of property rights. (The legal implications of such land regrouping do not come within the scope of this book and cannot be discussed here.)

We therefore introduce the following pages with the admission of the principle of the regrouping of the land as a basic corollary.

Our immediate task is that of formulating the conditions underlying any program whose aim is the transformation of our cities, stopping the spread of chaos which menaces their existence and making them adaptable to the needs of our time.

Taking this as our point of departure, what is the line of action to be followed?

The Need for a Regional Plan — Assuming that the regrouping of the land is possible, through a consolidation of present lots, the first problem is that of determining the most efficacious means of achieving this new consolidation of the land.

It is obviously necessary that this consolidation be accomplished with guarantees of a maximum period of duration. At the same time, foreseeing a future in which many changes may occur, any plan for consolidation should be sufficiently flexible to allow for these future developments.

We have already shown that cities extend beyond their limits into the regions surrounding them and that there is an intimate interrelationship between city and region. A regrouping of the land cannot be achieved without taking these basic facts into consideration.

We should proceed with the regrouping of the land according to the functions of the buildings or spaces affected — in other words, *by zones*. Each one of these, by virtue of its use, will suggest a certain grouping of existing lots. The first steps toward the complete reconstruction of the city should therefore take place on a regional scale, since the varied character of the zones composing the region will determine the type of lot-consolidation most advisable in each case.

Several different series of plans on the regional scale will be required, showing the conditions of the present as well as the contemplated regrouping of the land. These general plans would serve as *master plans* for the city and its region.

There is no question that the big cities of today are not merely "regional products" [1] but have been shaped by national and international factors of the most varied and often the most arbitrary type.

These factors cannot be ignored by planners.

(It should be emphasized that the word "region" is not used here in its traditional sense. What we mean is the area of the economic influence of cities, though the indirect influence of a great metropolis, such as New York or London, may reach far beyond what can properly be called a region.)

In view of the present chaotic state of most cities and their regions, it is urgent that all action for their reconstruction begin with the establishment of a series of master plans.

These master plans will serve to indicate the general lines to be followed for the replanning of both cities and regions. It is important that one should proceed from the large to the small, from the general distribution of units throughout the region (complying with the requirements of a national plan) to the examination of districts in detail. It is impossible, for example, to study a dwelling district if one has not first determined whether the site should be devoted to housing or should fulfill some other urban function. (It should be observed that this could not be established from a city plan alone, since the problem goes beyond the administrative limits of the city: only a regional plan can serve this purpose.)

[1] See J. M. Richards, "Towards a Replanning Policy," *Architectural Review* (London), July 1941, in which regionalism is reëxamined.

Examples like these, of the Dutch reclamation of the Zuider Zee polders (left), which increases by 10 per cent the arable surface of the whole country, and the work of the Tennessee Valley Authority (right), prove that large-scale planning involving vast areas (26,000,000 acres in the T.V.A., 543,400 in the Zuider Zee), is not a dream for tomorrow but an *immediate possibility* for today. By planning on this scale, entire regions can be revalorized, their economy and physical aspect transformed by the machines that man has at his disposal at this moment. In these two areas, when the water was uncontrolled, one was submerged, the other eroded. Today farmers live in them, and water irrigates the land and supplies the power to move machines and light homes. Entire continents await similar transformations. One thing is necessary — *to plan on a large scale*. But such planning is not a private function and will not be decided upon by private initiative. Neither is it a task for local governments. It constitutes a *national enterprise*.

The first series of plans necessary for *a complete reorganization of the city*, as required by present circumstances, must be on a regional scale. To begin this study:

- *"The city should be examined in the economic ensemble of its region of influence. A plan of the economic unit, or 'city-region,' in its totality must therefore replace the simple city plan of today."*

Town-Planning Chart

As a basis for the study of these plans of *cities in their regions, or regional plans,*

- *"It will be necessary to fix the limits of the plans in accordance with those of the region, defined by the scope of the city's economic influence."*

Town-Planning Chart

The delimitation of economic regional units, their analysis, and the redistribution of their elements, together with all changes affecting their structure, are of direct interest to the town planner.

In discussing the relationship between the city and its region, we suggested that the networks of communication and of public services might constitute one of the bases for the delimitation of the region. All factors, however, should be taken into consideration before establishing these limits. And these factors will vary greatly in each case.

Of one thing we can be certain — that the administrative limits which are still observed in most cities, and which mark the boundaries of city maps, no longer have any real value. Many of these limits are only survivals of old regional confines, or those of communities, or of estates, often established arbitrarily or based on natural demarcations, such as rivers, lakes, and mountain chains, which have ceased to be obstacles to expansion today. For if they were once outside the channels of transportation, or if they were at one time difficult to traverse or easy to defend, technical progress has altered their significance as barriers or limits.

Only blind obedience to the practices of the past, sometimes dating back several centuries, and the initial cost of deviating from those practices have preserved these arbitrary limits. The revolutionary changes brought about by the motorization of transportation in themselves have made these old municipal limits obsolete — if they are technically considered — and without justification.

In reality, of course, these limits have in no sense *limited* cities. The real city of London, for example, is greater than the county of that name, while officially the "City of London" remains enclosed within its old limits. The city of New York straddles three states. And the real city of Paris now occupies two *départements*.

Because of the persistence of these old communal or provincial limits, the legislative functions of many cities are cramped. As a result, their plans are drawn up in piecemeal fashion and without coördination, the problems of the real city or the region as a whole being often ignored. Local statistics, as customarily compiled by municipalities today, are in the same manner partial or incomplete, thereby failing to provide a broad basis for general working purposes.

From every point of view, yet especially for town-planning uses, it is imperative that a new administrative scale be brought to bear on the city. This new scale should coincide with that of the zone actually influenced by the city. Where, then, shall the limits of this zone be fixed?

The *economic* influence of the city generally determines them. The fixing of the zone, however, should not be based entirely on the present situation but should include anticipated later developments, once the reorganization and control of the region have been put into effect.

Because of this fact, which is extremely important, the town planner depends for help on the experienced departments of the state and on the information they furnish from the researches of such specialists as economists, health officers, and others.

WHAT IS A REGIONAL PLAN?

When the area comprising the *city-region unit* has been delimited on the basis of its vital factors, the integral parts of this unit should be analyzed in their present state in preparation for future developments. These integral elements may be grouped into three series:

Series A. — *The site and the natural elements identified with it.*

The climatological factors — temperatures, rainfall and snowfall, winds, etc.

The land, its resources — the soil, the subsoil, and their nature. The topography of the region. Natural land routes. Water courses and their potential resources and power. Natural drainage and sewage systems.

Series B. — *The people — population and its distribution.*

Rural and urban populations; figures and proportions (percentages).

Increase and decrease of population.

Age groups in the population and classification by sexes (figures and proportions).

Classes of occupations — jobs and professions.

Population densities in the principal centers of the region.

Population movements (migrations) — those of the past and those anticipated in the near future.

Series C. — *What man has accomplished.*

Agriculture — cultivated and uncultivated areas, farms and their arrangement.

Agricultural products, their value and their distribution. Forestry.

Soil erosion.

Industry. Character and distribution of industries of the region. Production. Sources of required raw materials. Distribution of products. Markets. Occupations in industry and their classification.

Recreation. Forests, parks, and green reservations. Week-end recreation places. Trailer camps,[2] resorts for winter sports and summer sports (vacation centers).

Communication networks. Motor transportation. Car registration in the region. The number of people per car (proportion); increase of this number during recent decades. Mileage of principal roads. The number of cars per mile of surfaced road.

Air traffic; airports.

Railroad passenger service; railroad freight service.

Ports and the principal shipping lines converging upon them.

Telephone and telegraph networks.

Radio stations.

All this information can be presented by means of plans, diagrams, and reports of various kinds. The whole would constitute an analysis of the region and all its principal elements, and would serve as a basis for proposals for reorganization.[3]

These proposals will comprise another series of similar documents, showing the various contemplated projects in the region at different stages of completion. Here, for example, is an outline for a program:

I. A proposal for a new *distribution of the population.* This should be determined by the natural elements — climate, topography, soil, water — as well as by what has been done by man on each site. (Series A and C of the preceding general analysis.)

II. A series of *zoning* plans showing proposals for subdividing the land of the region into zones differentiated by their intended uses: cultivated lands (of different classes), uncultivated lands, rural housing districts, urban housing districts, industrial zones (heavy and light industries), business districts, civic centers, recreation centers (including seashore and mountain resorts). Networks of principal traffic arteries — roads, highways and parkways, railroads, airports, harbors — which link the principal zones. Some regions will also have special features which are not included in this general list, such as mining or archaeological zones.[4]

The city or cities included in these regional studies should appear in these plans, diagrams, and reports only in their general lines, as though they were shadows cast upon the larger terrain of the re-

[2] The importance of the trailer movement in the United States was overestimated in the early thirties; later figures have proved that the number of trailer-ites has not increased so much as was expected. See Donald Olsen Cowgile, *Mobile Homes* (Washington: American Council of Public Affairs, 1941).

[3] See the work done by the National Resources Committee.

[4] These zoning plans should also anticipate the probable development of each of these sites, the direction of their development, and possible changes. For this reason, the plans should be characterized by a certain degree of flexibility.

gion; for it must always be remembered that the features described are identified with the whole region, not with the communities alone.[5]

These series of maps or master plans of the region will often represent projects requiring long periods for their execution. But their principal object is to indicate in a general way the reorganization of the region, permitting the planning of any given section without hindering the functioning of the region as a unit.

The order which would result from the development of a region along the lines of such a regional plan would benefit not only the many but also those private interests who oppose reforms in our cities because they lack a broad view of the problem. In failing to see the long-term advantages assured in the replanning of our communities, they sacrifice their own future together with that of others.

It should be emphasized that, when we refer to regional planning, we do not mean that whole regions should be adapted to the needs of the city or cities located within them.

The following statements on the relationships between urban and rural areas are given here so as to prevent any misunderstanding.

Rural Urbanism, or the application of modern town-planning principles to farming areas, should form part of the study of any regional plan.[6]

Large-scale planning encompassing vast areas cannot be limited to urban needs. Both rural and urban populations living in these areas ought to benefit from the advantages that a modern plan can secure. Besides trying to bring the country to the city by developing open spaces for hygienic and recreational purposes, we must try to take to the open country certain advantages that have been considered until recent times exclusively urban.

[5] Nevertheless, the perimeter limiting the probable growth of the city, or its maximum area, ought to be indicated in these zoning plans. And certain portions of land within this zone will naturally be menaced by a more or less early invasion by the city. Their present character (agricultural, for example) will therefore be but temporary.

[6] *Urbanisme rural* was the name given by the French group of the C.I.A.M. to this aspect of modern planning, discussed with other national groups during the meetings held on the occasion of the Fifth Congress in Paris, 1937.

We cannot reorganize any city today without planning its rural environment. Neither can we replan this environment without reorganizing those urban zones to which it is directly related. Urban and rural factors are much more interdependent today than they have ever been before.

If proper contacts with cities were established, farm areas would benefit by the technical progress of which modern cities are big laboratories. Progressive building methods, controlled by a modern architectural spirit, should not be applied to urban developments alone but should also contribute toward improving standards of living in the farmlands.

The following paragraphs are quotations from a report sent to the Fifth Congress of the C.I.A.M. on this subject.

"We should not try to ruralize cities, since this would mean lowering their cultural position, but we ought to urbanize rural areas, so as to bring them the advantages of civic progress, preserving at the same time the most vital of the local factors that characterize the rural culture each region has developed.

"This rural urbanization should be complemented by a disurbanization of cities; or, to put it more clearly, a movement ought to take place that would tend to lessen the unjust differences between urban and rural living that still prevail within the limits of what should constitute one regional unit.

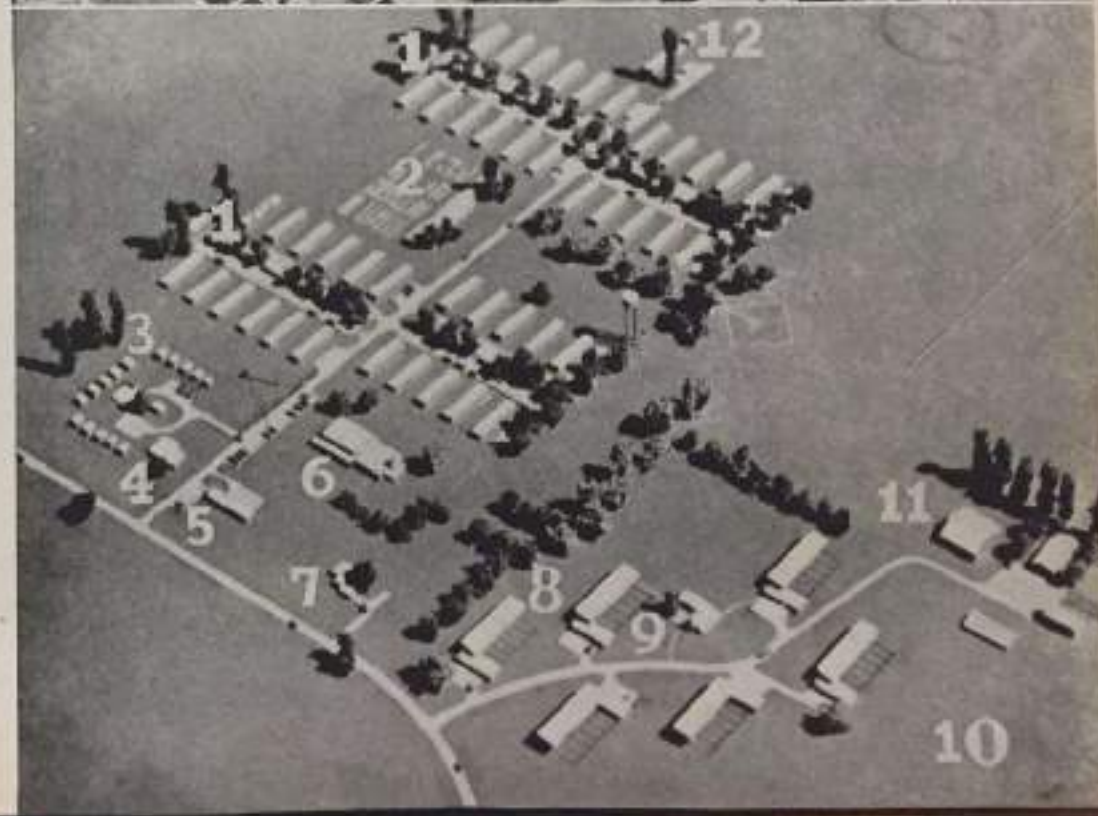
"Differences between urban and rural living conditions should be balanced by raising the level of the less favored areas to that of areas that benefit by higher standards of living." [7]

Though differences in standards of living in rural and urban areas are undoubtedly tending to diminish, the desirable tempo has not been reached. Nonetheless, the new networks of roads, the increasingly flexible means of transportation offered by the automobile, together with the wider dissemination of ideas, news, and pictures through press, radio, and movie, have brought cities and farms into much closer relationship.

[7] See the report sent to the Fifth Congress by S. Syrkus (Polish delegate to the C.I.A.M.), published in *Logis et loisirs* (Paris, 1938), p. 44.

THE SATELLITE TOWNS of the Farm Security Administration, called "Greenbelt Communities," are among the best examples of their type. The one shown here is Greenbelt, Md. It has a total of 885 dwelling units and is a "dormitory town," with no industries. These Greenbelt Communities are so called because they are surrounded by a broad girdle of park and farmland. To the small farmers living in this area they offer a steady market in the vicinity of their fields. To city commuters they offer homes in healthful surroundings. The garden-city theories formulated by Ebenezer Howard in 1898 have been successfully tested in these towns. It would be desirable to develop communities of a similar type which would also provide for industry. In them factories would be zoned, like dwellings and farmlands, according to plan. Such towns would be more independent of big cities than the one illustrated.

The Firebaugh camp and houses shown in this model are also by the F.S.A. Several communities of a similar type have been planned for the western United States. This example, though small in scale, offers many good features. Note the separation of buildings from the highway, their spacing, and the rational layout, free of the influence of the English garden cities.



1. Row shelters (six families each). 2. Central utility building — showers, laundry, drying yard. 3. Quarantine area. 4. Clinic. 5. Bath house, warehouse, office. 6. Assembly hall. 7. Manager's house. 8. Six multi-family apartment houses. 9. Homemaking and laundry building. 10. Farmyard. 11. Farm group, dairy, etc. 12. Camp employees, watchmen, etc.

In the United States,[8] given the development of mechanization, motorized transportation, and electrification on a vast scale, this movement of technical equipment from city to country promises to make greater progress in the post-war reconstruction period.[9]

Social services of an elementary type can today be made available to farming areas. But if this is to be achieved, a certain grouping of farms seems advisable.[10] In order to procure further social commodities for rural areas, other services might be of a mobile type, so that they could be used by the numbers of inhabitants necessary for their maintenance. These services might be small dispensaries, lending libraries, caravan theaters, traveling exhibits of an artistic or scientific character, etc.

Some communities recently planned for migratory populations in the West are promising in their possibilities for the near future. (see p. 221). Small communities entirely on wheels may also help in solving some local problems, if they are encouraged by good planning.

THE PRINCIPAL TASKS OF THE TOWN PLANNER

It will be asked, "What are the tasks of the town planner in this vast program?"

In the case of regional planning the town planner must play an important role. His tasks will be mainly those of classifying and distributing: on the one hand, classifying zones according to their intended functions; on the other, distributing these zones (or functions) in the most advantageous manner, always having in mind their interrelationship.

The need for collaboration between the town planner and other technical specialists is evident. Sociologists, economists, hygienists, teachers, agriculturists, and others should coördinate their labors and share each other's roles. *For the regional plan is the work of a team.*

The master plans of the city itself, though intimately related to the regional plans, constitute a separate section. In this section the role of the town planner becomes preponderant. As the head of a team of specialists, it is he who presents the general line to be followed. His principal tasks are:

- *(a) "To produce an equitable layout, with respect to locations and areas, of the various districts intended for dwelling, for work, or for recreation, as well as to establish traffic networks."*

  Town-Planning Chart

The task of determining the location of those "organs" which are the basic elements of urban life and of establishing their layout is of prime importance. For, if they were poorly laid out, it would engender a basic error of the gravest consequences to the city, disrupting its normal functions.

When a new city or a new district in a city already existing is to be planned, one of the chief problems is that of the selection of appropriate sites. But when the problem is that of replanning a city so as to make it function efficiently, the task becomes more complex, and the town planner finds it necessary:

- *(b) "To establish plans which will determine the development of different districts according to their needs and their organic laws."*

  Town-Planning Chart

In deciding upon the locations of the different organs of the city, the town planner should consider their future possibilities. He should also foresee the direction in which a given district ought to grow. He should base his plans for directing and controlling urban growth on the general research material assembled in connection with the city, and he should be familiar with the organic laws dominant in each part of the city and with estimates of present and future population needs.

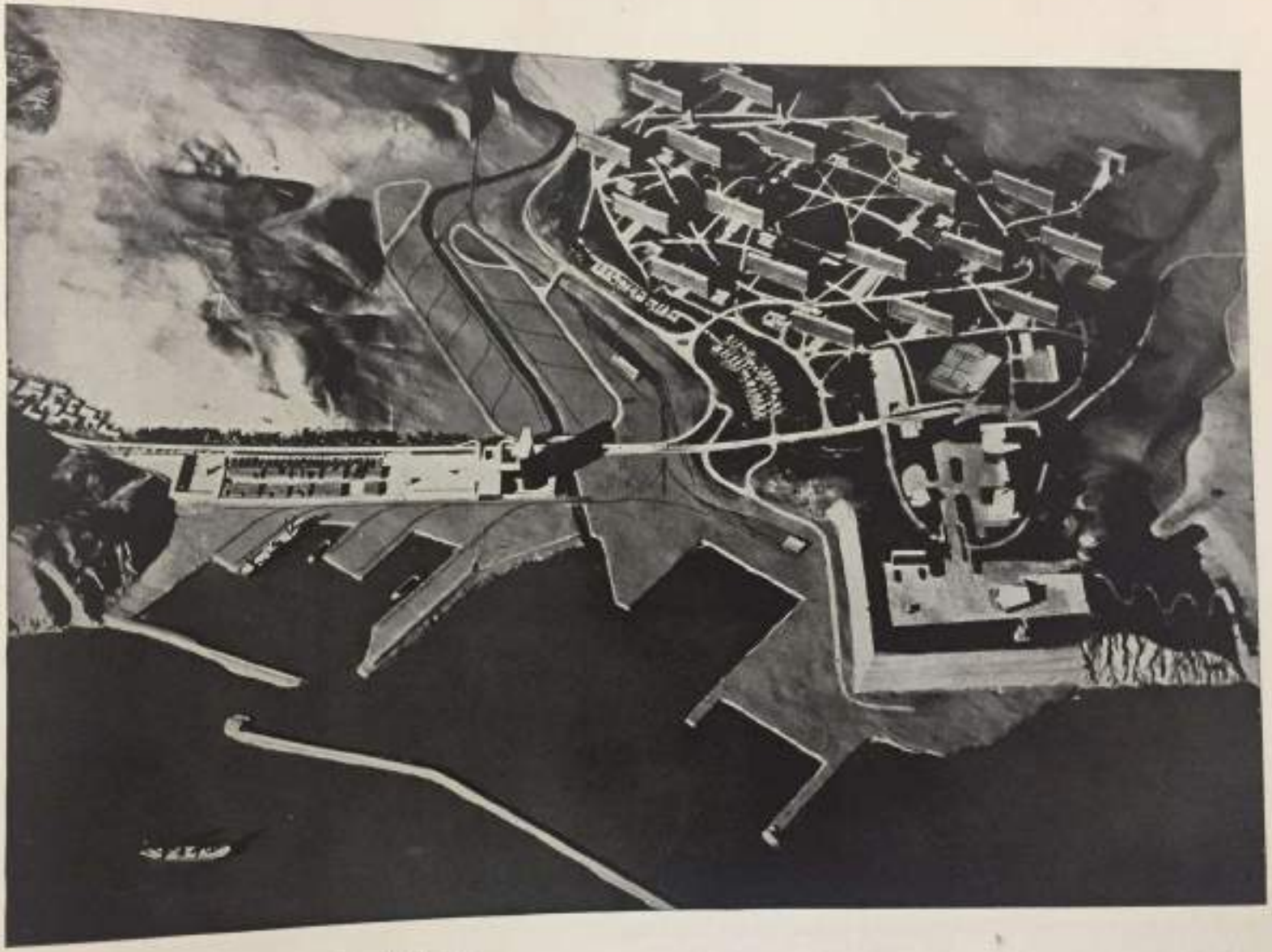
- *(c) "The town planner should also establish the relationship between places of dwelling, work, and recreation, in such a way that*

[8] In the U.S.S.R. there has been great progress in farm areas and their mechanization in the last few decades; planning on a vast scale has been applied to the transformation of enormous regions.

[9] Seventy-six per cent of the farmers in the United States own an automobile, according to the preliminary reports of the 1940 census. See *Automobile Facts and Figures*, issued by the Automobile Manufacturers Association in 1941, p. 63.

[10] See "Landscape Design in the Rural Environment," *Architectural Record*, August 1939, pp. 68–74.

City of Nemours, by Le Corbusier and P. Jeanneret, architects, C.I.A.M., France.



In this model for a new city in French North Africa, there is no crowding of buildings. The different functions of the city have been allocated to the sites that can best fulfill their requirements. Dwellings in high, widely spaced blocks and in small detached houses dominate the rest of the city from the hill overlooking the harbor. Warehouses and office buildings are on the waterfront. The civic center and the main recreation area appear in the foreground. All are connected by a modern highway system. The various zones are so disposed that they may be expanded freely when necessary.

the daily cycle of activities going on in these various districts may occur with the greatest economy of time. This economy is determined within the diurnal cycle.

"In establishing the relations between the different urban functions, the town planner must not forget that dwelling is the first urban function, a primordial element in the city pattern."

Town-Planning Chart

Another task of the town planner is that of studying the relationships between the various organs which perform urban functions. These organs, like those of the human body, are dependent upon each other and are linked together by extensive traffic systems and other means of communication, which are like pulsing blood streams. The different functions which must be performed in each section of the city are intimately related by their very nature, for they must all satisfy human needs — the need of shelter and privacy (housing), the need of production for living (work), the need of renewing one's physical and spiritual energies (recreation).

The Daily Cycle [1] — From day to day, year upon year, *man's existence is controlled by the daily cycle*, which dominates his entire universe. Since all activities which take place in the city are subject to this cycle, being performed within the time it limits, or a day, urban life cannot escape the influence it imposes. Each period of twenty-four hours must allow men the opportunity to work, to recuperate from their labors, to nourish and repose themselves, to change their environment. Any activity or circumstance which involves a loss of time — needless journeys from one place to another, for example — represents time that cannot be devoted to more productive activities, whether of the mind or of the body. It is therefore a waste, a waste which good planning could substantially reduce. (See p. 150.)

The daily cycle as it appears in the cities of today should be entirely transformed. The new distances produced by the urban expansions of recent years should be reduced in time, if not always in actual extent. Time can be saved through a more efficient location of places of work, through further mechanization of the means of production, through new street and highway systems, and other innovations. A replanning of dwellings so as to form neighborhood units will add still more time to the hours already liberated elsewhere. These hours could be devoted to recreation which, with intelligent direction, might serve as the basis of better living.

New Legislation Is Necessary — A complete knowledge of the means of procedure, widened by a constantly evolving world of technics, is indispensable to the town planner.

In proposing his new plans he should take into consideration the possibilities for their achievement as well as the obstacles which may be encountered. The latter may be found in the reactions of certain interests and in the unfavorable effects of old legislation made for other times and circumstances.

In certain cases the removal of unfavorable factors will seem to present almost insurmountable obstacles. Should these require *legislative changes*, it will be necessary for the town planner to collaborate with other specialists, such as legislators and economists, who will formulate new laws permitting the execution of the plans.

The creation of units based on the new urban structure will require special legislation. Existing laws may be vigorously opposed to certain technical proposals. If, however, the latter are based on real needs, such laws should not be permitted to stop the town planner's progressive researches but should be revised. *For building laws should not only be adapted to the needs of man but should protect them and serve them.*

It should therefore be the duty of the town planner to emphasize the importance of solving urban problems, in spite of these opposing forces, and to reveal the possibilities of overcoming them.

The town planner must not forget that:

Organic Development Requires Control

- *"The urban unit should be able to develop organically in all its different parts. And each phase of its development should assure a state of equilibrium among all its respective functions."*

Town-Planning Chart

[1] The daily cycle and its important role in town planning have been very well defined and discussed by Le Corbusier in several books and articles. See, for example, *La Ville radieuse* (Paris: L'Architecture d'Aujourd'hui, 1935), pp. 76–77.

HERE IS A WHOLE CITY PLANNED AS ONE UNIT, complete with industrial area, dwelling neighborhoods, recreation spaces, and cultural centers. No congestion and no land problem existed on this spot, and the different parts of this city may expand freely in the most convenient directions. Only such natural and unchangeable elements as climate, topography, and the characteristics of the land limit such plans. The needs of the populations and of the national economy are the other determining factors. Plan for a new city in the U.S.S.R. by the architect Mart Stam, C.I.A.M., Holland; perspective view of the whole city.

We have already indicated that a *limited* city, an immobile or *completed* city, is a utopian dream. *The city is an organism endowed with life* and with constant mobility, continually undergoing changes. These changes proceed from those which occur in the social, political, and economic structure of the country. They are progressive or retrogressive in the measure that they assert the natural aspirations of man toward the improvement of his spiritual and material well-being.

One can foresee a certain control of the growth of a metropolitan zone, as of a region, if some system of directed economy guarantees circumstances favorable to proper planning. But this direction will never be rigid, for the life of the regional plan and its chances of fulfillment depend upon its flexibility and upon its ability to adapt itself to whatever changes take place between the first and last stages of its development.

Since every city, in order to function efficiently, must have organic mobility, it cannot consist of a rigid unit enclosed within prescribed limits. The plan of the regional unit should look toward the unhampered development of the city, which should take place in the creation of *complete and fully serviced* units. This would mean that for every new housing unit there would be a corresponding new unit of work (heavy and light industry, business, administration, and public services, according to the character of the population of the new housing unit). Every new housing unit would be equipped with all the necessary community services.[12]

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12 "Any future planning must be *positive* planning: not merely planning that restricts and controls, but planning that performs" (Thomas Sharp, *Town Planning*, London: Pelican Books, 1940, p. 146).

PART FIFTEEN — MAN AND THE CITY

". . . their town was not a mere roof from the wind and the rain: it was a living personality, expressing and cherishing the instincts, tastes, beliefs, and the corporate pride of the citizens, widely and richly pictured." — J. L. and Barbara Hammond, *The Town Labourer, 1760-1832*.

TOWARD THE FUNCTIONAL CITY

From the foregoing it may be concluded that the town planner ought to have a knowledge of:

(*a*) *The principles which constitute the basis of modern town planning.* These principles are intimately related to technical discoveries and their application, as well as to the economic and social problems of our time.

(*b*) *The analytical studies of the regions* containing the cities to be replanned or the sites for newly planned cities. These studies reveal the present state of the region and its characteristics (both those which are natural and those developed by man).

(*c*) *The present and the past state of cities to be replanned,* their problems, and the factors which created and developed them.

Proceeding from these essential facts, the town planner, aided by the collaboration of the necessary specialists, should seek to transform the chaotic cities of today by altering their structures and replanning them on a functional basis — that is, directing them toward the achievement of an ideal urban structure. This ideal we shall call:

THE FUNCTIONAL CITY

In such a city the different urban functions would be so constituted that the material and spiritual needs of the people would be satisfied.

- *"It should therefore assure, both on the spiritual and material planes, individual liberty and the benefits of collective action."*
  Town-Planning Chart

The appellation "functional city" would probably mean, to most people, a city which satisfactorily performs *the economic function* for which it was created. For example, if an urban center develops around an industrial nucleus and if both industry and city prosper, the city will be functional to those who think only of its commercial possibilities. To many, "functional city" would therefore have a purely material meaning.

To us, however, a city would not be *functional* unless it satisfied and stimulated the more noble aspirations of its people as well — aspirations which strive toward a better life and which have always impelled men to seek a community existence. For these aspirations toward well-being and spiritual perfection are enlarged and stimulated in the exchange of ideas which characterize civilizations. And "civilization" and "city" are words derived from the same root.

Man as the Axis of New Cities; His Needs, the Basis of Their Plans

- *"The dimensions of the component parts of the functional city should be estimated on the human scale and in relation to human needs."*
  Town-Planning Chart

One of the principal causes of the failure of our cities is that their whole structure and their growth have been subject to the fate of their commercial fortunes and to the whims of real estate speculation.

At a certain point in the growth of cities real estate speculation clashed violently with the needs of the inhabitants, until the most elementary human factors came to be ignored.

This clash has only been intensified with time. Yet, *as long as business in general prospered,* prosperity served to offset some of the hardships of urban existence. If men were obliged to remain in cities, lashed to the galleys for a whole work-week, their reward at the end of the week was the possibility of fleeing the city for the pleasures of a holiday in the country.

With the end of prosperous years, business not being what it was before, men had more time to reflect upon the condition of their dwellings and their unattractive, uncomfortable surroundings. They felt *the inhumanity of cities,* as never before, until at length they forsook their city dwellings to live in the country.

Of the typical successful American business man it has amusingly been said that he "was born in the country, where he worked like hell so he could live in the city, where he worked like hell so he

could live in the country." [1] In its wide applications this statement loses some of its levity. For if the business men of American cities have not always succeeded in establishing themselves on country estates, in countless numbers they have turned their backs upon the cities in order to reside in the suburbs. And in so doing, they have joined the general exodus which, as we have seen, has caused our cities to become in themselves bad business propositions.

The losses in central urban and suburban areas due to decrease in residential property values may be measured in billions of dollars.

Even those who regard our urban structures only as sources of profit and means of speculation are now becoming uneasy at the turn of events. And because of the growing crisis in urban property, they dare to propose measures for the re-humanizing of our cities — as a way of recovering their economic health!

This state of affairs is also reflected in the advertisements of new apartment houses which appear frequently in the newspapers of large cities in the United States. In these advertisements the building owners seek to attract new tenants by offering them certain charming features, now almost un-urban in character but here restored "in the heart of the city" or in districts where they had been destroyed by the speculative operations of prosperous years. These new apartments boast of their pleasant vistas, their exposure to the sun, their ample light, their garden courts and play spaces, and similar features, all of which may be summarized in the statement, "We offer you a residence whose environment has been made human."

This should suggest that *the humanization of the urban dwelling*, which is the underlying principle of all reorganization of cities, would also constitute, if considered purely from the economic standpoint, "good business," contributing to the material revival of our cities.[2]

For it had come to the point where we had forgotten, in the midst of our feverish everyday activities, that the people squirming in the traps that our cities had become were nevertheless human beings and that they had to go on living, eating, resting, reproducing, and seeking shelter. Though their nature and their needs remained unchanged, we had forgotten that men had been made to live and to grow within a certain natural frame; for this frame had been destroyed, all its vital elements — light, air, sunshine, space, and verdure — eliminated from the urban environment.

It had also been forgotten that there is a human scale of values, whose measure is that of man's physical characteristics and his spiritual affinities. *In ignoring this scale of values, the most primary of human needs had become less and less well satisfied in our cities.*

It should therefore be emphasized that

- *"To the architect engaged in town-planning, human needs and the human scale of values are the key to all the architectural compositions to be made."* *Town-Planning Chart*

The reconstruction of our cities should be based on these primary factors. *In the new cities everything should assert man and his material and spiritual needs.* Dwellings should express his desire for shelter, repose, dignity, and intimacy; in the parks surrounding them, his hunger for open space, for recreation, and for an environment favorable to the development of his children should be satisfied. In his work-places, whether office or factory, all the elements conducive to the efficiency of his work should be found. Strategic sites in the city should be occupied by civic centers with facilities designed to stimulate the noblest propensities of the spirit — places for advanced research, for meditation, for the contemplation of works of art, for the cultivation of the mind. Throughout the whole city, the most diverse elements composing the urban whole should conform to the scale imposed by man, providing scope for his highest aspirations.

And though these aspirations should be considered in planning every organ of a city, they would find their clearest expression in the civic center.

The Civic Center, Nucleus of Urban Culture — Certainly without a reorganization of our *everyday life*, which depends on the proper functioning of dwellings, recreation centers, work-places, and the streets and highways that are their connecting links, life in the

[1] *New York Sun*, July 23, 1940.
[2] See pp. 46-76.

city cannot produce benefits for the individual or for the community as a whole.

By analyzing the conditions of these four functions and proposing solutions to the problems involved, the C.I.A.M. has approached city planning from a new angle, perhaps more comprehensible to the great number of people directly affected by these matters.

In expressing our views we have not overlooked the larger role of cities as organs of cultural progress. And we should like to insist that no urban reorganization would accomplish its aims if this role were underestimated.

But, with proper planning, the city on its cultural plane could proceed directly from the dwelling or neighborhood units, scaled to the elementary school and its needs.

In listing our recreational requirements we also consider that educational and cultural needs occupy the foreplan. The Greek and Roman gymnasiums set an example that modern cities have ignored. Organized sports should always alternate with intellectual pursuits; spiritual and physical recreation should be stimulated together.

Human contacts, now limited by social barriers, would easily expand in a city where everyday life was harmoniously conceived, within a planned frame. Greater possibilities of collaboration would arise from these more frequent and direct contacts. Open discussion, which press, radio, and films cannot take the place of,[3] would stimulate political, scientific, artistic, and social awareness; for this would come to many of us not only through lectures in classrooms, radio speeches, and books, but through opportunities for meeting our fellow citizens under conditions favoring an exchange of ideas.

But, besides all this, a city should be composed of something more than a sum of neighborhood units, industrial and recreational areas, business centers, and connecting highways, even if these elements be properly planned. Visible expression of man's higher aspirations should be found elsewhere in the modern city. This would be conceived in a nucleus of many urban activities, grouped to form the *civic center*.

Civic centers have existed in all important cities of the past, as seats of government or power, as places of worship, of knowledge, of parades, discussions, and festivals. Before machines impelled the urban expansion of the last hundred years, these seats of civic culture were usually situated in central areas, forming a nucleus and giving the skyline of the city its distinctive character.

It is of interest to note how closely the changes which overtook these civic centers have followed those of a cultural, social, economic, or political nature, affecting the lives of regions or countries in the different periods of their history.[4]

In the ancient world they sometimes grew up near fortified areas where temples to gods and heroes were grouped. Palaces, treasuries, and arsenals were given strategic sites for protective purposes. Below the citadels of power were situated places frequented by the populace — the agora, markets, theaters, stadia, and shrines.

In big cities and in capitals of empires, like Rome, civic centers of greater extent were needed. Below the palace on the hill triumphal ways were paved, where military forces could parade. Arches constructed across these roads and public buildings lining their sides made an imposing architectural background. In the limited acreage of such civic centers, centuries of civilization were shaped.

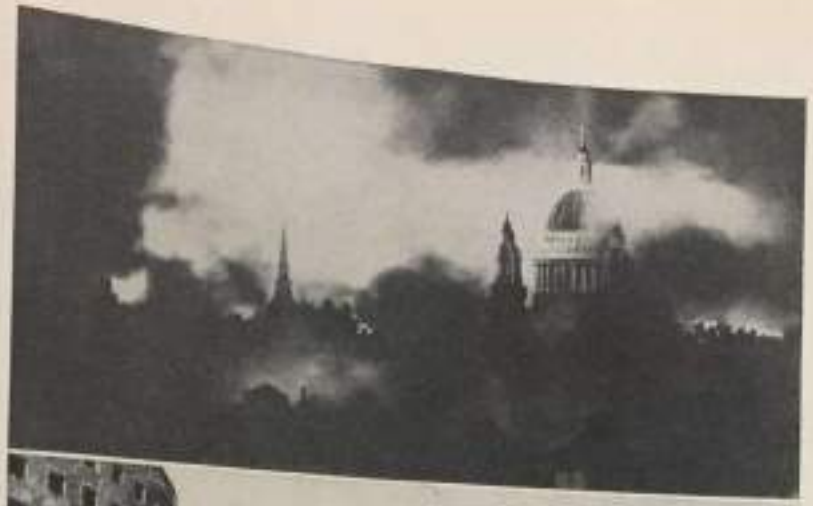
When certain political and economic factors brought about the fall of the empires, these civic centers became ruins of the past.

Monasteries and fortresses acted as archives of civism in periods of urban decline. In this sense they preserved the stabler elements of a culture that was to flourish in the *cathedral towns* of the Middle Ages; these in turn were expressive of a social system that was later to evolve into the system that produced the cities of today.

Cathedral, town hall, and market place constituted the nucleus of the new free cities. Symbols of the power of the church and the

[3] In spite of those who think that such facilities, together with other modern innovations, make city life unnecessary today and that cities should be dispersed into "urbanized farmlands."

[4] For a detailed discussion of these changes, see Lewis Mumford's *The Culture of Cities* (New York: Harcourt, Brace, 1938).



CIVIC CENTERS. The importance of public buildings and squares in the medieval city of Bruges is clearly visible in the view above at the left. Below it, a street in Rouen shows how the cathedral spire dominates over other buildings. It offers a curious contrast with the picture at the lower right, where spires stand in the shadow of office buildings, the outstanding elements in the urban skyline of today. Center, above: bombs have come to clear London's central areas. Perhaps after this war the necessary space will be found for a new civic center in these once-crowded districts. Some people have even suggested that it "will then be the moment to carry out Wren's plan of 1666"! . . . The attempt to revive plans — however good — conceived in other periods is likely to have such results as the "modern Roman" directly above, which tries, without much success, to perpetuate dead forms. Ruins of past periods (upper right) may be alive and interesting in a modern civic center, but beware of modern imitations!

people faced each other across the public square. Here all public gatherings of a mercantile, political, or religious character took place. The *civic elements* of medieval towns, their monuments and public buildings, exemplified good scale, if they are compared with the size of the town and with the dwellings surrounding them. They were imposing and dignified, planned to perform their function. No modern city has maintained this relationship between monument and dwelling.

In later periods, when communities were grouped into great national systems and some cities became capitals of empires that extended their power overseas,[5] the old cathedral square ceased to be the main nucleus. New elements of a more important character were needed as the political and economic machinery became more complex.

When cities ceased to be independent political units and the nation became the unit, the capitals of empires had to create new civic centers. The once-small area constituting the civic center developed in linear form; great avenues appeared, flanked by public buildings focusing upon new palaces, barracks, or other symbols of executive power. Streets converging on strategic points and wide radial avenues were deliberately conceived so that armies could display their force and artillery could control great multitudes of people. Stock exchanges soon took a place of preference in these centers, and, as business became more powerful, the stage was set for the death of the old civic center in nineteenth-century cities.

Obviously the civic qualities of baroque towns decline in cities of the nineteenth century. Plans of many new cities are only an endless and shapeless extension of similar blocks (the plan of Manhattan is one example among hundreds) where buildings constructed for speculative purposes — dwellings as well as factories and office buildings — are crowded together. Public buildings are scattered haphazardly wherever room can be found for them, while even the town hall is engulfed by the high structures of business interests which dominate the changing skyline of the metropolis.[6] Here in a community where suburbanism outweighs urban spirit, the civic center has ceased to be a dominant element; in fact, civic centers are at length condemned because they are not sources of immediate profit. So the city, without its nucleus, has come to be like a body without a head.

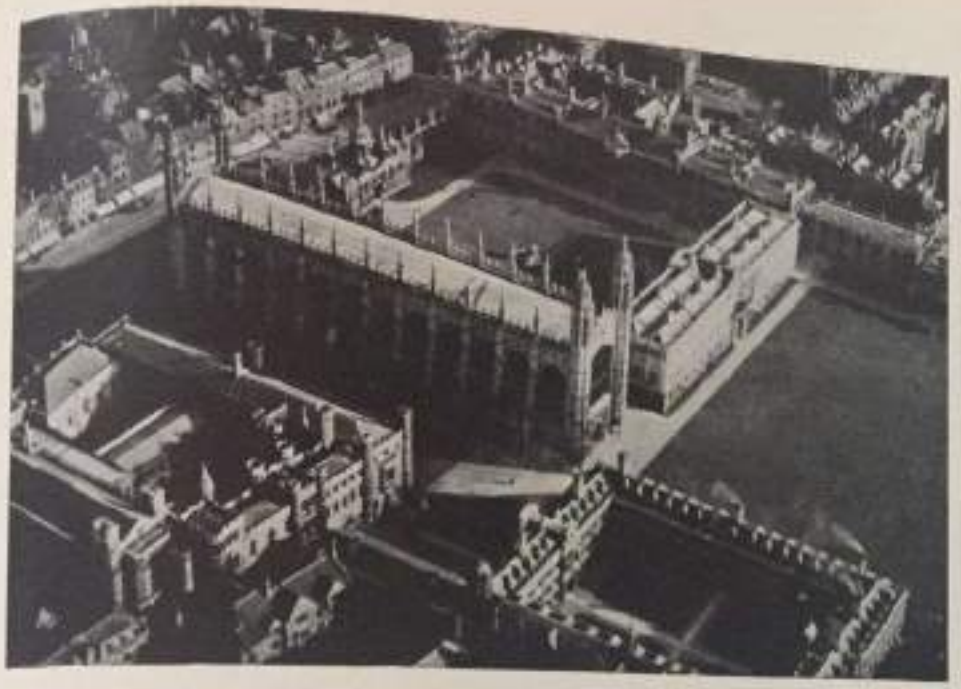
Even in our time certain "monuments" of academic conception, as defined by baroque artists, have continued to appear in central areas. Yet they are out of scale in the city of today, lost in a confusion of other buildings, neon lights, and traffic signals. Only structures like the Eiffel Tower in Paris, where a new conception and a new technique were applied in open surroundings, merit evaluation as monuments of modern times. Endowed with a civic scale that makes them noticeable even when one is speeding past them or flying above them, they are a lesson and a promise.

When properly planned cities appear, they will restore *civic centers* on their own scale. These will summarize the aspirations of their populations. Crowds will find in them appropriate gathering places; civic meetings will not be compressed within small squares as they are today, or be obliged to hire assembly halls that have not been planned for such uses.

Assembly halls, theaters, concert halls, museums of the arts and sciences, educational centers of different types, stadiums, administrative buildings, and open spaces for assemblies, mass demonstrations, and parades will be planned so as to form an organic whole. Here they will not be cramped, as they too often are today, in the midst of offices, shops, and dwellings; nor will they be deprived of light and view by buildings towering above them. Such civic areas will be accessible by a direct highway system to all districts of the city, and will have the necessary parkway connections, so that people coming from other parts of the region can reach them without crossing congested areas.

[5] The new cities created their civic centers: "The main plaza shall be of an oblong form . . . which is best for fiestas in which horses are used . . . ; a moderate and good proportion is six hundred feet long and four hundred feet wide. . . . *Building lots shall not be assigned to individual persons in the plaza* where the buildings of the church and royal houses and the public land of the city are placed." From the Royal Ordinances for New Towns given by King Philip II of Spain in San Lorenzo of the Escorial, July 3, 1573.

[6] Some cities, such as New York and Oakland, California, have built skyscraper city halls and courthouses.



IF CITIES ARE REBUILT after this war on the land patterns of today, they will inevitably reproduce the greatest weaknesses of those they replace. Recent plans and writings on future trends insist that the mistakes and want of foresight of the last post-war period must not be repeated. "Let us bear in mind that the rebuilding of Britain is not merely a matter of bricks and mortar. . . . The men who reconstructed local government in the Victorian era had an outlook which was limited by drains and policemen. Their narrow vision imposed a cramped spirit and a bleak atmosphere from which municipal life has not yet escaped." This side of urban life is "a dull affair, and man does not live by drains alone." In late years, "municipal services have gradually extended from gasworks and waterworks to schools and libraries, from police stations to child welfare clinics. But despite this humanizing trend, the climate of civic life remains cold and unimaginative." (W. A. Robson, authority on municipal problems.)

The plans at the right for rebuilding the center of Coventry have been designed to "provide open space" in what was a congested area, "disregarding property ownership" in its actual form (*Architect and Building News*, March 21, 1941). Only on this or a similar basis can the problems resulting from overcrowding and congestion find a satisfactory solution.

The view of Cambridge (England) reproduced above gives an idea of how a proper relationship between open and built-upon areas can be achieved. Similar formulas could be applied to the requirements of a modern city. By this example we wish merely to stress the importance of the open layout; we do not mean to encourage the imitation of dead styles.

Amplitude of space will be an outstanding characteristic of a modern civic center. It will then be possible to give the fullest scope to the employment of new technics, new materials, new color schemes, and a new approach to the use of space in obtaining monumental effects that the limitations imposed by existing city structures have prohibited to date. In this new monumental approach, public buildings will compete in scale with the best examples of modern engineering, as seen in highway crossings and suspension bridges.

Ultimately, no doubt, the scale of an organic city plan will be determined by that of the residential districts, which will occupy the greater part of the urban area.

The Dwelling as the Cellule of New Cities

- *"The point of departure for all town-planning should be the cell represented by a single dwelling, conceived together with similar cells so as to form a neighborhood unit of efficacious size. With this unit as the starting point, dwelling, work, and recreation should be distributed throughout the urban area in their most favorable relationship."* *Town-Planning Chart*

The cell representing the single dwelling is that elemental part of the city which is most directly and intimately associated with the individual. The proper assembling of a certain number of these cells and their community services so as to form neighborhood[1] units may serve as the basis for the establishment of *a humanized urban scale.*

These neighborhood units would constitute a whole in themselves, like a kind of city within the larger city. As organic units, they would perform different specific daily functions. The daily cycle in a child's life, for example, would take place entirely within their limits.

On a reduced scale the neighborhood unit will contain all the principal problems of town planning. A study of these problems as affecting the dwelling unit might therefore be employed as an approach to the study of other urban problems. It is as we consider dwelling units and their location in the urban whole that their relations to the districts intended for other urban functions should reveal themselves. The arrangement of the zones proposed for these functions will, to a great extent, be determined by that of the dwelling groups. Considering the importance of their function, these will require the town planner's closest attention, beginning with the selection of those sites throughout the whole urban area which are best adapted to their purpose.

The relationships of the different districts of a city are often most complex. In response to numerous factors determined by the special conditions of each city, they vary greatly in character. *The human factor, however, remains constant and universal, and must always be in the forefront when the nature of these relationships is determined.*

The Humanizing of Cities Requires the Collaboration of Specialists

- *"To solve this tremendous problem, it is indispensable to utilize the resources set at our disposal by modern technics and to procure the collaboration of specialists."* *Town-Planning Chart*

It should not be left to the town planner alone to determine what human needs consist of and what conditions will satisfy those needs. The complexity of the human organism and of its material and spiritual aspirations requires the assistance of sociologists, hygienists, doctors, pedagogues, and others to rehabilitate existing cities or shape new ones. In seeking the solution of these problems, the town planner should therefore join with these specialists in a labor of collaboration — a collaboration which would permit the formulation of *an urban program on a human basis.*

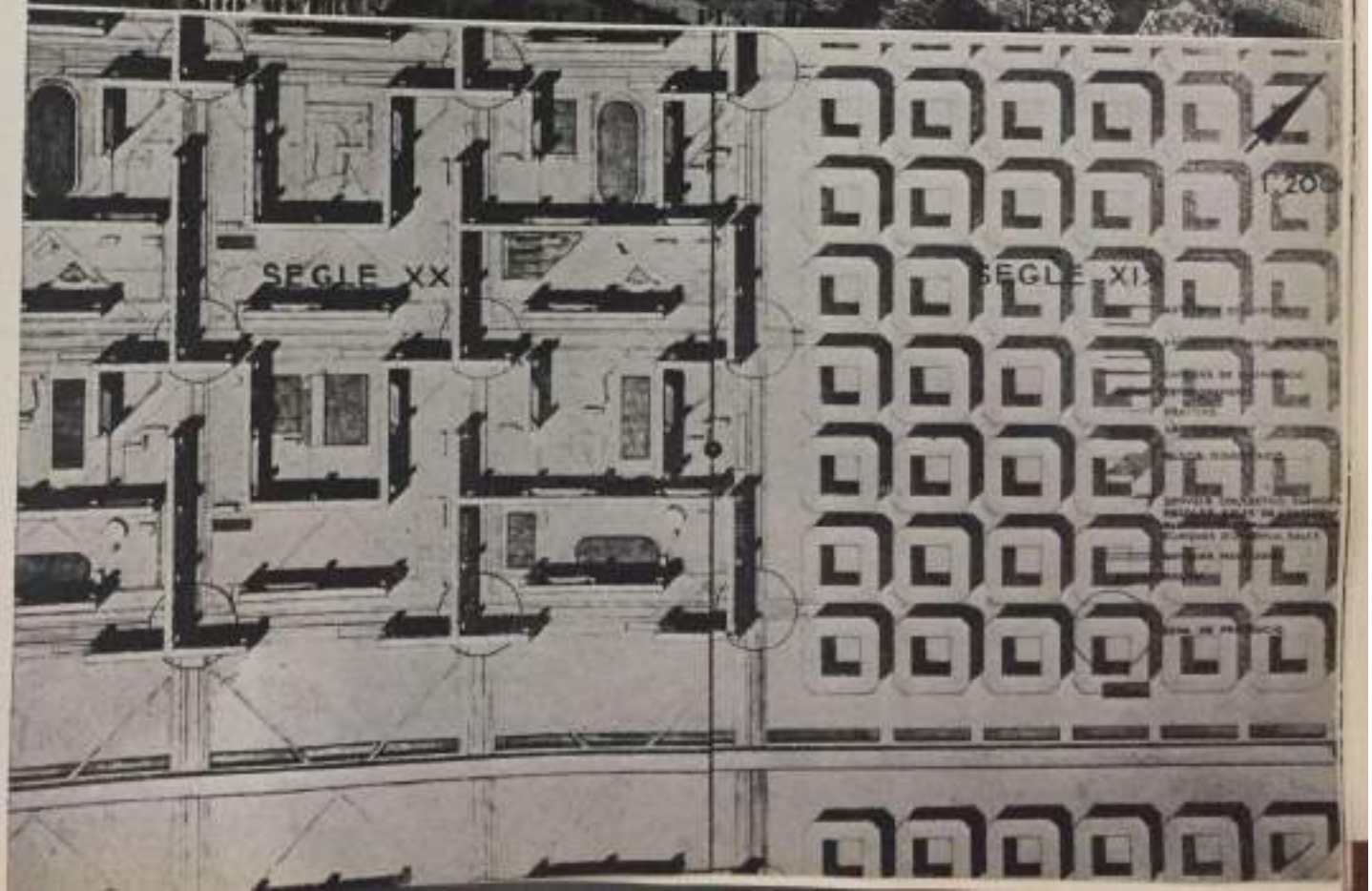
The following statements, like many others that have come to the C.I.A.M. from all over the world, stress this urgent need:

"It is impossible for medicine to accomplish its task — that is, 'to reduce the number of illnesses to a strict minimum and to build up healthy bodies' — without hygienic dwellings, organized recreation facilities, and the reconstruction of factories and offices — in a word, without the healthful equipment of modern cities.

"Medicine needs the collaboration of the town planners.

[1] See pp. 68–76.

OLD AND NEW NEIGHBORHOODS. This air view of a residential area in the city of Barcelona illustrates the difference between existing districts of a traditional gridiron pattern (dating from 1850) and proposed new neighborhood units which require a different street system. A modular relationship was adopted in this study. Each new *land unit* has a surface equivalent to nine old blocks, which covered one hectare per block. This relationship between the old and the new systems facilitates the task of replanning. As a rule, old and new must always coexist in cities which renew their buildings gradually.



In the new neighborhoods, through-traffic streets make use of intervals that differ from those of the gridiron based on the speed of the horse and buggy. The new neighborhood units, in consequence, are not cut by streets designed for rapid traffic. Only distributing streets and parking spaces are found within their limits.

"Your plans and our plans are determined by the basic principles of good living.

"We absolutely agree on the biological principles on which you base your plans: sunshine, open spaces, and trees constitute fundamental needs of human beings." [8]

Once a program has been duly formulated, the town planner should also consult specialists familiar with the resources of modern technics in its various departments. Then, in the role of coördinating agent, the town planner will strive to utilize these technical resources to the advantage of the new urban program.

The town planner will call upon the collaboration of staffs of specialists as frequently as the circumstances may require. For this reason, technical schools might well lay the foundations for such collaboration by opening advanced courses in town planning. Here the different activities involved could be coördinated by building up experienced staffs formed not only of students of architecture but also of graduate groups from schools of engineering, medicine, sociology, etc., technically equipped to overcome the tasks encountered in building or rebuilding cities, and in replanning regions. Such an organization could provide government agencies with complete groups of technicians possessing the extra knowledge gained through years of collaboration with specialists in various fields. This system should facilitate greater coördination of all the technical activities involved in the complex work of town planning that the post-war period will require.

Modern Town Planning Will Be Influenced by a New Architectural Technique

- *"The course to be taken by all town-planning projects will be influenced basically by political, social, and economic factors existing at the time and not, in the last resort, by the spirit of modern architecture."* *Town-Planning Chart*

Every attempt to define the trends of town-planning activities must take into account the factors which reign in our economy, our political organization, and our present social structure.

Today these factors are in the midst of a period of profound change, whose outcome is difficult to predict.

To identify the solutions of modern town-planning problems with any political system, whether it is actually in existence or in process of evolution, would be to limit their possibilities and to set up barriers against their achievement.

Today those solutions which have the best chances of surviving the present world crisis are those which are the most flexible.

It is in consideration of the mobility of present conditions that the principles which are based on man himself appear to make the most solid and immutable foundation for any town-planning program. Technological truths also indicate the direction to be taken.

That is why we decided to give preference in this book to the exposition of these aspects of the urban problem.

Modern town planning, shaping entirely new programs and executing them through technical means whose variety and richness of possibilities are still unknown to most of the world, will develop a spirit of architecture, today latent, which will give our cities a new plasticity. Here their dynamic forces may be fused to create the harmony which their material and spiritual renaissance requires.

In the last ten years it has been generally felt by the younger generation of architects in Europe, the United States, and Latin America that the possibilities of modern architecture as applied to detached structures (dwellings or others) are limited.[9] Only in the field of town planning will modern architecture find true expression and a wide field for discovery of new solutions. In England the circumstances of war have already provided incentives to these wider applications of the architect's role.

LARGE-SCALE TOWN PLANNING OR URBAN CATASTROPHE

In the preceding chapters we have revealed the general aspects of urban problems. We have also indicated the progress that has taken

[8] From a report by Dr. Pierre Winter to the Fifth Congress of the C.I.A.M. See *Logis et loisirs* (Paris, 1938), p. 61.

[9] We here refer to those who understand the social rule of architecture, not to those who practice modern architecture only as a fashionable hobby.

THE CITY OF AMSTERDAM has been for the last few decades a center of modern town planning. Amsterdam is one of the very few places where official planners have been allowed to apply modern principles when designing the extension of the city.

This plan for the extension of Amsterdam South (1934) is the product of a complete analytical study of future needs and trends in that city, carried out by the *Department of Public Works*. An increase of 250,000 inhabitants in the remaining decades of this century is foreseen before the population is stabilized at around a million. Because of the character of the soil in the region where the city is to extend, plans must be made well in advance. In this view of the new residential areas blocks of dwellings are seen to be well spaced, with open areas around them in which fields for sports and community services are rationally arranged. No anarchical suburbs can develop near such districts; where the city ends, the clean farmlands begin.

place in research methods and in town-planning technique in recent decades.

Accurate researches on urban problems are being carried on everywhere, and it would not be too great a task to coördinate them. The technical devices which might transform our cities are only waiting for such coördination and for the disappearance of certain obstacles. The formation of staffs of technicians does not present any difficulties, and world events point toward the removal of the barriers that have prevented large-scale planning in recent decades. In short, the stage seems almost to be set for the modern town planner, for the important role which he can and should fill in society today, and for his enlarged range of action.

All these elements in fermentation will produce no results, however, unless action directed by official governmental agencies opens the way *by expediting legislation* to unify research, coördinate findings, formulas, and doctrines, and make use of individual and group initiative.

- *"To this end it is of the most urgent necessity that each city should provide itself with a town-planning program, coördinated with the programs of its region and of the nation as a whole. The execution of these programs on a national, regional, or urban scale must be guaranteed by the necessary legal arrangements."*

Town-Planning Chart

Regional plans and city plans should be coördinated; so, too, the regional plans among themselves — when necessary, on a national scale.[10]

In all cases the national government should be the agency responsible for imposing and supervising the correlation of these different plans. It should also be responsible for creating blanket legislation encouraging and making possible their execution within a given period of time. This necessity for government control proceeds from various factors, the most recent being that of the air-raid menace and national defense programs, which require large-scale plans[11] and a tremendous contribution from the town planner.

The execution of regional plans should be entrusted to public agencies, which would work in direct contact with those of the state and of municipalities, so as to effect unity of action. This would give authority to regional planning committees, which at present are usually no more than consultative agencies, their actual functions limited to giving advice.

Nation, economic region, city, and neighborhood — these are the four planes on which planning might be developed. National laws should control the planning and assure the achievement of:

Main road and rail systems

Airfields

Location of the chief industries

National parks

Agricultural distribution

Technical projects of this magnitude must be based on an accurate survey of the nation's resources. Requiring a certain uninterrupted continuity in their execution, in no phase of their development should they be affected by *political maneuvers* which might jeopardize their existence. Their technical basis demands that the laws enacted in their behalf stipulate that a plan once adopted as a good one may be revoked only by a technical demonstration that a deviation from the originally accepted plan is necessary or otherwise justified.

It is unfortunately only too obvious that the legal measures heretofore adopted have generally lacked both the authority and the scope necessary for the initiation and the control of the large-scale planning which actual conditions require.[12] Many worthy inten-

[10] "A National Plan is essential. Local plans are no longer sufficient. It is no use sentimentalising over the tradition of local government. That government has done much good in the past and there is fine work for it to do in the future, but its work is not large-scale planning." (Thomas Sharp, *Town Planning*, London: Pelican Books, 1940, p. 147.)

[11] The most conservative nations (England, for example) have at length realized that this is true, bitter though the realization may be to many.

[12] A step toward this can be seen in the powers of the National Resources Committee and those of the T.V.A. in the United States, in the recent legislation of the U.S.S.R. providing for the creation of new, planned cities and the reconstruction of old ones. The English Town-Planning Act of 1919 may be considered as one of the first real impulses toward the application of master plans to entire regions, since joint town-planning committees resulted. In Germany the Rühr

tions have been handicapped through the absence of good legislation or the persistence of obsolete laws.

It is also to be regretted that authoritative voices rarely make themselves heard in the dictation of more energetic measures to eradicate the chaos of our cities. To delay action any longer assures the accumulation of even greater problems, for in most cases time itself is working against the town planner and putting new obstacles in his path.

Though the establishment of a program is urgent,

- *"Every town-planning program must be based upon accurate researches made by specialists. It must foresee the different stages of urban development in time and space. It must coördinate the natural, sociological, economic, and cultural factors existing in each case.'* *Town-Planning Chart*

district regional plan was adopted under a law of 1920, and in France the plan for the *région parisienne* under one of 1932. (See "I piani regionali," chap. IV of C. Chiodi's *La città moderna*. Milan, 1935.)

For the purpose of initiating an efficacious program of town-planning activity, it is necessary to encourage:

(*a*) *The formation of these programs*, plans, and necessary laws, which will guide in the immediate future the line of development of our cities and the regions about them.

(*b*) *The creation of a public opinion* forceful enough to demand with insistence immediate action in our cities. To this end, the proposed programs should be widely disseminated and their benefits clearly stated.

(*c*) *The protection of the town-planning program* by creating in advance the essential agencies, investing them with authority, and guaranteeing the survival of the program throughout a certain period of time.

To an informed public opinion belongs the responsibility of insisting upon these measures; to national and local governments, the responsibility of vigorous, planned action for the welfare of the people.

APPENDIX

THE AIMS AND STATUTES OF THE C.I.A.M.

In the introduction to this book the general history of the International Congresses for Modern Architecture has been outlined.

The following pages list the aims of the C.I.A.M. as formulated in its declarations and statutes.

The first formulation of principles, in the form of a published declaration, was a result of the congress held in 1928. The following extracts from this document, which served as a basis for later achievements, will acquaint the reader with the aims of the C.I.A.M.

Declaration of the First Congress, La Sarraz, June 28, 1928: Aims of the C.I.A.M.

On Architecture: ". . . We particularly emphasize the fact that to build is an elementary activity in man, intimately associated with the evolution and development of human life. . . .

"It is only out of the present that our architectural works should be derived. . . .

"The intention which brings us together is that of attaining a harmony of existing elements — a harmony indispensable to the present — BY PUTTING ARCHITECTURE BACK ON ITS REAL PLANE, THE ECONOMIC AND SOCIOLOGICAL PLANE; therefore architecture should be freed from the sterile influence of Academies and of antiquated formulas. . . .

"Animated by this conviction, we affirm our association and our mutual assistance toward the end that our aspirations may be achieved. . . .

"To us, another important point of view is that of economics in general, since it is one of the material bases of our society. . . .

"The conception of modern architecture associates the phenomenon of architecture with that of the general economy. . . .

"The most efficacious production is derived from rationalization and standardization. Rationalization and standardization directly affect labor methods, as much in modern architecture (its conception) as in the building industry (its achievement)."

Town Planning — "Town planning is the organization of the functions of collective life; it applies just as well to rural places as to urban agglomerations.

"It cannot be conditioned by the pretensions of an established estheticism; its essence is of a functional nature.

"The functions it embraces are four in number:

a. Dwelling
b. Work
c. Recreation
d. Transportation (which connects the first three functions with one another)

"The chaotic subdivision of urban land, as a result of real estate speculation, should be corrected.

"Present technical means, which multiply ceaselessly, are the very key to town planning. They imply and propose a complete change in existing legislation; this change should be commensurate with technical progress. . . ."

The following paragraphs are from the bylaws formulated during the congress held at Frankfort-on-the-Main, October 26, 1929:

The AIM of this Association is:

a. TO STATE THE CONTEMPORARY ARCHITECTURAL PROBLEM.

b. TO RE-STATE THE IDEA OF MODERN ARCHITECTURE.

c. TO DISSEMINATE THIS IDEA THROUGHOUT THE TECHNICAL, ECONOMIC, AND SOCIAL STRATA OF CONTEMPORARY LIFE.

d. TO BE VIGILANT OF THE SOLUTION OF THE PROBLEMS OF ARCHITECTURE.

The organs of the Association are:

1. The CONGRESS, comprising the general assembly of the members of the Association.

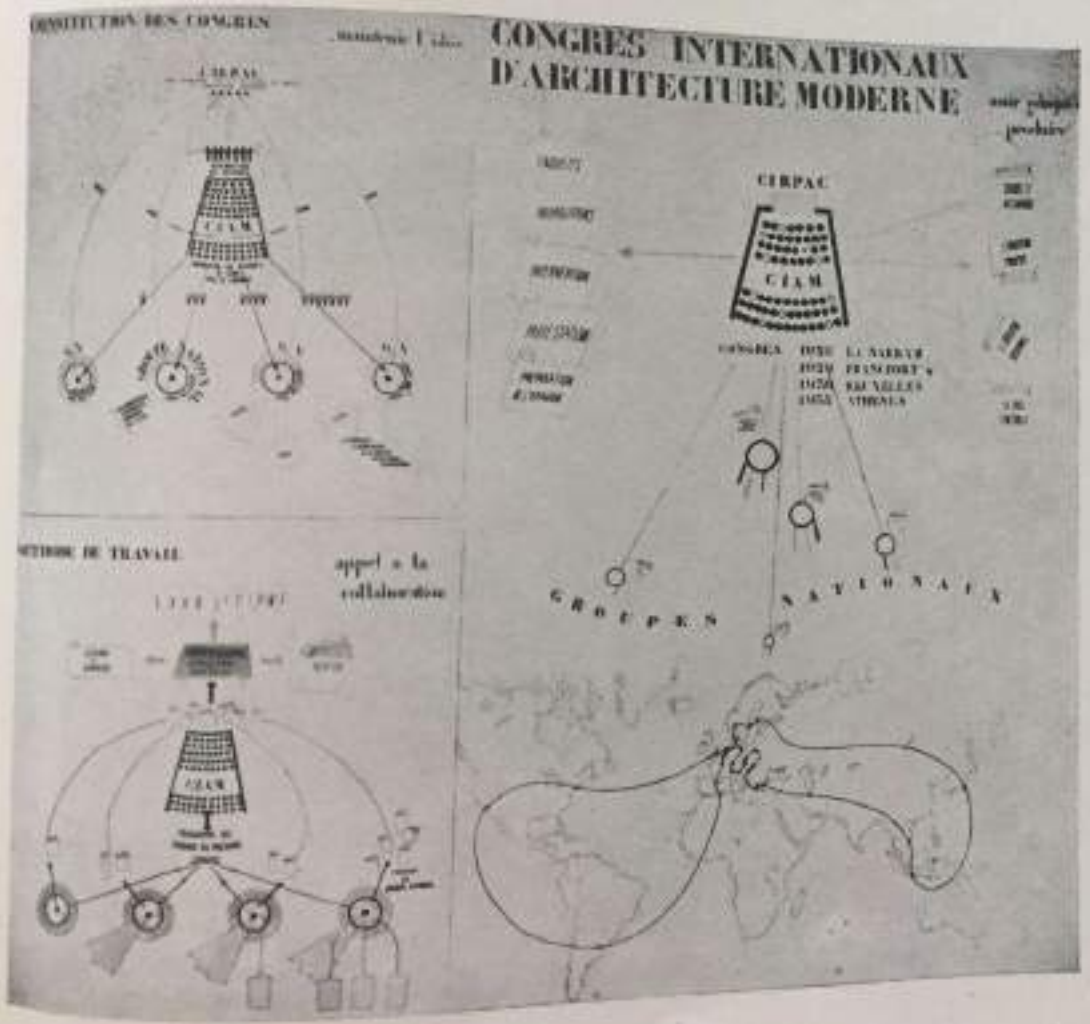
2. THE INTERNATIONAL COMMITTEE FOR THE STUDY OF CONTEMPORARY ARCHITECTURAL PROBLEMS ("C.I.R.P.A.C.").[1] This Committee is to be formed of the members of "C.I.R.P.A.C." (called "delegates") and their alternates, elected by the Congress.

Working Groups — The wide scope of the field of study of the C.I.A.M., which has evolved from the "low-cost house" to the "functional city," should suggest to modern architects the desirability of participating more and more in the preparatory labors of the Congress by forming WORKING GROUPS. These labors require not only collective study by many architects, but also the collaboration of various specialists (economists, sociologists, hygienists, and others).

The function of these WORKING GROUPS in the development of modern architecture is that of raising the average standard of planning and of contributing to the closer collaboration of different specialists through collective work.

[1] *Comité international pour la résolution des problèmes de l'architecture contemporaine.*

The C.I.A.M. (International Congresses for Modern Architecture) had delegates from eighteen countries. The chart below was designed by the French group of the Congresses to show its organization. The C.I.R.P.A.C. is the committee of delegates that organized the Congresses and established the working program (see pp. 242, 244).



Château of La Sarraz, Canton de Vaud, Switzerland. Here the C.I.A.M. was founded in 1928.

Frankfort-on-Main, a center of housing experiments in the twenties. The Second Congress, dealing with housing for the lower-income classes, was held here in 1929.

Brussels was the seat of the Third Congress, 1930, which dealt with rational methods of subdividing land.

Athens and the steamship *Patris II* were the meeting places for the Fourth Congress, 1933, which analyzed cities and their problems.

Paris. During the fair of 1937, officials of the French government invited the C.I.A.M. to hold its Fifth Congress in this city. Dwelling (especially the neighborhood unit) and recreation were the subjects here studied.

Congresses and Meetings of Delegates

Since its founding in June 1928, the C.I.A.M. has held the following congresses and meetings of delegates:

CONGRESSES	MEETINGS OF DELEGATES (C.I.R.P.A.C.)
1928 — *La Sarraz* (First Congress) Declaration of principles: The program Course to be followed	
1929 — *Frankfurt a/M* (Second Congress) "The Low-Cost House"	1929 — Basel
1930 — *Brussels* (Third Congress) "Rational Lot Division" Supplementary theme: "The Sliding Horizontal Window" [2]	1930 — Paris
	1931 — Berlin
	1932 — Barcelona
1933 — *Athens* (Fourth Congress) "The Functional City, I" (Analysis) Supplementary theme: "The Exterior Wall"	1933 — Paris
	1934 — London
	1935 — Amsterdam
	1936 — La Sarraz
1937 — *Paris* (Fifth Congress) "Housing and Leisure" ("The Functional City, II") Supplementary theme: "The Planning of Rural Areas" (Rural Urbanism)	
	1938 — Brussels
	1939 — Zurich [3]

The congresses have always been convoked on the basis of a definite program of work to be discussed and of resolutions to be adopted. The following list of publications and traveling exhibitions shows what has been accomplished.

[2] While major aspects of the problems of architecture and town planning were discussed, the program was supplemented by the discussion of minor aspects of these problems.

[3] Later developments in Europe caused the cancellation of the Sixth Congress, planned for September 1939 in *Liège*, Belgium.

A. Traveling Exhibitions

"Dwellings for the Lowest Income Classes." Material which served as a basis for the Frankfurt Congress (100 plates).

"Rational Lot Division." A series of documents prepared for the Second Congress, at Brussels (100 plates).

"The Functional City, I." Plans and analytical reports covering thirty-three cities in different countries and on different continents, prepared for the Fourth Congress, at Athens (90 plates).

"The Resolutions and Declarations of the Fourth Congress," comprising the Athens chart (40 plates, with text, prepared by the Swiss and Dutch groups).

"Modern Schools." A series of photographic documents and plans showing the best achievements, accompanied by critical text. Work of the Swiss group.

"The Bath and Its Relation to Cultural Development." History, illustrations, plans, critical text. Designed by the Swiss group.[4]

A series of large plates exhibited in the "Pavilion of Modern Times" in Paris in 1937. These plates illustrating town-planning problems were designed by the French group of the C.I.A.M. under the direction of Le Corbusier and P. Jeanneret.

B. Publications of the C.I.A.M.

Dwellings for Lowest Incomes (Stuttgart: Julius Hoffman, 1930), 2nd ed., 1933.

Rationelle Bebauungsweisen [Rational Lot Division] (Stuttgart: Julius Hoffman, 1931).

Logis et loisirs [Housing and Leisure] (Paris: Architecture d'Aujourd'hui, 1938). Basic reports, communications, questionnaires, reports of committees, Fifth Congress, Paris, 1937.

Can Our Cities Survive? (Cambridge: Harvard University Press, 1942). An A.B.C. of urban problems, their analysis, their solutions, based on the proposals formulated by the Fourth and Fifth Congresses of the C.I.A.M. Text by José Luis Sert.

In preparation

"The Analysis of Cities" — a basis for an international dictionary of town planning in visual terms. Prepared by the C.I.A.M. group of Holland. To be published in large format.

[4] The exhibitions on "Modern Schools" and "The Bath" were both worked out in collaboration with the Kunstgewerbe Museum of Zurich.

1933. The discussions of the plans and reports analyzing thirty-three cities that were sent to the Fourth Congress of the C.I.A.M. took place on board the S.S. *Patris II*, en route from Marseilles to Athens. As a synthesis of this study, the "Town-Planning Chart" was formulated on the return journey from Athens to Marseilles.

1929–1933. These publications of the C.I.A.M. present in brief form the discussions, reports, and plans prepared for three congresses. The work was done by members of the different national groups after it had been methodically planned and prepared for in several meetings of delegates. This made it possible to establish rules for presenting all material in unified form, so that comparisons could be made and conclusions reached within the limited time each congress had at its disposal.

THE TOWN-PLANNING CHART, FOURTH C.I.A.M. CONGRESS, ATHENS, 1933

The Town-Planning Chart (as drafted by the C.I.A.M. in Athens, August 1933) which has served as a basis for this book is reproduced in its entirety in the following pages.

1. *Definitions and preliminary statements*

Town and country merge into one another and are elements of what may be called a regional unit.

Every city forms part of a geographic, economic, social, cultural and political unit (region), upon which its development depends.

Towns or cities cannot, in consequence, be studied apart from their regions, which constitute their natural limits and environment.

The development of these regional units depends on:

(a) *Their geographical and topographical characteristics* — climate, land and waters, natural communications both within the region and with other regions.

(b) *Their economic potentialities* — natural resources (soil and subsoil, raw materials, sources of energy, flora and fauna); technical resources (industrial and agricultural production), the economic system, and the distribution of wealth.

(c) *Their political and social situation* — the social structure of the population, the political regime, and the administrative system.

Down through history, the character of cities has been determined by special circumstances, such as those having to do with *military defenses*, scientific discoveries, administrative systems, the progressive development of the *means of production and of locomotion*.

The basic factors governing the development of cities are therefore subject to continual changes.

It is the uncontrolled and disorderly development of the Machine Age which has produced the chaos of our cities.

All these essential factors taken together constitute the only true basis for the scientific planning of any region. They are:

(a) interdependent, the one reacting upon the other;

(b) subject to continuous fluctuations that are due to scientific and technical progress, and to social, political, and economic changes. Whether these fluctuations are forward or backward, from the human viewpoint, depends upon the measure in which man's aspirations toward the improvement of his material and spiritual well-being are able to assert themselves.

2. *The four functions of the city*

The following statements of the actual conditions of life in cities and what is needed to correct their deficiencies relate to the four functions of the city: dwelling, recreation, work, and transportation.

These four functions constitute a basic classification for the study of modern town-planning problems.

3. *Dwelling, the first urban function.* General statements on present conditions of housing in cities:

The *density of the population* is too great in central districts; in many cases it exceeds 400 inhabitants to the acre (1,000 to the hectare).

Overcrowding is not only to be found in the central parts of our cities. It also occurs in the vast residential areas which developed as a consequence of the industrial growth of the past century.

In overcrowded districts, living conditions are unhealthful. This is due to the fact that the land surface is overbuilt, open spaces are lacking, and the buildings themselves are in a dilapidated and insanitary state.

This fact is all the more serious in view of the low economic means of the inhabitants of such districts.

The progressive extension of the urban area has destroyed the green open spaces that once surrounded the dwelling districts of the city. This has served to deny many people the opportunity to enjoy the benefits of living near the open country.

Dwelling blocks and individual dwellings *are often badly located*, both in relation to their function and with respect to the sanitary conditions required for healthful housing.

The more densely populated areas are frequently those sites which are least appropriate for dwellings, such as those having northern exposures on hilly ground, lowlands subject to inundations or fog, or sites too close to industrial districts and consequently disturbed by noises, vibrations and smoke.

Districts of a low concentration of population have been developed on the best sites, favored by good climatological and topographical conditions, sheltered from industry, and easily accessible by roads.

This irrational location of dwellings is still permitted by *legislation* that does not take into consideration the health factors that are thereby jeopardized. Zoning plans, together with zoning legislation capable of enforcing such plans, are wanting. In fact, existing laws seem to ignore the consequences of overcrowding, of the lack of open spaces, of the dilapidated condition of many dwellings, of the want of community services. They also ignore the fact that the application of modern planning and modern technics would create illimitable possibilities for the reconstruction of cities.

Buildings erected on heavily traveled streets and in the neighborhood of corner crossings are made undesirable as dwellings because of noise, dust, and noxious gases.

In residential streets whose façades face each other, the varying circumstances of exposure to sunlight have usually not been taken into account. As a general rule, if one side of the street receives the necessary sunlight in the most desirable hours, sunlight conditions on the opposite side are different and often bad.

Modern suburbs have often developed rapidly, without planning and without control. Consequently their later connection with the metropolitan center (by rail, by roads, or by other means) has met with physical obstacles which might have been avoided if suburban growth had been considered as part of a regional development.

Suburbs have generally been incorporated under city control only when fully developed as independent units.

Their process of growth and decay often escaping all control, frequently these suburbs take on the shape of shack-towns — disorderly groups of hovels constructed of all imaginable kinds of discarded materials. In spite of all, this type of suburb is still openly tolerated in many metropolitan areas.

The distribution of buildings intended for *community services* is of an arbitrary and heedless nature. This is notoriously true of schools, which are often situated on the most congested thoroughfares and too far from the dwellings they serve. The following statement of desiderata is based upon what precedes.

Residential districts ought to occupy the *best sites*. The climatological and topographical conditions of those sites intended for dwelling purposes must be carefully considered, as well as their proximity to existing unbuilt land surfaces suitable for recreation purposes. The possible future location of industry and business in the immediate vicinity should also be considered.

A minimum amount of *exposure to the sun* should be established for residential structures, regardless of their location or class.

Different *density limits* should be fixed for different residential districts, based on the factors influencing the living conditions within each district.

Modern building technics should be employed in constructing high, widely spaced apartment blocks wherever the necessity of housing high densities of population exists. Only such treatment of dwellings will liberate the necessary land surface for recreation purposes, community services, and parking places, and provide dwellings with light, sun, air, and view.

The building of dwellings along *traffic thoroughfares* must be forbidden on grounds of health, since these houses are exposed to noises, dust, and gases emanating from traffic.

4. *Recreation*. General statement of recreation problems:

Open spaces in cities today are generally insufficient.

Open spaces are often poorly situated and consequently difficult of access to many people.

Since most open spaces are situated in outlying and suburban areas, they do not benefit the inhabitants of the unhealthful central districts.

The few existing playgrounds and fields for sports occupy, as a rule, sites that are destined to be built up in the near future. This accounts for their frequent displacement. As ground prices rise, these open spaces disappear, leaving the playgrounds and playing fields to be reorganized on new sites, each time farther away from the central districts.

It should be required that:

The general sanitation of too densely populated districts be improved by the razing of slums and other buildings, the *cleared sites to be devoted to recreational purposes*.

That open spaces near kindergartens or playgrounds be used as sites for nursery schools, and that certain sites in parks be devoted to general community purposes, with branch public libraries, small neighborhood museums, or auditoriums.

The chaotic development of modern cities has ruthlessly destroyed many sites in the environs of the urban zone which might have been converted into *week-end recreation centers*.

Advantage should be taken of those sites near cities whose natural features (rivers, beaches, forests, lakes) make them favorable for recreation purposes.

5. *Work*. Statements concerning problems in industrial and business areas:

Places of work (industrial, business, governmental) are not situated in the city structure according to their functions.

The *absence of a planned coördination* of the locations of work-places with those of dwellings creates excessive traveling distances between the two.

Traffic is overtaxed during *rush hours*, on account of disorganized communications.

Owing to high land values, increasing taxation, traffic congestion, and to the rapid and uncontrolled expansion of the city, industry is often forced to move away, bringing about a *decentralization* which is facilitated by modern technics.

Business districts can be expanded only through the costly action of purchasing and razing surrounding dwellings.

Possible ways of solving these problems:

Industries should be classified according to their character and their needs, and should be distributed in special zones throughout the territory comprised of the city and the region it influences. In delimiting these zones, it will be necessary to take into account the relation of the different industries to each other and their relation to zones intended for other functions.

The *distances* between dwellings and work-places should be direct and traversable in a minimum of time.

Industrial districts should be independent of residential districts (indeed, of other districts as well), and should be isolated by means of green bands, or neutral zones.

Certain small industries intimately related to urban life and not the source of any inconvenience or nuisance should remain within the city, serving its different residential districts.

It is necessary that industrial zones of importance should be contiguous to railroads, to navigable rivers or harbors, and to the principal transportation routes.

Business districts should enjoy favorable means of communication linking them to residential districts and to industrial zones.

6. *Transportation.* General statements concerning traffic and street problems:

The *street systems* found in most cities and their suburbs today are a heritage of past eras (the Middle Ages in many European cities, and later periods in America), when they were designed for the use of pedestrians and horse-drawn vehicles. As such, in spite of successive alterations, they no longer fulfill the requirements of modern types of vehicles (automobiles, buses, trucks) or modern traffic volume.

The insufficient width of streets causes congestion.

The *lack of space* in our streets and the *frequency of crossings* make the new possibilities of locomotion almost useless.

Traffic congestion, which is the cause of thousands of accidents, is becoming increasingly hazardous to everyone.

Our present streets fail to exhibit any *differentiation* in terms of their possible functions, a circumstance which excludes an efficacious approach to the modern traffic problem.

The solution of this problem is unattainable through present corrective measures (street widening, traffic restrictions, or others), and can be reached only by means of new city planning.

A certain type of "academic" city planning, conceived in "the grand manner" and striving mainly toward monumental effects in its layout of buildings, avenues, and squares, often complicates the traffic situation.

Railroad lines are often obstacles to urban development. Encircling certain districts, they separate them from other parts of the city with which they should have direct contact and easy communication.

Changes necessary for the solution of the most important transportation problems:

The universal use of *motorized transportation*, bringing speeds unknown only a few years ago, has violently agitated the whole urban structure and fundamentally affected living conditions within it. A new street system, designed for modern means of transportation, is therefore required.

For the purpose of providing *a new street system* corresponding to modern traffic needs, it is necessary that accurate statistics be available for the rational determination of street dimension requirements.

The speeds to be provided for in each street will depend upon the function of the street and upon the nature of the vehicles it carries. *These speeds therefore are also factors of classification*, determining the features of those thoroughfares intended for fast-moving traffic and those intended for trucks and other slow traffic, and differentiating these from tributary or secondary streets.

In the proposed network of restricted streets, provision should be made for *pedestrian lanes*, designed for the convenience of pedestrians and therefore not necessarily following vehicular routes.

Streets ought to be classified according to their functions, as residential streets, business streets, industrial streets, and so on.

Buildings of all kinds, but especially dwellings, should be *isolated* from heavy traffic by green bands.

With these difficulties solved, the new street network would effect other simplifications; for by means of efficient traffic organization and a proper coördination of different urban elements, *traffic could be reduced and concentrated within the great arteries.*

7. *Buildings and districts of historical interest*[8]

Buildings or groups of buildings that are remnants of past cultures should not be demolished:

(a) When they are really representative of their period and, as such, may be of general interest and serve for the instruction of the public.

(b) When their existence does not affect the health conditions of populations living in the area.

(c) Whenever it is possible to route main thoroughfares so that the presence of these old districts does not increase traffic congestion and so that their location does not affect the organic growth of the city.

All attempts at adapting new districts to these old layouts (which is often done under pretext of preserving local characteristics) have had bad results. Such adaptations to the past should not be tolerated in any case.

By a planned clearance of slum areas, which are frequently to be found in the neighborhood of these monuments of the past, it is possible to improve the living conditions of the residential areas near-by and to safeguard the health of their inhabitants.

[8] Section 7 of this chart has been omitted from the general text because it applies only to certain cities. It was introduced by the Italian delegates, who had to deal with these problems frequently.

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