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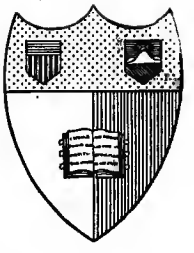
OAKLAND & BERKELEY

BY
WERNER HEGEMANN



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BY

WERNER HEGEMANN, PH. D.

AUTHOR OF "DER STAEDTEBAU NACH DEN
ERGEBNISSEN DER ALLGEMEINEN STAEDTEBAU-AUSSTELLUNG"
DIRECTOR OF THE INTERNATIONAL CITY PLANNING
EXPOSITIONS IN BERLIN AND DUESSELDORF

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CITY PLANNING IS INSURANCE AGAINST WASTE OF PUBLIC AND PRIVATE FUNDS.

City-planning means co-ordination of the activities that make for the growth of the city, especially the activities of railroad and harbor engineers, landscape architects, street-building and civil engineers, builders of factories, of offices, of public buildings and dwelling houses. Without this pre-planning co-ordination, clashes between these different activities, unsatisfactory results and most expensive rearrangements, become unavoidable. City-planning therefore does not mean additional expenditure of money, but it means an INSURANCE AGAINST INEFFICIENT EXPENDITURE of the enormous sums that go—in the regular course of events— into the development of a progressive city.

PREFACE TO THE REPORT OF WERNER HEGEMANN

BY FREDERIC C. HOWE

AUTHOR OF "THE CITY: THE HOPE OF DEMOCRACY," "THE BRITISH CITY: THE BEGINNING OF DEMOCRACY," "PRIVILEGE AND DEMOCRACY IN AMERICA" "EUROPEAN CITIES AT WORK," "SOCIALIZED GERMANY," ETC.

Dr. Hegemann was invited to this country by the People's Institute of New York in 1913, to co-operate with American cities in the promotion of planning projects, to make town-planning surveys and to lecture. His scientific training and wide practical experience as Secretary of the Committee for the Architectural Development of Greater Berlin and General Secretary of the City-Planning Exhibitions of Berlin and Duesseldorf, and as Director of the Division of City-Planning of the Boston Exhibit of 1909 fitted him admirably for the task of awakening American communities to the necessity of providing in an intelligent and far-sighted way for their future growth in population and their industrial development.

His work in this country took him from coast to coast—to some of the largest cities and many of the smaller ones, especially those with progressive chambers of commerce and city clubs. For these were the organizations through which, in most cases, Dr. Hegemann did his inspirational work. A number of communities, of course, had for years realized that they would have to take measures to insure their future growth upon wholesome lines and where possible to remedy the overcrowding, ugliness and other evil conditions resulting from the haphazard methods of town building, all but universal in the past. These cities, among which were Oakland and Berkeley, California, had therefore already taken the right attitude toward city-planning. Some of them possessed complete plans for the laying out of civic centers, the development of harbors and industrial districts and the obliteration of slum areas. In these cities Dr. Hegemann was called upon for expert opinion and advice, and it was here that his broad experience proved of the greatest material value. In Philadelphia, for instance, local organizations had under consideration ambitious housing schemes, upon which they consulted Dr. Hegemann. In Baltimore, after a survey of local conditions, he co-operated in an extensive beautification plan, which it is hoped will be carried out in the near future. In Oakland and Berkeley Dr. Hegemann made a particularly detailed investigation of the the field.

It is most encouraging and significant that the town-planning movement is making such steady gains in this country; that the day-to-day policy with which American cities have been permitted to develop is being superseded by intelligent prevision for the future. Our cities are beginning to understand that, like the cities of Europe, they must think in big terms. Europe, and especially Germany, is of course far ahead of us in the art and science of city-planning, or as they call it, city-building. In Berlin there is a college devoted to the training of town-planning experts. A few years ago a Greater Berlin planning project was begun, for which prizes amounting to $40,000 were offered and for which architects and town planners from all over the world competed. Munich and many other cities have engaged in comprehensive projects including the planning for the suburbs for many miles around. The competitive plans submitted provided for the growth of half a century at least. Duesseldorf held a similar competition a few years ago, and the conditions were that the successful plan must provide for the future development of steam, water and electric traffic, for health and for beauty, must make suggestions for the extension of existing lines of transportation and designate territory for industrial uses, with provision for workingmen's dwellings as well as traffic arrangements with surrounding cities. With Duesseldorf's competition Dr. Hegemann was closely connected, not only in its organization, but as a member of the Jury.

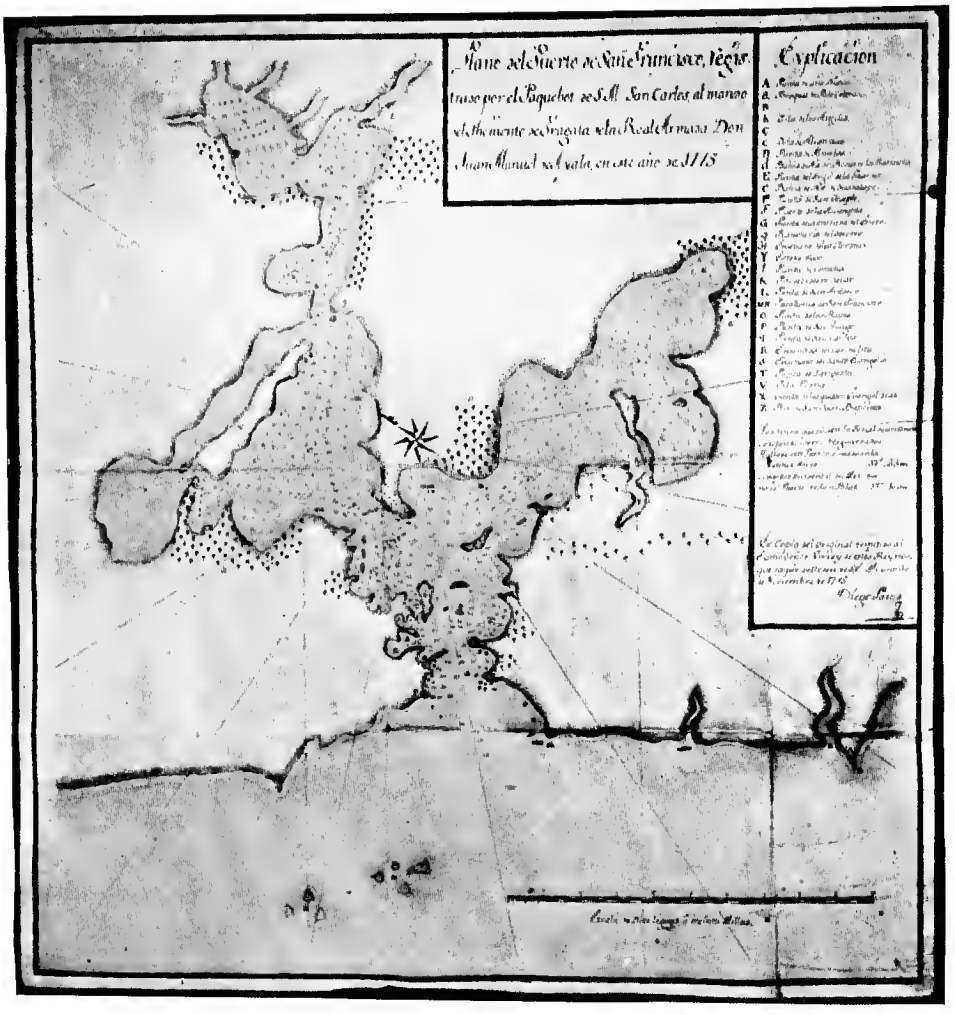
In Germany no municipal problem receives more attention than the building of streets. Officials and experts plan them with the greatest care. In America, till very recently, no subject was more neglected than this. Washington is almost the only American city that planned its street system with any vision of the future.

City-planning is the next big step which all our municipalities must take—all, that is, that have hope in their future. We have long considered it a function of the city to protect its health, its water supply, its food, its children, its workers. City-planning extends the community idea still further. It protests against ugliness, against dis-

comfort, against dirt and disease. It treats transit as part of the housing question, transportation as an adjunct to industry and commerce, the waterfront as a means of communication and of pleasure. City-planning means all these things and more. It means building cities for people to live in as well as to work in. It means building a community as an agency of civilization, culture and art. This does not imply that city-planning involves extravagant expenditures on new and elaborate undertakings. It does mean that whatever money is spent on a far-sighted, practical plan and its execution will bring a manifold return in the long run. It is the thoughtless, improvident methods that have led and will always lead to waste. The aim of city-planning is to protect the community purse against the tenement and the slum, from the denial of light, sunshine and air, from the short-sighted building of terminal facilities, etc., that soon prove inadequate and impractical for the needs of industry.

Dr. Hegemann's report on a city-plan for Oakland and Berkeley treats in a thorough and authoritative manner all the essential features of the subject. It is full of sound, practical advice and feasible suggestions. Based as it is on a long and intensive study of the conditions and needs of these cities and reflecting the author's wide knowledge of town-planning development in Europe and America, the report contains the sanest and most pertinent sort of constructive criticism. Its language is not technical, so that it carries its message of progress not only to the city official and engineer, but also to the business and professional man, who can understand from it just how and why its recommendations will benefit the community. The cities under whose auspices the report is published are to be congratulated.

FREDERIC C. HOWE.



FIRST SURVEY AND MAP OF SAN FRANCISCO BAY

From the original drawing made in 1775 for Don Juan Manuel de Ayala, Commander of the Packet Boat San Carlos; designed by the first officer (pilota) of the ship. The original is attached to the Log of the San Carlos preserved in the India office at Seville, Spain (photographed for E. J. Molera). The location of Oakland and Berkeley is indicated by the large expanse of wooded land just opposite the Golden Gate. The trees shown there are the oaks that gave the name to the city. The explanation given in the key to the map: "a—bosques de palos colorados," must be read with reference to the redwoods of Redwood Peak only.

INTRODUCTION

THE GREAT CITY ON THE EAST SIDE OF THE BAY

THE OLD ISSUE: WEST, i. e. PENINSULAR vs. EAST, i. e. CONTINENTAL SIDE OF THE BAY

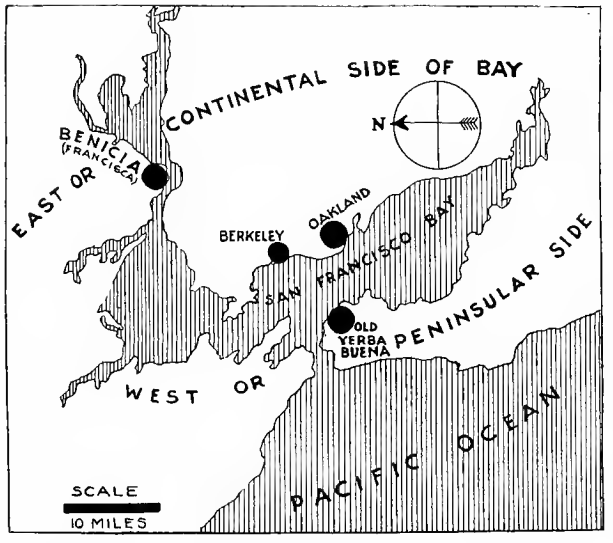
As early as 1847, the pioneer settlers and the United States Army and Navy officers, [1] first sent to California, recognized that the great city of the future—the city which it was hoped would become the "New York of the Pacific"[2]—was to be located, not on the west side, the present site of San Francisco, but on the east, that is, the continental side, of San Francisco Bay.

The west side, with the townsite that later monopolized the name of San Francisco, was, before the marvelous changes of later times, always considered the "worst place"[3] for a settlement—a

[1]Among the officers who favored the land side of the bay were General Smith, Majors Ogden and Leadbetter, Captains Goldsborough, Van Brunt, Blount, also the managers of the pioneer steamship company, the Pacific Mail, and United States Consul Th. O. Larkin.

[2]See "Memoirs of General W. T. Sherman," Vol. 1, pp. 95, 96, 101.

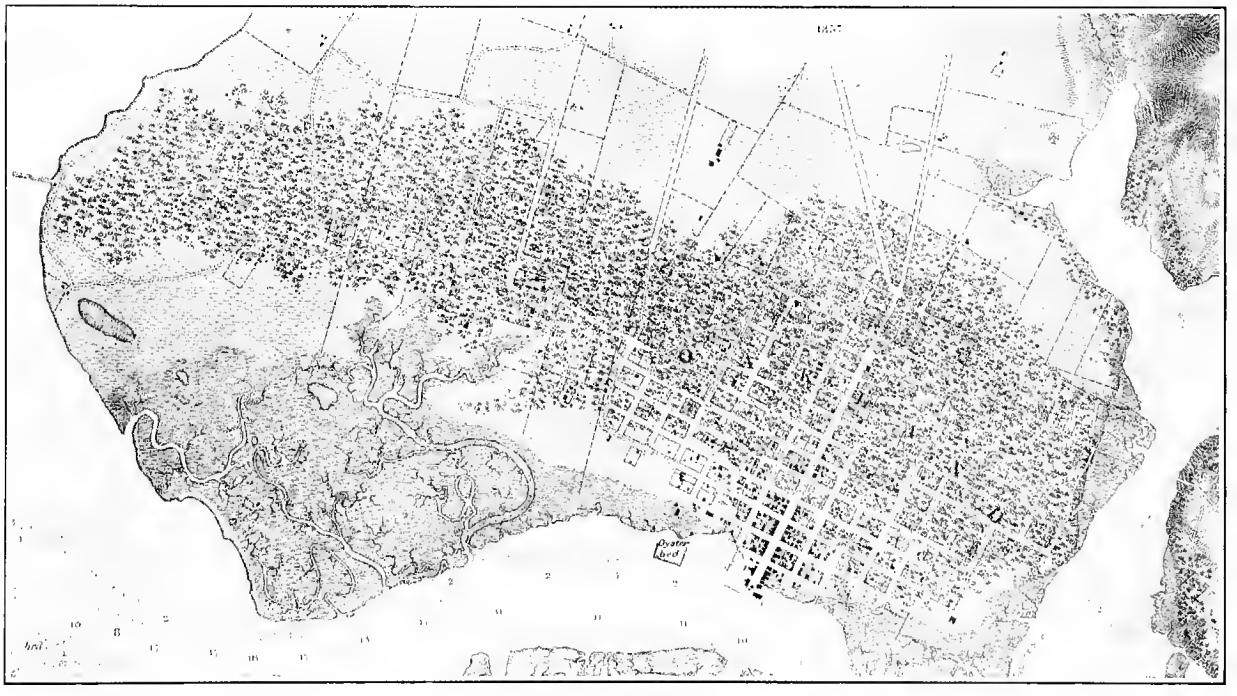
[3]This opinion of the peninsula was expressed by Don Pedro de Alberni in the year 1796 after a careful examination of the country; see Dwinelle's "Colonial History of San Francisco," Addenda p. 18, where the full text of Alberni's letter is given.



"hilly and barren waste."[1] Even in 1847, General Sherman "felt actually insulted that one should think him such a fool as to pay money for property in such a horrid place as Yerba Buena."[2]

This "horrid Yerba Buena" on the west side of the Bay of San Francisco was the little place that since, by the extraordinary efforts of its citizens, has become the great city of San Francisco. Not only have tremendous economic disadvantages been overcome, but civic enterprise has created worthy monuments of civic pride, especially a thousand-acre park, world-famous for its beauty, in the midst of a location that, as late as 1867, made the famous landscape architect, Frederick Law Olmsted, Sr., say: "It must, I believe, be acknowledged, that neither in beauty of greensward, nor in great umbrageous trees, do the special conditions of the topography, soil, and climate of San Francisco allow us to hope that any pleasure-ground it can acquire will ever compare *in the most distant degree* with those of New York or London. There is not a full grown tree of beautiful proportions near San Francisco."[3]

The initiative and shrewdness of the citizens who so successfully fought for the advancement of the west side of the bay manifested itself for the first time after the United States Government officials (1847) had declared their decision to develop a new city on the east side of the bay and after General Vallejo had granted the necessary land on the east side.



OAKLAND IN 1857

Part of the map: "San Antonio Creek, California. From a Trigometrical Survey under the direction of A. D. Bache, Superintendent of the SURVEY OF THE COAST OF THE UNITED STATES. Triangulation by A. D. Cutts, Assist. Topography by A. F. Rodgers, Sub-Assist. Hydrography by the Party under the command of Comdr. James Alden, U. S. N. Assist. 1857." This map appears to show how far the streets, which Kellersberger's Survey (filed September, 1853) put on the map, were actually built by 1857. In addition to Kellersberger's rigid gridiron (checkerboard) streets, the map shows a number of roads naturally grown and winding among the oak trees. The Twelfth Street bridge is the outlet to the East. San Pablo and Telegraph Avenues, as roads, were already in existence.

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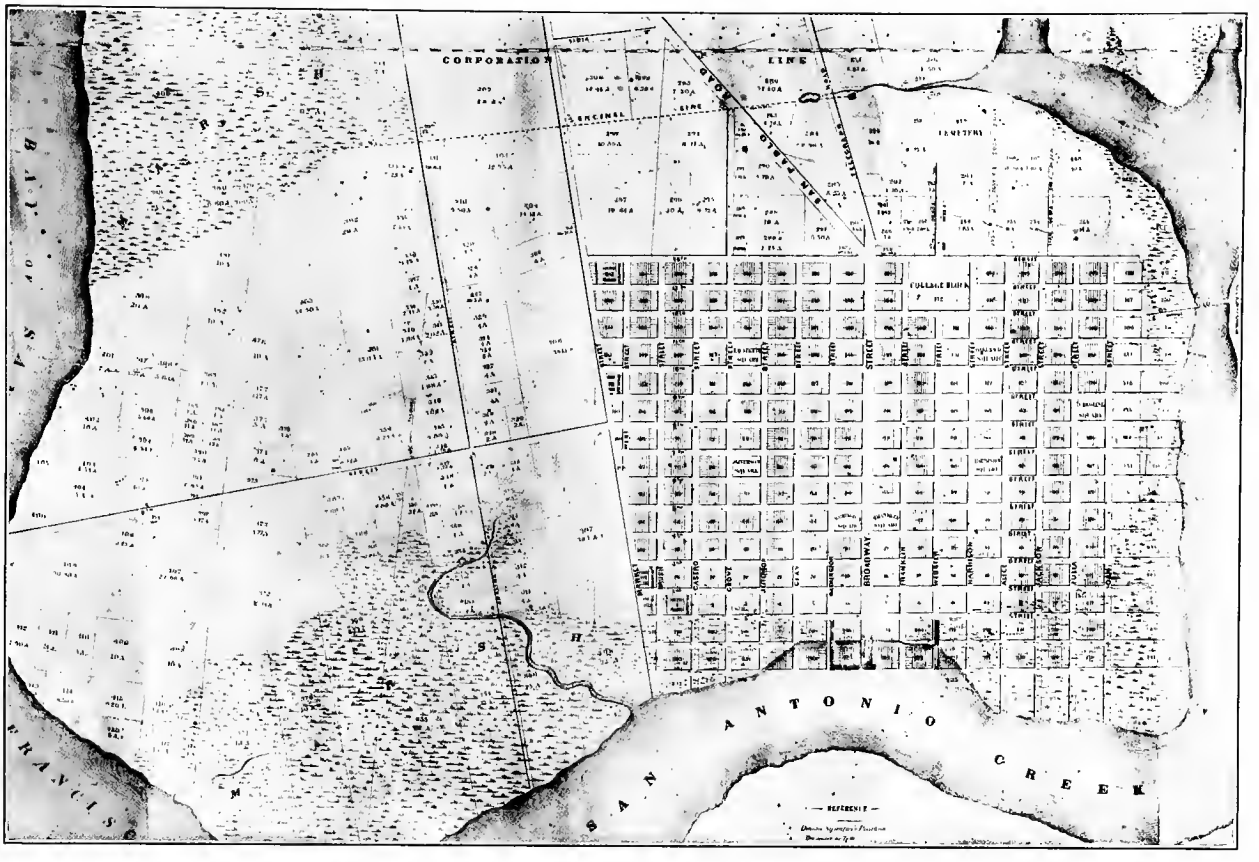
[1]See "An Historical Sketch of San Francisco" by James D. Phelan in Report of D. H. Burham on the improvement and adornment of San Francisco, p. 194.

[2]"Memoirs of General W. T. Sherman," Vol. I, p. 61.

[3]See "San Francisco Municipal Report 1867-68;" quoted in D. H. Burnham's Report, p. 207.



OAKLAND IN 1860

From the "Official Map of the City of Oakland compiled from records & Surveys by J. E. Whitcher 1860. Publsd. By Drouaillet Lithogr. Cor. Washington & Kearney Streets, San Francisco." This map shows the original layout (1853) by Kellersberger, plus some new streets. The map also gives the explanation for the extremely long blocks, which still exist, in the area between Telegraph and San Pablo Avenues; namely, because this area lying outside the subdivided territory remained for many years in an agricultural state, and its streets were later developed with reference to the purely accidental lines of the two country roads (San Pablo and Telegraph) leading to town.

GENERAL SHERMAN'S CITY OF PALACES.

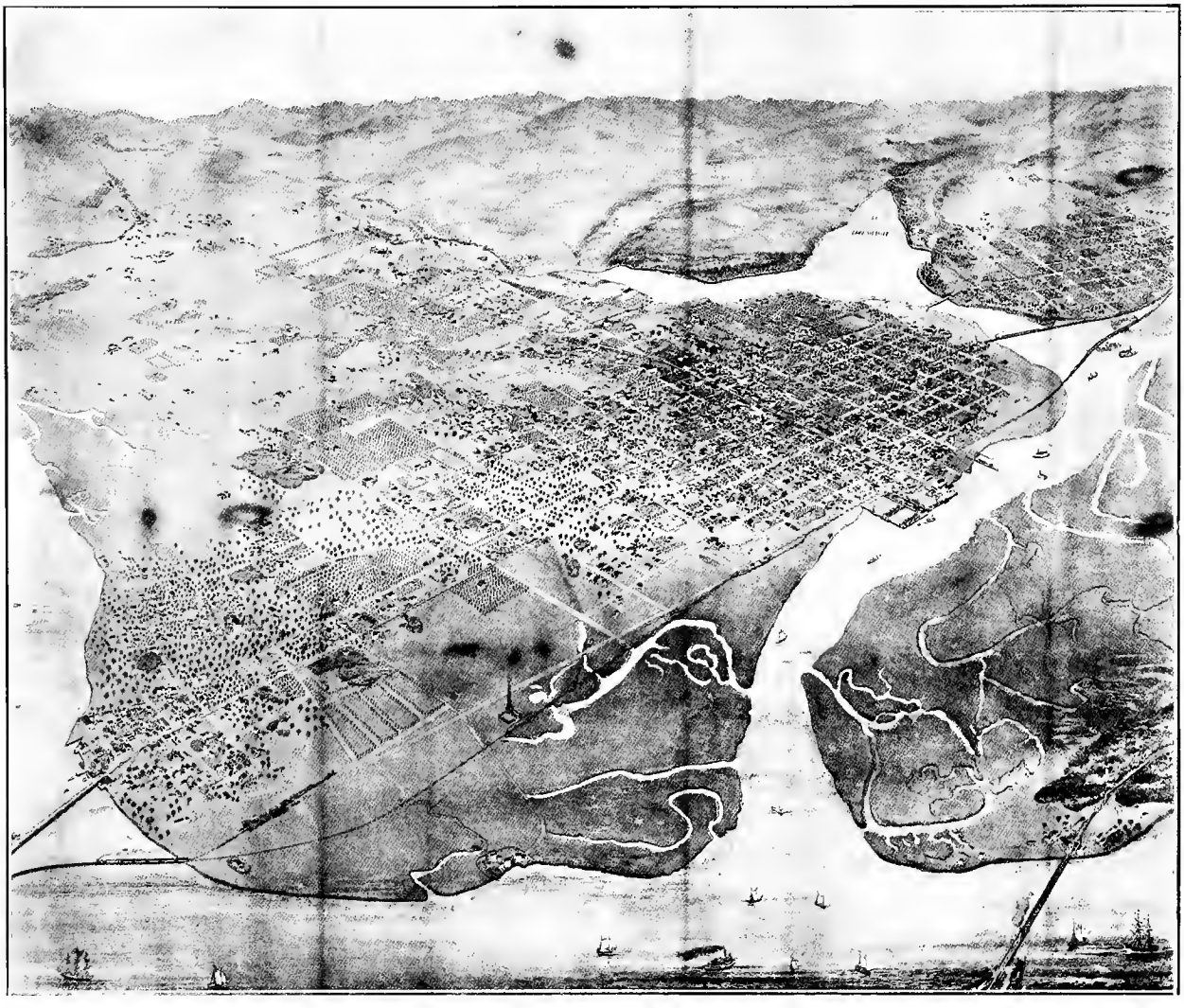
This land was given—where Benicia now is—(the following are General Sherman's own words) on condition of building up a city thereon to bear the name of Vallejo's wife. Accordingly, the new city was named Francisca. At this time the town near the mouth of the bay, the San Francisco of today, was known universally as Yerba Buena; but that name was not known abroad, although the name Bay of San Francisco was familiar to the whole world. Now, some of the leading men of Yerba Buena, knowing the importance of a *name*, saw their danger, and, by an action of the town council, changed the name of Yerba Buena to San Francisco. This little circumstance was big with consequences. *Had half of the money and half of the labor since bestowed upon San Francisco been expended on the east side of the bay, General Sherman claims, we should today have a city of palaces.*

The name of "San Francisco," however, fixed *the city* where it now is, for every ship which in 1848-49 cleared from any part of the world, knew the name of San Francisco (the historical name of the whole bay region) and, accordingly, ships bound for California came pouring in with their cargoes and were anchored in front of San Francisco, the first town. Captain and crews deserted for the gold mines, and now, says General Sherman, "half of the city in front of Montgomery Street is built over the hulks thus abandoned." San Francisco had secured the *name*. About six hundred ships were anchored there without crews and could not get away, and there the city was and had to be. (Compare Map of Bay, p. 20.)

This is the wording of General Sherman's report.[1] Or in other words, as a prominent citizen of San Francisco[2] lately phrased it, "The name of Yerba Buena was changed to the city of San Francisco in order to checkmate the founders of Francisca," the city planned for on the logical, that is to say, on the continental, side of the bay. The illogical location of present San Francisco as a center of commercial redistribution to and from the vast hinterlands of the Bay was brought to its full significance by the introduction of railroads.

[1]See Memoirs pp. 83, 84 and 96. Very similar facts about the most comfortable habitations at San Francisco being on board the deserted ships are related by Jacob Wright Harlan in "California '46 to '88," p. 153.

[2]James D. Phelan in D. H. Burnham's report, page 194.



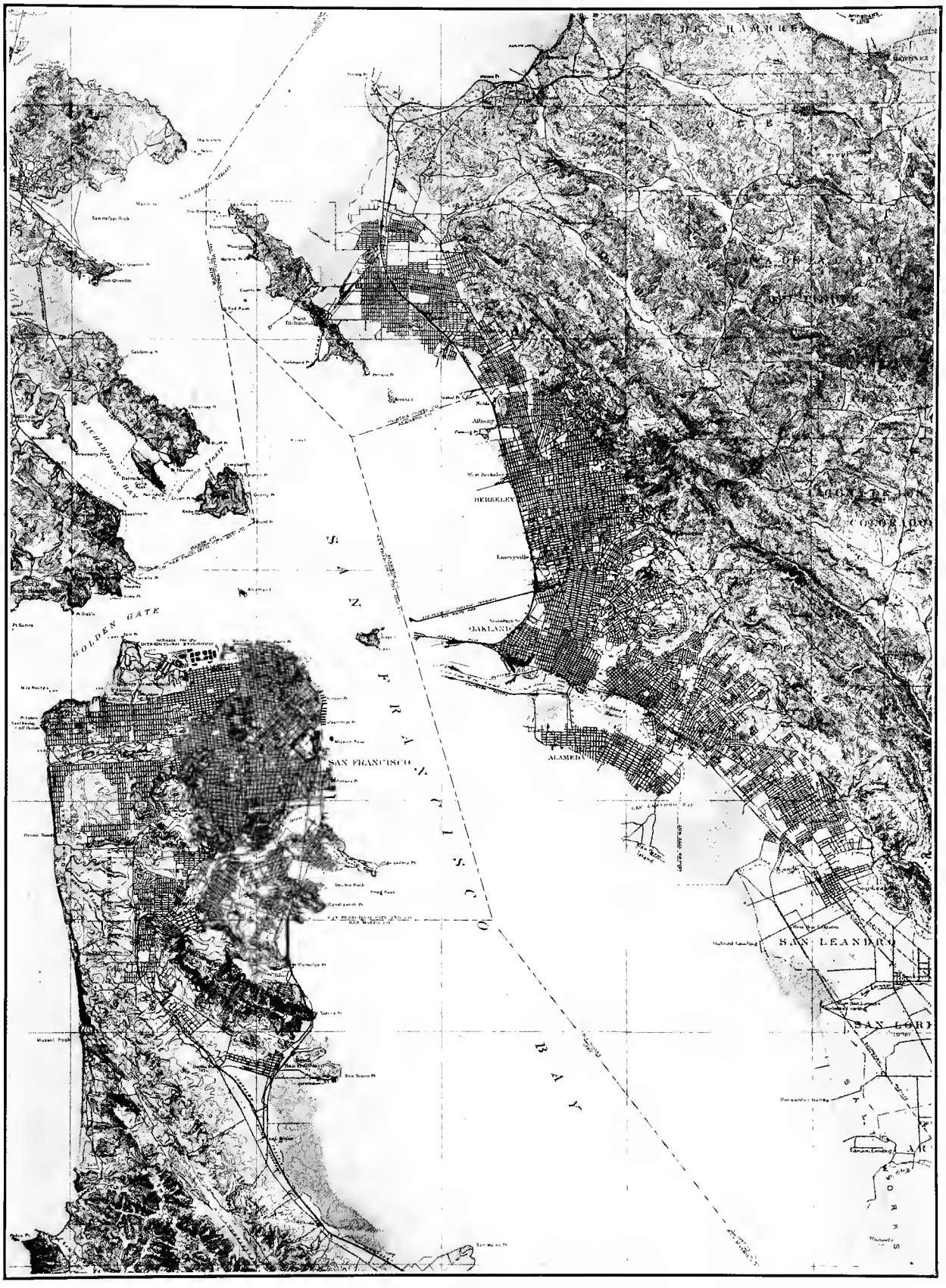
BIRDSEYE VIEW OF OAKLAND, 1872

From an old lithograph: "City of Oakland and Vicinity, Alameda County, California. Published by Snow & Roos, San Francisco. Drawn by Augustus Koch. Lith. Britton & Rey, S. F." In possession of Mr. Wilbur Walker. A comparison with the map (Page 5) shows the growth of the community. Oakland with a population in 1870 of 11,104 had a city hall; several private schools; six public schools; ten churches and three hotels. Southern Pacific tracks occupied First and Seventh Streets, as now. Twelfth and Broadway was the business center. The region north of Fourteenth Street was devoted chiefly to farms and orchards. Above Lake Merritt, now a principal residence section of Oakland, there was scarcely a habitation.

THE PRE-RAILROAD CONDITION PERSISTS

Very curiously, the situation as described in the middle of the nineteenth century by General Sherman, prevailed. As in the days of the pioneers, all vessels bound for San Francisco Bay, (though their cargoes were destined for interior California, *and though there were deep water points on the east, i. e., continental side of the bay),* somewhat unintentionally stopped in old Yerba Buena, the successful monopolizer of the name belonging to the whole bay region, so today international commerce directs to the same point the goods destined for the wide areas west of the Rocky Mountains by labelling them "San Francisco," instead of "San Francisco Bay." Though material saving could be made by unloading them on the east side of the bay, they are first unloaded in old Yerba Buena, the present San Francisco proper, and have to proceed afterwards to be reloaded and transhipped by ferry to the continent. As an instance, two-thirds of Oakland's commerce comes from San Francisco by ferry.

This state of affairs, requiring a wasteful and unnecessary transhipment by ferry of two and a half million tons a year from San Francisco to Oakland alone, can be understood only as a curiosity of a prehistoric, that is, a pre-railway, age. If San Francisco had been founded in modern times, namely, after the introduction of railroads in California (1867), its location on the wrong side of the bay would have been out of the question. The further development of the bay region inevitably must emphasize the natural advantages of the east side of the bay, as the point where ship and railroad meet. The site, however,



SAN FRANCISCO AND VICINITY, CALIFORNIA

U. S. Geological Survey. Surveyed in 1892-1913. Culture revision (part of area) 1913-14.

CORNER BROADWAY AND SAN PABLO, OAKLAND, 1867

Some of the live oaks that have given the city its name stand on the site of the present First National Bank Building.

that will profit from this movement towards the continental side of the bay cannot be as near the mouth of the San Joaquin river as the pioneers planned. The new great city must be located nearer the entrance door of the ocean and near the already developed city of San Francisco.

The logical site for the great commercial and manufacturing metropolis of San Francisco Bay is opposite San Francisco, where Oakland, Berkeley and Richmond are building on shores that are so favorably situated that so eminent a harbor engineer as Colonel Rees believes only the insufficiency of their water terminals has postponed their development.

"If deep water had existed close to the habitable and level shores on the east side of the bay," Colonel Rees says,[1] "there the great city would have been, and there it may be if deep water is provided." *Deep water has been provided* and additional meeting points for ships and railroad can be provided at moderate cost. If there is no unexpected breakdown of civic enterprise and foresight then the east side, where ship and railroad meet, will see the development of a great commercial and industrial harbor. A great harbor, especially an industrial harbor, will mean a great population, and it is in view of the large population to come that the plans for the further laying out of the city must be made.

FUTURE POPULATION OF THE BAY REGION

There is little doubt that the bay will be the site of one of the great cities of the world. Bion J. Arnold, one of the best students of these matters, makes the following forecast for the development of the population in the bay cities:[2]

	San Francisco	San Francisco and Commuter District
1910	416,912	730,000
1920	558,000	1,019,000
1930	722,000	1,366,000
1940	909,000	1,760,000
1950	1,121,000	2,202,000

The commuter district of San Francisco that Arnold contemplated includes Alameda, Albany, Belvedere, Benicia, Berkeley, Burlingame, Emeryville, Hayward, Larkspur, Martinez, Mayfield, Mill Valley, Oakland, Palo Alto, Piedmont, Redwood City, Richmond, Ross Valley, San Anselmo, San Jose, San Leandro, San Mateo, San Rafael, Santa Clara, Sausalito, South San Francisco and Vallejo.

Another careful forecast of population giving somewhat higher figures, as follows, has been made by Engineers Haviland and Tibbetts:[3]

CORNER BROADWAY AND SAN PABLO, OAKLAND, 1906

A wooden structure stood on the site of the present First National Bank Building. Some of Oakland's old oaks still remained in front of the old City Hall, the building with the tower on the left.

[1] In his letter of October 28th, 1913, to the President of the Oakland Commercial Club.

[2] Bion J. Arnold, "Report on the Improvement and Development of the Transportation facilities of San Francisco, 1913," pp. 22, 23.

[3] Haviland and Tibbetts "Report on Richmond Harbor Project to the Council of the City of Richmond," September, 1912, p. 162.

CORNER BROADWAY AND SAN PABLO, OAKLAND, 1914

Immediately in the foreground is the flatiron building of the First National Bank. At the left is the new City Hall of Oakland and the Heeseman Building. In the distance, at the right, the Federal Building. At the extreme right the Central Bank and Realty Syndicate Buildings. In front of the City Hall is the last of the oaks, dying. The oak if properly cared for can stand city environment as well, if not better, than any other native tree, and there is no reason why the flight of the oaks, as shown on plans, pp. 3, 4, 6, and on these pictures, should be an illustration of the colloquial phrase, "Going, going, gone."

	San Francisco	Oakland, Berkeley & vicinity	Alameda	Richmond (inclusive recent annex)	Greater San Francisco	Bay Counties
1910	416,912	195,748	23,383	6,802	651,805	925,708
1920	632,000	393,000	30,000	37,400	959,000	1,300,000
(1920)[2]	610,000	311,000	43,000	20,000	998,000	1,280,000
1930	810,000	428,000	61,000	45,000	1,388,000	1,720,000
1940	1,290,000	558,000	105,000	62,500	2,074,000	2,410,000
1950	1,610,000	711,000	144,000	103,000	2,630,000	3,000,000

These forecasts are based partly on the normal growth of the bay cities in the past and partly on comparisons with the rates of past growth of other cities of greater population. They are *not* based, however, on the rates of the somewhat sudden and erratic growth recorded for the east bay cities after the San Francisco disaster of 1906. The forecast, therefore, is conservative,—neither optimistic nor pessimistic. It is not impossible, nor even unlikely, that a much larger growth will come in connection with the rapid development predicted by reliable observers, as a consequence of the natural progress of settlement in the western hemisphere, and of the opening of the Panama Canal. These conservatively made estimates show that the population of the bay region may be expected to reach one million by 1920, and two millions by 1950, and that about one-half of this estimated population will live on the east side of the bay. Every plan for the future development of the east bay region must be made for a city, or rather for a citified district, to house economically and comfortably at least a million people.

It may be regretted that the development of the east side of the bay has gained its real impetus only in the last ten years. This fact, however, is bound to have the most beneficial results upon the future of the east bay cities. Even a hurried visit to any great city developed in the nineteenth cen-

SUCCESSFUL TREATMENT OF A CORNER

This corner, in Paris, is similarly situated between two avenues of at least as great importance as in Oakland are San Pablo and Broadway. The population of Paris is in excess of four millions, while the population forecast for the entire Bay Cities is three millions by 1950. The picture shows that planting is possible and a great enhancement of beauty in large cities. Notice how effectively any flatiron appearance in the corner building has been avoided, and compare the picture of 1867 on page 8, where the orderly white fence avoided the sharp corner in the same fashion.

2. The second set of figures for 1920 rests on another basis of calculation.

tury must convince the observer of the enormous mistakes that have been made everywhere under a system of haphazard city-building. In all of them the lack of comprehensive planning has resulted in badly laid out streets, congested conditions in the business district, and still more congested conditions in the housing of the large masses of the population, not to mention lack of open spaces, parks, and pleasant surroundings in general.

The admiring attitude of the American traveler for the splendor of famous cities like Paris, Berlin and Vienna might often be altered considerably if he clearly realized how many hundreds of thousands of the citizens of those much quoted capitals and supposed "model cities" (though conditions on an average may be better than in the most congested tenement districts of cities like New York or even San Francisco) are suffering under the most inhuman conditions of overcrowding. Every big city in the world, without any exception, is full and overfull of conditions that seem like the result of madness, and that are recognized as great public calamities to be remedied only by the outlay of millions and billions and by the untiring labor of generations.

THE TWO LESSONS TO BE LEARNED FROM THE HISTORY OF CITY-BUILDING AND CITY PLANNING.

In considering the future development of any modern city, two fundamental facts can be learned from the experience of city-building in the past:

First: The lack of planning ahead has nearly always proved to be very detrimental to the growth of cities, and to the well-being, and especially to the pocket-books, of a city's inhabitants.

Second: Since the needs and ideals of modern city-building differ fundamentally from the ideals of past centuries, even the best plans made for great cities in the past can be adapted to the growth of modern cities only after very material changes.

THE FAILURE OF THE OLD CITIES.

Concerning the first of these two facts little need be said. One has only to remember the enormous sums spent in the old cities for the clearing of congested areas, or for the opening up of streets in built up sections, or for the belated creation of some inadequate playgrounds in overcrowded neighborhoods. One also must keep in mind the terrible penalties in health and happiness paid in the old cities by the body of citizens as a whole for having permitted the congestion of the buildings in which men live and work. One must consider the vicious effects of the high land values created by congestion, those exaggerated land values, that create in turn new congestion of office buildings and denser over-crowding of tenements, prohibiting parks and playgrounds, while common sense asks imperatively for the spreading of the increased population over increased areas for the benefit of the people themselves and of the landowners in outlying districts.

All the terrible calamities mentioned may be simply illustrated with some figures.

Paris, the oldest of large cities, had to spend about a billion dollars for a campaign of street widening and opening in the old sections.[1] The Royal Commission on London Traffic, which has made and published the most elaborate investigation into London's traffic needs that can possibly be conceived of, proposed in its report (published in eight big volumes) the breaking of two new avenues across the built up area of entire London at a cost of $120,000,000 altogether; the already accomplished opening of Aldwich-Kingsway at a gross cost of $25,000,000 is a part of the scheme.[2] The London County Council in the ten years from 1889 to 1899 spent for clearing away of unsanitary areas, and for their reconstruction, the sum of fifteen million dollars.[3]

New York spent in one single district five million dollars for the acquisition of ten acres of slums and for their transformation into open spaces, thus paying more for these ten acres than for the original area of the huge Central Park (840 acres today).[4]

The Mayor of Boston in 1892 stated that $40,000,000 had been spent by the City of Boston for the widening of too narrow streets. At the beginning of this century, a commission of leading business men appointed by the Mayor of Boston came to the conclusion that a number of important street widenings in the downtown district deemed necessary by the commission could not be carried out because of prohibitive cost.

In communities that make up Greater Berlin, from 500,000 to 600,000 people are congested into tenements with an average of from five to thirteen persons to every room.[5] To remedy these appalling conditions by taking the victims out of the tenements would be equal to destroying hundreds of millions of invested capital and acquired rights. By lack of forethought in city planning the economic foundation of a large part of the nation's wealth has been based on over-crowding.

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[1]This sum of one billion dollars is an estimate of the money spent for the reorganization of Paris since the French Revolution; it includes the sums spent by the revolutionary governments, Napoleon I, the Restoration, Napoleon III, and Haussmann, and by the City Government since 1871.

Details about these figures may be found in Vol. II, "Der Staedtebau nach den Ergebnissen der Allgemeinen Staedtebau Ausstellung," etc., by W. Hegemann, Berlin, 1913, pp. 215-231.

[2]These $25,000,000 do not include the large losses of interest charges on the areas remaining unbuilt on for years.

[3]Compare: "The Housing Question in London 1855-1900" prepared at the order of the Housing Working Classes Committee of the London County Council under the direction of C. J. Stewart, Clerk of the Council.

[4]Compare the impressive diagram in B. C. Marsh's "Introduction to City Planning," New York, 1909, p. 17.

[5]Kitchens and bathrooms (where they exist) are not counted as rooms in these statistics and only rooms that can be heated are counted; one-tenth of the one-room flats have siderooms that cannot be heated.

At the same time over three hundred thousand children in Greater Berlin have no adequate playgrounds. In 1911 the fifty official school physicians of the public schools of Berlin reported 34% of the young school recruits either physically or mentally unable to attend school or in need of medical supervision. And these bad housing and playground conditions of Greater Berlin, far from being unique, are equaled in nearly every great city, especially on the European continent. The great cities of England and America with their so-called "slums," have produced in some limited districts congestion-figures that exceed even the most unfavorable averages of continental Europe

Most of the figures and facts given so far can be considered as the direct outcome of a lack of comprehensive city-planning; the cities mentioned either had no plan at all for their growth, or, if they had plans, they were only surveyor's plats or were related only to special, chiefly artistic, features, and had no special provisions to prevent the calamities mentioned. The argument that these calamities could not have been foreseen is not sound, because in very many cases history shows that these calamities *have* been foreseen. This point is important enough to warrant some examples. The writer of these lines made a special study of the development of city-planning thought[1] and found that in many of the capitals the present amazing conditions in housing and in park and playground development were foreseen very clearly long before they came. A long line of men with national reputations have, since the forties of the nineteenth century—that is, before the overwhelming growth of modern cities came about—repeatedly and most emphatically pointed out the danger to come, and proposed practical and efficient preventive and curative measures. Many of these writings of the forties, fifties, sixties, and seventies show the most excellent city-planning thought, hardly surpassed by present-day writers. However, all the clearness and the influence of these writings were not strong enough to overcome the lethargic leniency and the stupid optimism of those men who held the political power and made money out of the prevailing vicious system of city building until today, when the calamities have ceased to be local and have become by their overwhelming size a national danger clearly acknowledged by every faithful observer.

Studies of conditions in Berlin, Paris and Vienna alike show, beginning with the fifties, a strong fight against congestion through plans to introduce better methods of rapid transit, making greater decentralization of housing possible.

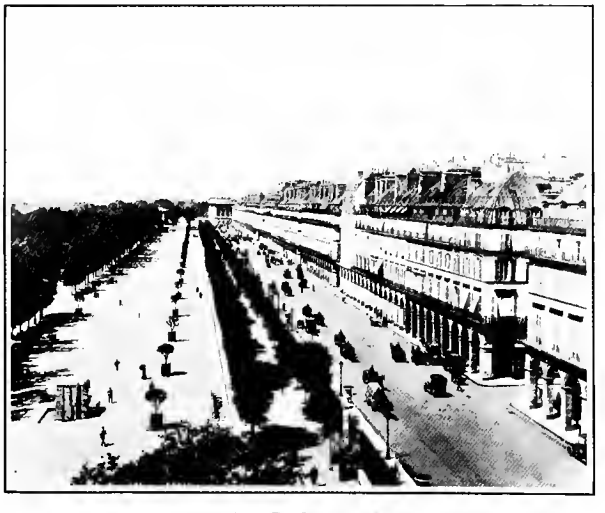
FASHIONABLE COATS, BUT DIRTY UNDERWEAR.

This tendency toward proper city planning and the prophetic warnings of the dangers of congestion were nullified, however, by the shortsighted and onesided desire to center the city planning activities merely around the idea of the city spectacular, "the city beautiful," to surprise the provincial, and to dazzle the foreign visitor. As Napoleon III and Haussmann expressed it, they wanted to create the "City Queen," and as the Emperor of Austria said: "I want an elegant capital."

To the production of this metropolitan "elegance" the most refined thought was given, but this thought benefited mainly the central sections of these capitals, (the part near the castles) and the exterior facades of the tenement houses. This was indulging in fashionable looking coats, not minding dirty underwear. Behind these good looking facades, miserable crowding, lack of housegardens, and the choking of the next generation were permitted. This kind of city planning did not attempt to make comprehensive preconceived plans covering all the different branches of city growth; but touching only one or two aspects (mainly artistic), exaggerated their importance and did nearly as much harm as no planning at all.

THE OLD CITY MIXED BUSINESS, MANUFACTURING AND DWELLING.

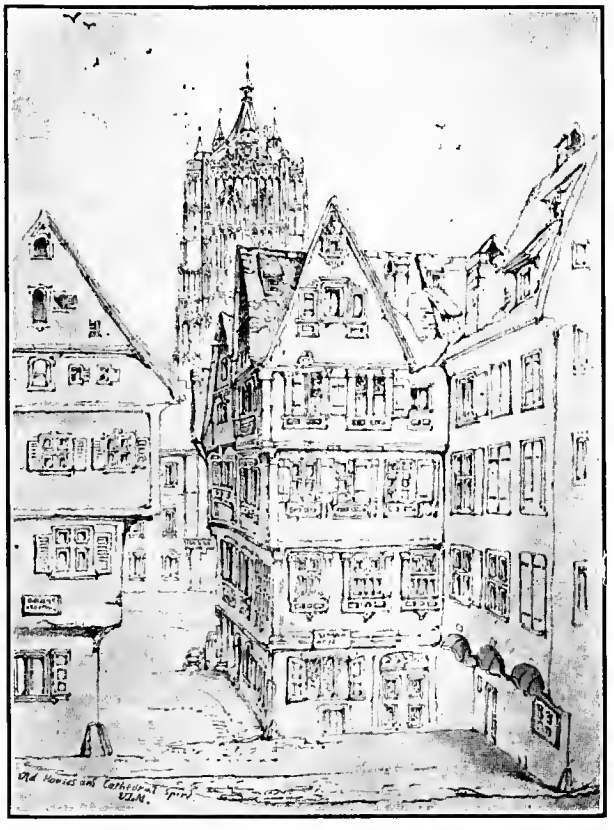
This failure emphasizes the value of the other fundamental fact to be learned by the experience of the past in city building, that even the best plans made for cities in the past can be adapted to the growth of modern cities only after material changes. Our modern ideals in city planning must differ fundamentally from those of past centuries. Many city planners of the old school still consider cities like Nuremberg and Rothenburg, or Paris, Berlin and Vienna, as ideals that for their artistic value can be held up for imitation in modern cities. This, however, seems to be fundamentally wrong. All those supposed model cities, though they present most valuable material for



RUE DE RIVOLI, PARIS

This creation of Napoleon III is one of the most remarkable examples of an entire street treated as an artistic incident to a castle (burnt by the Communists) and its gardens. This long stretch of uniform cornice and roof lines will always serve as a model for the treatment of the background of public buildings.

[1]Published in Der Staedtebau nach den Ergebnissen, etc.



"OLD HOUSES AND CATHEDRAL SPIRE, ULM," in 1825

From a drawing by John Ruskin, showing a little street connecting two minor squares. This view of the old Free Imperial City is a typical example of the architectural effects of high facades and closed-in vistas. Notice the business premises on the ground floor (advertising signs), while the upper stories are used for residential purposes; they hang over the streets, space being scarce in these narrow fortified cities. Effects like these, captivating as they are for any one who understands architecture, have been improperly held by city planners to be desirable for modern cities.

study and suggestion, represent an old type; they are cities of buildings for joint dwelling and business purposes—a type that was developed in the ages before the introduction of the omnibus, street cars and railways. The failure of this type has been aggravated by the influence of the fortifications of these cities. The presence of fortification barriers was as harmful as the absence of transportation and of suburban rapid transit; both made for congestion of business and for overcrowding of people in many-storied tenement houses; both prevented the extension of the cities into the open country, that is to say in width and length, and forced them up in height. This congestion has developed its own beauty, whose architectural effects of splendid towering and powerful combinations of high facades and closed-in vistas, have unduly set the standard in city building.

MODERN CITY DIFFERENTIATES BETWEEN BUSINESS AND RESIDENCE DISTRICTS.

The old type of city building is the city of congested tenement houses, with stores and business premises on the ground floors and in the cellars of these tenements. The most fundamental idea of *modern* city planning goes back to the years 1665 and 1666, when one after another the great plague and the great fire revolutionized the congested city of London, and, frightening its citizens out of the old city walls, taught them to desert the congested district and to live in garden suburbs scattered over wide areas.[1]

Open spaces and parks, especially the large (1000 acres and over) public parks and the individual house gardens remained in the *old* city only occasionally, as a rare remainder of agricultural conditions or of aristocratic luxury; they form an integral and essential part of the *modern* city. The modern city differentiates between the business district and the dwelling house district of the garden city type; both are connected by those astonishing systems of rapid transit that are the backbone of every modern big city.

The prevalence of this modern type of city building has big consequences in every direction; some of these consequences must be enumerated here, because only by knowing them can the American visitor to European cities properly judge the value of the old European city-planning schemes and find out how many of their advantages can be adapted to American city-building.

SPREADING OF LAND VALUES BY DECENTRALIZATION.

The modern system of decentralization in city building spreads city land values over much wider areas than can be made use of in connection with the congested type, and at the same time prevents the coming into existence of those unwholesomely high values of land for dwellings, which necessitate tenements and crowding.

These extravagant land values, as one views them in the congested cities like Paris, Berlin and Vienna, are the death of private gardens and a danger to public parks and playgrounds, while public and private gardens thrive in the modern decentralized cities. The men who own and operate the high-valued land of congested cities, and still more the men who build and finance the big tenement houses, in many cases have proved to be, and justly by public opinion are considered to be, very detrimental to the well-being of the community. In the decentralized city, on the contrary, the work of the real estate operator in the shape of development and opening up of real estate for small residences, becomes a matter of high social importance. It is not only that the living in country-like surroundings, to which the clever real-estate operator so unceasingly invites, affords a much more healthful, in fact the only, chance for the development of the next generation, but the individual lot and house that are offered furnish financial opportunities small enough to attract the individual saver, thus making him an interested part of the community, giving additional force to its physical development. In contrast, the masses living in unhealthful tenements

[1]See the account of this revolution by Macaulay in "History of England," and the contemporary remarks of Defoe, famous author of Robinson Crusoe.

and paying high house- and ground-rent to a small percentage of house owners are only too justified in assuming an antagonistic attitude towards the present state of society. The revolutionary attitude of the masses in the big cities in continental Europe has been often, and to some extent probably very aptly, explained by the unsocial system of housing under the old system of city-building.

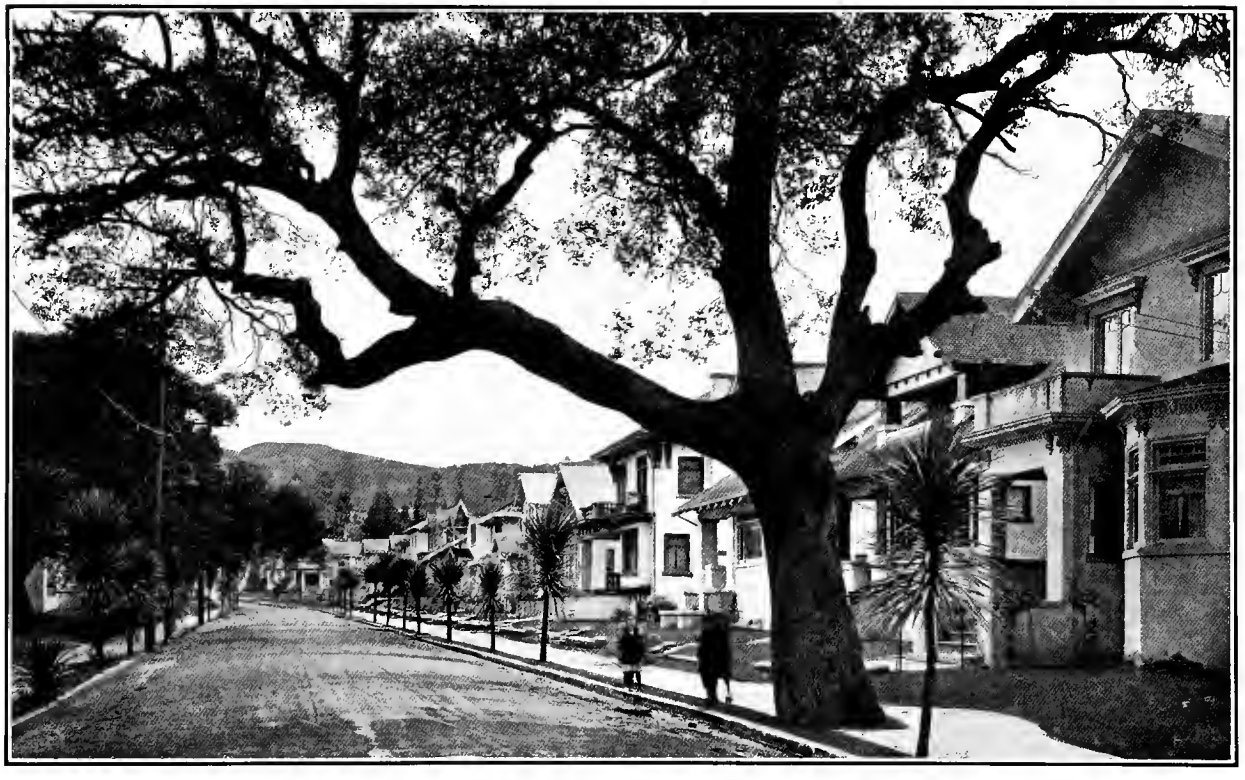
The development of real estate in small units for individual homes acts as an important form of savings bank. Congestion in tenements deprives a wide and important part of society of a time-honored form of taking part in the progress of their community.

THE APPEARANCE OF THE AMERICAN CITY—ITS CRITICS.

There is another important difference between the continental system of congested city building and the English or American system of decentralization and clear differentiation between business and residence districts; and this difference is probably the one that most baffles the American visitor to European cities and inclines him to favor European systems. The system of housing the people in high tenements leaves the land in the out-lying districts unused and gives an exaggerated value to the land in the built-up district. This high value of the land in the built-up area makes it possible, and a matter of course, to develop it in a much more expensive fashion than can be done in cheap residence districts of American cities. The traveler in European cities, either finds land not used at all or developed with most expensively paved wide streets lined by stone or imitation stone and ginger-bread facades of four to six storied tenements and apartment houses. This, though it generally hides an undesirable state of housing and often terrible over-crowding, makes upon the unprepared mind an impression of wealth and splendor which leads to the thought that his American home city must necessarily be inferior.

THE WILDERNESS OF THE BUSINESS DISTRICT AND ITS GLORY.

What does the American city look like? The American city has a central district with public and office buildings, department stores, theatres, clubs and apartment houses which always in expensiveness, generally in comfort, and often in beauty, very favorably compare with similar buildings erected during the last generation in European cities of similar size. The superior beauty of older epochs which is found in the historic centers of Europe is another matter, to be referred to later. The fact, however, that the American city as a rule does not restrict the height of buildings as is commonly done in European cities, often



KEITH AVENUE, OAKLAND

This is a typical street of homes; roadway 30 feet; sidewalks 5 feet, 6 inches; macadamized pavement; street planting done by property owners. Cost of houses ranges from $4000 to $8000; value of ground about $50 a front foot; width of lots 50 feet. Streets like this are capable of considerable improvement by giving more planting (notice what the few old trees do for the appearance), by selecting more suitable street trees (instead of young palms) and by less paving, in accordance with the proposition outlined on pp. 103-5 of this Report, also by grouping the houses and aiming at more harmonious and uniform architecture and material. But even as they are, streets like these and hundreds of very similar ones with houses more moderate in price can justly be considered the pride of American city building, and they must by proper planning be protected against invasion by tenement and factory and against overcrowding.

AN EAST BAY ARTERY OF TRAFFIC IN PROCESS OF TRANSFORMATION

New fireproof department store, at a distance, semi-business property and old residences with private garden in foreground. The main arteries of traffic, which often show the European tenement house city at its best, by reason of uniform roof lines and good planting (compare picture, pp. 9 and 11), are a great problem in the American city. Since they are not desirable for residence purposes, they hesitate in a somewhat intermediate state. Street planting can improve their appearance considerably. (Compare proposals on page 88.)

gives a rather disorderly appearance to the American business districts. The alternating sky-line of two story with twenty story buildings, commonly found in American cities, can work out very surprising effects in architectural beauty; but since practically no thought is given to these effects, they are only accidental and the visitor usually sees from the street the architecturally undeveloped side walls and an endless repetition of badly lighted interior courts, ready to be blanketed by buildings erected later. (St. Francis Hotel, p. 101).

SQUARE MILES OF GARDEN-HOMES.

Aside from this expensively but inconsistently developed business district, nearly every American city has some high class residence districts, the beauty and comfort of which is acknowledged to be equal, or superior, to similar ones in continental Europe. The American city further is developed for miles and miles with modest, but sometimes quite charming, little houses surrounded or half surrounded with little gardens along cheaply paved (or unpaved) streets. Often playgrounds and sometimes splendid great parks can be found in the neighborhood. (Views pp. 120-1).

These square miles of little houses, where the man of modest or small income can give a decent and healthful home to his family, as a rule are forgotten when the American traveler compares his home city with the pretentious exterior of the European tenement-house-city.

THE PROBLEM OF THE STREETS OF MAIN TRAFFIC.

Instead, the American, in making his comparison, thinks of the long streets of main traffic that connect the extensive suburbs with the business district of his home city. These main arteries of traffic present one of the great problems of American city building; not being very desirable for residence purposes, they hesitate in a somewhat intermediate state. Old residences in need of repair and new cheap business blocks give a very undesirable appearance to those streets by which the commuter has to travel every day, and that, together with the unordered appearance of the business districts, largely shapes his unfavorable opinion of his home city. Compared with this undesirable state of affairs, even the undesirable new European tenement streets are imposing to the American mind, though the bad features of these pretentious streets are now recognized more and more.

ESTHETIC VALUE OF EUROPEAN CITY-PLANS.

Where then is the value of European city-plans today mainly to be found? If one leaves aside the efforts of the very last years, the value of European city-plans mainly rests on the esthetic inheritance from an older time; from a time that—without thinking of the modern problems connected with the rapid growth of cities—has solved some of the artistic problems of city-building in the most surprising fashion.

The old Gothic cities like Nuremberg and Rothenburg had their marvelous "feel of the land," the intimate and sympathetic adjustment of the lines and grades of streets, as well as of the

character and the quality of buildings, to the beauties of natural contours and to the inspiring appearance of some centrally located cathedral.

Most of the newer capitals present in their central areas, and sometimes in some of their main out-reaching arteries, the realization of some great thoughts in artistic city planning,—thoughts conceived by great creative minds and fostered by centuries. The great formal garden schemes as preserved in their original beauty in Versailles, and as adapted to later city requirements in the Champs Elysees of Paris, the Unter den Linden-Tiergarten of Berlin, the Mall of Washington; or the ingenious transformations of old fortifications into beautiful modern city streets, as the Grand Boulevards in Paris, or the Ring in Vienna, or the Koenig's Allee in Dusseldorf; the shaping and counter balancing of wide volumes of space into plazas more beautiful than closed rooms ever can be; the ingenious handling of perspective art to capture the deceptive sky as an ever-living, beautifully framed ceiling for the plazas and vistas of the town; the creation of these inspiring vistas; the preservation of wide out-looks; the effect of contrast between enclosed spaces, and spaces commanding wide views; effects either achieved by informal treatment, or by formal design,—all these are treasures of past ages. To introduce these great esthetic values in modern city-planning will always be a great aim, worthy of great efforts, but it surely presents only a single phase of the comprehensive city-planning problem and that hardly the most important one.

SOCIAL VALUE OF EUROPEAN CITY-PLANS.

It must not be understood, however, that the artistic effect has always been the only aim in city-planning schemes of the old regime. There were exceptions, the most remarkable one the case of Berlin in the seventeenth and eighteenth centuries, when the Prussian rulers practised city-planning on an entirely social basis, and in a very efficient and far-sighted manner, working with powerful hands for the rapid opening and building up of wide and healthful suburban areas, without neglecting the beauty of the central district. It is largely due to this powerful and advanced city-planning that Berlin, from a little medieval town of eight thousand people, became one of the leading capitals of Europe, with one hundred and sixty thousand people at the beginning of the French Revolution. This social kind of city-planning, however, was the exception, and, with the entire change of the political situation caused by the French Revolution, the social tendencies in city-planning suffered the same decline as artistic city-planning all over Europe. The city-planning conscience became submerged in the wild flood of self satisfied but often altogether incompetent individualism with its surprising, often great and more often ridiculous and harmful results. Only the great city-planning revival of the last decade has brought, especially in Germany, Austria, Sweden and England, the realization of new social ideals in city-planning along the lines followed in this report.

THE FAILURE OF DEMOCRACY IN CITY-PLANNING.

Before the new city-planning revival set in democracy—it cannot be denied—has depressed the standard of civic art.

The prevalence of artistic ideas in the city-planning of past ages, and the artistically less successful efforts of the last generation, can be explained by the fact that city-planning work then was done either by architects or landscape architects, both of whom were mainly trained to see esthetic values. But during the nineteenth century these artists have often been supplanted by surveyors or civil engineers. This is one of the reasons which explains the much greater success of artistic city-planning in the past, compared with the newer efforts. But there is another important reason: before the nineteenth century not only the men who executed, but especially the men who directed, the work were possessed of much broader and more general culture than today is found in those men who hold most influential positions. The most convincing examples of this are the Princes of the old regime, who, in so many cases, were the directing force that brought about the great artistic achievements in city-planning that we admire today. These men, as a rule, made it their business to keep in constant touch with the leading exponents of the best and newest ideas. All over Italy, Germany and France, courts could be found that were the continual meeting places of the best artists, painters, architects, engineers and thinkers on every interesting subject. Only in this atmosphere of perpetually enlightened discussion, and congenial criticism, could the fine conceptions in artistic city-planning grow, the realizations of which have stood the test century after century.

After the general change of the political situation that took away the city-planning activities from the Princes, and either annihilated these activities or put them in the hands of the citizens, those citizens in very many cases turned out to be very ordinary short-sighted and uneducated bourgeois. It came to be considered somewhat a matter of course that a citizen elected a member of this or that commission, to manage matters relating to city-planning (or to any other subject), could not be expected to know much about it, and the results were in conformity. It almost became a matter of pride to be "just a plain citizen" and to be somewhat ignorant on subjects of general culture.

A DUTY TO BE PERFORMED BY CIVIC ORGANIZATIONS.

Even in cities such as the so-called free cities of the German Empire, where for centuries the power had been in the hands of the citizens, the fundamental change in economic conditions in the nineteenth century brought into power quite a new stratum of men, who neither in their education nor in their family traditions possessed anything but good intentions to guarantee desirable results from their civic work. Nearly every

artistic product of city-planning, turned out by those new city governments in any part of the world, is to the brilliant realizations of former periods somewhat as gravel to diamonds; this is a sad but hardly debatable fact, and it is to be feared that it may remain so for generations. It will be one of the tasks of general education of civic bodies and local organizations gradually to raise again the level of artistic discussion and culture above the vulgarity that largely prevails today. Surely modern democracy will not permit itself to lag behind the commendable achievements of former periods. There are cases, where the patient and determined work of a really cultivated secretary or member of a Commercial or City Club has entirely changed the grasp and outlook of communities in regard to city-planning matters.

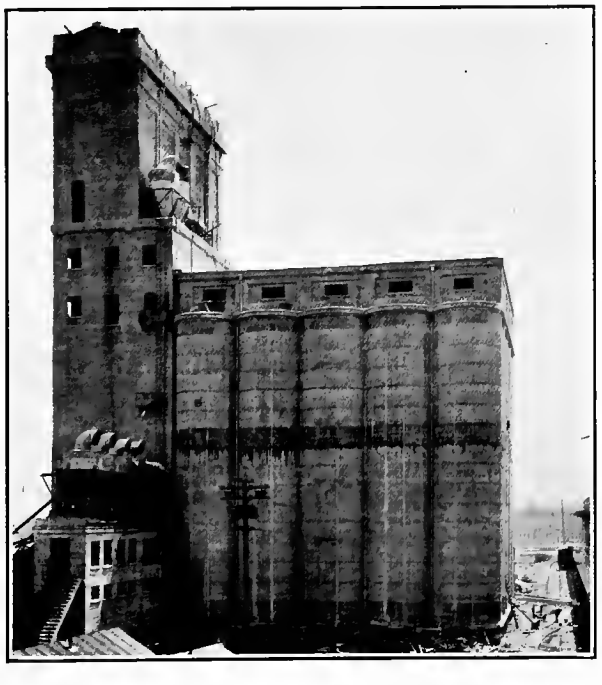
THE OBJECTS OF MODERN CITY-PLANNING.

If these artistic aspirations of modern cities have usually turned out ridiculous results, at what can the modern city successfully aim? There are even more important and more fundamental objects than esthetics in city-planning, objects that are altogether within the reach of modern civic effort; many lines indeed in which the modern city has already surpassed older efforts, and will and must do so still more. If civic art is the sublime flower that finally can be hoped for, the necessary roots, stems, and leaves must be found in the economic, social, hygienic and recreational life of the communities.

Industry and transportation; transit and rapid-transit connections between economically and hygienically developed factories, business districts and healthful enjoyable homes; plenty of playgrounds, open air and indoor schools, and public parks are the logical objects of modern city-planning—the necessary foundation on which civic life and civic beauty must rest before anything worthy to find expression in art, radiating towards a physical and beautiful civic center, can be developed. These somewhat utilitarian objects of the new civic art are susceptible of a high grade of development unheard of in the plans for the cities of former times.

City-planning is the science of investigating and achieving these results. Extraordinary efforts and quite new departures must be made in order to develop a new type of city, free from the old plagues.

The city of the old type was built to house only a small percentage of the nation and this small percentage was destined to an early death in the second or third generation. The cities did not continue to exist by their own increase of population, but by the continuous influx of people from wide agricultural areas. *The old congested city, therefore, was essentially a place to die in; the modern city must become a place to live in.* In the beginning of the nineteenth century, only a small percentage of the population in the United States lived in cities, a condition which has changed materially today. Especially is the state of California a remarkable example of this change. According to the United States census, the population in California cities of over one hundred thousand people has increased in the decade from 1900 to 1910, from 30 to 37.3 per cent. The population in districts outside of cities of ten thousand and over has decreased from 56.9 per cent in 1900, to 46.7 per cent in 1910. Most of this decrease of the percentage of population of agricultural districts has gone to the big cities of over one hundred thousand. This clearly shows the prevailing tendency. It also shows the grave necessity for building cities that are fit places for the permanent housing of the larger part of the population.



GRAIN ELEVATORS, OLD AND NEW

Concrete elevator built at a cost of $678,000 by the Municipal Government of Seattle; capacity 500,000 bushels. The "Staple House" at Ghent, Belgium, a granary of the early 13th century (the third of the three gables). These pictures contrast the higher efficiency and powerful yet uncombed appearance of modern building and machine methods against the quaint facades of the Middle Ages and its hand methods. Gradually the modern methods and building materials, which at present have stifled good traditions and taste, will be mastered by man. The city of the future will be not only more economic and hygienic but perhaps as beautiful as the cities of the past.

With the fundamental change in the importance of cities to the life of the nation, the meaning of the term "city" also has changed fundamentally. The term "city" was originally applied to those small built-up commercial places that were mainly used for the exchange of goods produced outside. The modern "city" applies to those tremendous citified areas, or urban regions, the industrial activities of which become more and more the back-bone of the leading nations.

The United States census calls "metropolitan districts" the land within the city boundaries of large cities and within a radius of ten miles outside of city boundaries. The metropolitan district of New York comprises 617,000 acres, Philadelphia 437,000 acres, Chicago 409,000 acres, Pittsburg 405,000 acres, Boston 335,000 acres and of San Francisco and Oakland 289,000 acres. In order to understand what these big figures mean, one must remember that the city of Paris at the time of the French Revolution comprised only 8425 acres, on which 600,000 people were crowded. Even today the city of Paris proper crowds its 2,840,000 people on an area of only 19,500 acres, and Berlin proper crowds over two million people on 15,008 acres.[1] How can any standard of air-space in private or public buildings, and especially in gardens, public playgrounds and parks, that has been developed by these antiquated cities, ever be used in looking for the solution of the problems of the new city?

"New times demand new measures and new men,
The time is ripe, and rotten-ripe for change."

—*James Russell Lowell.*

[1]In the slums of New York, that is, in some areas of very limited extent, conditions are much worse still. If all New York City were populated in the same way as some of its congested parts, the population of the whole of China and India could live in its boundaries.

GOETHE'S PREDICTION OF THE PANAMA CANAL AND THE DEVELOPMENT OF THE AMERICAN WEST

(From Eckermann's "Conversations with Goethe")

Wed. Feb. 21 [1837].—Dined with Goethe. He spoke much and with admiration of Alexander von Humboldt, whose work in Cuba and Colombia he had begun to read, and whose views as to the project of making a passage through the Isthmus of Panama appeared to have a peculiar interest for him. "Humboldt," said Goethe, "has, with a great knowledge of his subject, given over points where, by making use of some streams which flow into the Gulf of Mexico, the end may be perhaps better attained than at Panama. All this is reserved for the future, and for an enterprising spirit. So much, however, is certain, that, if they succeed in cutting such a canal that the ships of any burden and size can be navigated through it from the Mexican Gulf to the Pacific Ocean, innumerable benefits would result to the whole human race, civilized and uncivilized. But I should wonder if the United States would let an opportunity escape of getting such work into their own hands. It may be foreseen that this young state, with its decided predilection to the West, will in thirty or forty years, have occupied and peopled the large tract of land beyond the Rocky Mountains. It may furthermore be foreseen that along the whole coast of the Pacific Ocean, where nature has already formed the most capacious and secure harbors, important commercial towns will gradually arise, for the furtherance of a great intercourse between China and the United States. In such a case, it would not only be desirable, but almost necessary, that a more rapid communication should be maintained between the eastern and western shores of North America, both by merchant-ships and men-of-war, than has hitherto been possible with the tedious, disagreeable, and expensive voyage round Cape Horn. I therefore repeat that it is absolutely indispensable for the United States to effect a passage from the Mexican Gulf to the Pacific Ocean; and I am certain that they will do it.

Would that I might live to see it!—but I shall not. I should like to see another thing—a junction of the Danube and the Rhine. But this undertaking is so gigantic that I have doubts of its completion, particularly when I consider our German resources. And thirdly, and lastly, I should wish to see England in possession of a canal through the Isthmus of Suez. Would I could live to see these three great works! it would well be worth the trouble to last some fifty years more for the purpose."

THE STRUCTURAL RANK OF THE DIFFERENT ELEMENTS IN A CITY-PLAN

TABLE OF CONTENTS

City-planning is the co-ordination of the different activities that make for the physical growth of the city, *i. e.*, the activities of the builders, landscape architects, railroad and harbor engineers, civil engineers, etc.

The different factors that together make up a city and the map of a city and that are essential in organizing and developing the tremendous areas covered by a modern metropolis are all objects of city-planning, *i. e.*, of logical and comprehensive consideration and forethought. Consideration must be given to these different elements of the city-plan according to their structural rank in the city-plan. It would be bad policy to find, first, locations for those parts of the physical city which can find place equally well in different locations, instead of determining, first, everything about those parts, the location of which for overpowering reasons cannot be shifted without detriment, but is fixed in certain unchangeable localities. For structural and economic reasons, the water and rail transportation systems for freight, urban, suburban and interurban passengers, in a city-plan are fixed in certain definite localities, and to find these strategic localities must be the first aim of the city-plan.

There is nothing in a city-plan, with the exception of great historical or natural monuments, that should not give way to the economic and engineering necessities of transportation. The amount of capital that has to be invested in the freight and passenger facilities of a city is so enormous, and the efficiency of these systems so much depends on their being located in the right—the most strategic and most economic—positions, that anything that can be reproduced with less cost at another place of the metropolitan area has to give way to transportation and industry. When Hamburg in 1883 started her new harbor scheme with an initial expenditure of thirty million dollars, one thousand dwelling houses were razed to make room for a part of the harbor.

From the same point of view *a harbor has a higher rank than any parksite* that does not contain altogether unusual qualities to be protected at any cost; and again a site suited for a beautiful park must not be used for things that can be accommodated elsewhere; a public park must enjoy a higher rank than an area for private residences. Again, if the city selected a certain site for its civic center, or if—still more important—the people of the whole state have decided upon one certain site to be developed as a state capitol, *i. e.*, the center of State Government or as a university, *i. e.*, a center of learning; and if the investment of millions has been begun upon such sites, the aim whose achievement is sought in this special locality is such a high one and can be achieved only with such a great degree of consideration and care. that no other purpose of the city-plan, even in the matters of transportation, should be permitted to interfere afterwards. A civic center of any kind, be it for administration, recreation or learning, once agreed upon and established, enjoys even higher rank than the economic needs; it is or is to become an historic monument for the community. After the historic monuments rank transportation, the business districts and the industries; after them the parks, and then residence districts take their rank. If an ideal plan could be made, no collision between the different objects of city-planning ever could arise. On the contrary, all the different elements of the city-plan would form together an ensemble of beauty and efficiency. Where, however, by avoidable or unavoidable lack of foresight, such a collision arises, the different elements of the city-plan have to be considered and have to give way according to their rank. By considering right from the beginning the highest rank and purpose to which every district of the metropolis can be devoted, the costly reorganizations of the city map, and the difficult regroupings of the different facilities and purposes can be avoided. In the following study the different factors that make up the city map and that should be planned for in a comprehensive way will be considered in the following order: The City Economic, the City Recreational and Beautiful.

THE FOREST OF MASTS, OAKLAND INNER HARBOR

Part of the Alaska Packers' salmon fleet which winters in Oakland Harbor from September until April each year. This fleet consists of 32 ships, of a total of 47,000 tons. It is the largest steel and iron fleet, and contains the largest sailing ships, under the American flag. The largest vessel has a tonnage of 3381 tons.

THE HARBOR

THE ASSET OF A HARBOR.

The development of the wide area of a modern great city necessarily rests on the economic basis of commerce and industry. The most efficient instrument of commerce and industry is a large harbor. The harbor binds together railroad and water transportation and produces at the place of exchange between land and water the ideal industrial site with the possibility of cheaply transforming, combining and distributing the transient goods. All large cities necessarily must have large harbors. London, probably the only city in the world that ever attained a population of one million people before the introduction of railroads, achieved this result only on the basis of the famous London harbor. The coat of arms of Paris since the first century of the Christian era has been a sailing vessel, and today Paris, though it is located far from the ocean,[1] on a comparatively small river only, is the largest harbor of France, with a tonnage of fifteen millions, twice as much as Marseilles, the great French ocean harbor. Forty-three per cent of all the imports of Berlin come by water. Much more, of course, than in the case of the cities mentioned, lying far away from the ocean, the future of the cities on the Bay and especially on the east side of San Francisco Bay, will depend on the development of a harbor. In view of the evidence of this fact, it is very surprising to see how little forethought has been given to the development of the greatest harbor of the Pacific Coast. In truth, there could hardly be a phase in city-planning in which the serious consequences of lack of forethought could be better demonstrated than in the history of the Bay as a port.

COMPARISONS: SHIPPING; HARBOR INVESTMENTS.

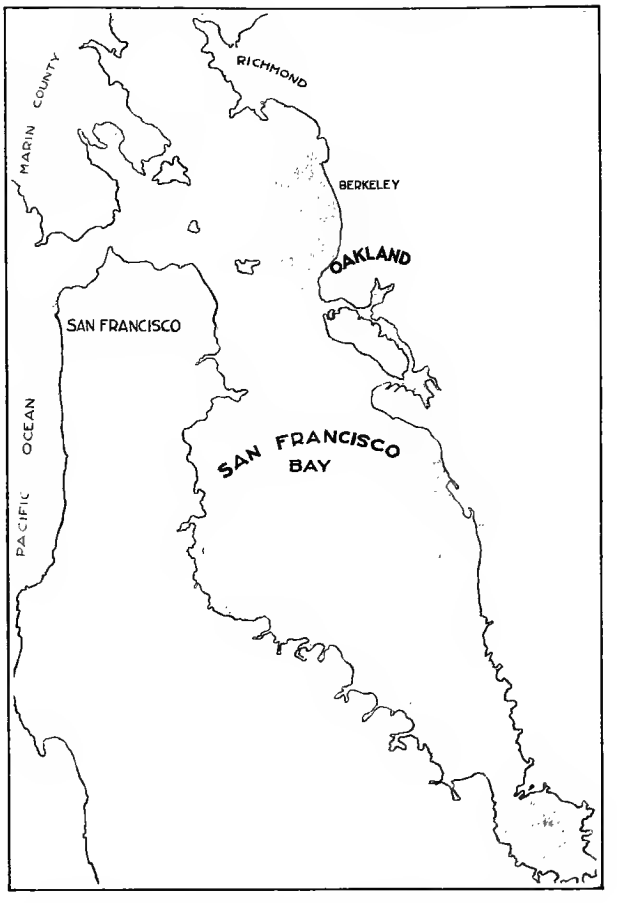
The ship tonnage movement of the San Francisco Bay ports in total amounts to 7,575,875 tons; it is therefore still superior to its competitors; the total of the five Puget Sounds ports is only 7,141,-968 tons; the Columbia River ports have less than five millions and the Los Angeles ports 1,283,094 tons. But it is known that the trade of these competitors of the Bay is growing at a more rapid rate and that the absence of some of the natural advantages found in the Bay is compensated for by better financial support. The mere fact that the trade of the Puget Sound ports already nearly equals the Bay trade shows a state of affairs not found on the East coast of America, where New York always has maintained a notable superiority over other competitors, the entire tonnage of Boston, Philadelphia and Baltimore together, (less than fifteen millions), being much inferior to New York's tonnage.

The figures given include domestic and foreign tonnage; the foreign tonnage alone of the San Francisco Bay ports amounts to 2,203,551 tons; while New York's foreign tonnage is 20,458,526,[2] i. e., nearly ten times more than that of San Francisco Bay. The Bay, however, has the necessary

1. Havre, the harbor on the mouth of the River Seine, on the borders of which Paris is located, is by railroad 140 miles away from Paris.

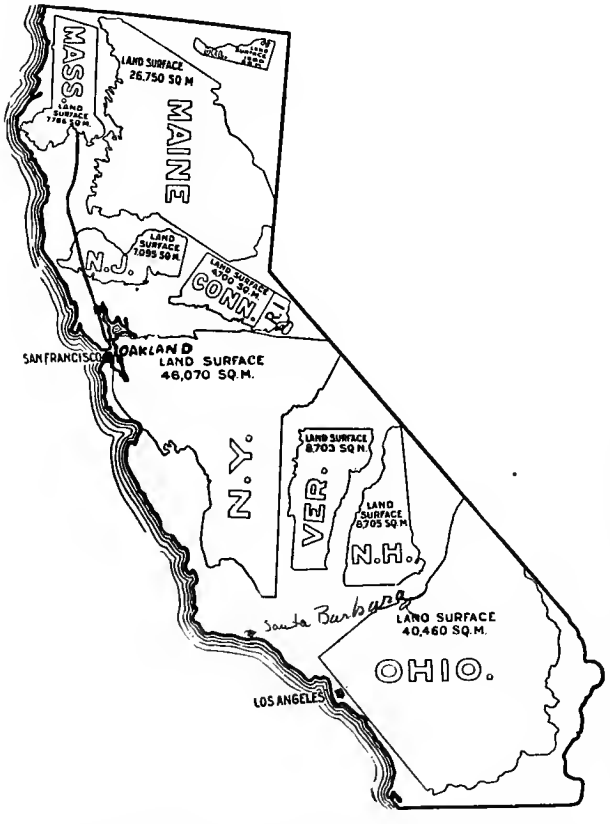
[2]The above figures refer to the year 1907. Compare p. 331 of Report of the Commission of Corporations on Transportation by Water in the United States, Water Borne Traffic, 1909. Compare also, Haviland and Tibbetts Report on Richmond Harbor Project, p. 39, and statistical chart of Haviland and Tibbetts on San Francisco Harbor.

physical characteristics to compare favorably some day, with the harbor of New York. It has a total area of 420 square miles, and a shore line of about 350 miles.[1] This will accommodate the largest development that can be dreamed of. Even the largest harbor of the world, New York, today has developed a straight water front of only 120 miles.[2] The area of San Francisco Bay that exceeds thirty feet in depth at low water, is about 190 square miles; exclusive of fairways and forbidden anchorage, there is approximately 100 square miles (64,000 acres) of available anchorage found in the Bay, enough to anchor almost the fleets of the world at the same time. The largest German shipping center, Hamburg, ranking in its tonnage close to New York, has since 1908, by expensive improvements undertaken to increase the developed area of its harbor from 1387 to 1960 acres; the entire area of the dock estate in Liverpool is 1677 acres (583 acres in basins and docks). This compared with the 64,000 acres that can at comparatively small expense be developed in San Francisco Bay, shows unlimited possibilities for the leading harbor of the Pacific. The Bay is sheltered from ocean storms, and therefore no building of expensive break-waters is required, as for instance in Dover where $25,000,000 were spent for this purpose.[3] The Bay is not subject to the effects of flood and no building of locks or entrances, similar to those costing millions in London and Antwerp, is necessary.[4] The Bay is absolutely free from ice, and there is no danger of



SHALLOW AND DEEP WATER, SAN FRANCISCO BAY

Shallow shown dark, deep water shown in lighter shade. This map suggests one of the reasons for the first larger settlement on the Bay being located on the almost isolated Peninsula. On its northeastern front was that natural anchorage, where the 600 ships of the gold-fever days dropped anchor immediately upon entering the Golden Gate. Captains and crews deserted for the gold mines, writes General Sherman, and the new city was built largely over the abandoned hulks. There are other natural deep water points on the continental side of the Bay not handicapped by peninsular location, e. g., at Point Richmond and further north at Benicia; additional deep water points with the advantage of continental location have been created by human energy in Oakland.



THE HINTERLAND OF SAN FRANCISCO BAY

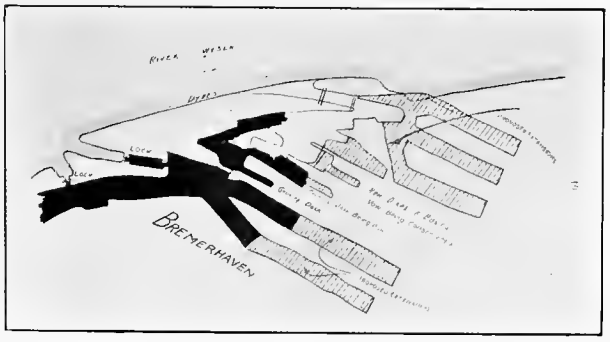
The two great valleys and a large part of the remaining area of California and even of Nevada and Utah must look to the East Bay Cities as their natural deep water point. California alone is a commercial domain of over 91,000,000 acres, or about 320,000 acres more than the area of ten other rich and populous states shown in the above diagram. The area of California is greater than that of Italy, which has a population of 34,700,000. The fertile area of the Sacramento Valley is 4,000,000 acres; of the San Joaquin Valley, 5,500,000.

[1]The following data regarding San Francisco are taken from H. M. Chittenden's paper "Ports of the Pacific" in Proceedings of the American Society of Civil Engineers, Vol. XXXVIII, No. 7, p. 1093, etc.

[2]Altogether (developed and undeveloped) Greater New York has 555 miles of straight water front, to which 193 miles on the New Jersey side should be added.

[3]Similar expensive breakwaters had to be built in Cherbourg, Genoa, Marseilles; also at Los Angeles it was necessary to build the San Pedro Breakwater 11,000 feet in length.

[4]Seattle is just building the Lake Washington Canal Lock, exceeded in size, on the American Continent, by the Gatun locks of the Panama Canal only.



BREMERHAVEN DOCKS

Diagram of docks completed (black) and projected (cross-lined) of Bremerhaven, the deep-water harbor of Bremen (pop. 246,000). This small republic since 1886 has spent thirty-two million dollars for harbor improvements.

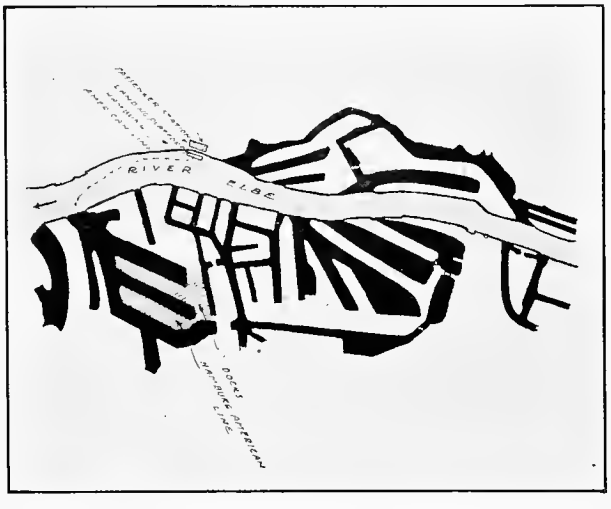
having the money invested in harbor improvements ever lie idle from this account, as it does, for instance, in Montreal where lately $14,000,000 were spent for water-front improvements to be used only during seven months in the year. Another enormous advantage arises for the Bay cities from the fact that the entrance to the Bay through the Golden Gate is deep, wide and straight. Many of the great sea harbors of the world were dependant for their development on the expensive dredging and regulation of their approaches. The growth of the harbors of Glasgow and Antwerp intimately depend on the control of the Clyde and the Schelde. In the reorganization scheme of London Harbor, begun in 1911, the control of the Thames River is considered as the most urgent work and will swallow a large part of the seventy-two million dollars required for the harbor scheme. Hamburg between 1859 and 1907 had to devote thirty millions (out of one hundred seventeen million dollars spent for harbor improvements) for the control of the lower Elbe River and by far the largest part of the harbor improvements, costing $12,000,000, undertaken since 1908 is devoted to improving the river channel between Hamburg and the ocean. Bremen, with a population of only 246,000 inhabitants today, and with an ocean bound tonnage of only five million tons had, since 1886, to devote $7,500,000 for the control of its river approach, out of $32,000,000 spent up to date for harbor work (including Bremerhaven). Even at a harbor site as famous as the one of New York the approach needed dredging. Since 1884 dredging operations south of the New York Narrows have had to be carried on, and in the year 1899 alone six million dollars had to be dedicated by Congress for this dredging. Seventy-two million cubic yards have been removed since 1899.

Comparisons of this kind show the ideal character of San Francisco Bay and make it the more surprising that so little intelligent effort has been made to carry out the comparatively cheap improvements required for the proper development of its natural advantages. All that has been done or is being done so far suffers from being insufficient and inefficient; in other words not enough money is spent and the expenditure is made at the wrong place.

SAN FRANCISCO BAY A GREAT FREE GIFT.

It has been estimated[1] that if the present harbor front and facilities of the city of San Francisco alone (not considering Oakland, Richmond, etc.,) were owned and operated by private interests they would be capitalized at least for the sum of $250,000,000 and handsome returns could easily be made on that figure.

In helping to create this enormous productive capital, valued at a quarter of a billion, the United States since the establishment of the government had up to 1911 expended only $387,801, and only small amounts since that time. Such a sum is hardly worth mentioning, since it compares with figures like $10,402,687 spent by the United States for Boston Harbor, $8,443,703 for Savanah, $13,774,762 for Galveston, $9,700,280 for Cleveland's harbor, etc.[2] In contrast to these large expenditures San Francisco harbor is maintained entirely on a self-supporting basis and out of current receipts $34,328,000 has been spent in the last fifty years, (1863-1912) for sheds, buildings, wharves, bulk-heads, seawalls, dredging and for salaries.



HAMBURG DOCKS

Diagram of docks of Hamburg Harbor showing the efforts necessary to overcome natural difficulties, the docks being largely dug out of solid land adjacent to the River Elbe. Hamburg's new harbor area dates from the year 1883, when thirty million dollars were spent for excavating new docks, in which operation 1000 private houses were razed. Hamburg's expenditure for harbor improvement from 1857 to 1914 was one hundred twenty-nine million dollars, of which a large part went for river control. Hamburg's tonnage about equals that of New York.

[1]Biennial Report of the Board of State Harbor Commissioners for the fiscal years commencing July 1, 1910, and ending June 30, 1912, p. 8.

[2]Compare U. S. Treasury Report on Expenses for rivers and harbors, March 6, 1912. Compare also the note below on p. 32, note 2.

NECESSITY OF UNIFORM HARBOR MANAGEMENT FOR EFFICIENCY.

San Francisco, unlike most of the leading seaports of the United States, enjoys the advantage of a harbor front owned and operated by the people; the people being represented—not by the city of San Francisco—but by the State of California. One should think, therefore, that in developing the Harbor the local interests of the city of San Francisco would have been set aside in order to develop the Bay as a whole from the point of view of getting the highest efficiency for the general good. Unfortunately, however, there is no uniform management of San Francisco Bay; there is the jurisdiction of the State extending to territory on the peninsula, inside the boundaries of San Francisco; on the continental side of the Bay different local bodies administer their respective harbor facilities. This regime has made comprehensive development impossible; it invited inefficient rivalry; it is a serious menace for the future and is against the fundamental rules of harbor organization. Somehow, and the sooner the better, the recommendable "Hands around the Harbor" movement must for the sake of higher efficiency lead to a uniform management of the Bay as a whole, a management of course, in which the East Bay interests are represented in a manner that corresponds to the superior strategic value of the East Bay section as a harbor to be. "The time will come," says the latest Report of the Board of State Harbor Commissioners[1] "and it is not far off, when one State Harbor Commission shall have control and management of the entire Bay of San Francisco and perhaps of many of its tributary waters. We regard this as a much more likely and desirable development, imperiously dictated by the march of events and the growth of commerce and the modern trend of cooperation and coordinated effort in industry, than a further segregation into many bodies with local control of separate harbor fronts, each jealously and shortsightedly striving to take away from other ports by foolish cutting of rates, a practice leading surely to economic waste and chaotic conditions."

A SAN FRANCISCO HILL

The hills of San Francisco make industrial development of the Peninsula very costly. The picture shows a part of Telegraph Hill (elevation 296 feet), hemming in the waterfront development and practically worthless for industrial purposes. Any amount of flat, cheap land can be had on the east side of the Bay.

Amongst the harbors the writer of this report has studied, there is only one, the Harbor of Sydney, New South Wales, that can by the great gifts of nature bestowed upon it, favorably compare with the Bay of San Francisco. In this fortunate harbor of Sydney since 1901 the control of the entire harbor front, irrespective of the boundary lines of many adjoining cities, has been lodged with a State Harbor Commission, which has worked to the greatest satisfaction of the individual cities; complaints are exceptional and refer to minor points only.

To quote Calvin Tompkins,[2] the well known Commissioner of Docks in New York City: "The fundamental idea of port organization may be briefly expressed as the policy of adapting each part of a port to the best uses to which it can be put, and of connecting the several parts into an organic whole."[3]

This fundamental idea is not carried out in San Francisco Bay. In the introductory chapter the historical reasons have been pointed out for the location of the great city on the wrong side of the Bay and for the failure to take advantage of those locations on the continental side that have deep water approach, or could easily get it. But this point is of so great importance that it must be more fully dealt with.

PENINSULAR *vs.* CONTINENTAL SIDE: A SERIOUS ISSUE FOR THE DEVELOPMENT OF CALIFORNIA AND THE ENTIRE PACIFIC COAST.

The Peninsula practically is a narrow and mountainous island suffering from lack of area and difficulty of approach by railroad. The industries that seek sites in San Francisco find, as in most old cities and especially in hilly cities

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[1]Biennial Report of the Board of State Harbor Commissioners for the fiscal years commencing July 1, 1910, and ending June 30, 1912.

[2]This quotation is from an address by Calvin Tomkins, Commissioner of Docks, City of New York, before the New Jersey Harbor Commission at the Assembly Chamber, State House, Trenton, New Jersey, February 19, 1912, "A Comprehensive Plan and Policy for the Organization and Administration of the Inter-State Port of New York and New Jersey." Mr. Tomkins, who by his position has an eminent view on the conditions of the biggest harbor in the world, always is very emphatic about this point of the "Organization of the port as a whole tract for its natural use."

[3]This general view was also set forth by Professor C. T. Wright of the University of California, in a paper presented in January, 1913, to the members of the Commonwealth Club of San Francisco. Professor Wright advocated the formation of a harbor district, which should include the whole Bay, including also the Straits of Carquinez.

with small level areas, the land values are too high and endanger the successful carrying on of many industries. The Peninsula is not only practically a narrow island, but moreover *only a small percentage of its very hilly land can be used for industrial development.* The map showing the different elevations brings out clearly this fact. The flat land available in San Francisco altogether, including the whole Market Street shopping district, is only about six square miles, while any amount of land can be developed on the east side of the Bay. No wonder that the great scarcity of level land has produced extraordinarily high land values in San Francisco. Industrial sites run from $125 a front foot up. Ninety thousand dollars an acre is a fair average price in San Francisco, while on the east side of the Bay which has all the logical requirements for efficient development, land for five thousand dollars and less an acre can be had. How necessary it is to provide this latter land with the best terminal facilities instead of trying to operate on the expensive land of San Francisco, may be gathered from the fact that in Cleveland, the great progressive manufacturing town of the middle west ranking in population far ahead (25%) of San Francisco, industrial sites served by the most efficient new Belt Line Railroad (compare pp. 54 and 56) are advertised for one thousand dollars an acre. The industrial supremacy of the Pacific Coast depends on the efficient development of the East Bay section as an industrial and commercial harbor. Every citizen of San Francisco therefore, every Californian, not only the people of Oakland and Berkeley, is vitally interested in the efficient development of the East Bay Cities.

SAN FRANCISCO A CITY OF HILLS

This map, based on the San Francisco section of the U. S. Geological Survey, shows the scarcity of land suited to manufacturing and transfer of heavy merchandise on the Peninsula. The shaded area has an elevation of 100 feet, or more. There are 21 points in San Francisco having an elevation of from 300 to 1000 feet. There are only about six square miles in which heavy trucking is practicable. This accounts in part for the excessive cost of industrial land on the Peninsula. Many industries can not afford to pay this high cost and must therefore find locations on the cheap land of the East Shore and elsewhere.

THE WASTE OF TRANS-SHIPMENT.

As the present site of the city is determined historically great waste is brought about by having a large amount of the tonnage destined for the continent unloaded first in San Francisco, practically an island, and re-loaded and trans-shipped by ferry to Oakland.

The insular location of San Francisco is emphasized by the fact that even such mighty transcontinental service approaching from the south, as the Santa Fe System, does not enter San Francisco by its bottle neck connection with the mainland, but deals with San Francisco, exactly as if it were an island, reaching it from the east side by ferry and expensive car-floats. (See map p. 53).

Two-thirds of the four million tons of Oakland's commerce come by ferry from San Francisco.[1]

[1]Compare also the following extract from the address by M. J. Laymance, Chairman of the Harbor Committee of the Oakland Commercial Club, on the occasion of the organization of the Committee:

"With the landing of all the heavy freighters from Europe, the Orient, South and Central America at the docks to be created in connection with the system of trans-continental railway lines—with a full up-to-date equipment for handling tonnage with a system of government bonded warehouses, and a freight storage capacity, and on a scale which will permit of berthing ships without charge—making our margin in dock and warehouse charges, would of itself be sufficient encouragement and the docks contracted by people who are handling the products from the several countries named, should be sufficient guarantee to you of the business that would be done at that location. And when you take into consideration that warehouses on the San Francisco side are not permitted to locate alongside of the piers, and merchandise must be carted one, two and as far as three miles for storage, and at which locations are the bonded warehouses, entailing a drayage charge each way, while with us would be the bonded warehouses for different lines, and free warehouses for business, all within reach of the improved mechanical appliances for cheap and quick handling, and storage capacity to accommodate all, I hardly need ask you would it command the business?

Again, the tramp steamers arriving from all parts of the world, without representatives here, would naturally find their way to these docks, and last, but not least, with ninety million people in the United States, thirty million of whom are embraced in States known as the Middle West, their supplies of import goods, and much of the manufactured goods on this Coast would find their way in our warehouses to be shipped out on orders from jobbers as far East as Chicago.

In the case of San Francisco, I may say that the State laws, or warehouse rules, require all tonnage to be removed within forty-eight hours from the piers, which entails a very considerable expense and means the drayage to government warehouses and back again for shipment, which runs from 50c to $1.50 per ton one way. All of this would be overcome and you can readily see that the jobbers who are importers that it would be to their advantage to pay warehouse charges and ship direct from the warehouse on all Middle West and Western business."

A similar waste is found in the fact that an important part of the tonnage leaving Oakland has to be first trans-shipped to San Francisco before it can be loaded on the steamer. Oakland and Berkeley have not yet availed themselves of the enormous benefit which can accrue to them from their locations on the finest bay in the world. The city of Berkeley has not yet been provided with deep water approach. In the city of Oakland deep water can be reached by the new municipal wharves, and by the Long Wharf of the Southern Pacific Railroad Company. The municipal wharves were not used up to 1914. The Southern Pacific Long Wharf can be used only by the *shipper of car-load lots* and even he does not find regular steamship service there. Only casual steamers dock at Long Wharf; all the regular ocean liners still dock in San Francisco. Regular service to the east side is given only by River and Bay steamers, not by ocean steamers. Even the shipper of car-load lots therefore suffers under the present state of affairs. If, as it often happens, no tramp steamers are ready to take his goods he has either to wait or to ship his goods to San Francisco, paying fifty cents per ton instead of twenty-five cents as charged by the railroad company for service to Long Wharf. While the cost of loading the vessel at Long Wharf and also the toll is absorbed by the vessel, he has to pay additional drayage of approximately sixty-five cents per ton if the vessel in San Francisco lies at a dock without a spur track. The transfer of goods to San Francisco therefore increases the charges for local handling from 100 to 360 per cent. As serious as this financial loss that in many cases must wipe out the Bay merchants' power to compete with better organized ports, is the *loss of time* that goes with the wasteful transfer of goods from private switches in Oakland or Berkeley to the San Francisco dock. This transfer takes eighteen hours or more, under normal conditions. The car-ferry, however, holds only sixteen cars and there may be nineteen cars to go across; three cars are left behind and in the ordinary course of events that means twenty-four hours delay. In case of congestion in the ferryage

SOUTHERN PACIFIC LONG WHARF, OAKLAND

One of the most important deep-water terminals of the Bay. In 1912, vessels having a total tonnage of 1,223,889 tons touched at this wharf, discharging 357,573 tons; taking on 283,877 tons. This large movement of freight at present is handled by tramp steamers, there being no regular service. East Bay shippers can only use this wharf via S. P. freight cars, as there is no wagon road to the wharves, which are served by two tracks. This wharf by agreement between Oakland and the S. P. must be removed on or before November 23, 1918, when the S. P. will use a far more efficient terminal adjacent to solid ground inshore and possible of approach by trucks. (See map, p. 37.)

of cars across the Bay, the Southern Pacific makes it a practice to send cars from San Francisco to Oakland by way of the Dumbarton cut-off near the southern end of the Bay. This long movement means a still more serious waste of time. A prominent Oakland shipper states that in eighteen months he has suffered about twenty delays of four days or more through the movement of goods from Oakland to San Francisco by the Dumbarton cut-off. This very unsatisfactory state of affairs equals the delay necessitated by the traffic-congestion of the old and over-crowded shipping centers in the East.

As serious as the losses in money, time and competing power by the shippers of car-load lots are the sufferings of the *shipper of less than car-load lots.* The shipping of less than car-load lots is a very important item in the economic make up of an industrial community. The character of the trade of large producers often is such that their shipments have to be split up into small lots to different addresses; and besides the big producer in every growing community there are many small producers that are building up new industries. These growing new industries, just starting from small beginnings, are of great importance for the future of any industrial community, if they can prosper and develop into large industries under favorable conditions. They are strangled, however, if the conditions of local handling and local expense are adverse. Until the east-side terminal facilities have been perfected, the expenses connected with shipping of less than car-load lots are strongly against the building of new industries or the carrying on of industries that have to split their shipments into less than car-load lots. This point is proved by the following figures computed f. o. b. San Francisco docks at ships' side: the examples are selected from Berkeley in order to prove at the same time how important it is for Berkeley quickly to fall in line with Oakland on a comprehensive scheme of harbor development. The Monarch Oil Refining Company has to pay 40 cents per ton for drayage from factory to Berkeley wharf (not deep water), 5 cents Berkeley wharf toll, 75 cents for freight from Berkeley wharf to San Francisco, 5 cents wharf toll and $1.00 for San Francisco drayage to ships' side, an average total of $2.25 per ton. Arrangements can be made with a local Transfer Company to deliver the goods at any wharf in San Francisco at the ships' side thereby eliminating the drayage charge in San Francisco. This brings the transportation down to $1.25 per ton, the minimum rate that can be had at the present time. If deep water were available on the Bay shore the only charges would be the Berkeley drayage of forty cents per ton, and the Berkeley toll of five cents, a maximum of forty-five cents.

Similar figures are given by the Pacific Guano Company. Another interesting illustration is furnished by the Pure Carbonic Company that used to pay $2.90 per ton for the different charges connected with the transfer of its finished goods from the factory to the side of the different vessels in San Francisco. By introducing a motor truck and using the ferry, the cost per ton was cut down to $1.90. But a saving of a further one and a half dollars could be made by having the vessels dock in reach of the motor truck without crossing the Bay. This result, however, can be reached only by co-operation between Oakland and Berkeley in developing the common waterfront.

In international trade the power of competition often depends on a few cents. Waste of full dollars of course must be of vital consequence and mean life or death to the industrial future of a community.

FIVE MILLIONS ANNUALLY WASTED. HANDICAP FOR COMMERCE AND INDUSTRIES OF SAN FRANCISCO BAY, *i. e.*, OF CALIFORNIA.

In a paper on the "Economic necessity for the development of deep water facilities on the east shore of San Francisco Bay" read before the Berkeley City Club,[1] Mr. Henry A. Lafler succeeded in making a reasonable calculation, according to which "Five millions of dollars now are annually wasted, every dollar of which might be saved were deep water facilities provided on the East Shore of San Francisco Bay, and the functions of manufacture, warehousing and distributing performed on the mainland adjacent to the terminals of the transcontinental railroads."

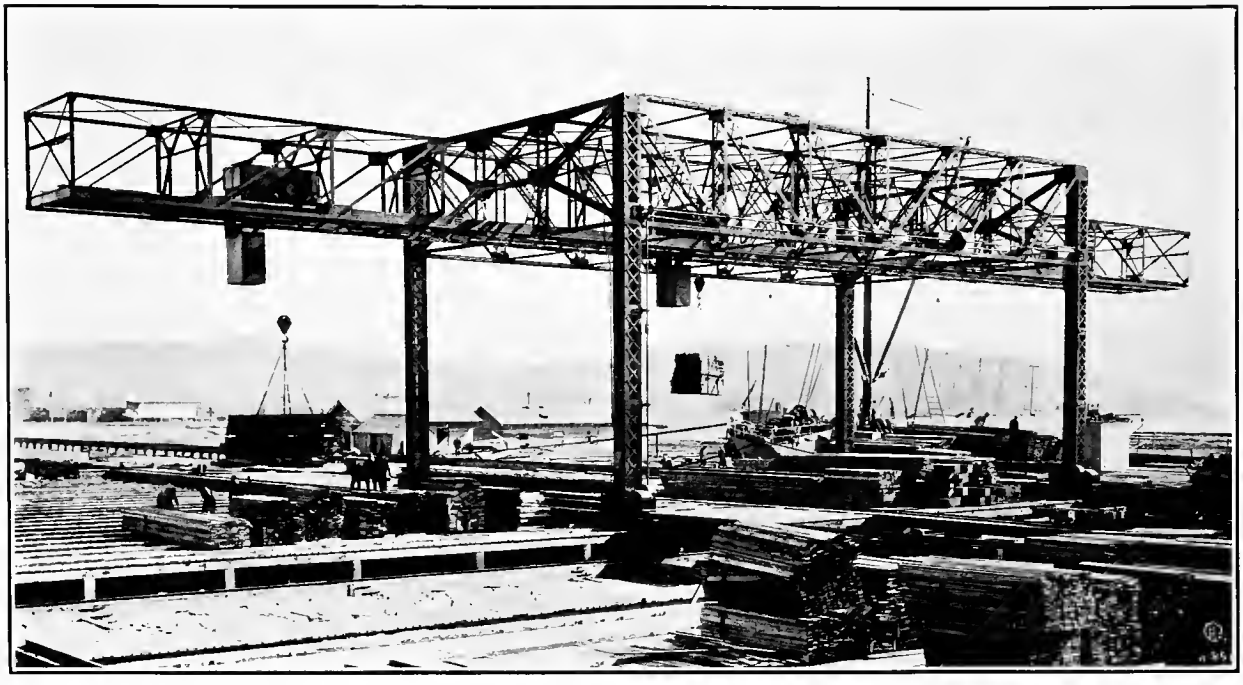
Thus the requirements of efficiency and of space make the development of a harbor on the east side imperative. Only by developing it on the east side can a harbor be secured that in efficiency can compare and economically can compete with modern great harbors or with the re-constructions that are planned at present for every one of the older harbors in the world.

THE RADIUS OF ACTIVITY FOR CALIFORNIAN INDUSTRY.

The far reaching importance of avoiding all unnecessary waste in local handling is more and more recognized. As the excellent report of the Commission on Metropolitan Improvements for Greater Boston, dated 1909, says:[2] "Under modern conditions excessive cost of transportation is likely to be found in charges for handling and transfer rather than in those for carriage. It is there that we must look for reduction in cost. Every necessary item in the way of local charges for handling or transfering freight reduces the distance to which the manufactures of Massachusetts can be profitably shipped. On the other hand, every saving in such local charges will correspondingly *extend the radius* within which Massachusetts may successfully compete with other states or countries. It requires only a comparatively moderate extension of such *radius* to bring

[1]See Berkeley City Club Bulletin No. XX.

[2]Pages 13, 14.



LUMBER CRANE, OAKLAND HARBOR

An example of efficient handling by large businesses which have been obliged to seek East Bay sites rather than sites on the Peninsula. One of two cranes identical in character, owned by C. A. Smith Lumber Company, capable of unloading a vessel carrying 1,700,000 feet of lumber in 12 hours. At the mills in Marshfield, Oregon, the lumber is made into packages inclosed in a light metal sling, each package weighing about 8700 pounds. When the vessel is in dock at the Oakland plant, hooks are attached to these slings and the package lifted out intact and depositied upon the proper pile in the yard, for which purpose the crane moves back and forth on metal rails. Devices like this make Oakland Harbor the efficient deep-water terminal for heavy freight.

within the circle of our industrial and trade relations millions of possible consumers otherwise cut off from our field of competition." *The extension of the radius* within which the Bay cities may successfully compete with other harbors and manufacturing centers, and of the *radius* within which California may successfully compete with other states or countries, will determine the future, the population, and the wealth of Oakland and Berkeley. What the *extension of this radius* means may best be illustrated by the answer of a prominent East Bay manufacturer who now sells only in Pacific ports, to the question: "What influence would the saving in local handling expenses of a dollar and a half per ton mean to your sales?" "I could sell in New Orleans" the manufacturer, after some calculation, replied, and after further thought added, "I could even sell in New York."

He thus anticipated the Californian supremacy that would go with the proper development of an industrial harbor on the continental side of San Francisco Bay.

THE BAY CAPABLE OF HIGHER DEVELOPMENT THAN OLDER HARBORS.

The proper development of the east side of San Francisco Bay will make it possible for San Francisco Bay not only to be equally efficient, but even more efficient, than other harbors, be they new or under the process of reconstruction. Most of the older harbors of the world, as already mentioned, have labored under very serious difficulties and their maintenance is a "task almost Herculean and very costly."[1] The largest of the old harbors, London and New York, have at present to face expensive reorganizations necessitated by natural disadvantages resulting from lack of planning. Among the figures given above, the sum of seventy-two milion dollars necessary for the reorganization of the London harbor has been mentioned. While New York suffers from the water separation which is being gradually overcome by enormously expensive tunnels and bridges, the lack of comprehensive plans has produced conditions, especially on the west Manhattan water front, that are impossible of continuance. The present harbor authorities strongly advocate the reconstruction of the older part of the harbor, and impress on the mind of the public the necessity of following a comprehensive plan and a likewise comprehensive municipal policy of control, organization and administration, with a view of correlating the several parts and planning each district for its best natural use.[2] Difficulties like those encountered in London and New York find their unavoidable solution either by powerful reorganization or by the comparative decline of the harbor in question, as for instance in the case of

[1]Charles W. Staniford, Chief Engineer of the Harbor of New York in his report on "Physical Conditions of European Seaports," Page 5.

[2]Commissioner of Docks, Calvin Tomkins, has made many statements to this effect.

London, once by far the largest European harbor, but at present equalled by Liverpool, Hamburg and Antwerp.

The equipment of efficient harbor sites has proved to be a city-building factor of the greatest importance attracting investments, payrolls and population. The practically unlimited amount of land on the east side of San Francisco Bay, that with a small outlay of money can be developed to adjoin deep water, makes it possible to develop a harbor that gives better facilities, and that largely surplants the older type of the more commercial harbor by the newer type of the more industrial one. The development of manufactures within a port is of far greater importance, locally, than the passage of commodities through it in transit.

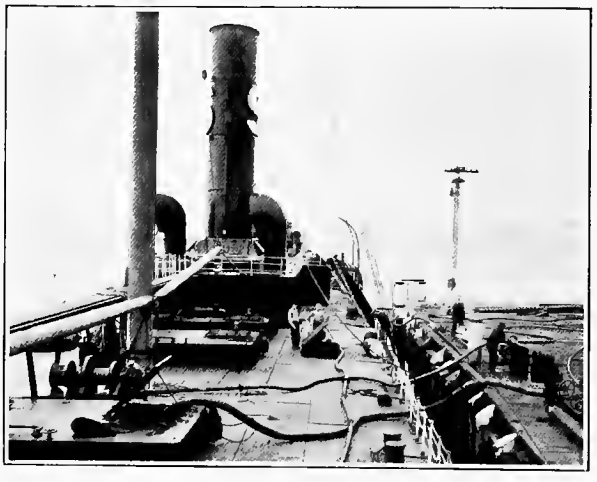
THE POSSIBILITIES OF A MODERN INDUSTRIAL HARBOR.

A modern industrial harbor does away with the expensive handling of the products between factory and steamer by truck, and in many cases may eliminate even the freight car as an intermediary. As soon as direct water approach is given to every factory that can make use of it, the ship and dock winches, swinging and traveling cranes, bucket elevators, belt conveyors, derricks, lifting towers, grab buckets and hoisters can put their superhuman powers to work with a marvelous intelligence and reap the hundredfold harvest of true efficiency.

To lift the raw materials directly from the hold of the vessel into the claws of the transforming machinery and to drop the finished goods directly after leaving the last process of transformation into another vessel or into the freight car: this means to do away with unnecessary handling and waste of time, one of the important items in the cost of old-time manufacture. This ideal efficiency is the logical goal aimed at by the modern development. Wherever the centralization of the modern capitalistic forces has permitted the application of the best methods and thought, the waste in local handling is eliminated. Even the simplest minded could not but smile if he tried to imagine for instance, the Richmond Standard Oil Refinery, with its 60,000 barrels daily production, ferrying its oil across the Bay to peninsular San Francisco, or operating under as inefficient methods as the Oakland or Berkeley merchant who loads his finished goods on a truck, teams them down to Oakland or Berkeley wharf, unloads them and reloads them on a Bay steamer, crosses the Bay and unloads and reloads once or twice before the ocean steamer is reached. Avoiding every bit of unnecessary handling is one of the most important factors that determined the choice of the organization of the sites of Standard Oil or United States Steel plants; one has to think only of the new Standard Oil Works on the Bay or of Gary, the huge and suddenly developed steel town on Lake Michigan.

WATER ON FRONT AND RAIL AT BACK DOOR OF FACTORY.

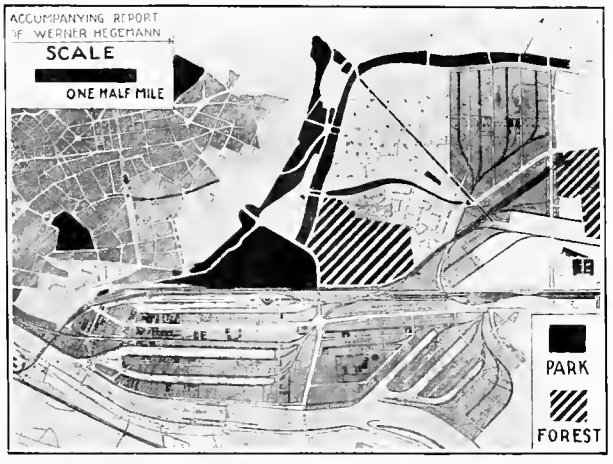
There is a strong tendency in modern industry to quit the old congested conditions and to exchange them against new sites that combine the advantages of the old with plenty and cheapness of land in immediate reach of rail and water. Industrial sites of this type with water on the front and rail at the back door of every factory, have been largely developed in the big industrial river harbors, in Germany, for instance, some of which in tonnage compare with the very largest ocean harbors.[1] Basins are built only about four times the width of the vessels to be docked. The room between the basins is carefully calculated to give sufficient space to the different industries expected; while the minimum depth for the industrial sites along the basins is 155 feet, the rule is about 400 feet, and, in some cases, as for instance the sites of the chemical industries in the industrial harbor of Mannheim, 800 feet; in Duisburg even 1100 feet are found. To furnish equal accommodations on deep water harbors is a newer departure. Great efforts in this direction have been made in Bremen and Hamburg where a strong demand for these industrial sites has justified the expenses connected with their operation. The Clyde river below Glasgow has a large industrial district with deep water approach. The large harbors of the world, more and more, multiply similar examples. The creation of industrial sites with deep water approach is justified as soon as the production of the factories is big enough



LOADING AN OIL VESSEL, POINT ORIENT, RICHMOND

An example of efficient handling of merchandise. The Standard Oil's Richmond plant receiving its raw product by pipe lines from the oil fields delivers its products again by pipe lines to the holds of vessels. It is significant that this great plant, whose volume of business demands economics of handling, was forced to seek the East Shore of the Bay. The location of the plant is close to the northern end of the proposed Rees channel, inside the limits of the rapidly growing City of Richmond, which carries on waterfront improvements in conformity with the Rees Plan (p. 34) for comprehensive development of the East Bay waterfront location and contours of the city.

[1] In the Duisburg harbor twenty million tons are handled annually.



EASTERN ADDITION TO FRANKFURT HARBOR, A MOST COMPREHENSIVE EXAMPLE OF CITY-PLANNING

The City of Frankfurt-on-the-Main in the last decade has carried on a fourteen million dollar extension of its industrial river harbor, co-ordinating ingeniously docks, railroad terminals and industrial sites served by both with parks and dwellings of the laboring men who work in the factories and docks. The dwellings (light cross-lined) are screened off from the docks by large parks, playgrounds and parkways (black) and by forests (heavy cross-lined). Residential and industrial areas are connected by pleasant walks through parkways. As the prevailing winds are from the west, these industrial areas have been located east of the city.

to warrant the transfer of steamers. In New Orleans the activity of the American Sugar Refinery (capacity $30,000,000 to $40,000,000 a year) is based on immediate deep water approach and the consulting engineers (Ford, Bacon & Davis) of the Harbor Commission, declare: "The basic need at the port is a way whereby the manufacturer who depends on transportation, either by rail or water, of his material or finished product, can be located so that he has the water facility immediately on one side of his factory and the railroad on the other." An important role may be destined to the factory site with deep water approach through the organization of big industrial buildings housing many different industries in an efficient way under one roof with a production that added together is large enough to warrant the landing of steamers. (Compare plans and pictures pp. 58, 29 and 48). The organization of these mixed industrial buildings deserves careful attention and has to be considered in connection with the development of manufacturing districts in units of efficiency. In the older sea-harbors, as a rule, factories were scattered around in a hap-hazard fashion and had to be contented with railroad tracks on their own sites with the freight car as an intermediary between factory and ship without expecting to drop the finished goods by belt conveyor directly into the steamer. Deep water approach under the ordinary conditions of the old crowded harbors is more of an exception—too valuable a thing to be given broadcast to every factory that can make proper use of it. It needs a bay as big as the one of San Francisco where deep water approach for a tremendous stretch of land can be provided for cheaply, in order to realize an industrial deep water harbor of the most modern type of efficiency.

DEVELOPMENT OF LIGHTERING.

But even under the most ideal harbor organization there will always be a very large number of factories that will not need nor want deep water approach. Many of them, however, will be able to make very effective use of lightering business that reaches the factory by comparatively shallow water. An enormous amount of business is handled this way in the big harbors of the world; especially well known is the case of Hamburg where a large percentage of the steamers moor in the middle of the harbor along pile dolphins and unload rapidly on lighters on both sides. The noted engineers of the New Orleans Harbor Commission recommend the investment of $2,400,000 to $6,800,000 in order to secure at least a barge canal 10 feet deep for the industries of New Orleans not located on the Mississippi River.

Behind factories that thus are served either by deep or shallow water is room for factories that are sufficiently served by freight cars as the connecting links between deep water and the factory. Here another type of ideally efficient factory unit must be laid out and provided with possibilities of direct rail shipment by water—not directly approaching the factory site—but from docks immediately contagious to and a part of the general properties; also with cheap and reliable power available from one or more central stations. There should be one general management, for each unit at least; industrial tracks connecting all factories and warehouses with each other, with the piers and with a general storage and switching yards, and via the clearing yard to the general trunk lines.[1] Some further discussion of this will be given in the chapter on rail transportation (p. 55).

In order to secure high efficiency, and prevent undesirable interference, these manufacturing dis-

FIRST MUNICIPAL WHARF OF HOUSTON, TEXAS

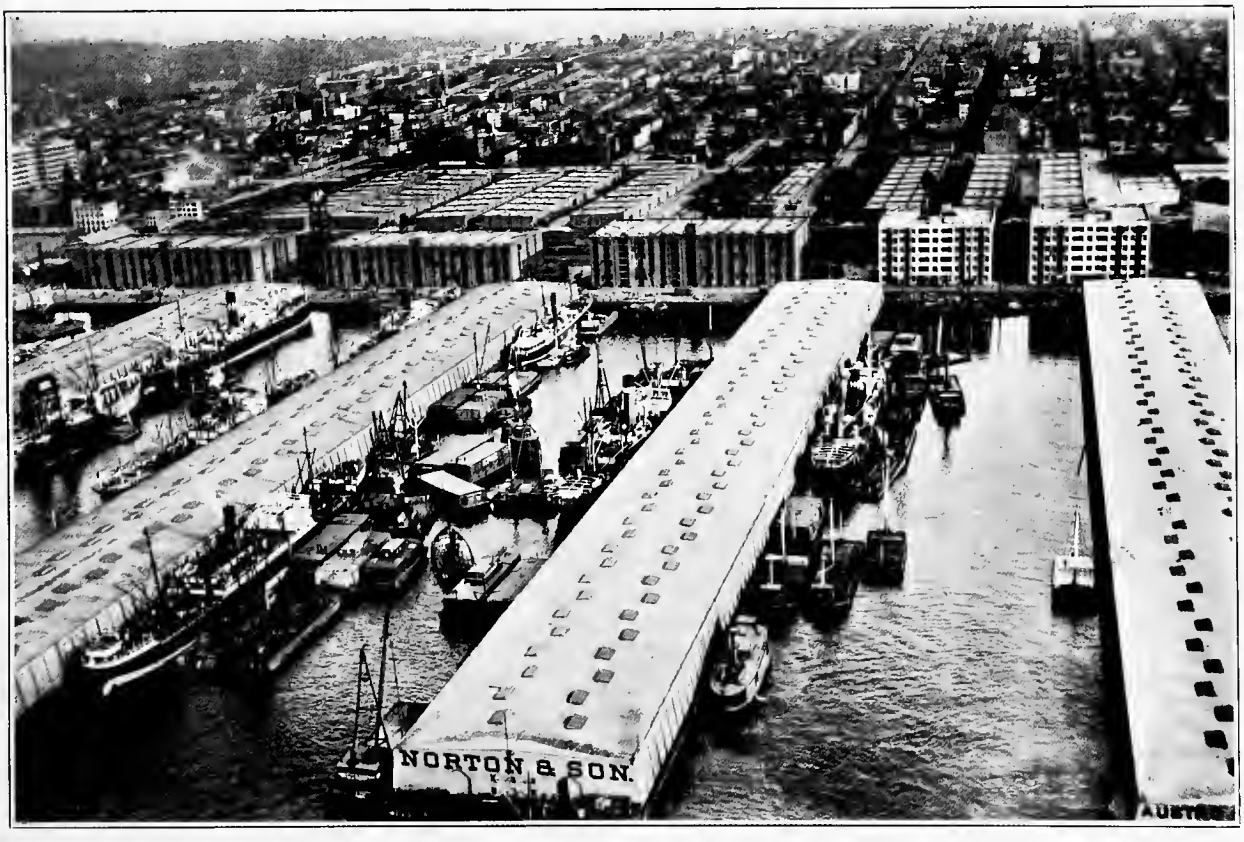
Reinforced concrete warehouse (425 by 100 feet) to the left; railroad tracks on wharf (wood piling); first steamer from New York in the channel; Houston (population 150,000) secured a two and one-half million U. S. Government appropriation for the dredging of a meandering bayou for a distance of fifty miles. Thus a "ship channel" 25 feet deep, minimum bottom width 150 feet, length 50 miles, was created, and the slogan, "Here 17 railroads meet the sea," justified. Houston spent three millions additional for free wharves.

[1]Compare the suggestions of the Mass. Metropolitan Improvement Commission Report, p. 142.

tricts have to be held clearly separated from the terminal features for strictly transportation purposes; the proper locations for the different facilities for commerce and the industries with their different needs deserve a good deal of investigation.

DISTRIBUTION OF TERMINAL FACILITIES. NECESSITY OF DECENTRALIZATION.

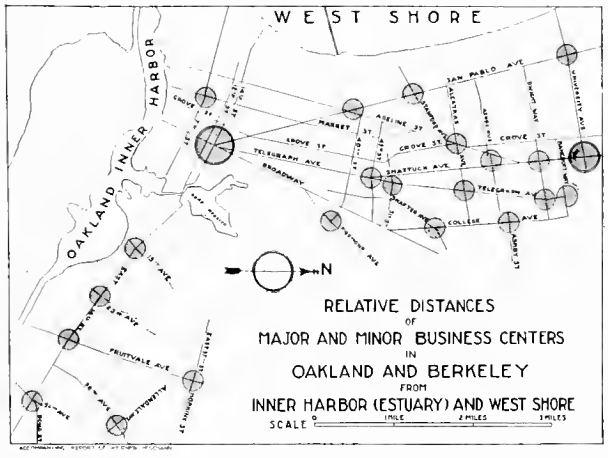
What shall be the principles to be followed in the distribution of the terminal facilities? It can be accepted as proved that the continental side (that is, the East side of the Bay) is superior to the peninsula for manufacturing and commerce; the reasons have been given. The East side offers possibilities along the west shore of Oakland, Emeryville, Berkeley, Albany and Richmond and again south of Oakland and north of Alameda in that large body of water called the Oakland harbor, consisting of the Estuary with its connection eastward to San Leandro Bay by the tidal canal. It is frequently assumed that this so-called Oakland harbor—more even than the west shore—is likely to attract commerce and the important industries that will determine the future of the great city on the continental side of the bay. This largely will be true. The main reason, however, given as a rule for this forecast seems erroneous to me. The reason that is mostly given is that the Oakland harbor is nearer to the city than the west shore. The analogy presented is with old cities, such as Chicago, where not the large stretches of open water available but the narrow rivers have attracted the great industries and produced that teeming congestion, which, to the old fashioned mind, still largely seems to be the test of prosperity. Against this reasoning it must be emphasized that the congested conditions as found in the older industrial cities are clearly acknowledged by the best observers to be one of the most serious handicaps to the otherwise splendid prosperity of those cities. Every modern city, therefore, should be very careful to prevent any repetition of this industrial congestion and not take it as a model. There is no special advantage for a large variety of industries or ware-houses to occupy locations along the Estuary or Inner Harbor along a channel of about 500 feet in width only, if they could get equally cheap land and deep water somewhere on the west shore on a channel that is at least twice as wide. Only those



PART OF THE BUSH TERMINAL, BROOKLYN, NEW YORK

The Bush Terminal was established with the aim of reducing costs of transportation by eliminating the truck. The Bush Terminal occupies 200 acres; has seven piers each 1400 feet long; 25 miles of railroad tracks, and 130 warehouses, some of which are 75x700 feet and six stories high. Comparatively efficient as this terminal is, its efficiency can be outstripped in the East Bay Harbors with proper planning. The Bush Terminal has no direct rail connection. Every pound of freight must be expensively car-floated to the various railroad terminal slips around New York Harbor. (The delay due to this operation is as great as 24 hours.) Furthermore, no freight can be dropped directly into the holds of vessels by mechanical conveyors from factory or warehouse. In the East Bay Harbors, thanks to the wide areas of cheap land and unlimited deep water available, with proper planning, car-floating can be completely eliminated, delays avoided, and the factory can drop its product directly into the holds of deep-sea vessels. Regarding the waste of car floating compare Note 3, p. 53. The railroad yard of this industrial unit is shown on p. 48.

industries and ware-houses, the main business of which is done for the local market, have a special interest in being near the center of population and near the different centers of business. The center of population of Oakland and vicinity is likely to shift further and further away from the Estuary and at present probably is equally distant from the Estuary and from the west shore. While the

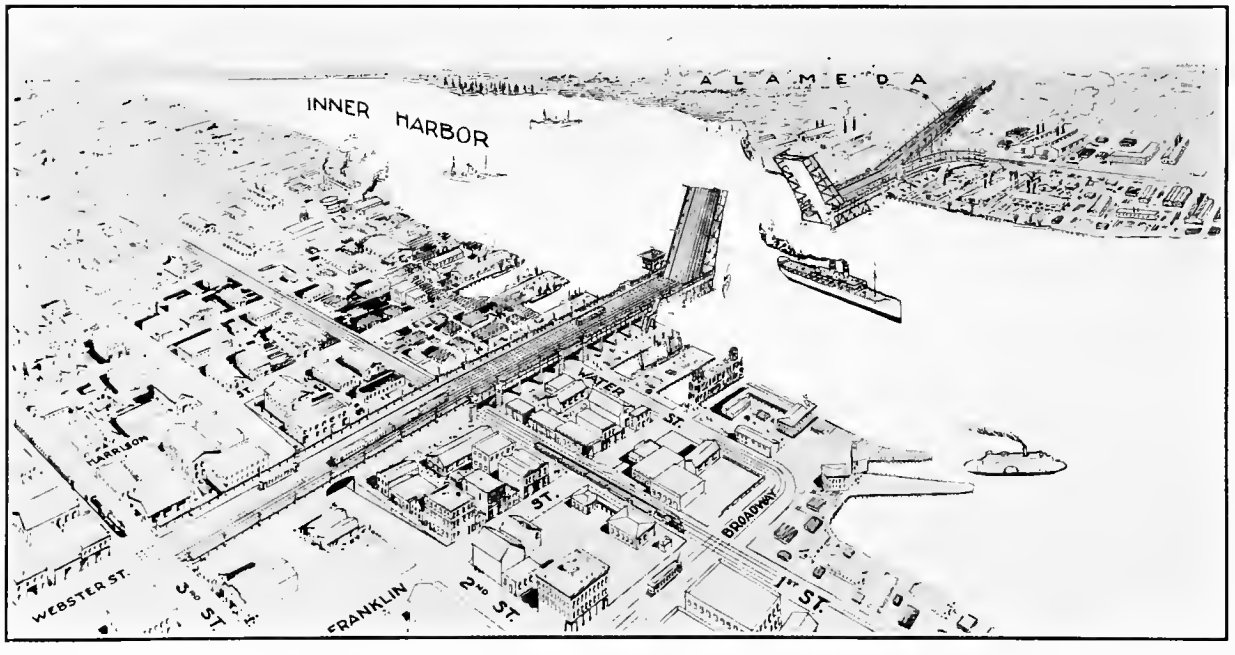


main business center of Oakland (Broadway and 14th street), no doubt always to be the main business center on the east side of the Bay, is located much nearer to the Estuary than to the west shore, the other business centers like the one on 51st Street and Telegraph Avenue, and especially the ones of Berkeley and further north, are very much further away from the Inner Harbor than from the west shore.

PREVAILING WINDS AND SMOKE.

There is, however, another good reason that can be advanced for the claim that the lands around the Estuary and Inner Harbor ought to become an important factory district. This reason is to be found in the fact that the prevailing winds of the Bay, blowing from west to east, will not carry the smoke of a factory district located south of Oakland over the whole city area and into the foothill residential districts that from every point of view are an ideal asset of the city. On the other hand, if only a few smoke producers like the Pacific Gas and Electric Company (1st and Market Streets) or the Standard Oil Works in Richmond begin to occupy a newly developed industrial harbor on the west shore, the development of the continental side of the Bay as a residential district would be seriously handicapped; being enveloped in a continuous veil of smoke, it would be, in comparison with the now smoke-free residential districts of the Peninsula (St. Francis Wood, Forest Hill and further south), one of the less desirable industrial east sides that have such ill-fame in many of the great metropolitan cities of the world.

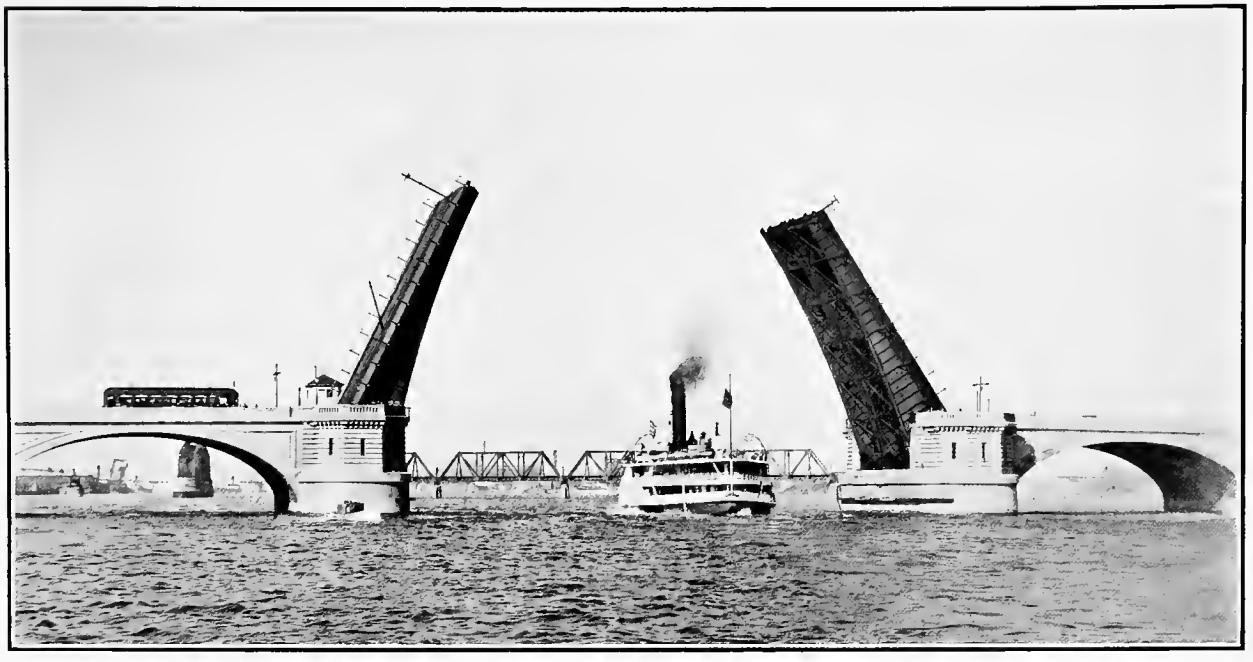
Of course every effort towards more economic combustion and towards the abatement of the smoke-nuisance[1] ought to, and will be, made, and



BIRDSEYE VIEW OF PROPOSED BASCULE BRIDGE FOR ESTUARY

From tentative plan submitted by Scherzer Rolling Lift Bridge Company of Chicago to Board of Supervisors, Alameda County. Main features: Length, 3450 feet; maximum grade, 4 per cent; width, 80 feet, subdivided into two 8-foot sidewalks, 36-foot roadway carrying two tracks of the street car lines, 28-foot right of way for S. P. trains; clearance, 200 feet; height of lower chord above high water, 25 feet, permitting passage, without opening, of bulk of traffic. The Webster and First Street railroad crossing at grade would be eliminated by this bridge. Estimated cost exclusive of the land, $750,000. It is claimed that this bridge would obviate 90 per cent of the delay involved in the operation of the present two bridges at Webster and Harrison Streets.

[1]Compare the valuable "Transactions of the Commonwealth Club of California, September 1913, Vol. VIII, No. 9, Smoke Problems of California."



SCHERZER ROLLING LIFT BRIDGE, TOLEDO, OHIO

A good example of construction such as is recommended in this report for the Oakland Estuary. The length of the bridge with approaches, 1200 feet; width of span when open, 200 feet; width of roadway, 52 feet; two sidewalks, 9 feet each; roadway carries two standard tracks. The cost of this bridge was $900,000, of which the approaches represented a cost of $800,000 and the movable span $100,000. The time of complete operation (opening and closing), one and one-half minutes.

in the long run abuses like the smoke stacks of the two companies mentioned will not be permitted. But considering the fact that progress moves only slowly where it has to make headway against private interests, it would be good policy at least to combine the efforts towards the abatement of the smoke-nuisance with an effective municipal policy for the proper location of industries. The Municipal Harbor and Beltline policy recommended in this report gives the city large influence with the private manufacturer. (See pp. 38, 54 and 55). The west shore ought, therefore, to be reserved strictly for terminal facilities for transportation purposes, and for those industries that pledge themselves to the use of either electricity or fuel that permits of complete combustion. The shores of the Estuary, the Inner Harbor (including the large marshes that have just been reclaimed and invite manufacturing in Alameda) and the Tidal Canal can accommodate industries that are not yet free of smoke with much less detriment to the entire community than any other place in the vicinity of Oakland and Berkeley.

LIGHTER SERVICE FOR INNER HARBOR AND TIDAL CANAL; WEST SHORE FOR LARGER STEAMERS. BASCULE BRIDGE.

A large part of the water transportation to be given to these future industries along the Inner Harbor, can and ought to be rendered by lighters and small craft. This is a condition of serious consequence in connection with two or three other problems determining the future of Oakland's shipping: namely, first, the problem of the bridges across the Estuary at Webster and Harrison Streets, with the agitation for their replacement by from one to five tunnels at an estimated cost of from three to ten million dollars; second, the opening of the Tidal Canal, the water front along which is in general unimproved because inaccessible, due to the fact that the drawbridges over the Tidal Canal have not been regularly operated; and third, the increasing danger arising from the fact that all large steamers that enter the Inner Harbor have to cross the ferry line between San Francisco and Oakland. This danger is much smaller if the west shore accommodates the greater part of the large steamers, while the service to the Inner Harbor is mainly given by smaller craft and lighters. Since the Estuary has upon the completion of the recent project a width of only five hundred feet; the Inner Harbor a channel 300 feet wide around its basin, and since the Tidal Canal is still more restricted in width, these waters furnish ideal accommodation for small craft so that the realization of a ten million dollar tunnel project is not absolutely necessary. The tunnels under the Estuary would be altogether indispensable only if outside the Inner Harbor there was no other place for the accommodation of large vessels. The plans for the Inner Harbor were made before the great harbor along the East Bay shore was thought of. Furthermore, even the largest craft bound for the Inner Harbor could be accommodated much better than at present and much cheaper than by tunnels, by crossing the Estuary with a better type of bridge than the present cheap bridges on Webster Street ($95,000) and Harrison Street ($104,000). The proper bridge used in similar cases is the quickly opening bascule bridge as shown in Chicago, Cleveland and other cities. Bridges of this kind are opened and

closed again in less than half the time of the Webster Street type. Opening and closing of the latter takes five and a half minutes, while *e. g.* the bridge over the Calumet River in Chicago (225 feet clear waterway) requires only two minutes and 24 seconds. Anybody advocating large shipping for the Inner Harbor will also keep in mind that a great many of the openings required of the present bridges over the Estuary are needed only because the bridges used at present are too low giving hardly ten feet between lower chord and high water. The bridges have to be opened for every tug; in fact 6534 of the 13,035 bridge openings in the year 1911 were made for mere tugs. A higher bridge could easily be built and produce an altogether different state of affairs. The new bascule bridge on Passyunk Avenue in Philadelphia gives a 35 foot clearance over high water and permits a large percentage of the craft to pass under the closed bridge. Its entire cost was $600,000. A high bridge of the deck type could be made one of the most beautiful land-marks like the Oakland City Hall, and with even considerable less grade than the proposed tunnels would give a clear height many times greater than the present bridges. From the fact that the top-most part of the tunnel must be forty feet below low water, that furthermore the recommended tunnel has a diameter of twenty-six feet, and that at present the clear height between the lower chord and low water of the Webster Street bridge is about fifteen feet, it results that an elevated bridge without having any more grade than a tunnel could give about seventy feet of clear height at high tide and more even at low water. So much is not needed to accommodate most of the traffic using the bridge without opening.

The problem of the proper crossing of the Estuary, however, has so many aspects which are not only connected with the harbor problem, but with different phases of general transportation, that a conclusion can be reached only after the discussion of the latter in the following chapter. Here may be mentioned only the fact that the streets from the Estuary up to Seventh Street and further north rise, and therefore directly invite to a crossing of the river by a bridge, while a tunnel is made expensive because it must make a longer approach by reason of this rising grade of the streets. Second Street already is eleven feet above city base.

All that has been said about bridges in connection with the Inner Harbor is still more true in regard to the Tidal Canal. As soon as the main business done in this neighborhood is accommodated on small craft, especially lighters, a proper type of bridge can take care of it with few or no openings and the development of this land, retarded by the present state of the draw-bridges, can take the necessary new impetus. Of the larger ships that have to pass under the bridges even now the majority is represented by those of the Alaska Packers Association's fishing fleet passing in and out only twice in a year in the spring and autumn. (View p. 19).

MONEY EXPENDED IN THE WRONG PLACE.

If it is advantageous to find accommodations for larger ships on the west shore instead of the Inner Harbor, the carrying out of the project adopted by the Secretary of War, July 25th, 1910, for the Inner Harbor[1] providing for a channel five hundred feet wide and thirty feet deep from the Bay to the Tidal Basin, three hundred feet wide and twenty-five feet deep around the Tidal Basin, and eighteen feet deep in the Tidal Canal at an estimated cost of $1,110,000, and $25,000 annually for maintenance,[2] gives more than sufficient accommodations for the future requirements.[3] It seems doubtful even whether not all the requirements could have been satisfied with the expenditure of less money (by providing less depth). Since 1874 and up to the starting of the present project about three million four hundred thousand dollars has been expended. But no comprehensive plan for the development of San Francisco Bay, or at least for the whole of Oakland's water front was in existence; the plans for the Inner Harbor were made without regard for the possibilities of the west shore. The same lack of comprehensive planning which has held back the efficient development of the Bay as a whole can be found here in the development of the shores of the single city of Oakland.

There can be no doubt that the great future as a shipping center lies along the west shore of Oakland, Berkeley, Richmond, etc., where at comparatively small expense one of the largest and most efficient harbors of the globe can be built. Along this shore there have been accomplished already some improvements by private concerns consisting of long piers and moles extending away from Oakland and Alameda towards San Francisco to terminate on deep water far out in the Bay. "These improvements," says the representative U. S. En-

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[1]Annual report of the Chief of Engineers, 1912. Report upon the Improvement of Rivers and Harbors in the First San Francisco, Cal., district.

[2]It is important to note this pledge of the U. S. Government for cost of maintenance. What has been called up to a short time ago Oakland Harbor is in official compntations not considered as a part of San Francisco Bay; the figure of $1,110,000 mentioned above, therefore, is quite independent of the sum of $387,801 expended for improvement of San Francisco Harbor as mentioned p. 21.

[3]In answer to a request dated Nov. 5, 1913, Col. Rees gave the following information:

"I have to advise that the project for the improvement of Oakland Harbor is now about 45 per cent completed and the depths of water available in the channels referred to by yon are as follows:

Entrance to jetty channel from San Francisco Bay 30 feet and thence to Webster street drawbridge the depth is 30 feet. From Webster street drawbridge easterly for a distance of 1,400 feet the depth is 25 feet. The depth in the north channel around Brooklyn Basin is 11 feet. The depth in the sonth or Alameda channel is 25 feet for a distance of 2,320 feet and 13 feet for the rest of the way to the tidal canal. The depth in the tidal canal is 10 feet."

gineer, Col. Rees, "have been made separately and independently for the advantage of the several owners there, and without any consideration of a general and comprehensive plan of harbor development." This kind of inconsiderate development is dangerous, and future prosperity depends on the solution of the question whether future development on the Bay front shall be continued by what Col. Rees calls, "the hap-hazard, piece meal, disconnected methods of the past," or whether all the East Bay cities shall co-operate in a general plan of improvement that will secure the greatest benefits to all at the least cost.

The situation along the East Bay water front is summed up by the following letter, a valuable contribution made by the eminent U. S. Engineer, Col. T. H. Rees to this report:

LETTER OF U. S. ENGINEER COL. T. H. REES

WAR DEPARTMENT.
United States Engineer Office,
401 Custom House,
San Francisco, California.
January 26, 1914.

Dr. Werner Hegemann,
Faculty Club,
University of California,
Berkeley, California.

Dear Sir:

Replying to your request for a statement concerning the Harbor Plan for the East Bay cities in connection with your City Plan studies and report, I take pleasure in submitting the following remarks:

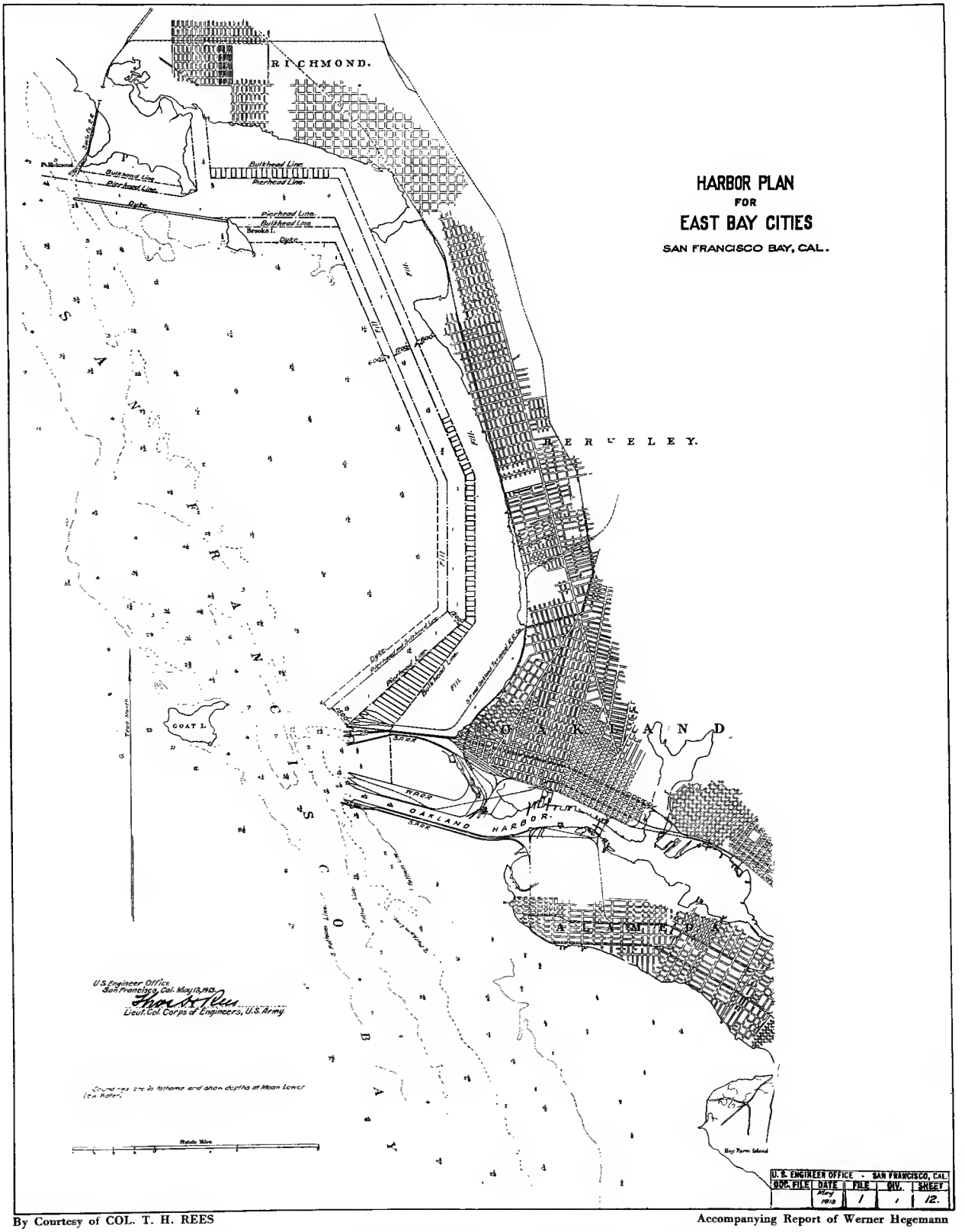
The cities most directly interested in this subject at the present time are Oakland, Berkeley and Richmond, as they are all actively engaged in seeking a method and plan for the development for harbor purposes, of their bay frontage.

I will take it for granted that the economic necessity for increased and better harbor facilities on San Francisco Bay is understood and acknowledged and I will not enter into that phase of the question further than to state that all of the fairly level and habitable land that lies adjacent to deep water on San Francisco Bay is already fully occupied.

Additional harbor facilities must be artificially created and the question arises, Where can such facilities be provided to the greatest public advantage and at least expense? A large and growing population, a good city administration, active civic organizations, large business and industrial interest, ample through and local railroad connections, level or gently sloping sites rising gradually from the water's edge to the hills beyond, a location directly oposite the Golden Gate, and unequalled climate and a great fertile and productive back country reached by rail and water, are among the many advantages possessed by the East Bay Cities. Unfortunately, however, these cities are blanketed from the deep draft commerce of ocean and bay by wide shoals or tide flats extending several miles from shore and this frontage is therefore useless for commercial purposes.

Attempts have been made in several instances to overcome this difficulty by building long piers out to deep water in the Bay. This plan is, however, costly of construction and maintenance. It carries commercial activities far out into the Bay away from city streets, business centers, and residence districts. It developes no lands and encourages no industrial enterprise except through transportation.

To establish a great industrial and commercial port the wharves and shipping must be an intimate and integral part of the city's life; they must lie along the shore frontage and have the service of the city streets and transportation lines; they must be near the business centers and adjacent to warehouses and industrial sites, and they must have belt line connection with all railroad lines of the vicinity. Therefore, since all of these interests and activities cannot be pushed far out into the bay on trestles to deep water, the deep water must be brought into the city's shores. This is not a difficult or expensive undertaking. On the contrary, the incidental advantages of reclaimed tide lands and of higher land values will go far toward defraying the expense of creating the deep water harbor, if planned with this object in view. The reverse of this statement is also true, namely, in reclaiming the tide lands along the shore by the use of dredged material a deep harbor frontage will incidentally be created if the work be planned with that object in view. A careful balancing of cost and values, of cut and fill, will be necessary in order to secure the greatest benefits at least cost. The cost of reclamation and of corresponding deep water will increase very rapidly as the line of the proposed fill is advanced into the bay. The most economical results will be obtained by determining the minimum width and depth of harbor that will subserve all probable future needs of commerce and then so locate the harbor area that the material to be dredged therefrom will fill up and reclaim all of the area between the harbor and the shore. This principle was applied in the harbor plan which I submitted to the East Bay Cities. Any departure from that principle will be attended by increased and unnecessary expense which would be justified only by the prospective equivalent value of the reclaimed lands. In a depth of 6 feet at low water the cost of reclaiming one acre of land to a height of four feet above high water would be approximately $3,800, exclusive of the cost of retaining bulkheads, and in this or greater depths reclamation should not be attempted unless values equal to or greater than the cost can be clearly anticipated. The effect upon existing land values of adding extensive areas of reclaimed lands would also be carefully considered.



By Courtesy of COL. T. H. REES

Accompanying Report of Werner Hegemann

COL. THOS. H. REES'S COMPREHENSIVE PLAN FOR THE ULTIMATE DEVELOPMENT OF THE ENTIRE BAY FRONTAGE

"The only practicable solution of the problem is to abandon the old idea of separate basins with independent entrance channels and to create one continuous and unobstructed deep water frontage extending along the reclaimed shores from deep water at Oakland Estuary to deep water at Point Richmond."

In planning for a greater harbor in San Francisco Bay the accidental and fortuitous delimitations of the several municipalities concerned, their separate individual interests, and their natural rivalries should be given no consideration whatever. It is manifest that Alameda, Oakland, Emeryville, Berkeley, Albany and Richmond cannot each have a separate and distinct harbor with independent entrance channels and disconnected lines. If a general and comprehensive plan cannot be agreed upon and adopted it will be useless to attempt any extensive harbor development for the East side of the Bay.

Existing conditions are very unsatisfactory as regards the economical development on the frontage of Oakland and Berkeley. A deep channel has been dredged into Oakland Estuary. Another approach must be dredged to the basin between the Western Pacific and Southern Pacific moles. A third entrance channel must be dredged and maintained to the Key Route Basin. To reach Berkeley and Emeryville a fourth long canal would have to be dredged, and Richmond requires the fifth. The mere statement of these conditions demonstrates the absurdity of trying to carry out such a plan. The only practicable solution of the problem is to abandon the old idea of separate basins with independent entrance channels, and to create one continuous and unobstructed deep water frontage extending along the reclaimed shores from deep water at Oakland Estuary to deep water at Point Richmond. Oakland and Richmond already have outlets on deep water and are engaged in efforts to extend deep water along their bay shores. For Berkeley there is no chance of an outlet except by connecting with the harbors of Oakland and Richmond on either side.

The requirements of commerce and navigation of the present time and of the near future do not demand the extensive development of harbor facilities that has been proposed along the entire East Bay frontage. The present plans of Oakland and Richmond, if carried out, will furnish ample facilities for the increasing commerce of a number of years, and present consideration of the larger and more comprehensive plan is justified only by the probable requirements of the more distant future and by the existing demand for additional land adjacent to deep water suitable for industrial, manufacturing and warehouse sites and for railroad yards and terminals. It would be most unwise to proceed with any work of harbor development on this frontage that does not conform with a comprehensive plan for the ultimate development of the entire bay frontage. The present unfortunate situation on Oakland's western waterfront is due to the fact that there has been no general plan, and that separate interests have each attempted independent improvements without coordination or plan. If the East Bay cities work independently and separately, each for its own advantage, the same difficulties of detached and non-related improvements will result and will involve greatly increased costs and diminished benefits to all. By working together on one general plan the East Bay Cities may have the finest harbor and the best harbor facilities in the world and may become a great industrial and commercial port.

Very respectfully,
(Signed) THOS. H. REES,
Lieutenant Colonel, Corps of Engineers,
United States Army.

THE REES HARBOR PLAN.

Colonel Rees's admirable harbor project provides for a channel of over 10 miles length and 1200 feet width (widening considerably at the two entrances) to be dredged through the East Bay shores beginning in the neighborhood of Point Richmond and swinging around nearly parallel to the present shoreline to a point between Goat Island and the Oakland mole. The dimensions and location of the channel are to be so fixed that the dredged material will fill up and reclaim all of the tide land between the bulkhead and the shore as well as build up an outer dyke that will protect the harbor and confine tidal currents and thus tend to prevent the deposit of silt. This uninterrupted sweep of the tides will go far in maintaining deep water, reducing dredging expenses to a minimum. The government estimate for maintaining cost in the Estuary runs from $12,000 to $25,000 per annum. Every linear foot of the west waterfront harbor channel will lie close alongside of the reclaimed shores and will make every foot of the latter available not only for piers and slips but also for the industrial and commercial development of the reclaimed lands with railroad on one side and deep water on the other.

NECESSITY OF MUNICIPAL CO-OPERATION ALONG WATERFRONT.

Unfortunately the rivalry between different cities and interests which is so detrimental to the organic development of the Bay is not limited to the shortsighted antagonism between the East side and West side of the Bay, but has also taken root between the different communities on the East side as they happen to exist with their purely accidental boundary lines; and even among the citizens of some of the different cities for a long time anything but concerted, well considered action could be found. This unfortunate situation found a striking illustration in the original attitude of these communities towards the described comprehensive plan for the development of the East shore drawn by the engineer representing the government. This plan, that aims safely at the highest possible efficiency to be obtained inside the next fifty years, was opposed by eminent citizens of Berkeley because it did not seem big enough to

them, while at the same time other influential people in Oakland opposed the plan as being too big. The attitude of the Berkeley people was rather to wait twenty-five years and then carry out a much larger project combining the development of the harbor with a large reclamation scheme covering over 10,000 acres. (Col. Rees's plan reclaims 3,000 acres.) The attitude in Oakland, as it still finds expression in the harbor lines drawn in all Oakland maps drawn before 1914 was to limit the plans to improvements inside the present city boundaries of Oakland, regardless of the two facts that, first, the carrying out of plans limited merely to Oakland was equal to the killing of the Emeryville and Berkeley shore development,[1] and that, second, the interests of Oakland are intimately associated with the development of the other cities all of which form a big community of common harbor interests. The Berkeley attitude was wrong because it was visionary; to wait twenty-five years for the development would be equal to permitting the competing harbors of Los Angeles, Columbia River and Puget Sound to get ahead of San Francisco Bay. The Oakland attitude was wrong because it neglected the fact that one of the greatest assets of the harbor is to be large and capable of development. Only a harbor that is large and that is growing larger each day can in the long run attract trade and wealth, and be the powerful instrument of civilization that attracts national activities. "The reason why one trunk railroad after another has been deflected to New York, and why coastwise trade centers there, is to take advantage of regular ocean liner service. A ship will, on short notice, be found waiting at New York to take package freight in large or small quantities to any port of the world. Accessibility to these great national and international terminals makes it possible for our manufacturers to receive raw materials, and ship package freight promptly and economically to all parts of the world."[2]

In Europe the political reasons have diffused the ocean trade of the different nations among a large number of ports, while in America forming *one* undivided economic empire of tremendous size, over two-thirds of the total volume of freight and commerce passes through the single port of New York.[3] A similar success on the Pacific side has to be looked for in the direction of creating not many, but one very big, very powerful, instrument of commerce and industry.

INDEPENDENT ACTION DANGEROUS TO OAKLAND, BERKELEY AND VICINITY.

Harbor projects that do harm to further development, as the Key Route plan did, fail in the most essential points. Fortunately the harbor-planning agitation of the last months of 1913 has led towards a mutual understanding and agreement between the different communities. The city of Oakland is to relinquish the entirely fortuitous and accidental lines of the so-called Key Route Basin plan, in which Col. Rees very rightly states,[4] "there was no other line except possibly the bulkhead line that has been drawn with reference to the proposed plan of the harbor." The lines of this Key Route Basin plan which still can be found on most maps of Oakland, were determined by the Oakland Mole and the Key Route Pier which were built not for the purpose of enclosing the harbor but only to carry tracks out to water that would float a ferry boat. The resulting shape of the enclosed basin was extremely awkward and inconvenient for harbor purposes, running down to an acute angle at the inner end, where the proposed piers crowded each other and left insufficient manœuvring space. The piers were oblique to the respective frontages, the resulting small triangular spaces were wasted. Vessels backing out of slips would have had to turn completely around 180 degrees in order to leave the basin. The course of vessels approaching and leaving the basin would have had to cross on a long slant the course of the Key Route Ferries. The Key Route Basin not having the uninterrupted sweep necessary for the maintenance of deep water would have become a deep indentation silting up rapidly. The carrying out of this same plan would have intercepted nearly one mile of the shore frontage with about 8000 feet of berthing space. The dredged material would not have been sufficient in amount to fill up all the flats behind the bulk-head line, part of which therefore, would have been left as stagnant pools. If this Key Route Basin plan should have been carried out the further development of the northern part of Oakland's frontage and also Emeryville's and Berkeley's would have been possible only at so greatly an increased expense, that it appears to be economically prohibitive. An entirely new and additional approach channel would have had to be dredged and protected by dykes and that channel would have three right angle bends.

POSSIBILITY OF MUNICIPAL WATERFRONT CONTROL WITHOUT DEVELOPING MUNICIPALLY OWNED LAND.

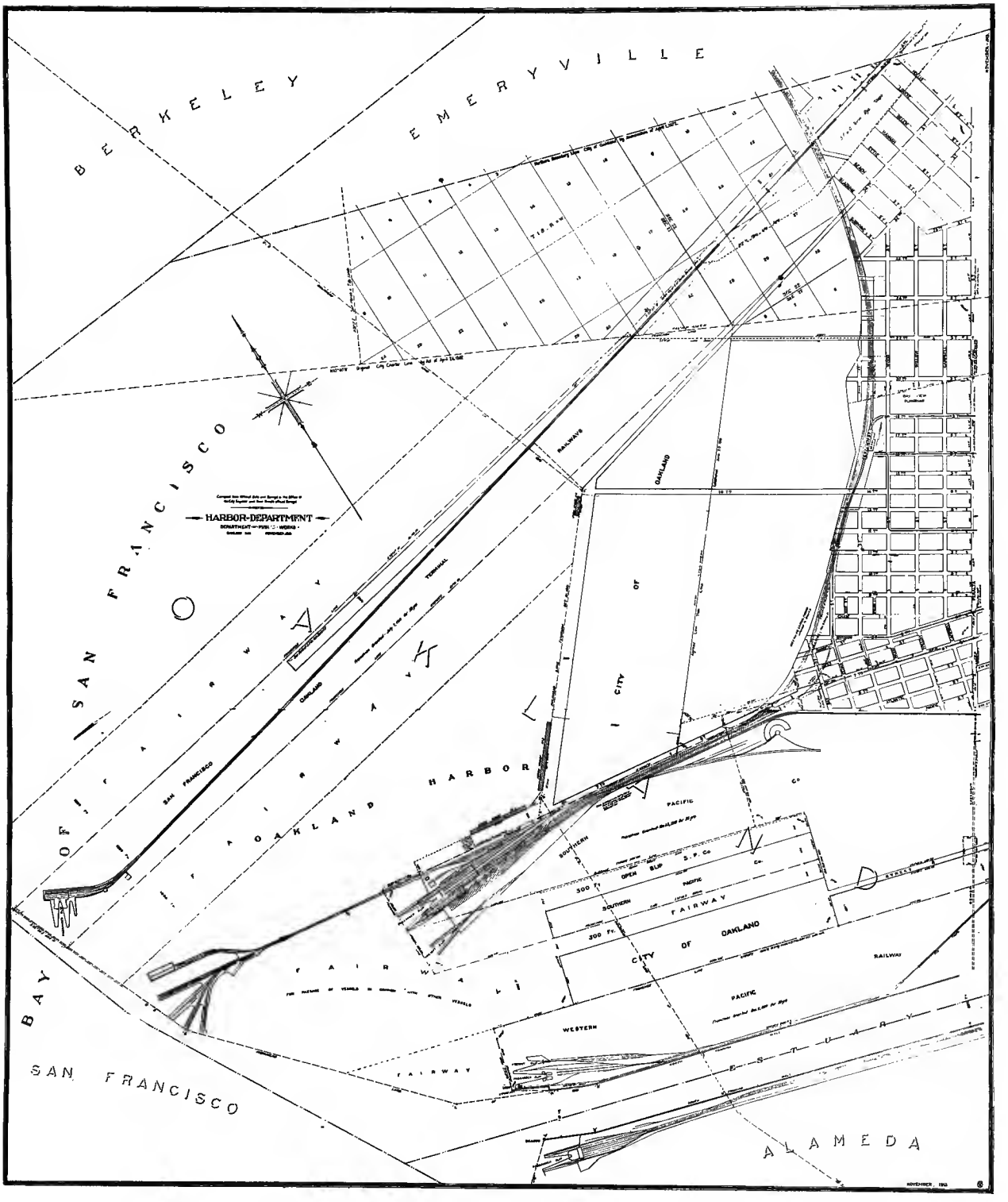
The serious danger in a faulty Oakland Harbor plan also for the development of Berkeley was finally recognized in Berkeley and the reclamation scheme for 10,000 acres was given up in order to reach an early agreement with the other commu-

[1]About this point Colonel Rees wrote in his letter to the President of the Oakland Commercial Club, published in the Oakland Tribune of October 30, 1913: "The Key Route Basin is incapable of further extension and if carried out will *forever* confine Oakland's harbor development to the limits of the basin on a frontage which stops at Fourteenth street and includes less than one-half of the available frontage between Oakland mole and the city line." The eminent engineer gives in the same letter the convincing reasons for his argument.

[2]From the address of Calvin Tomkins, Commissioner of Docks, City of New York, before the New Jersey Harbor Commission, State House, Trenton, New Jersey, February 19, 1912.

[3]Compare Haviland and Tibbetts' report on Richmond Project, p. 19.

[4]Letter to the President of the Commercial Club, printed in the Oakland Tribune of October 30, 1913.



MAP OF OAKLAND WATERFRONT

Compiled for the Harbor Department, City of Oakland, F. W. Johnson, delineator. This is the first reliable map based on accurate surveyor's methods. Maps of such completeness and accuracy are a pre-necessity in proper planning. See p. 39. Starting at the bottom the map shows the Alameda Mole and South Training Wall; the freight and passenger slips of the Western Pacific. North of the W. P. holdings are the so-called "white meat" holdings of Oakland, amounting to 175 acres. Directly north of these are the newly dredged channel, filled in lands, and mole of the Southern Pacific. Here will be the deep water terminal of this railway upon the removal of Long Wharf, as agreed, on or before November 23, 1918. North of Oakland Mole, labelled "Oakland Harbor," is the so-called Key Route Basin, City Wharves Nos. 1, 2, and 3, the basin holdings of Oakland amounting to 283 acres, and behind these the tidelands of the San Francisco-Oakland Terminal Railways. The most northerly mole is that of this Company. A rearrangement of this passenger terminal is necessary in order to carry out the Rees plans, of which the other lines of the Key Route Basin are a part. The complicated lines of this map illustrate "that separate interests have each attempted independent improvements without co-ordination or plan."

nities. The possibility, however, of having the bulk-head line in front of Berkeley drawn somewhat farther (about 1200 feet) to the west than originally planned by Col. Rees will, as Col. Rees points out in his letter reprinted above, depend upon the cost at which additional reclamation not directly necessitated by a mere harbor project can be done. The U. S. Government will hardly be expected to pay more than about one-half of the work strictly necessitated for the Harbor, the other half plus all additional cost for reclamation work as may be desired by the City of Berkeley, or other cities, will have to be done by the respective cities. If, as Col. Rees estimates, the cost per acre of reclamation will be nearly $4,000 exclusive of the cost of retaining bulkheads, it is doubtful whether this reclamation can be attempted with much profit. There is now much reclaimed marsh land at $4,000 on the market. The effect upon existing land values of extensive areas of reclaimed lands must also be carefully considered; this too is pointed out by Col. Rees. If the city of Berkeley wants to go into this extensive reclamation scheme she will hardly do so without special expert investigation. One of the reasons given for Berkeley undertaking this tremendous work is found in the fact that the city of Berkeley owns tide lands some distance further west of the bulkhead lines considered by Col. Rees while the land east of this bulkhead line is in private ownership. As desirable as it may be, however, for the city to develop its own tide lands, it must not be forgotten that the carrying out of the original plan of Col. Rees by the city of Berkeley would give the city something like a high hand with the private owners of the at present worthless tide lands. An agreement granting some of the private lands to the city in exchange for the large benefits bestowed upon the private owners could be reached. The city can perform all municipal duties by operating some model piers without necessarily operating all possible piers.

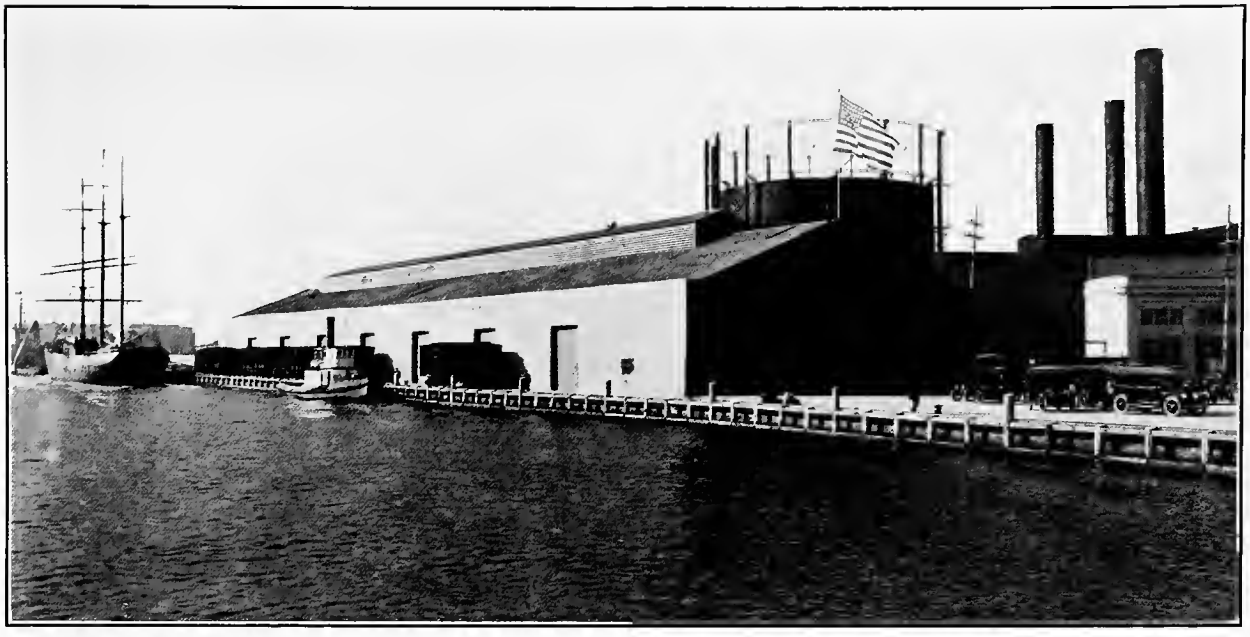
LACK OF A CITY-PLAN. THE KEY ROUTE PIER: A MONUMENT OF CIVIC CARELESSNESS.

In view of the fact the U. S. Government will give its financial support only to a sensible plan capable of future development nothing at present is of higher importance for the East Bay Cities than the strong and unanimous endorsement and support of such a plan and the bringing about of effective co-operation for its realization. The fact remains that the Key Route plan that would have been so fatal for the future of the East Bay cities was imminent enough to permit the granting of a fifty year franchise for the Key Route pier, a franchise that will have to be changed by intelligent co-operation between City and the Company operating the Key Route. The lack of a farsighted Harbor plan will revenge itself in the laborious transactions necessitated for the re-arrangement of this franchise. If no agreement of some kind should be reached, the building of a great effective harbor would be impossible. Repetitions of unfortunate accidents like the one mentioned must happen again and again if no comprehensive, far-reaching plan is laid out beforehand. The Key Route Company at present, sticking to the letter of its franchise, does not stop with its solid fill on the point where the carrying out of Col. Rees' plan makes the stopping imperative; in spite of the unanimous endorsement of the Rees plan by the Cities of Oakland, Berkeley and Richmond, the Key Route Company thus very literally has thrown stones in the fairway of a development that would be more promising for all concerned.

THE PROGRESS OF WORK IN HARMONY WITH THE REES PLAN.

1. KEY ROUTE BASIN.

Fortunately the transactions which must take place for the abolishment of the present Key Route Pier will not stop the Oakland harbor project. There are two important units of the Oakland harbor that can be worked upon. One is the so-called "white meat" district and the other one the so-called Key Route Basin. In the latter extensive and successful work has been carried on by the City of Oakland. In November, 1909, a bond issue of $2,503,000 was voted and nearly $800,000 has been expended in the development of the Key Route Basin. As soon as the U. S. Government had drawn the western water front bulk-head line 2000 feet further westerly the sewers were extended from the old bulkhead line to the new line. In February, 1914, 6000 feet of rock-wall bulkhead has been constructed with 2327 feet of apron wharf connected with the Bay by a ship canal 350 feet wide at the bottom and 25 feet deep at low tide. The canal extends from deep water south of the Oakland Mole of the Southern Pacific Railway northward into the basin and along the face of the three apron wharves and the rock wall to west 14th street extended. 1000 feet of rock wall is parallel to the Oakland Mole, 5000 feet follow the new bulkhead line across the basin; 326,856 tons of rock were used in this work which cost $215,278. At the same time excavators were at work digging the channel in front of the wall and filling in behind it. This work cost $198,231 and in it 1,143,768 cubic yards of earth were moved. Owing to the character of the bedrock at a certain portion of the bulkhead line, a wooden bulkhead had to be constructed at a cost of $18,073. Three apron wharves 65 feet in width were then built, one paralleling the Southern Pacific mole, 949 feet long and costing $27,965; one adjoining and at an angle to the first, 1077 feet long and costing $33,455, and the third at Fourteenth Street extended 301 feet long and costing $9,752. This latter wharf was connected with the mainland, at the urgent request of West Oakland citizens, by a trestle roadway extending from Fourteenth Street westerly to the bulkhead, which cost the city $11,430, a portion of the cost of construction being borne by the United Properties Company, across whose land it extends.



OAKLAND MUNICIPAL WAREHOUSE AND QUAY WALL

This is the most important harbor improvement yet achieved by the City of Oakland. The quay wall on Oakland Inner Harbor is a solid piece of concrete masonry 22 feet wide at the base, 40 feet from top to bottom, and 1927 feet in length. Behind it is a strip of land owned by the Municipality 150 by 2000 feet. Cost of land acquired in connection with the quay wall, $1,009,729.29. Cost of quay wall with pile facing, $285,291.77; of the dredging to approximately 30 feet in front of the wall, $143,392.23. The steel warehouse shown measures 92 by 402 feet and cost $40,000; cost of paving and track, $33,920.21. The track is set back 10 feet from the face of piling; distance between track and warehouse, 6 feet.

In dredging the ship channel, which leads in from deep water in San Francisco Bay to the city's wharves, the 2,200,000 cubic yards of earth moved were used to reclaim 77 acres of land back of the rock wall and fill the strip that is to be the extension of Seventh Street paralleling the Oakland Mole. This work cost $205,420.

The present plans for the further development of the Key Route Basin consist of a series of piers extending into the Basin from the bulkhead line parallel with the Oakland Mole of the Southern Pacific and extending to the main ship channel of the Rees plan. The wharves at first contemplated are five in number. They will be the longest piers along the channel planned by Col. Thos. H. Rees; the first being about 1900 feet in length, decreasing to a length of 1300 feet for the fifth. It is to be hoped, however, that before the final settlement of these plans the transactions about the resettlement of the Key Route franchise will have progressed far enough to make a final decision possible whether this area in the southern part of the Key Route Basin will be needed for the accommodation of the Key Route ferry slips as proposed by Col. Thos. H. Rees. Otherwise the other suggestion of Col. Rees for accommodating them must be taken up. These suggestions are referred to later. (p. 40). It also is worth while considering that a greater amount of space can be secured for less cost by the extension of the present apron wharf scheme along the entire bulkhead line in the Key Route Basin outside of fairways. The minor disadvantage of this plan, viz., that dredging from the sites of future extended piers would ultimately be the contrary of useful, is not thought to offset the superior cheapness of developing wharf space parallel to the present bulkhead line, and in accordance with the work of construction upon Wharfs 1, 2 and 3 which has already been done. In this connection it may be noted in passing that the recent excellent map of the west water front put forth by the City Engineer's office shows in striking manner the necessity of planning before action. The lack of adequate preliminary study and real scientific and full survey before work resulted in this case in the placing of apron wharf No. 3 within a fairway, which the City had agreed with the Key Route to maintain. Had the excellent map referred to been made before work was done, no such error could have been made. The map is reproduced p. 37).

2. THE "WHITE MEAT" DISTRICT.

The other area in the West Oakland water front in which immediate work can be carried on in conformity with the comprehensive plans for the future are the holdings of the city near the Southern Pacific Mole, in what is popularly known as the "*White meat.*" Here the City of Oakland controls a strip 4285.8 feet in length and 785 in width. It is bounded on the south by the franchise line of the Western Pacific railway, and on the north by fairway three hundred feet in width and of the entire length of the city's holding. This city-controlled strip, amounting to 88 acres, is reached by a street eighty feet in width across the Western and Southern Pacific lands. This site is capable of the development of at least 4286 feet of berthing space capable of handling three-quarters of a

million tons of merchandise yearly. This is more than one-tenth of the entire tonnage handled on the San Francisco water front. If the Western Pacific plans, which are not yet perfected, should provide—as it is to be hoped—for a slip or fairway to the south of the city's holdings, the usefulness of this area would be almost doubled. As will be pointed out in the chapter on railroads, this area presents an almost ideal terminal for a trunk line railway. It would appear that no development that might be conducted by the city in the construction of wharves or fairway should interfere with such ultimate use, which also would increase the desirability of the area. (p. 50).

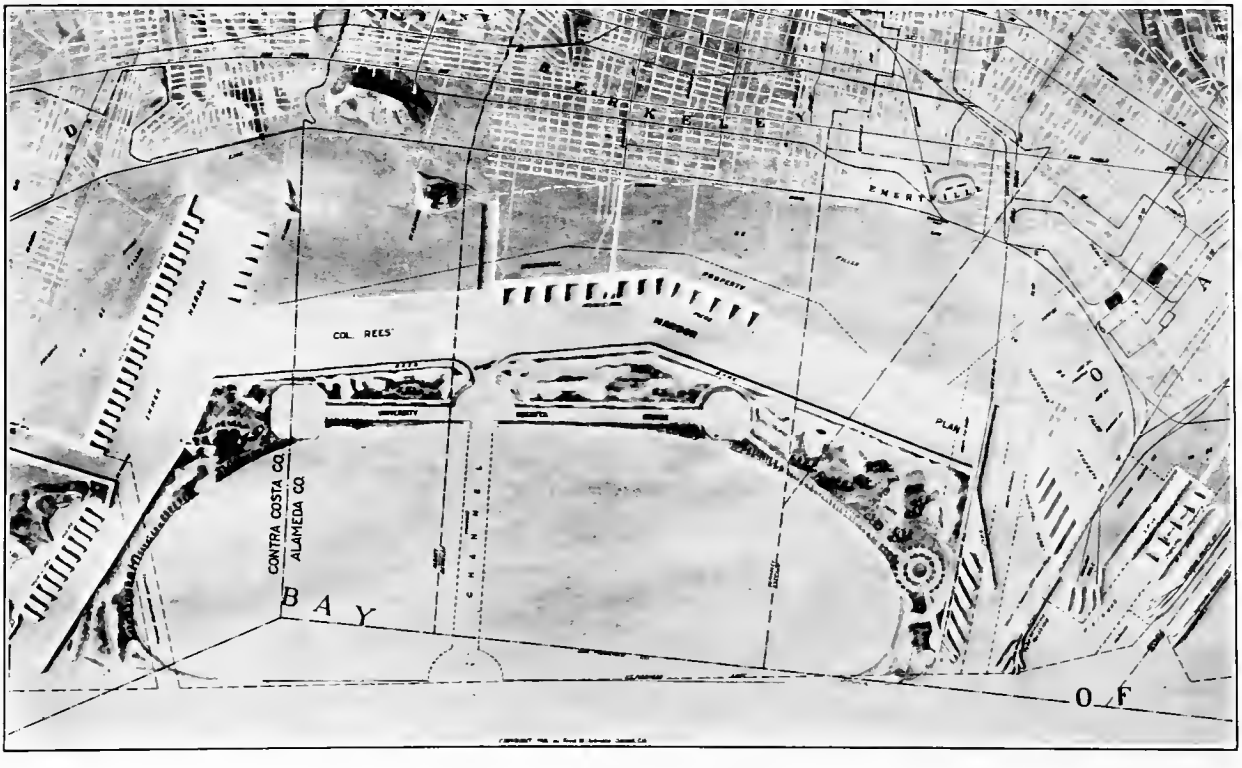
The dredging operations conducted by the Southern Pacific railway, south of its present broad gauge mole, in accordance with the franchise provision for a channel 300 feet wide and 30 feet in depth along a bulkhead line of 4297 feet are greatly increasing the desirability of the "white meat" district for the uses of the city. The Southern Pacific's operations have created a channel from 36 feet depths near the end of Long Wharf to the vicinity of the city's "white meat" holdings. It is therefore only necessary for the city to dredge a short channel connecting with the Southern Pacific channel in order to bring deep water directly to the municipal property.

COL. REES' SUGGESTION FOR A UNION PASSENGER STATION.

In connection with any consideration of the "white meat" district a suggestion of Col. Thos. H. Rees deserves close attention. In the letter to the chairman of the Committee on Harbor Development of the Oakland Commercial Club, Col. Rees speaking about the possible accommodation of the ferry slips just north of and adjacent to the Oakland Mole, writes as follows:

"An alternative arrangement which would probably work out better ultimately, if it could be secured, is as follows: Line up all of the ferry slips on the frontage between Oakland Mole and the Estuary. Build a great Union Passenger Station across the same frontage just behind the ferry slips. Bring the railroads into this station in the following order from north to south: Southern Pacific, Santa Fe, Key Route and Oakland, Antioch and Eastern, Western Pacific. This arrangement would bring all of these lines in without crossing one another's tracks. Open city streets through to the Union Station between the several lines of tracks. Provide berths for ocean steamships adjacent to Oakland Mole on the north and in the Estuary on the south with broad elevated communications leading through the station and connecting with all steamships, ferries, railroads and streets. An elevated belt line might also be provided connecting all of this frontage with the street car systems.

"By assigning corresponding slips to the several ferry lines on the San Francisco side the courses of the ferry boats would not cross each other, nor would the ferry lines cross the courses of ocean vessels entering the new harbor. All ferries would



BIRDSEYE VIEW OF ISLAND PARK

Photographic reproduction of part of a plaster model exhibiting the contemplated waterfront development of the East Bay and showing the island park in front of the Rees Harbor Plan as proposed by this Report and indorsed by Colonel Rees. The Island Park is further discussed on p. 134. The location for the piece of gigantic sculpture on the order of the Statue of Liberty on an artificial island on the axis of the Golden Gate is shown by a small cross close to bottom of picture.

be on equal footing and all would have a straight course well clear of Goat Island. There is room on this frontage to admit additional railroad lines when necessary."

The carrying out of this suggestion of Col. Rees, though it seems somewhat remote at present, would be in the highest sense in the interests of the East Bay cities, as well for the reasons given as for the enormous advertising value that such a big union depot would possess; strategically located not only from the point of view of the Railroad Engineer and Manager, but also by its location just opposite San Francisco, it would, in fact, be a great inviting gate-way to the continent. While the Ferry Building in San Francisco had to be seated with greatest difficulties on mud piles, a splendid concrete construction would be possible on the continental side of the Bay outdoing by far anything possible on the San Francisco water front. The suggestion of Col. Rees therefore surely needs further study. If this study should lead to a negative result, two other sites remain; one has been suggested in the original plan of Col. Rees and described by him in the following words:

"A location just north of and adjacent to the Oakland Mole could, if desired, be made to accommodate the passenger terminals and ferry slips of the Key Route System, the Oakland, Antioch and Eastern Railway and any other lines that might seek ferry connections at this point, such as the Santa Fe Railway or the Western Pacific Railway.

"Just north of such a ferry terminal several piers and slips might be allotted for the use of ocean steamships landing their passengers close to all the San Francisco ferries, to all the transcontinental railway lines and to the local city and suburban lines. There might also be available (with the consent of the Secretary of War) several bulkhead berths for ocean vessels in the mouth of the Estuary alongside of the Western Pacific Railway's present terminal."

Mention of this location has been made before. The other remaining possible site for the ferry slips would be on Goat Island, as strongly recommended by the Report of the Board of State Harbor Commissioners. The discussion of this matter will be taken up in connection with a general problem of railway transportation. (See pp. 66-70)) In connection with the harbor, however, it must be said that a contraction of what is called the Rees Channel would be necessary for the sake of economy in accommodating tunnels to Goat Island. Such a contraction would not be visible on the surface of the water, but would restrict the width of the deep channel at the critical point where the tunnels are crossing. This contraction to about 600 feet, though not desirable, is not impossible.

RELATION BETWEEN HARBOR AND PARKS. THE ISLAND PARK PROJECT.

There are many other questions of railroad transportation, especially the belt line railroad problems, and the problem of creating high class industrial sites that are intimately connected with the harbor problem, but have to be taken up in the following chapter on railroads. Another problem intimately connected with the harbor is the suggestion of creating a large water park, island park or lagoon park. This will have to be dealt with in the chapter on parks. Since, however, a similar suggestion made some years ago for the City of Chicago has been opposed by the same Col. Thos. H. Rees as harmful to the shipping interests it is important to mention that Col. Rees has given his endorsement to the suggestion of an island park for the East Bay cities. In his letter to the President of the Oakland Commercial Club, Col. Rees makes the following statement:

"While not strictly within my province, a suggestion of Dr. Werner Hegemann appears to be pertinent and valuable. The outer dyke can be so shaped and treated as to make one of the most beautiful park systems in the world, with driveways, walks, trees, shrubbery, flowers, boating lagoons, bathing beaches, yacht harbors, pavilions, refectories, etc., extending from Goat Island to Brooks' Island and reached by ferries or tunnel.

"There has been planned for the city of Chicago by Burnham and Company a system of such islands and lagoons extending for 20 miles along the water front, for park purposes only without any reference to the creation of a harbor. Here, for the East Bay cities, the basis for such a park system is provided for as an incident to harbor development."

ISLAND PARK, TORONTO, CANADA

Showing charming effects produced by winding channels among irregularly shaped islands—a suggestion of what might be accomplished in parts of the proposed Island Park west of the Rees Harbor project (compare p. 134).

HIGHLY DEVELOPED TRACKAGE OF THE SOUTHERN PACIFIC RAILROAD

The Southern Pacific tracks at Sixteenth Street Station, being the line which enters Oakland from the North. At the extreme right may be seen a part of San Francisco Bay. Adjoining it are (1) the westbound freight track, (2) the eastbound freight track, (3) the westbound steam passenger track, (4) the eastbound steam passenger track, passenger platform between them. At the left of the picture are the tracks of the elevated electric lines, eastbound and westbound. This is the first example of an elevated railway on San Francisco Bay, foreshadowing the future necessity of grade separations. By reason of this elevation connections between the Sixteenth Street Main Line Passenger Station (left background of picture) and the main line trains are not interfered with by the Suburban electric trains.

RAILROADS

The means of rail transportation are the structural features of the city-plan that we must next consider. They also—in nearly as great a degree as the harbor—are fixed in certain unchangeable locations; they cover very large areas of the city map, (see plans of railroad properties, pp. 44 and 59), and they represent very large investments that will allow a proper return only through proper location. This proper location, moreover, must be secured at a time, when land is still cheap, *i. e.*, before it has been taken up for other purposes. The best railroad plan is worthless when its excellent qualities are discovered too late.

THE TWO MAIN PROBLEMS OF RAIL TRANSPORTATION IN THE PRESENT EAST BAY SECTION.

Rail transportation—though its development is important in every one of its many phases—may solve chiefly two problems of special urgency in the East Bay cities. The first one is connected with the freight service which must be developed toward making, (a) the East Bay region the most economic location for modern industries; and (b), making the East Bay region an efficient center of commercial redistribution. This includes the development of the old and the attraction and accommodation of new trunk lines; and it includes further the development of the best possible industrial sites by giving to all of them and to the harbor at large the benefit of transportation by all the trunk lines through a proper system of connecting links, in the shape of what might be called a Belt Line service.

The second problem of special urgency is the development of the suburban passenger service so that the East Bay region, at present chiefly tributary to San Francisco, may win its own business center,—able to compete with San Francisco. The development of a large center of retail commercial activity on the East Side of the Bay will benefit

the whole East Bay region, and especially all the smaller business centers. The different communities will be nearer the center of activity and will therefore develop with vigor and rapidity instead of being satisfied with the comparatively much slower progress that must come to them as distant suburbs of San Francisco.

MODERN RELATIONS BETWEEN CITIES AND RAILROADS: CO-OPERATION.

While the building of harbors, even in such a highly individualistic country as the United States, admittedly is more and more considered an object of—not private—but public enterprise, the American attitude toward the railroads is still so strongly individualistic that intelligent and comprehensive planning, so far as it affects the divergent interests of the different competing railroad lines, is often considered an utterly hopeless undertaking.

It is important, therefore, before proceeding to any detailed consideration of the problems of Oakland and Berkeley, to define what is conceived to be the just and logical attitude of the city toward the railroads upon the one hand, and of the railroads toward the city upon the other.

It need scarcely be repeated here that, in the past, the attitude of railroads has been, especially in California, arbitrary and inimical to the interests of the people at large; and the attitude of the cities, in consequence, retaliatory and exacting toward the railroads. Such hostile attitudes appear everywhere to be giving way to a greater spirit of fairness and a marked desire for co-operation on all sides. This modern attitude was brought out at the National City-Planning Conference of 1913, by Milo R. Maltbie, the eminent engineer and chairman of the New York Public Service Commission: "Conditions change," he said, "and what is proper and adequate in one generation is often inadequate and ill-suited to the demands of the succeeding generation. Consequently not only must there be public control over the first location or first scheme of development of railroads, but there must be in the hands of the city the means whereby continually the varied interests may be kept in harmony and whereby the ever-changing needs may be met by changes in transportation facilities. The city should always be in a position where it can dominate the situation."

Another of the leading authorities of this country, Bion J. Arnold, in his new Chicago Railroad Terminal Report, says: "The easiest thing for the city to do is to require nothing and to let the railroads have what they ask; the most difficult thing for the city to do is to require the railroad companies to carry out the plan best suited to the entire city, at their own expense; the just thing to do is to join with the railroads in carrying out, on some equitable basis, the plan which will gradually put into effect such recommendations as are considered sound."

Mr. Arnold makes very clear in many passages of his report that there is no disposition on his part to cause the railways loss or inconvenience, but that he sincerely believes such co-operation between the railroads and the city will ultimately benefit both parties concerned. It is such a broad and liberal spirit that I would invoke to solve the present and all future problems of railroad transportation in the East Shore cities.

CO-OPERATION BETWEEN RAILROADS.

Going one step further and regarding the relations between the different railroad companies, the logical attitude of the modern community in planning for its improvement is expressed by the Massachusetts Metropolitan Improvements Commission:

"Any specific recognition of the present identities of the several steam railroad managements and properties as determining factors is believed to be wholly incompatible with logical suggestions for an ultimate and homogeneous development of the transportation lines within the terminal district.

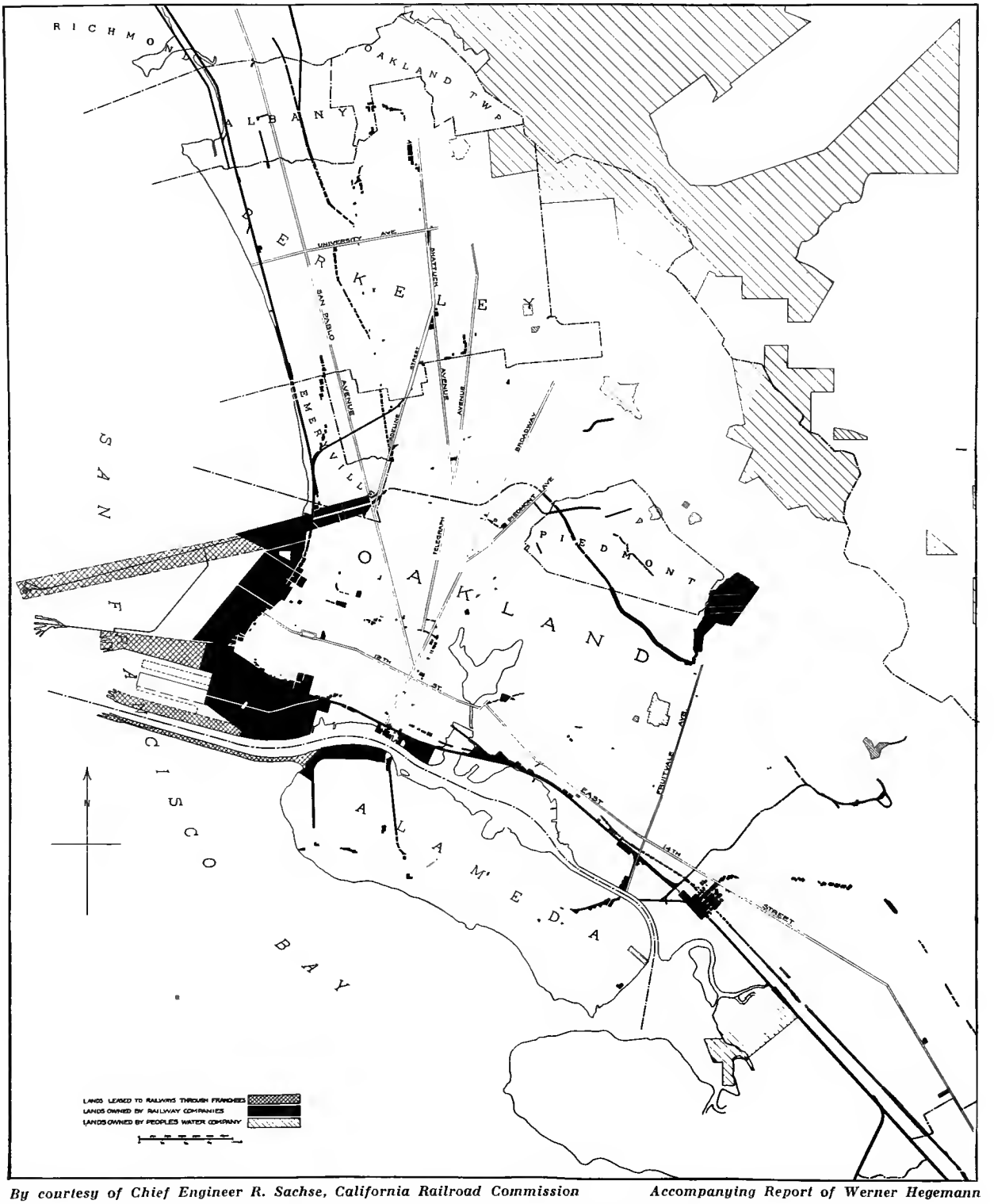
"That a due recognition of these corporate divisions, both physical and operating, must be made at the outset is obvious, but any system which will ultimately represent the highest type of public service, consistent with economy in operation and maintenance, must be developed along the broadest lines throughout the entire horizon. Such a development *is not possible* under a system requiring more or less strict adherence to the interests of the several railroad corporations involved. A development along the broadest lines, acknowledging the unity of the terminal transportation problem, would result in a property representing the most effective consolidation, and, advisedly, the greatest operating economy."[1]

The necessity of co-operation between the railroads is further emphasized by the latest opinions rendered by the U. S. Supreme Court and the representative of the largest American railroads. They are reproduced below (Page 51).

THE MODERN ATTITUDE OF THE CITY-PLANNER TOWARD THE RAILROADS.

In connection with the different authorities quoted, there may be added a word about their significance. A decided change has come about in the attitude of the city-planner towards the railroads. After the architects—supplanting the surveyors and civil engineers—had gained a hold upon the making of city-plans, they for a while thought they had jealously to guard themselves against the influence of the railroad engineer. This has changed lately. Three events may be cited as significant of the change—events that put city-planning on a new basis. These are the work of the Massachusetts Metropolitan Improvements Commission (finished in 1909); the two great city-planning competitions of Greater Berlin and

[1]Compare the Boston Metropolitan Improvements Commission's report, page 51. The quotation is from George R. Wadsworth, the Advisory Engineer of the Commission, in a special report on "Railroads and Terminals."



By courtesy of Chief Engineer R. Sachse, California Railroad Commission *Accompanying Report of Werner Hegemann*

CHART SHOWING ACREAGE OF LAND CONTROLLED BY PUBLIC SERVICE CORPORATIONS IN THE EAST BAY CITIES

(Figures supplied by the California State Railroad Commission)

Company	*Operative*	*Non-Operative*	*Total Owned*	*Leased Franchises Etc.*	*Total*
Western Pacific	194.452	14.280	208.732	210.187	418.919
San Francisco-Oakland Terminal Railways	143.098	680.631	823.729	311.00	1134.729
Southern Pacific (steam and electric) East Bay	*840.40	*100.00	*940.40	*188.10	*1128.500
	1177.950	794.911	1972.861	709.287	2682.148

*Approximate.

The total area controlled by three of the railroads in Oakland, Berkeley, and Alameda is equal to one-seventh of the area of Paris (2.8 million inhabitants).

Greater Dusseldorf, judged in 1910 and 1911; and finally the experience of Chicago between 1909 and 1913.

The remarkable fact in these three city-planning events is that they were largely brought about by the intelligent initiative of architects, and that they have led to a recognition, both surprising and over-whelming, of the importance of the railroad engineer in making a city-plan. The Metropolitan Improvements Commission would scarcely have been appointed except for the commendable initiative of the two strong organizations of the architects of Boston. But the Report of the Commission considers as "the paramount question" "the great problem of transportation in its various phases" and as the "subject which it was most essential that this Commission should investigate."[1] In a similar way, the Greater Berlin City-Plan Competition was brought about, perhaps even more notably than in Boston, on the initiative of the two Berlin architectural organizations. The architectural trend of thought also found strong expression in the making up of the Jury. This latter was true also in the competition for Greater Dusseldorf that grew directly from the preceding one in Berlin. It was a great surprise to see how in both competitions all of the great prizes, with one single exception, went to the projects that considered the work of the railroad engineer as the necessary basis on which to build up great architectural ideas.[2] Perhaps still more striking was the experience of Chicago where the public spirited members of the Commercial Club spent over $100,000 in financing the late Daniel H. Burnham's report on a city-plan, beautifully printed and wonderfully illustrated. This stunning plan may be considered as a typical product of that older school in city-planning which did not give full recognition to the fundamental importance of a preliminary and exhaustive investigation into the railroad problem. It was not at all surprising, therefore, that the great work of the Chicago Commercial Club started a long discussion on the railroad problem as the one point on which the plan of the Club was weakest. This discussion led, largely under the influence of the City Club of Chicago, to the creation of a self-appointed Citizens' Terminal Plan Committee, which invested another $100,000 in order to get an exhaustive investigation into the steam railroad terminals, as the necessary basis for the city-plan. The product of this great enterprise is the "Report on the Rearrangement and Development of the Steam Railroad Terminals" submitted to the Citizens' Terminal Plan Committee of Chicago by Bion J. Arnold, Chicago, November 18, 1913. This report is different from previous railroad investigations of other cities by reason of the mere fact that it is made in the City of Chicago where such an enormous amount of energy has been spent in popularizing great city-planning ideas. This report, therefore, shows a leading railroad engineer thinking in terms not only of railroad engineering, but of city-planning, one of the most necessary steps in the development of the new science and art of city-planning which is so essentially an art of collaboration, coordination, composition.[3]

The fact of such large sums being spent in these different cities for mere investigation into railroad problems gives an idea of the overpowering perplexity of the railroad problems of these cities; problems which in some cases have grown into serious calamities.

LAWS OF GROWTH IN RAILROAD TRAFFIC.

To some it may seem that there is no pressing necessity for careful guarding against such expensive mistakes as those that old cities, or even comparatively new cities like Chicago, are endeavoring to remedy. But it must be pointed out that it is a well established law that freight and passenger traffic will increase with much greater rapidity than population. The law briefly stated is: train movement increases as the square, and the number of passengers as the cube, of the population. Therefore, when the population of Oakland has doubled the train movement will have quadrupled. Still more rapid is the increase of freight traffic; it increases as the fourth power of the population. This means that a doubling in freight business will result from an increase of about 20% in population.[4] To care for conditions that will thus be brought about, greatly enlarged railroad facilities must be anticipated.

There has been reproduced in this report a careful population forecast made by Engineers Haviland and Tibbetts. If this forecast is correct, a doubling of the population of Oakland, Berkeley and vicinity is to be anticipated at least by 1930—possibly by 1920. This will mean, at least by 1930, perhaps by 1920, a multiplication of the train movement by four, of the number of passengers by eight, and of the freight traffic by sixteen. It takes little power of the imagination to foresee how new and now altogether unexpected problems must arise from a normal increase in population of the East Bay Cities, not to speak of the difficulties that will quickly spring up, if any sudden and unexpected growth should come, as through the Panama Canal, for instance. The enormous difficulties that must be anticipated can be solved economically only by comprehensive planning, in the absence of which much loss necessarily must result to the community.

ANALOGY BETWEEN THE EAST BAY CITIES AND CLEVELAND.

A comparison will make the point clearer. Oakland, Berkeley and their neighboring cities, which at present form one undivided railroad district

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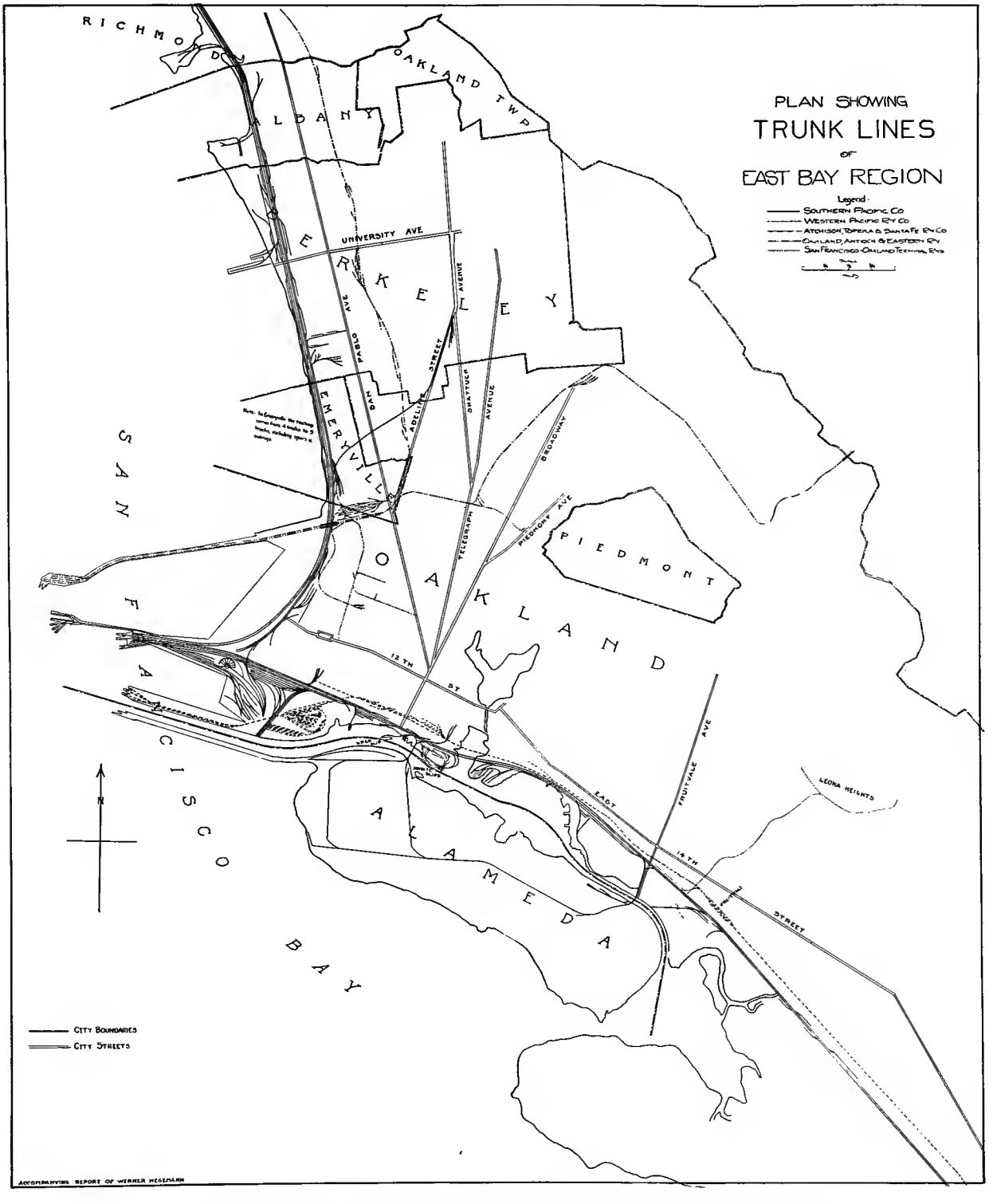
[1]Compare the report of the Commission. Page 8.

[2]The author of this report was closely related to the work connected with the Berlin competition and in the Dusseldorf competition was a member of the jury and of the committee drawing up the conditions ruling the competition.

[3]Regarding this essential feature of co-ordination compare the convincing article by Professor John Galen Howard, the architect: "The Art of City Planning" published in "Brass Tacks," March 4, 1914.

[4]Regarding these laws, compare Arnold's Chicago Report, pages 47, 70, 72, 74.



PLAN SHOWING TRACKAGE OF TRUNK LINES IN OAKLAND AND BERKELEY

On this map an attempt has been made to show on a small piece of paper the entire trackage of the trunk lines serving the East Bay cities (including all yard, service, and industrial trackage as well as that part of the Key Route System that serves as a belt line in switching connection between the S. P. and Santa Fe systems). In many places it was—in spite of the distortion allowed—impossible to give on so limited a map an adequate idea of the complication of the tracks, as, for instance, in the Emeryville area (see picture, p. 50), where inside a space of one inch the frequent variations of from four to nine tracks could not be shown. The complication of this map would be greater still if an attempt had also been made to show the extensive suburban electric trackage of the Southern Pacific as seen on picture, p. 67. In judging the extent of the problem presented by the many intersecting lines of a railroad map, it is to be kept in mind that even small changes in any single location may seriously affect the entire track situation, not only of the immediate neighborhood, but of localities many miles distant.

served from Oakland as the railroad freight center, may properly be compared with Cleveland, which in the year 1890 was a city of even less population (261,000) and area than the East Bay Cities today. The population of Cleveland increased from 261,000 in 1890, to 622,000 in 1912. The enormous difficulties that arose in railroad-planning in connection with this increase in population will be considered here only in the one single aspect of separation of grades. As early as 1896, Cleveland was compelled to begin the work of eliminating grade crossings. This led gradually to a real clash between the municipal authorities and the railroad managements. In 1910 sixteen crossings were eliminated at an average cost of $78,200 to the city treasury alone, for every single crossing, not to mention approximately equal amounts expended by the railroad companies. This, however, was only the beginning of the great work, and the Cleveland City Engineer, R. Hoffman, as the conclusion of a careful paper dealing with the problem, states: "It is safe to say the total sum to be expended in connection with grade elimination based upon the present conditions will amount to over $24,000,000."[1]

MILLIONS TO BE SAVED BY PLANNING.

It is interesting to remark how in the discussion of the paper just referred to the engineer in charge of grade elimination for the New York, Chicago and St. Louis Railroad (the Nickel Plate Railroad) emphasizes the point that this enormous expense could have been avoided if the growth of the city had been foreseen and properly planned for: "We are planning to remedy an evil but not to remove the cause. The cost of this work is fabulous. We must think well and plan wisely that the wealth intrusted to our care be not frittered away in costly mistakes or careless management."

The fact that Cleveland while spending large amounts for grade elimination has at the same time spent $20,000,000 for the creation of an efficient belt line, the location of which through built up areas presented enormous difficulties, will later be dealt with (p. 54).

The situation of Oakland, Berkeley and vicinity, with reference to the planning for the enormous development of rail business which must be anticipated, is not less complicated than the situation of Cleveland. On the contrary, the fact that the West Oakland freight yards are not only the freight redistribution center for the east side of the Bay from Richmond to Elmhurst, but have to handle at the same time something like 50% of the railroad freight destined for San Francisco; and that even a larger percentage of all San Francisco's long-distance passenger travel passes through Oakland, would make it necessary, in order to get a really fair comparison, to take the railroad difficulties of a city even much larger than Cleveland.

THE ADVANTAGE OF THE EAST BAY CITIES

On the other hand, Oakland and Berkeley have two valuable assets compared with other and older cities: the one is the fact that the sad experience of older cities affords valuable examples from which to learn; the other is a physical situation which, without being free from difficulties, makes the solution of many railroad problems comparatively easy.

In fact, the physical characteristics of the East Bay cities represent, in many respects, a decided advantage over many other cities of this country and of Europe, *i. e.*, if proper planning takes advantage of the peculiar and interesting physical situation. The peculiarity of this situation arises from the fact that along the entire eastern and northern boundaries of the East Bay cities there are high ranges of hills and that access to the level lands, which originally constituted the cities proper, was only to be had through a narrow passage at the north and by way of Niles Canyon or the level plain to the south. The railways that have their termini on the East Shore of San Francisco Bay follow closely the shore line of the Bay itself or the line of the Oakland Inner Harbor, leaving the entire district lying towards the hills free from the tracks of freight carrying roads.

FREIGHT ROADS SHUT OUT FROM THE LARGE RESIDENCE DISTRICTS.

This district, stretching from Richmond to San Leandro and beyond will without doubt constitute a large well protected residence section at the base of the foothills and on their gentle slopes—a residence section that will be practically free from the yards and terminals of railways and from the difficulty of taking care of them (Views pp. 63 and 103). In cities like Cleveland or Chicago, seated upon a comparatively level plain, railways enter from nearly every direction and, in the absence of proper legal protection of the residential districts, tend to prevent any considerable part of the city from being strictly and purely residential in its character. Industrial districts grow up all over the city's area; railroad service must be given to them and extended continuously: soon concentration of railroad efficiency becomes impossible where it is needed, and its presence in the center of the city creates congestion where it is most undesirable. While the science and practice of creating efficient industrial districts and of protecting the residential districts, by private or municipal restrictions, against the dangers arising from the steam road terminals and adjacent industries, is developing only gradually, the features of the East Shore's topography gave to the cities of Oakland, Berkeley and their neighbors, the great gift of industrial districts mapped out by nature and of natural protections for ideal home districts. The increased efficiency of the industrial districts must benefit all and it is equally

[1]Compare the paper by City Engineer, Robert Hoffman, "Railway Grade Crossing Elimination in Cleveland," in Journal of the Cleveland Engineering Society, Dec., 1910.

possible and necessary that the natural protections be enjoyed not only by the wealthy, but by all. Their benefit can and will accrue to the homes even of the poorest if proper planning and transportation schemes counteract the possible dangers that may be connected with the limitations of the physical situation. These possible dangers must be overcome by a rapid development of suburban transit (as pointed out p. 71 ff.) or the East Bay Cities, like San Francisco, will become tenement house districts.

FREIGHT TRANSPORTATION BY RAIL

THE RAILROAD IN RELATION TO INDUSTRIES AND COMMERCE.

As stated before, freight transportation in the East Bay Cities has chiefly two problems to solve—the two problems of making the East Bay region a most economic location for modern industries and of making the East Bay region an efficient center of commercial redistribution.

As has been pointed out in the preceding chapter, the wealth, growth and population of the East Bay Cities depend upon the radius within which the merchandise of these cities can be shipped economically. The place where savings can most readily be made is in terminal costs. If rail and water facilities are so economically arranged that the terminal costs reach a minimum, then the manufacturer and the merchant may reach out toward the rich cities and countries of the world in competition with manufacturers and merchants in other cities. If the facilities for shipment by rail and water are inefficient and insufficient, then the East Bay region cannot effectively compete with other cities, and its growth will be retarded.

How can the city-plan serve railroad development and therefore industrial and commercial interests? The first duty of the city-plan in this connection is always to provide a wide and unobstructed highway, an open door for the entrance of trunk lines. Only by proper control of main lines will main entrances to the city be protected against undue and harmful interference by local traffic. Where those entrances are in a still unsatisfactory state, proper planning must develop

FREIGHT YARD OF BUSH TERMINAL, BROOKLYN, N. Y.

To give efficient service to this single unit of warehouses and factories with 200 incoming cars a day a trackage of twenty-five miles and yard as large as this is required. The reclamation scheme incidental to the carrying out of the Rees Harbor Plan for the East Bay cities will create large areas on which to lay out railroad yards not only sufficient in size but also in physical and convenient connection with the trunk lines. All railroads connect with the Bush Terminals by car floats only. Compare picture, p. 29, and Note 3, p. 53.

them to efficiency. Again, only by proper planning will the door be held open for new trunk lines which sooner or later in their search for the great Bay of San Francisco will find their way to that city which gives them convenient connections with strategically located waterfront property. As deep water and ocean shipping irresistibly attract the trunk lines, the trunk lines will powerfully attract industries. "Accessibility to the great national and international terminals makes it possible for our manufacturers to receive raw materials and ship package freight promptly and economically to all ports of the world."[1]

The close inter-relation between trunk lines and shipping and industrial interests has made the city of New York. "Unlike most foreign ports, those of America, so far as distribution of imports and exports are concerned, owe their existence to the railways, instead of to rivers and canals."

UNOBSTRUCTED ENTRANCE FOR THE TRUNK LINES.

The importance of the unobstructed entrance of the great trunk lines, therefore, is so paramount that no requirements of the harbor, no planning of suburban lines, and especially no requirements of local freight service, should be permitted to interfere with the trunk lines existing or to come.

The great boast of as small but promising a city as Houston, Texas, is that it is the place: "where seventeen railroads meet the sea."

The East side of the Bay is fortunate in having attracted six trunk lines already (map p. 46): the three branches of the Southern Pacific to the north, east and south, including Mexico: the Western Pacific to its eastern connections at Salt Lake, and the Santa Fe to Chicago and Galveston. To these must be added the new Oakland, Antioch & Eastern Electric Line, which with its central California connections, constitutes the longest through passenger electric line in the United States. This line seems destined to provide the outlet to tidewater for the extensive network of electric lines of the Sacramento and San Joaquin valleys. The hopeful beginning for the organization of the physical entrance of these trunk lines into the East Bay Cities is subject to much improvement The long established position of the Southern Pacific is well known, but only one of the two lines with which this old and powerful road reaches the large yards on the West Oakland waterfront is sufficiently well equipped. This is the north branch connecting Richmond (the northern boundary of the district for which the West Oakland yards serve as a freight redistribution center) with Oakland by five tracks, *i. e.*, two main line passenger tracks, two main line freight tracks, and one service track. The other line of the Southern Pacific approaching the West Oakland yards from the east has only two main line tracks for passenger and freight and one service track, the latter reaching only a few miles, namely, to Fruitvale Avenue. The Western Pacific inefficiently and uneconomically duplicates one of the S. P. main tracks by paralleling it with a single track. There is, in the heart of the city, a distance of two city blocks between the Southern Pacific and the Western Pacific. Franchises were asked for by the Western Pacific Company for another line (so-called Western Pacific Blue Line) south of the Southern Pacific, crossing the latter in East Oakland (26th Avenue) and paralleling it very closely until it reaches the Western Pacific terminal yards at the foot of Chestnut Street. These franchises and rights were never allowed except for a very short distance. Further franchises were asked by the Western Pacific in order to secure direct connections with the Key Route on Poplar Street and with the Santa Fe on Wood Street thus creating new duplications of lines by using public streets. Not only the Western Pacific, but even the better developed Southern Pacific has, of course, to serve many local industries off the main tracks and independent connections for each individual road simply means an especially obvious form of duplication and economic waste. Similar criticism applies to the Santa Fe railroad towards the north.

UNIFIED, HIGHLY DEVELOPED RAILROAD HIGHWAYS AN ESSENTIAL FEATURE OF THE CITY PLAN.

The thing that suggests itself is the linking together of the entrances of the different companies thus creating unobstructed tracks for main line travel and sufficient service tracks for all industries. The railroads must forget their private struggles the moment they enter the precincts of a great city. However desirable railroad competition may be, the streets of great cities are not the places to fight out these battles. By using the new fills along the waterfront for linking together the different lines, two wide and efficiently operated railroad highways, one to the North and one to the East can be created. This will have many advantages: a right-of-way sufficiently wide for efficient management comes into existence; a joint use by the different companies on the interchange or reservoir principle will give higher efficiency at less cost of maintenance; the danger arising from street grade crossings by two roads paralleling each other within a few city blocks will be avoided; the elimination of grade crossings where necessary will be much easier. The crossings of the main line tracks, if they cannot be abolished, can be separated much more easily. At present there are a large number of very dangerous crossings of main steam lines by electric standard lines at grade. In one case, at the foot of Chestnut Street, the Western Pacific main line crosses the main line tracks of the Southern Pacific at grade though the agreement between the two roads explicitly calls for an overhead crossing by the Western Pacific. The rearrangement that will have to come about very soon should not be made piecemeal, but as a part of a comprehensive scheme on

[1]Compare quotation from Calvin Tomkins given p. 22, Note 2.

the basis of which a promising terminal organization can gradually be built up.

ENTRANCES FOR NEW TRUNK LINES.

The plans for the two great railroad highways that enter from the North and from the East must be made with special reference also to the future of new trunk lines, the advent of which is so highly important for the East Bay Cities. At the present time there are at least three distinct routes by which new trunk lines could, without serious economical or legal obstructions and without co-operation with the existing trunk lines or the necessity of a previous rearrangement of the East Bay terminals, reach the strategic location on the Oakland waterfront which gives at the same time access to deep water and immediate proximity to San Francisco. (See maps pp. 46, 44, 37 and 127).

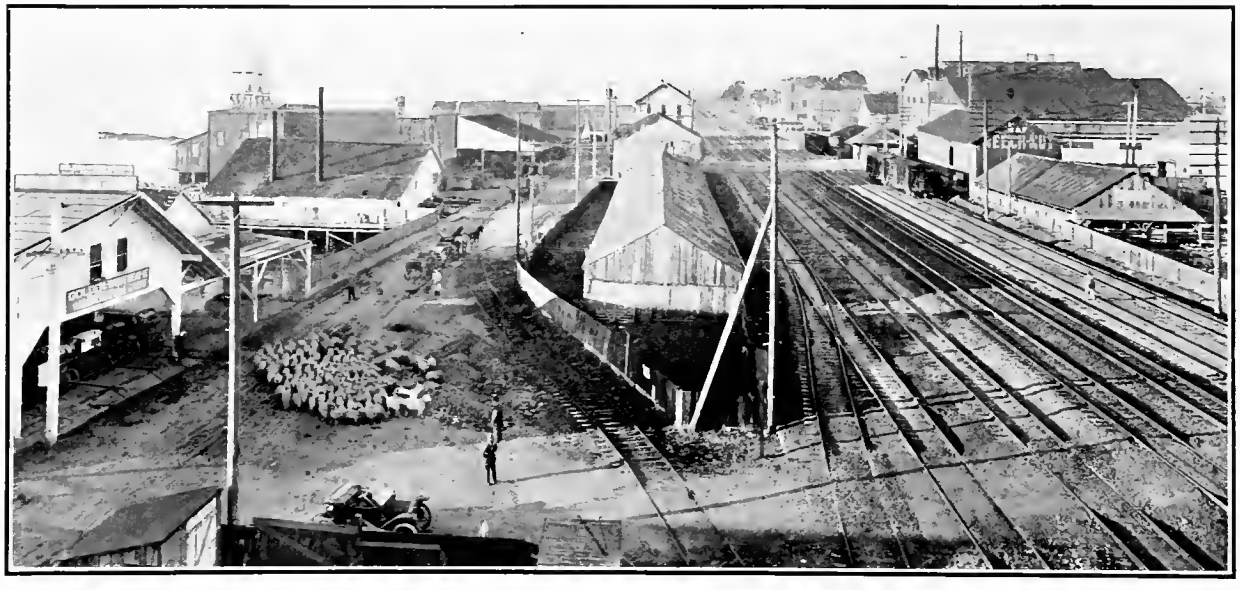
The first is on the new fill along the north shore of the Inner Harbor and the Estuary paralleling the Southern Pacific; thence (after crossing the Western Pacific tracks immediately south of the dangerous point where at present the latter crosses the Southern Pacific main tracks at grade) via the 80-foot unnamed street (The course of this street well shown on map p. 44) across the city's holdings between the broad-gauge and the Western Pacific moles, known as the "white meat."

The second practicable route for a new trunk line is again along the shore of the Inner Harbor. but crossing the Southern Pacific and the Western Pacific at about Fallon Street, and thence by Fourth or Fifth Streets after another crossing of the Southern Pacific to newly opened Seventh Street north of the broad-gauge mole to the west waterfront in the Key Route Basin.

The third route for a new trunk line approaches from the north by way of Pinole Creek and Vaca Canyon and follows the shore west of the Southern Pacific tracks, using the land which will be filled, in carrying out the Rees Harbor Plans.

STRATEGIC VALUE OF THE NEW ROUTES.

While in contrast to the third route, the two former routes suggested would have to cross already existing trunk lines—and this should surely not be done at grade—all three suggested routes have the enormous advantage of closely paralleling the entire harbor districts just being created, including the Rees Channel, *i. e.*, the harbor area from Richmond to San Leandro. The importance of the latter fact can hardly be overestimated: it would enable the new trunk lines to break the practical monopoly enforced at present by the Southern Pacific through its present location along the waterfront. This much mentioned monopoly of the Southern Pacific so far as it exists, is chiefly created by this strategic location parallel to the waterfront. Most of the freight, that is, most of the paying business, originates here. This monopoly makes it possible for the Southern Pacific to exact high premium switching charges to competing points from the other railroads less fortunately situated. If the railroads, and especially the Southern Pacific. should be blind enough to work, not for the absolutely necessary co-operation inside the terminal district, but for the continuance of the old fighting methods, then here, *i. e.*, in the possible location of a most strategic new trunk line on the new land along the waterfront, lies



SOUTHERN PACIFIC STEAM TRACKS ENTERING OAKLAND FROM THE NORTH (AT EMERYVILLE)

A highly developed railroad highway. The six tracks shown are, beginning at the right of the picture, as follows: (1) Industry siding, (2) eastbound freight, (3) eastbound passenger, (4) westbound passenger, (5) westbound freight, (6) industry siding. The other two tracks in the immediate foreground at the left of the picture are industry spurs. This is an example of a high state of railroad development adequate to serve many and great industries for a long time. The next step of developing this trackage will be the separation of the street grade (crossing in foreground) from the grade of the main line tracks and possibly the separation of the level on which industrial switching service (belt-line service) is given from the main line service. These improvements will become the more necessary with the development of the lands reclaimed by the Rees Harbor plan. At the same time this reclamation scheme will furnish not only plenty of space for right of way extension but also be the means of easily producing different levels for streets, main lines, and belt line trackage. The suction dredge will pour out the new levels as a preconceived plan requires them. A special level for rapid transit electric trackage also is required, as shown by picture, p. 42.

the powerful weapon in the hands of the people to doom shortsighted aspirations against the common interest.

But co-operation, not fighting, is needed. Co-operation will lead to a systematic reorganization of the two great railroad entrances from the North and from the East. This reorganization will make possible the running of more main line trains with less expense on fewer tracks and with fewer crossings of main lines. The waterfront, instead of being monopolized by one single fighting road, must be opened up by a belt line which, independent of the mainline service, can give industrial railroad service without further interference with main line business, and which, securing level grades, easy curves, elimination of grade crossings and uncongested right-of-way, will give ideal connections between *all* the industries and *all* the trunk lines indiscriminately.

U. S. SUPREME COURT AND LARGEST AMERICAN RAILROADS IN FAVOR OF TERMINAL CO-OPERATION.

Anyone who should consider such a beneficent and efficient co-operation between the different railroad corporations as that proposed in the preceding paragraph to be rather a fantastic plan, hardly possible under American competitive conditions, must be reminded that the two highest authorities on this point that could possibly be found in the United States, *i. e.*, the Supreme Court and the legal counsel of railroads controlling one-third of the railroad mileage of the United States, have expressed themselves in the strongest and most explicit terms in favor of such terminal combinations. In 1889 the railroad magnate, Jay Gould, began the creation of such a terminal combination for the large railroad center St. Louis, where the physical conditions of the surrounding land, together with the rivers, produced a situation showing some very striking analogies to the situation in Oakland. The Terminal Association of St. Louis, which he created, finally had about forty-five millions of dollars of mortgage and an authorized capital stock of fifty millions (twenty-eight millions were issued). When, later, an effort was made to force the dissolution of this Terminal Association of St. Louis, as representing a restraint of trade, unlawful under the Sherman Act, the counsel of the powerful railroad companies made the following statements (United States vs. Terminal Railroad Association of St. Louis; decided April 22, 1912; in U. S. Rep. 224, p. 383).

"Community use of terminals in a large city is more than a matter of convenience or economy; it is an absolute public necessity. Every consideration of a public nature points to a consolidation of the terminals and to a common use of them by all the railroad companies coming into the city. But to avoid the odious phases of a monopoly, this use must be open to all upon equal terms.

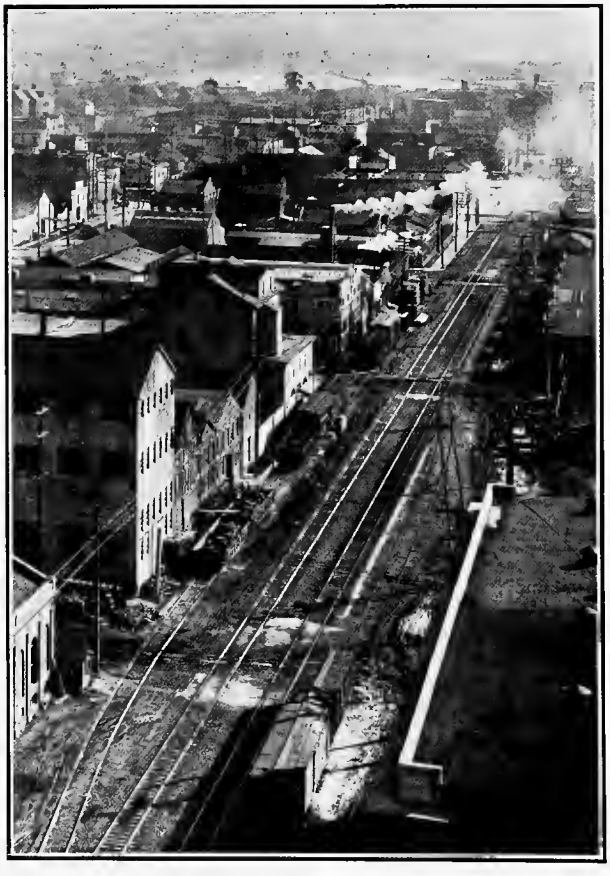
"Any new railroad built into St. Louis now has but to secure a way to a terminal track and it has at once the advantages of the entire terminal system. Terminal service is a matter of internal economy which the companies may adjust to mutual advantage."

This opinion of the corporation lawyer speaking for the most powerful American railroads that could be gotten together is shared by the Supreme Court. The Court says in its opinion:

"Terminal systems are a modern evolution in the doing of railroad business and are of the greatest public utility. They, under proper conditions, do not restrain, but promote commerce."

In support of its opinion the high Court quotes the expert opinion of railroad engineer Albert L. Perkins: "The terminals of railway lines in any large city should be unified as far as possible." The Supreme Court also approves of an opinion given by the Missouri Court, quoting it as follows: "Referring to the legitimate use of terminal companies, the Missouri Court said that a more effectual means of keeping competition up to the highest point between parallel or competing lines could not be devised. *The destruction of the system would result in compelling the shipper to employ the railroad with which he has switch connection.*

"Suppose it were required of every railroad company to effect its entrance to this city as best



UNDEVELOPED TRACKAGE OF SOUTHERN PACIFIC RAILROAD, FIRST STREET, OAKLAND

View looking from near Clay Street eastward on First Street towards Broadway. Here the most important trunk line of California has only two tracks to serve both passenger and freight traffic. Spur tracks for the use of adjacent industries are served from the main tracks. Compare the much higher development of the same railroad in its trunk line from the north. Pictures pp. 42 and 50.

it could and establish its own terminal facilities, we would have a large number of passenger stations, freight depots and switch yards scattered all over the vast area and innumerable vehicles employed in hauling passengers and freight to and from those stations and depots. Or suppose it became necessary in the exigency of commerce that all in-coming trains should reach a common focus, but every railroad company provide its own track: then not only would the expense of obtaining the necessary rights of way be so enormous as to amount to the exclusion of all but a few of the strongest roads, but, if it could be accomplished, the city would be cut to pieces with the many lines of railroad intersecting it in every direction, and thus the greatest agency of commerce would become the greatest burden."[1]

PRINCIPLES FOR REORGANIZATION OF RAILROAD ENTRANCES.

Among the general principles to be followed in a reorganization of the East Bay terminals the following must be emphasized:

FIRST—Under no circumstances should the different main lines cross each other at grade;

SECOND—The crossing at grade of main line tracks with Belt Line tracks or with electric standard lines should be avoided;

THIRD—On a sufficient number of strategic points, there should be separations of grades of the main and belt lines from the street level to assure easy communication for passengers and teams between the city and the harbor.

In order to reach these results it will be important to have all surveys and plans ready before the commencement of the work on the Rees Harbor Plans. If the filling connected with the latter work is combined with the excavating and filling necessary for the grade separations, the money expended will reap two-fold results and subsequent rearrangements will be avoided. The reclaiming work connected with all East Bay harbor projects practically makes the East Bay Cities the masters not only of the shore lines, but also of the contour lines, and makes it possible to exploit the latter for the avoiding of interference between harbor, street and railroads. The desired harbor lines, including the different grades for street and rail service, can be poured out of the dredging pipe, much as a modern concrete structure is moulded into the desired shape in one piece and at one time.

BELT LINE.

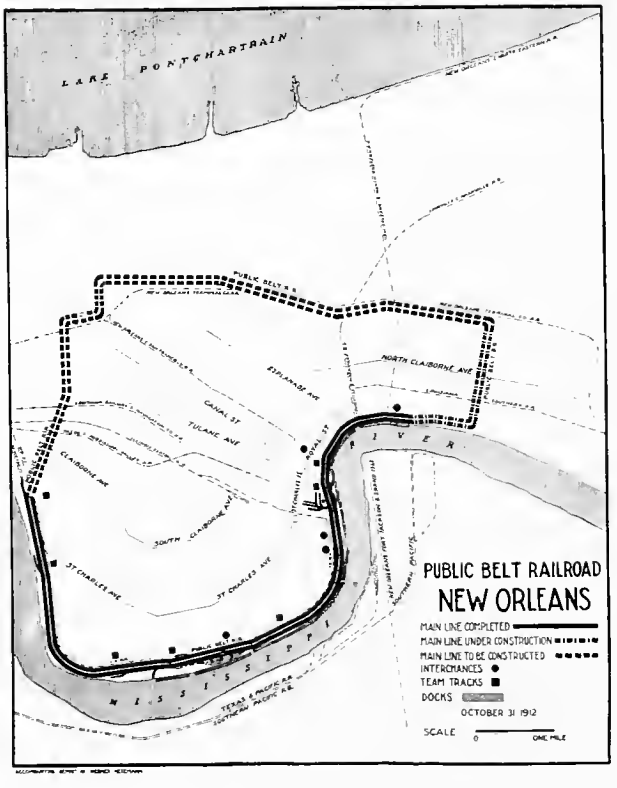
One of the most essential features in the reorganization scheme of the railroad terminal system will be a proper survey for an efficient belt line. The term "belt-line" is often used for railroad tracks that only represent the rudimentary beginnings of a full fledged belt line. In the neighborhood of Oakland and Berkeley the Richmond Belt Railroad is incorporated representing nothing but a few miles of tracks with the object of "providing trackage facilities to industries located on its road." Even the State owned Belt Line in San Francisco, and the municipally owned Belt Line of New Orleans (both most useful instruments) are not belt lines in the full sense of the word.

The principal functions of an efficient belt line are three:

FIRST—It must open up all the territory suited for industrial and commercial activities; it will especially have to serve the harbor;

SECOND—and equally important, the function it serves in providing flexibility of operation in the interchange of traffic between the various trunk lines: the belt line is the basis of the clearing system;

THIRD—the Belt Line will have to take a large proportion of the freight traffic off the main line tracks and will detour this traffic around the centers of freight congestion.[2] This last function of a Belt Line has in many traffic centers of the

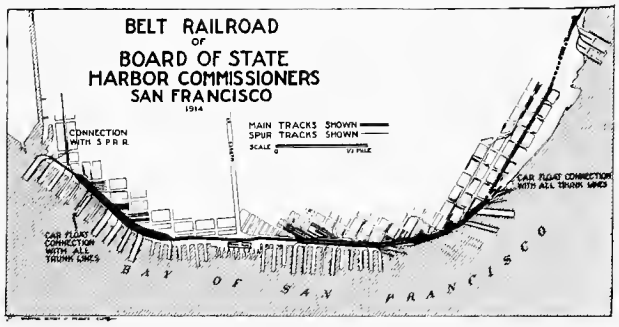


A terminal switching railroad (1915, forty miles of track, ten locomotives) owned and operated by the City of New Orleans; supplying non-discriminatory switching service between trunk lines, industries, and wharves. One hundred and ninety-seven thousand cars were handled in 1914 at a uniform charge of $2 per movement (including return movement). Before the beginning of the belt operation charges went up as high as $15. This belt was built with a small outlay (about half a million dollars), using the city-owned streets instead of acquiring rights of way. The streets, having been laid out long before without reference to future railroad needs, are far from being ideal railroad highways.

The East Bay cities by planning now can secure a belt line as cheap, but much more efficient than even progressive New Orleans.

[1]U. S. Report, Vol. 224, p. 383. What a lecture in city-planning to be found in a court document!
[2]Compare Massachusetts Metropolitan Improvement Commission's Report, page 157.

world been one of the most potent reasons for going into very expensive belt line construction. The necessity of freeing congested railroad tracks of the inner cities from all traffic that is not absolutely required there, has enforced the detouring of as much traffic as possible. Any traffic that is not destined for the inner city itself, but is only passing through the city for some near or distant outside destination, should go around the congested district by way of a belt line, *i. e.*, a detouring line. In this sense the Dumbarton cut-off by which the Southern Pacific sends a part of its traffic destined for San Francisco around the Bay instead of congesting the Oakland yards with it, acts as a belt line for the East Bay Cities. All through traffic, *i. e.*, traffic destined for points outside the limits of the East Bay Cities, must rapidly disappear from the trackage of these cities, as soon as this trackage is needed for the cities' own use. The great belt line system of cities like Chicago[1] and Cleveland further aims more and more at detouring also that traffic which, though destined to points inside the city limits, still will reach its special destination with less delay by not trying to make headway straight across the heart of the city—for example, coming from the north for some yard in the southern part of the city—but by going around the city and entering it from another direction; for example, from the south instead of from the north. Thus, for the mere matter of illustration, the Southern Pacific San Ramon valley tracks connecting in the east of the East Bay Cities could, if they were not too far away, be developed as a belt line to bring goods from the northern part of the East Bay Cities, *i. e.* from Richmond or Berkeley, to the southern part, *i. e.*, Fruitvale or San Leandro. This would mean to exchange the inconvenience of a very much longer haul against the advantage of not having to pass over the central Oakland tracks, which rapidly will become congested with the advance of commerce and industry. The same result could be reached in a somewhat better manner by connecting Richmond with the Inner Harbor by car floats as the Santa Fe has to do in connection with its development of Adams Wharf, as long as this company does not succeed in winning its way along Oakland's waterfront by rail.[2] But the long haul around Oakland by any possible line behind (*i. e.* east of), the hills, is expensive and time wasting; the use of car floats, on the other hand will have to be recurred to for very many purposes in the operations about San Francisco Bay; car floats will be the most economic thing in many cases, but should be avoided wherever possible because they also are expensive and time wasting.[3] An efficient belt line is needed.



A terminal switching railroad, seven miles main track, 18.3 miles spurs and sidings, cost $560,000, on publicly owned land. Seven locomotives. Owned and operated by the State of California; giving non-discriminatory switching service at a uniform charge of $2.50 ($5 if across Market Street). One hundred and twelve thousand cars were handled in 1913-1914. This belt line claims to be "the most complete harbor belt line railroad switching system in the country"; but, like the New Orleans belt line, its tracks have to use public streets, which were laid out in bad angles to the waterfront and without reference to railroad needs. Another handicap is the fact that the peninsular location of San Francisco gives its belt line physical connection with only one single trunk line. All other trunk lines have to connect by water, *i. e.*, by the expensive system of car floating.

In the East Bay cities a belt line free from these two handicaps can be built.

MILES OF FACTORIES ALONG THE EAST BAY WATERFRONT CREATE A DEMAND FOR BELT LINE SERVICE

[1]Chicago's Belt Line system is stupendous. Chicago claims thirteen belt or transfer lines used in exchange of freight from one road to another and from and to shippers. Their mileage ranges form 3 to 289 miles and totals 1159 miles. Compare the work of G. E. Plumbe, LL.D. Statistician of the Chicago Association of Commerce: "Chicago, the great industrial and commercial center of the Mississippi valley," 1912, p. 71.

[2]A similar connection by car floats along the waterfront was made by the State owned Belt Line in San Francisco before the completion of the connecting link between the northern and southern parts of the little belt line.

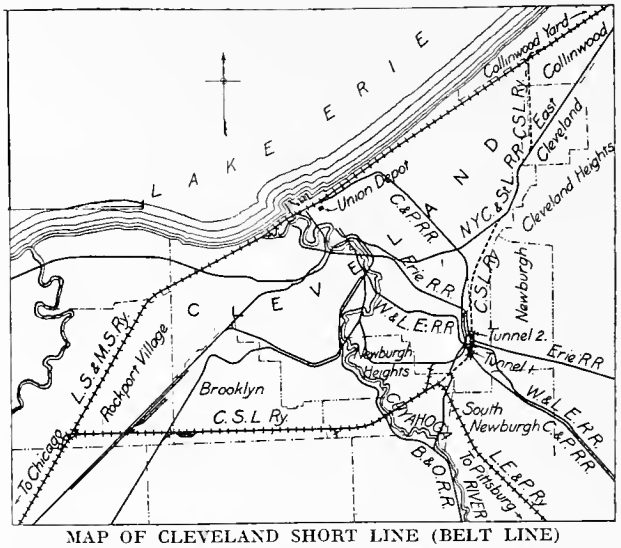
[3]The great expense connected with car floating is shown by the following calculations made on the basis of New York harbor conditions, quoted from Engineering Record, 1911: "A car float 250 ft. long, 37 ft. wide, holds 12 cars, each car in less than carload lots holding 7 tons gives a sum of 84 tons or in carload lots about twice as much, *i. e.* 170 tons. Without the cars the float would have a loading capacity of 1060 tons *i. e.* from 6 to 12 times more than with the cars; each float needs a tug with a cost of maintenance of about $100 per day, while the maintenance cost for the car float is about $20 per day; under these conditions it costs in New York harbor about 40 cents to take a ton L. C. L. across the river."

IDEAL BELT-LINE CAN BE BUILT CHEAPLY IN CONNECTION WITH REES HARBOR PLAN.

The physical situation of the East Bay Cities is especially fortunate because it may with some planning, in a perhaps unique way, do away with the expense and waste of time originating necessarily from both long detouring lines or connection by car floats. All the East Bay Cities have to do is to lay out the plans for the new harbor and for the use of the new land in such a way that sufficient areas are set aside right from the beginning to accommodate the most ample rights-of-way for all the railroad service that can possibly ever be needed. The belt lines of other cities have to run around the cities because there is no possibility of securing sufficient rights-of-way along the waterfront. Their land on the waterfront is scarce and therefore extremely valuable; also the trunk lines that must be intercepted by the belt line run into the city from all directions. In the East Bay Cities all the trunk lines to be intercepted and served by a belt line come in along the waterfront, and at the same time by one of the happiest accidents in city-building, there comes, right handy, cheap land just when it is needed. Especially on the west shore of Oakland, Berkeley and Richmond any amount of cheap land can be had to accommodate efficient rights-of-way with all the necessary additions for yards, storage tracks and other needs of operation, without which a belt line would be worthless or expensive to operate. A belt line thus splendidly accommodated will not have to restrict its connections to the hours between I A. M. and 5 A. M. as is necessary in San Francisco for the State owned belt line in front of the Ferry Building in order not to interfere with the street traffic.

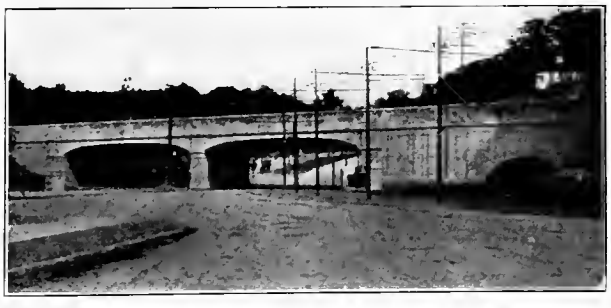
THE NEW CLEVELAND BELT LINE.

In this connection some figures about the new Cleveland belt line (Cleveland Shortline Railway) may be given as being of the highest interest and as showing the newest ideas in belt line construction.[1] The narrowest right-of-way secured for this line is 150 feet; the average width is 250 feet, while the width of the right-of-way in some places goes up to 800 feet. The extremely high cost of $20,000,000 for twenty miles of railroad is caused largely by the advanced state of the city of Cleveland's growth when the belt line was built. The railroad had to be located through busy industrial sections and high class residential districts of established character; in many cases the removal of factories and residences was necessary; in some places it was enormously difficult to carry on the work of construction owing to the traffic on the street and railroad crossings. The grades were separated at all street crossings, in residential parts at nearly every city block. The grades were also separated at all crossings of railroads with the exception of two where it was not feasible because of the advanced state of development. In these two cases, electrical interlocking was provided. In the section where grade separation from crossing streets had to be made at nearly every block, seven miles of road elevation, almost entirely on fills up to about twenty feet high, had to be built. Wherever it was desirable from the character of the neighborhood, especially in traversing parks, the railroad bridges passing over the streets crossed were treated as ornamental bridges in a spectacular way. The maximum grade of the road is 0.3% with one exception where it is 0.74% over a short distance. The maximum curvature is four degrees with one exception where it is six degrees. Thus a practically level grade; easy curves; the elimination of grade crossings; good connections with five trunk lines entering Cleveland at points most advantageous for interchange and outside of the congested area; right-of-way



MAP OF CLEVELAND SHORT LINE (BELT LINE)

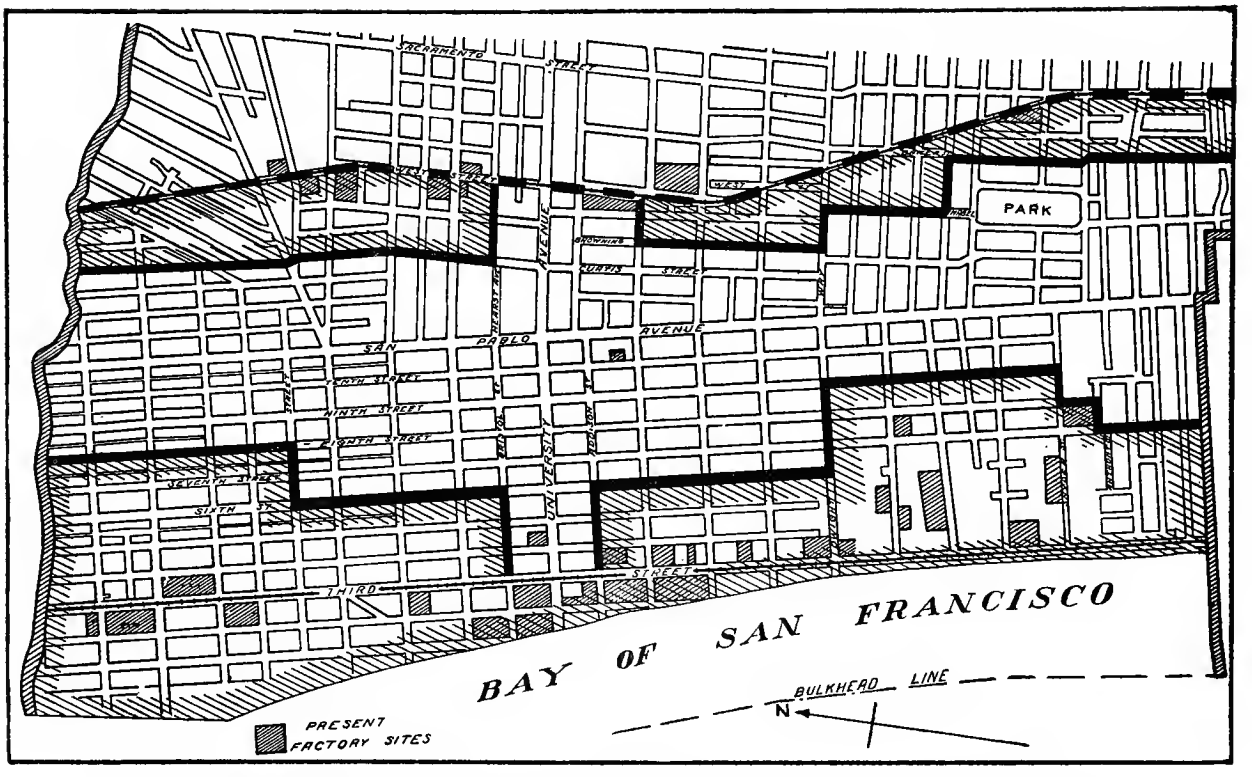
A highly developed belt line, built for $20,000,000, on a new right of way, twenty miles in length, opened for this purpose. This right of way, 150 to 800 feet wide, was designed to accommodate not only main belt tracks but double track trunk switches besides. No street or railroad crossings at grade. The cost of this belt line was enormous because it was built after the city had grown large; also this belt line not being publicly owned, connects only with five out of seven trunk lines. Public belt line for the East Bay cities taking advantage of the waterfront to be reclaimed, may embody all the Cleveland advantages without the drawbacks.



CLEVELAND BELT LINE HAS NO GRADE CROSSINGS

One of the many girder spans treated as arches that were required to avoid grade crossings and obtain good appearance.

[1]These figures were given personally by officials of the Cleveland Short Line Railway and especially by the Secretary of the Belt and Terminal Realty Co., Engineer Ben F. Hopkins; also the Engineering Record of Sept. 30, 1911, contains articles about this belt line pp. 373, 376 and 417.



BERKELEY'S FACTORIES (SHADED DARK) AND SUGGESTED FACTORY DISTRICTS (SHADED LIGHT)
(Suggestion by B. J. Bither, director of Manufacturers' Association, Berkeley)

The necessity of restricting the factories to certain areas specially suited for them is equally acknowledged by the manufacturer who does not want to be harrassed by complaints and by the home-owner who wants to be protected against smoke, smell, noise, and dust. As this map shows, the factories locate along the trunk lines (Southern Pacific on Third Street and along the waterfront; Santa Fe on Sacramento and West streets). This proposal for factory districts takes account of the present location of factories. The wide areas in the west include 1500 acres of mud flats. University Avenue, as the front door or gateway to the city, is protected against factories. The desirability of eliminating the present right of way of the Santa Fe and to accommodate it further west along the waterfront has been strongly emphasized in this Report. Thereby the Santa Fe would develop into a high-grade trunk line instead of having one track only, as at present. The carrying out of the Rees Harbor Plan will give all the land required for ample rights of way. The western factory districts are to be screened off from the residential sections in the east by a chain of parks, parkways, and playgrounds, as described in the park chapter under the heading "Midway Plaisance." There are wide unbuilt-upon areas waiting for this purpose. (Compare maps of building progress in Berkeley and the Frankfort Harbor Plan, pp. 137 and 28.) San Pablo Park would be part of this Midway Plaisance and no factory district east of it would be necessary. By a clear separation of factory and home districts by this park screen, definite impetus would he given to the development of the city.

and facilities ample for all the future may require, were secured at an enormous cost.

FACTORY SITES SERVED BY THE BELT LINE.

In connection with this belt line development, the opportunity for the creation of ideally efficient factory districts was secured. The belt line authorities and their engineer have the final word about the most suitable points for location of new factories according to the probable future needs of belt line service. The special needs of special factories are taken into account in every individual case, insuring lasting flexibility of streets and railroad sites along double track trunk switches not interfering with the main line of the belt railroad. Comprehensive subdivision plans provide for trunk switches to serve every area without pulling on to a main line track. There will never be any crowding of the railroad rights-of-way, no sharp curves will have to be rounded in the switching operations, no switch engines will obstruct the right-of-way, no factory too close to the right-of-way will be prevented from expansion. The mistake is avoided of definitely fixing any trunk switch and the street on either side thereof by leaving that to the time when sales are made; then the distance can be fixed in accordance with the requirements of each concern located on each street. The ideal lay-out of buildings and yards for one concern may require a great length by a shallow depth, while for another concern two or three times that depth would be ideal. The possibility of starting out with a clean sheet suggested the segregation of industries with reference to the character of buildings to be erected and with reference to odors, noise or smoke. One district is to be developed as an "industrial spotless town" excluding foundaries, boiler shops and other factories producing excessive noise, odor or smoke. Such establishments will be accommodated elsewhere. A similar segregation has been proposed in this report (See Harbor Chapter p. 31). It is there pointed out that an undesirable kind of factory district on the west shore would endanger the ideal residential character of the East Bay Cities.

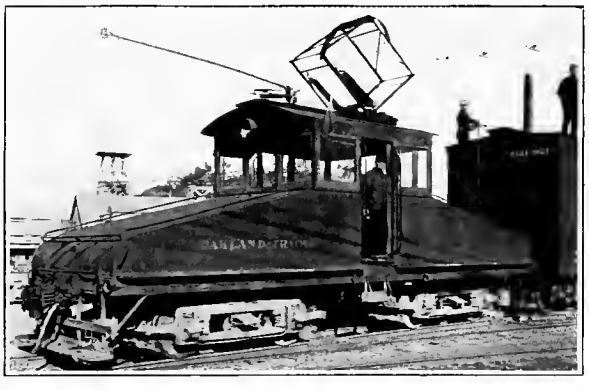
LOCATION OF EAST BAY BELT LINE.

While there will be plenty of room for the Belt Line system along the new filled-in west front, the southern part of the city will present somewhat greater difficulties. But there the harbor plans

of the City of Oakland contain already some embryonic provision for the establishment of a Belt Line. In a series of fifteen leases executed by the City of Oakland to the occupants of the Estuary frontage from the vicinity of Ninth Avenue eastward to the tidal canal, there is a specific provision for a strip of one hundred feet in width (whose location is not completely determined) for the purposes of a belt line or such other purpose as the City may determine. Though this is narrow, less than the narrowest right-of-way secured, for instance, for the the new Cleveland belt line, there still is at least the possibility for a Belt Line system along this frontage, and by perhaps difficult, though possible, negotiations with the various lease-holders and the adjoining railroads, this right-of-way may be extended and carried from where the city's control on Brooklyn Basin terminates, across Broadway to the quay wall, and thence to the 294 acres in control of the city in the Key Route Basin, and to the municipal holdings of Oakland and Berkeley to the northward, if developed in accordance with the Rees plans.

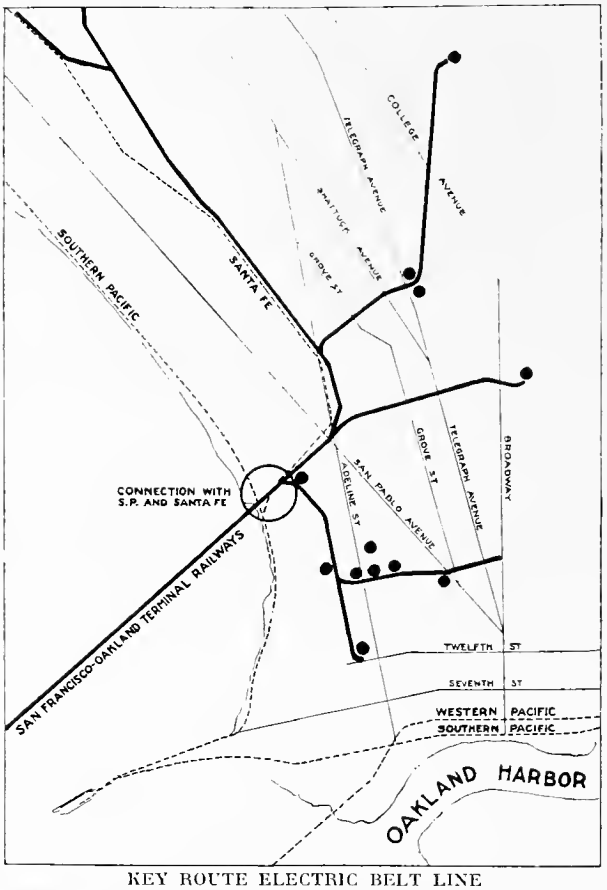
THE ELECTRIC BELT LINE OF THE EAST BAY CITIES.

With California's enormous resources of hydro-electric power, there being still undeveloped, according to the best authorities, from four to eight and a half million horse power, it may be assumed that the electrolization of lines, both freight and passenger, within the borders of the city, will come much sooner in California cities than in eastern cities, where, however, such electrolization is confidently anticipated. In fact, the East Bay Cities have already, without even knowing it, an electric belt line whose efficiency seems to be



ELECTRIC MOTOR OF THE KEY ROUTE SYSTEM PERFORMING VALUABLE BELT LINE SERVICE

destined to grow rapidly to high importance. The electric system of the Key Route, at the present time, performs this function of a belt line to a small degree, transferring freight cars over certain of its lines to team tracks all over town and to a growing number of industrial establishments which are not served directly by spur tracks of the Santa Fe, Western Pacific or Southern Pacific. The provisions in the franchises granted to the San Francisco-Oakland Terminal Railways and its predecessors, in many cases contained provisions



KEY ROUTE ELECTRIC BELT LINE

Map showing the location of the team tracks and private spurs to which the Key Route system gives switching service. Before the establishment of this service a Berkeley shipper, for instance, desiring to transfer his freight from one part of the town to another by way of the Southern Pacific and Santa Fe tracks, had to send it to Bakersfield, the nearest juncture of these lines; later it became possible to make the transfer from the Southern Pacific to the Santa Fe at Stockton. Now the Key Route, within the borders of the East Bay cities, is the intermediary between the two lines. Besides this service, electric switching service will play an important role in realizing a "smokeless industrial" town.

which do not permit of such circulation of freight traffic. No more desirable end can be imagined than that the considerable trackage of suburban and rapid transit lines in Oakland and other East Shore Cities, might be used in conjunction with a municipal belt line for the circulation of freight traffic through the entire industrial district. This circulation would take place chiefly between the hours of 1 a. m. and 5 a. m., at a time when passenger traffic is at a minimum or nil.

The development of the Key Route System as a freight distribution line will be an important item in securing better shipping facilities, especially for the small shipper and for less than carload lots. It is highly desirable to establish a system of collecting and delivering freight by street cars, this to be finally combined with a system of package freight lighterage operated between delivery points along the waterfront and the universal clearing yard which will be referred to later. Successful steps in this direction are made in several cities and strong recommendations to the same effect have followed in others. It takes little imagination to realize what it would mean

ELECTRIC SPUR TRACK OF OAKLAND FACTORY

Served by electric motor switch engines of the Key Route System (compare picture, p. 56). The steel rails bordered by well kept grass; factory and fence nicely planted. If every individual did as much for his house or business place what would a city look like?

if the great department stores, for instance, would receive carloads of merchandise directly into their basements from the surface tracks of the Key System in the early morning hours. This electric street car freight service would help the decentralization of those industries which, by reason of their not being accompanied by objectionable features (such as smoke, noise, odor) can be tolerated in close proximity to the residential districts; this brings them near to the labor supply, a very important feature for many industries. The question of *universal freight houses*, where freight can be delivered from all railroads and received for all roads deserves careful attention. It seems that there should be at least one such universal freight house in each section of the city. They would be best managed as a part of the general terminal system in order to give indiscriminate service to all shippers and roads; they would form an important part of a uniform clearing system.

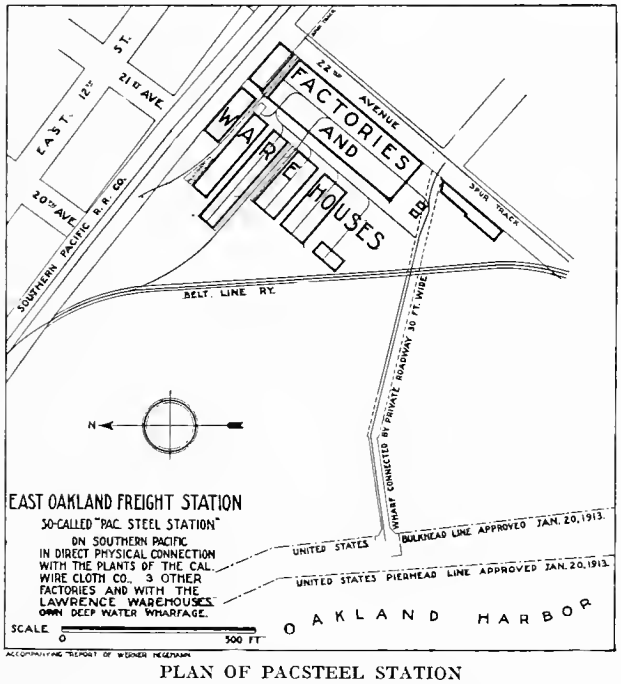
A CLEARING SYSTEM.

The belt line with a well regulated system of collecting and delivering freight in C. L. L. and L. C. L., and with the warehouses just mentioned, is the necessary basis for an efficient clearing system.

At present it is safe to say that over 75% of all the freight on the East side of the bay is handled by the Southern Pacific. The transfer of cars from one of the trunk lines to another does not play any considerable role, and is handled in a most primitive manner by delivery tracks connecting the different roads either directly or through the medium of other trunk lines. In the latter case the switching charges are doubled. As soon as freight business develops, and therefore the development of the trunk lines other than the Southern Pacific progresses, a more elaborate system of clearing the freight will be necessary. The ideal solution of the clearing problem may be considered to be the creation of a clearing yard where the cars from all entering trunk lines are classified, sorted and forwarded to the desired points for local delivery. The ideal location of such a clearing yard is at the focus of all entering trunk lines. Fully developed clearing yards of this kind cover enormous stretches of land, not only hundreds but thousands of acres; their location, therefore, is a very difficult one especially so because not only wide stretches of level land are required, but also because this land must be very cheap. If room is available, a clearing yard should be combined with a universal freight yard for joint use of the entering trunk lines, for the receipt of inbound trains prior to sorting the cars, for local distribution, for making up outbound trains after cars pass for local delivery stations through the clearing yard, for the general storing of cars, care and housing of road and switch engines. The Chicago clearing yard occupies ten square miles with a standing capacity for about 8500 cars. Whether such a combination of yards —on a smaller scale of course—is desirable and possible on the western waterfront; where its exact location ought to be, and what its capacity should amount to, cannot be investigated in this report. Different possibilities are mentioned here in order to show the necessity of an early investigation of the terminal needs in view of reserving in time the large areas required. Another solution of the problem similar to the proposals of the Metropolitan Improvements Commission for Boston, would be to have only the clearing yard itself, in addition to all that is necessary to give proper service to the harbor, in a somewhat central location, while the receiving yards would be located at

PART OF PACSTEEL STATION, EAST OAKLAND

The trunk line tracks pass (extreme right of the picture) outside the well kept hedge surrounding the grounds. The switch service to the warehouses and factories penetrates the entire grounds without interfering with their good appearance. Compare plan below.



PLAN OF PACSTEEL STATION

This station forms an industrial and commercial unit which, though on a smaller scale, is superior to the Bush terminals in New York Harbor in so far as it is in physical connection with the trunk lines. A number of industries and warehouses are brought together with the freight station of a trunk railroad, which accepts and delivers the shipments without further switching charges. This industrial unit has also its own deep water wharf, though not at the very door of the factories.

OUTER WALL OF PACSTEEL STATION

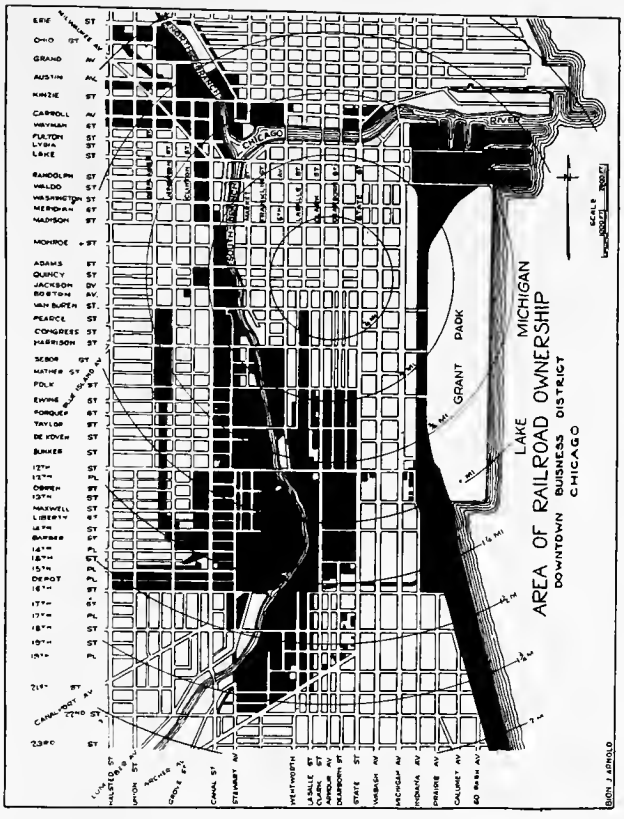
Northeast wall showing the attractive treatment of the California Wire Cloth Company's plant.

the boundaries of the East Bay freight distribution district, that is, in San Leandro and Richmond. The Santa Fe already has its receiving yards in Richmond. The site of these yards will have to be secured at an early date.

PROPER ASSESSMENT OF RAILROAD AREAS NECESSARY FROM CITY-PLANNING POINT OF VIEW.

This latter solution would take into consideration the fact that land along the Oakland and Berkeley waterfront, though it can be created comparatively cheaply at present, still will be too valuable in the long run to be used for extensive railroad yards. The holdings of the railroads in Oakland are already enormous (map p. 44). The Southern Pacific, for instance holds nearly 1000 acres, an amount of land that for the matter of comparison is equal to one-twentieth of the city of Paris proper. The holdings of the Key Route and the Western Pacific are not much smaller. The facility with which the railroads may hold enormous stretches of land without paying taxes corresponding directly to the value of these lands, has created a great danger in many cities, *i. e.* the railroads withhold land that is badly needed for commercial and industrial purposes without being forced by assessments corresponding to the real value of the land to develop it to its full capacity. Comprehensive investigations in Chicago have shown that about half of the land held by the railroads practically tax free is only slightly used or practically unused by the railroads. The method of levying taxes in California, namely upon the gross receipts of railroads, encourages in a way very similar to that in Chicago the inefficient use of much of the railroad property.

A proper system of assessing the land held by railroads inside the city limits is of high importance for good city-planning development. Only proper taxation of their land can force the railroads to develop their holdings in a progressive way according to the rising value these lands gain from the fact of their lying close-in to a big city. Only if the railroads progress with their development from an extensive to an intensive use of their



THE SO-CALLED "CHINESE WALL" AROUND CHICAGO'S BUSINESS DISTRICT

The area shown in black indicates the great extent of railroad-owned property hampering the extension of and causing much congestion in Chicago's business district. Because of the present method of taxing railroad property, it is possible for railroads to hold large areas of land practically tax free. Much of this land is either unused or not used intensively, although it is badly needed for city-planning improvements.

land can a proper city plan be made. If, with the growth of the city and the rise of land values, the railroads are forced to change from a system of extensive to intensive operation, comparatively small areas are sufficient forever.

Under a system of intensive operation every service of operation that can be performed outside on cheaper land will be gradually taken away from these inner highly valuable railroad areas and finally the high value of the inner railroad land will warrant even its development on a two-story basis. Thus with intensive operation satisfactory service can always be given to the inner city, which after having been built up to its full capacity finally must reach a "point of saturation" regarding its traffic requirements.

The enforcement of proper assessment and taxation of railroad areas corresponding to their real value is of high importance also in connection with the service of railroad valuation secured by the State Railroad Commission. The commission at present differentiates between operative and non-operative property of the railroads. For the latter the railroads, *i. e.*, their sub-companies holding the land, have to pay taxes and the railroad is not permitted to include its price in its list of capital expenditures. The Railroad Commission ought to go further, making its decisions from a city-planning point of view: No railroad should be permitted to count any of its city properties as operative that is not developed to its full capacity corresponding to the city land value. It is too easy indeed for a railroad to make its sub-company acquire land at a cheap price, buy it afterwards at a high price from the sub-company, and put this high price into the property valuation as the basis for fixing of rates without giving any development to the land that corresponds to this assumed high price.

NEW TERMINAL POLICY.

The Public Belt Railroad Commission of the City of New Orleans charges $2 per car (initial movement; return movement gratis) for switching on all carload freight between switches, tracks, industries and warehouses on the Public Belt Line and between all connections. This must be kept in mind reading the following paragraph:

Adequately to serve the industries developing and to be developed on the east shore of the Bay will require large improvements over the present condition with respect to transportation charges and facilities. At the present time there is, contrary to conditions in eastern centers, no agent which serves all railroads alike in the transfer of freight at a fixed charge per car. Indeed, the Southern Pacific, being the first in the field, and occupying a strategic position, exacts what is called premium switching charges, in addition to the normal switching charges in case of shipment over other railroads. This is very onerous. The Southern Pacific demands and receives from 7 to 25% of the total freight charge on cars originating in mercantile establishments provided only with Southern Pacific spur tracks and destined for shipment over other lines; in the same manner the other roads, when shipping cars from their own spur tracks over the lines of the Southern Pacific, must pay a similar tax to the latter road. By far the largest number of the industrial spur tracks belong to the Southern Pacific, and this situation acts as a serious handicap against the other trunk lines, practically annihilating competition. The minimum charge for switching, plus premium switching charge, exacted by the Southern Pacific from the competing line, is $7.50. There are cases in which the entire profit of the line that does the hauling goes to the Southern Pacific which enjoys thus a kind of monopoly. This situation acts against the individual shipper only indirectly by making it impossible for the new trunk lines to develop their service and systems. But the individual shipper suffers also directly under the present state of terminal policy: in all cases where he has to ship goods to non-competing points (*i. e.* to points reached only by one carrier), the switching charge of $2.50 for each road he has to cross is not absorbed by the railroad that gets the haul, but has to be paid by the individual shipper. In the case, for instance, of a car transferred from the Western Pacific by

means of the Southern Pacific to the Santa Fe this means an additional charge of $5.00 for the shipper. There is also no absorption of switching charges if the net income to the road that gets the haul is less than $10.00. The solution of these difficulties has been found in San Francisco by the creation of the state owned belt line giving indiscriminate service to all the railroads at a uniform switching charge of $2.50. This makes it possible for the trunk lines other than Southern Pacific to secure business on an equal basis without paying disastrous premium charges to the latter road. New franchises for industrial spur tracks provide that every railroad must be allowed to come in on equal terms provided it pays one-half of construction and operation costs. The impossibility of keeping up the present state of terminal affairs in the East Bay Cities is clearly brought out by the quotation given above from the U. S. Supreme Court decision against the Terminal Association of St. Louis. What happens under the state of affairs ruling at present in the East Bay Cities is described in the quotation from the Missouri court as a danger and as "resulting in compelling the shipper to employ the railroad with which he has switch connections."

PASSENGER TRANSPORTATION BY RAIL

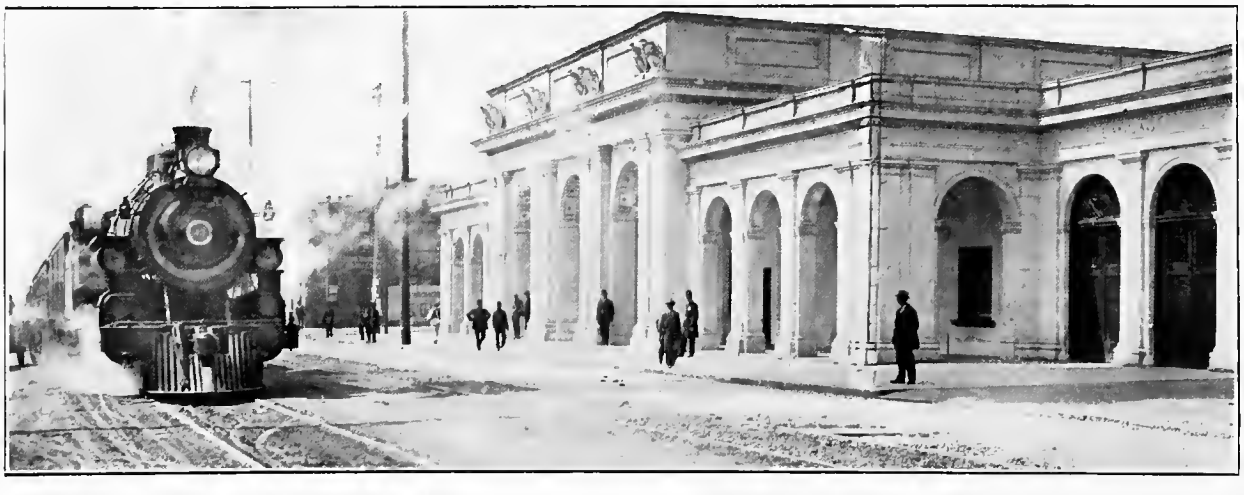
LONG DISTANCE TRAVEL

FIRST STREET STATION OF SOUTHERN PACIFIC, OAKLAND

A regular "through station" (as contrasted with a stub-end terminal) that would satisfy all possible requirements forever, were it not for its running on street level.

The reasons having to do with physical contours were not alone potent in determining the fortunate location of the railways entering the East Bay Cities. Perhaps a still more determining factor was the circumstance that, at the time of the construction of these railroads, except possibly the Western Pacific, the communities on the east shore of the bay were little regarded by the railway builder. His objective was almost solely the city of San Francisco.

This special circumstance, incidental in its character, seems destined to have ultimately most fortunate results. To understand clearly what these results may be, it is necessary to consider for a moment the typical development in great cities elsewhere. In Chicago, perhaps the most typical



WESTERN PACIFIC STATION, OAKLAND. ANOTHER EXAMPLE OF A "THROUGH STATION" ON STREET LEVEL

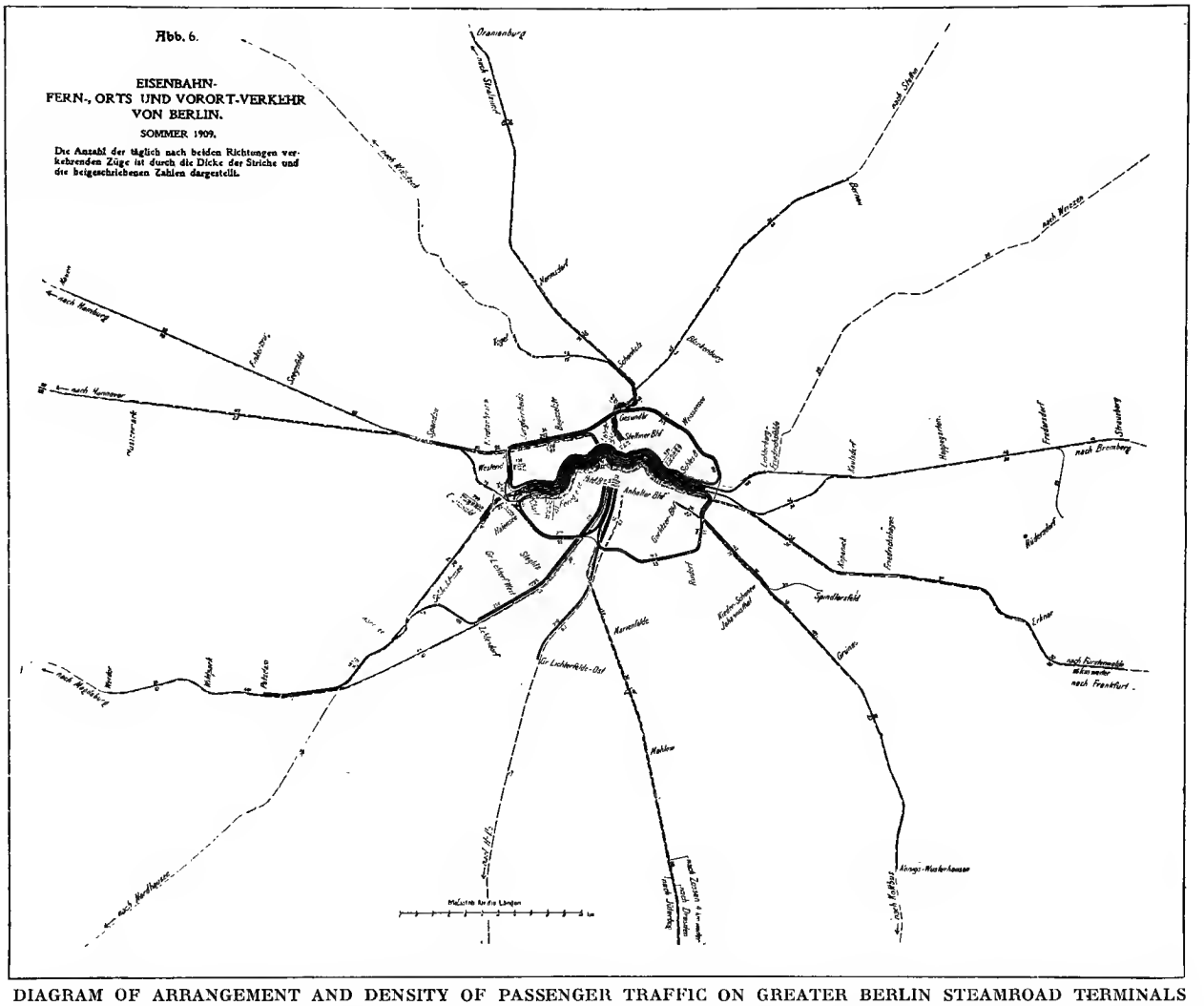


DIAGRAM OF ARRANGEMENT AND DENSITY OF PASSENGER TRAFFIC ON GREATER BERLIN STEAMROAD TERMINALS

The thickness of the lines shows the density of traffic. The very thick line through the center represents one of the heaviest passenger movements in the world. This enormous traffic is handled on four tracks, but by far the largest part—the urban and suburban trains—use two tracks only which, by reason of their being through tracks and having no stubends, are wonderfully efficient. The yards for these through tracks are away from the center. On the other hand, the dead end (stub end) terminals shown, reaching very close to the center, have a far larger number of tracks and in addition very large yards in a central location. In spite of the larger space thus taken by these stub end terminals the traffic handled by them, as shown by the thickness of lines in the diagram, is much smaller. An overwhelming argument for through lines against stub end terminals. This diagram is taken from Professor J. Petersen's report forming part of one of the premiated designs in the greater Berlin City-Planning competition judged 1910 (see note 2, p. 63). The scale of this map represents eleven kilometers, equaling about seven miles. Compare statistics given, pp. 62-3.

case, but not different in this respect from many other cities, railways have crowded forward to as near the heart of the community as it was possible to attain, and there they have established large and constantly enlarging passenger and freight terminals, occupying vast areas of high priced land and gradually forming about the business center what has been called a Chinese Wall that hampers very seriously the expansion of the business center; produces untold economic waste through congestion thus created; and is, in short, a serious malady that it will cost many millions to cure.

The seriousness of the malady is convincingly illustrated by the diagram of Chicago (printed on page 59) showing the land owned by the railways that are permitted to crowd in with their great yards and terminal stations without regard to a plan made for the ultimate welfare of the growing city.

THROUGH-ROUTING EASY IN CONNECTION WITH REES HARBOR PLAN.

Through the curious circumstances which have been outlined above, the cities of the east shore of the Bay can, with proper planning, avoid the transportation ills from which Chicago and other cities suffer. The thing which appears to the leading transportation experts of the world to be an ideal solution for many urban transportation problems, namely, through-routing, the East Shore Cities already have, at least in embryo. The fact that the railroads originally did not make Oakland their objective is a reason for gratitude rather than complaint. Through-routing, the ideal railroad arrangement, involves the establishment of the terminals and great yards, not in the middle of the city, but nearer the boundary or beyond the boundary of the city to be reached by direct lines

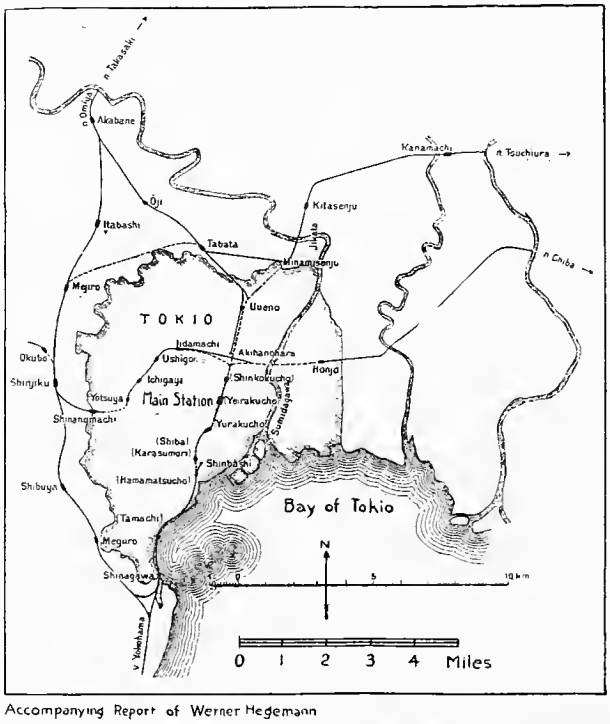
BERKELEY STATION OF SANTA FE RAILROAD

Another "through station" on street level, being at the same time a striking example of an undeveloped trunk line entrance into the East Bay cities. This great trunk line enters Berkeley and Oakland with one single track (for freight and passenger service) as shown in the background of picture and this single track at stations branches sporadically into three. Instead of having an efficient railroad entrance to the Bay cities the Santa Fe must send its freight by car float from Richmond to Oakland, treating Oakland as if it were an island, thereby destroying the advantage Oakland ought to have over San Francisco. On the left in the picture is seen a street car whose conductor, looking out for steam line trains, illustrates the danger of grade crossings which, with increase of traffic, will enforce separation of grades.

across it. Such a plan avoids the congestion of activities about a terminal station within the heart of the city. Instead, the city can be stretched, growing along the entire length of the tracks. Possibility of easy growth is what the city needs, not centralization and congestion.

The present tendency toward a through-routing transportation system in the East Shore Cities will be given an added impetus from the carrying out of the Rees plan for the development of the harbor. By this plan the terminus of the Key Route system will be removed from its present location to a point just north of the Broadgauge Mole, The Key Route has a traffic arrangement with the Oakland, Antioch & Eastern Ry., which in turn has a connection with the Northern Electric, so that trains from the west waterfront now run as far north as Chico and Marysville. It seems logical that the Santa Fe line with its station at 40th and San Pablo, but maintaining a spur running parallel with the Key Route tracks to a point near the junction of the Key Route Mole with the mainland, and thence southerly along Wood and 20th Streets to Adeline Street, will ultimately find it desirable to get a deep water approach in the new Oakland harbor, be it only by entering into traffic arrangements with the Key Route system to use that system's terminal facilities. Thus will be reached a situation which somewhat approaches the ideal described by Milo O. Maltbie, of the Public Service Commission of New York City: "Terminals in central locations should be limited so far as possible. They are costly to acquire; expensive to maintain; and increase rather than decrease congestion. So far as possible the lines should be operated through a city and not terminate therein."

The best known and most successful example of such a through operated railroad terminal is the Stadtbahn, Berlin's through route for steam lines, seven miles long. It has twelve stations. Two of the four elevated tracks are for long distance, and two for local and suburban trains. Long distance trains stop at five of these stations, local and



Accompanying Report of Werner Hegemann

RAILROAD TERMINAL ARRANGEMENT IN THE CITY OF TOKIO, JAPAN

The terminal plan for the Tokio mainlines includes a copy of the most essential feature of the Berlin terminal plan, *i. e.*, the through-routing idea. It was designed by the German engineer, F. Baltzer, employed by the Japanese government for this purpose. So far the plan is carried out only in part. Masonry arches, very similar to the Berlin "Stadtbahn," are built from the south towards the heart of the city as far as Main Station only. The remainder of the connecting links (dotted) is still missing.

suburban trains stop at all. This seven-mile, four-track, twelve-station, elevated-line has earned its reputation of being in principle and practice the most satisfactory example of urban passenger transit in the world. Its practical value is evidenced by the fact that it receives at its twelve stations as many passengers as do all the steam railroads of Chicago put together.[1] Calculations made by the highest authorities in connection with the Greater Berlin city-plan competition, estimate that it would be possible to run daily in each direction 180 long distance trains over the two long distance tracks during a thirteen hour service.[2] The Imperial Government of Japan after a study of the railroads in the big cities of the world has copied for Tokio the Berlin railroad plan. Since the authorities of America and Germany agree on the perfection of through-routing systems, the location of the trunk line terminals on the West Oakland waterfront can be considered as satisfactory. Their combination into a union passenger station as proposed by Col. Thos. H. Rees and jointly operated on the reservoir principle would be a further step towards perfection. From this union passenger depot trains would run towards the north and towards the east along the two main railroad highways, with stops at 16th Street depot, West Berkeley, Richmond and at the foot of Broadway, Fruitvale and any number of stations that will gradually be found desirable, all stations being for joint use.

Union terminals in the heart of the city as have been proposed for instance on Lake Merritt, near the Auditorium, are out of the question. "They are costly to acquire, expensive to maintain and increase rather than decrease congestion." (Maltbie).

The depots at the foot of Broadway and on 16th Street would be too far away from the business district if they had to accommodate the daily suburban traveler, but they are close enough for long distance trains provided the street car connections are satisfactory.

East Bay home protected against interference from railroad yards

HOUSE SKIED UPON A HILL

Showing how the difficulties to be overcome in the upper parts of the East Bay hills are solved by the architect and gardener. The planting is low growing shrubs where the ground is too steep for lawn.

[1]Compare Mr. George E. Hooker's address "The Railway Terminal Problem of Chicago." A series of addresses before the City Club, June 3rd to 10th, 1913, dealing with the proposed reorganization of the railway terminals of Chicago, including all terminal proposals now before the City Council Committee on Railway Terminals. Published by the City Club of Chicago, September, 1913.

[2]Wettbewerb Gross-Berlin, Die Preisgekroenten Entwuerfe mit Erlaeuterungs-Berichten. Berlin, Verlegt bei Ernst Wasmuth A. G. 1911, p. 9.

THE PIONEER OF THE GARDEN SUBURBS

Electric suburban steel car equipment of the Southern Pacific Railroad, one of the typical sights of the East Bay cities, and one of the important factors in East Bay development. The cars are 72 feet 4½ inches in length; gauge, 4 feet 8½ inches; wheel base, 52 feet; direct current, 1200 volt; horsepower, 540; seating capacity, 116. One hundred forty miles of trackage are used by this equipment of the Southern Pacific or by similar equipment of the Key Route. Wide new areas suitable for the building of homes have lately been made accessible by the Oakland, Antioch & Eastern electric line.

SUBURBAN AND URBAN PASSENGER TRAFFIC

Through-routing results in even greater advantage when applied to suburban service. The capacity of through stations is from 25% to 35% larger than that of stub and terminal stations, according to the newest capacity studies.[1] Therefore what has been considered by many observers as a detriment to the development of the East Bay cities, *i. e.*, the fact that the suburban service of the east side of the Bay was built mainly not for the development of the East Bay, but for making connections with San Francisco, seems likely to have ultimately fortunate results, provided the great electric streets of travel leading to San Francisco pass close enough to the different East Bay centers, which need to be connected with each other themselves. This closeness of rapid transit to the business districts is indeed essential to a suburban scheme.

RAPID-TRANSIT IS NOT A DANGER TO LOCAL INTERESTS.

Before discussing this problem, the solution of which is of such vital importance to the East Bay cities, it seems essential in this connection to correct a fallacy that is widely current. This fallacy is that by bettering rapid transit facilities between two centers, such, for example, as the centers of Oakland and San Francisco, or of Oakland and Hayward, or between the center of Oakland and the center of Berkeley, the mercantile interests of the smaller centers necessarily lose to the larger center because of the facility with which people can come to the larger center to shop. This is the same erroneous argument which has destroyed the development of good-sized cities of the early nineteenth century in Germany. Their fear of losing part of their local market by permitting railroad connections to a larger center made them oppose the approach of trunk lines so strongly that the newly built railroads had to pass these cities at a considerable distance, a condition which practically eliminated the opposing cities from the railroad map.

INCREASED SPEED—INCREASED POPULATION.

This fear of improvements in transportation is equally shortsighted when applied to suburban rapid transit. The betterment of rapid transit facilities between congested centers and minor centers upon the outskirts of the community results in a strong and steady outflow of population from the

[1] Arnold's Report on Chicago Steam Terminals, p. 120 f. contains a series of new capacity studies, which give the last word in these much debated matters.

SOUTHERN PACIFIC STATION, SEVENTH AND ADELINE STREETS, 1867

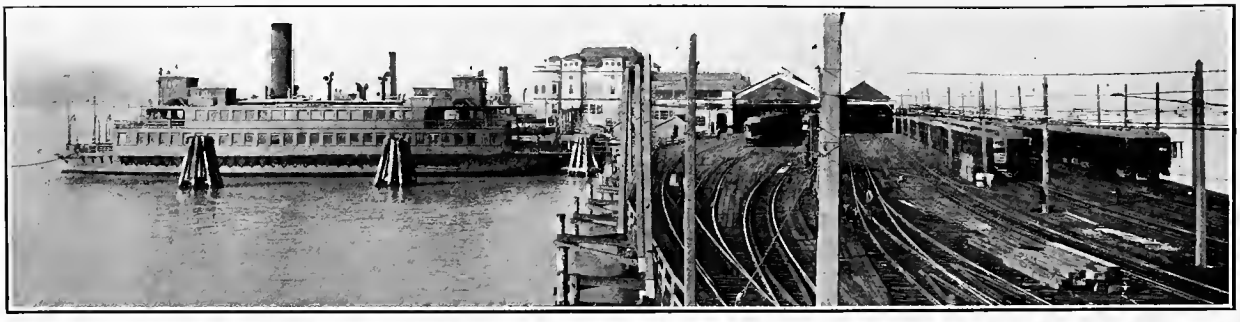
From a water-color by William Keith. This quiet rural scene on the line of the "Seventh Street local" shows what mighty strides the East Bay cities have taken in less than fifty years. Today the Southern Pacific local lines carry some 17,000,000 passengers annually and 1200 electric cars daily enter and depart from the ferry terminal on Oakland Mole.

congested centers toward the outskirts, and the merchant in the outer center, if he is anything like an efficient and enterprising business man, soon finds that for every dollar he loses from the attraction the larger centers offer to shoppers, he gains two through the proximity of a greatly increased population to his own establishment. The progressing standardization of our wants makes it easier from day to day to supply a great many of these wants as well in a small center as in a large one. The fascination which a large shopping center has on the buyer of certain commodities, is out-balanced for the majority of commodities by the convenience of the shorter trip to the shopping place and by the "trade at home" movement. Therefore, if better rapid transit connections between two large centers make it possible for a large number of people to live around the smaller center, it must benefit the smaller shopping center. It is inevitable that should the traveling time between the center of Oakland and the center of Berkeley be cut from thirty-five minutes, as at present, to twelve, fourteen or sixteen minutes, which is entirely possible, the growth of the population of Berkeley would be so immediate and considerable that the Berkeley merchants would benefit largely.

BETTER TRANS-BAY COMMUTATION.

While many Oakland merchants will be easily convinced of the fact just mentioned, they are sometimes still in the old fashioned attitude of fear against good connections with San Francisco. Nevertheless, the same principle may as justly be applied to rapid transit between Oakland and San Francisco. What little loss the merchants of Oakland might suffer, with the traveling time between the center of Oakland and the center of San Francisco cut in half, would be more than offset by the increase in the population of Oakland which would follow. Instead of the old fear of improvements in rapid transit, everything must be done to secure better connections between the different centers. These improvements surely must lead to the development of a great shopping center on the east side of the Bay—one able to compete successfully with San Francisco. After the development of such a large center of retail commercial activities on the east side of the Bay, all the different East Bay communities will be nearer to the center and they will therefore develop with more vigor and rapidity rather than make much slower progress as distant suburbs of San Francisco.

There are, furthermore, specific reasons for improving the ferry traffic across the Bay of San Francisco. This ferry traffic has largely contributed to the building up of the East Bay section and it should still do so in the future, but there is danger that it will not do so if connections are not improved. This danger is clearly stated by Mr.



KEY ROUTE PIER, FERRY BOAT TERMINAL

Handling about 15,000,000 passengers during the year out of a total of 34,000,000 transbay passengers (figures of 1913).

Bion J. Arnold in his Report on the Improvement and Development of the Transportation Facilities of San Francisco.[1] He uses the following words: "That the rapid trans-bay suburban expansion of the past few years cannot continue in the future is shown by the fact that the probable limit of quick transit has been reached over the present system of electric train service through city streets: and as the fare could not conservatively be any lower, the filling up of the suburbs now laid out will tend to determine the future limits of the trans-bay settlement.

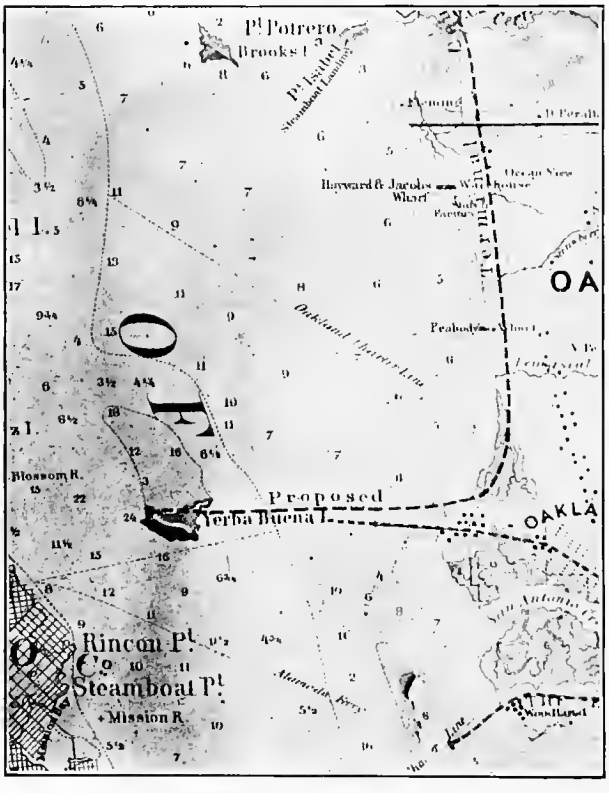
PENINSULAR COMPETITION A DANGER.

"San Francisco, on the other hand, will always continue to be the business and social center and instead of attempting to curtail trans-bay development it should turn to the development of the immense acreage at its *own borders and down the Peninsula.*" Indeed in San Francisco, where the development of rapid transit down the Peninsula is far behind the needs, a promising effort in that direction is now being made in connection with the Twin Peaks Tunnel. If the East Bay wants to keep up with this great improvement it will have to offset it by an improvement of the service across the Bay. The daily migration of the population across the Bay presents no parallel in this country with the exception of New York City. This is all the more astonishing, Bion J. Arnold remarks, when it is considered that none of the trans-bay commuters are able to reach land within twenty minutes of the business center of San Francisco, twenty or thirty minutes additional being required for these commuters to reach their homes in Oakland, Berkeley, etc. The passenger traffic across the Bay amounted in 1913 to 33.839,092 passengers of which 19,340,227 travelled by the Southern Pacific, 14,409,503 by the Key Route system, and 89,362 by the Western Pacific. This vast volume of travel can further develop only if the means of transit across the Bay keep up with the logical development—which necessarily must come—of San Francisco rapid transit down the Peninsula.

GOAT ISLAND TERMINAL PROJECT.

If the Rees plans are carried into effect, and the Key Route with its traffic arrangements with the Oakland, Antioch & Eastern Ry., places its terminals directly north of the Southern Pacific broad-gauge mole in accordance therewith, the Goat Island Terminal plan would furnish the logical method for the shortening of the time of trans-bay travel. It is from the point of view of bettering conditions for the development of the East Bay region that this much discussed Goat Island Terminal plan must he judged.

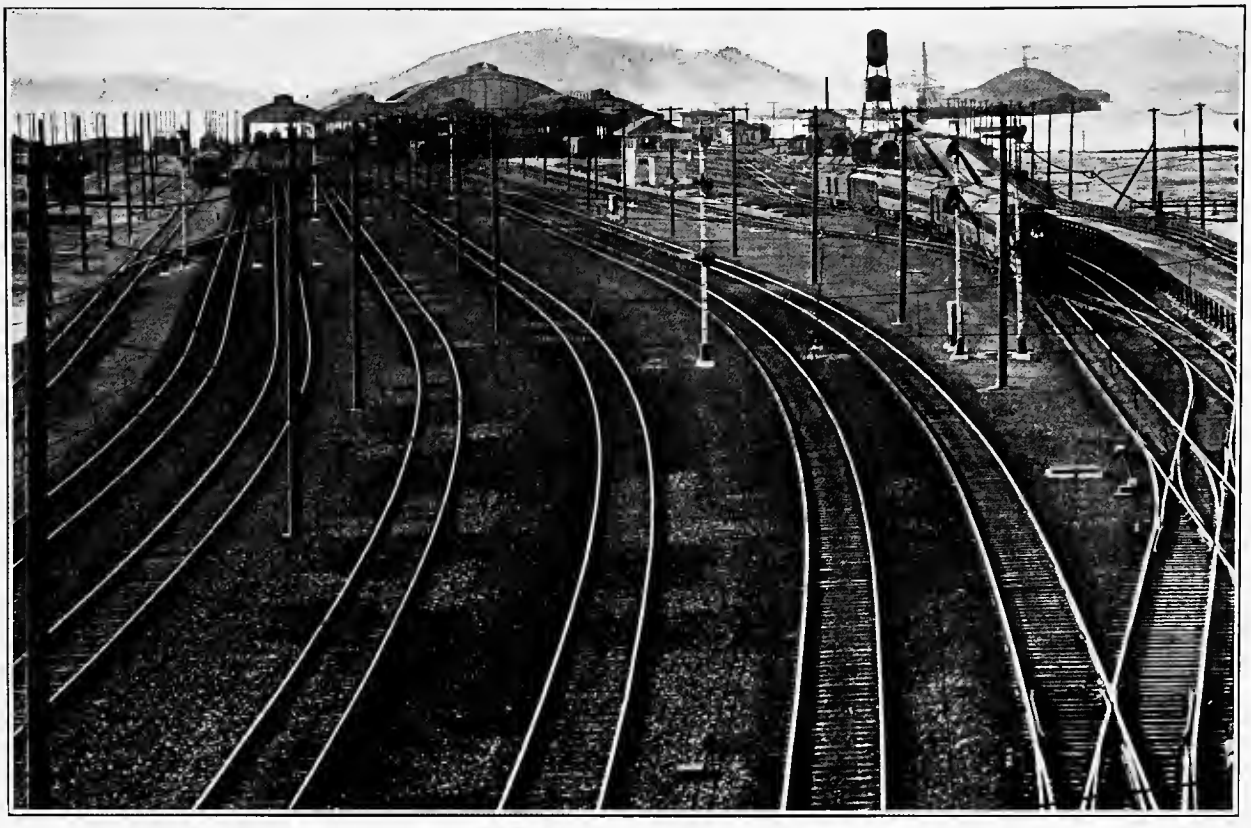
The Rees plan provides a channel 1500 feet wide at its entrance. The plan calls for a dyke 600 feet wide. Col. Rees has, however, expressed the opinion that this dyke can be made as wide as desired without detriment to the harbor, since the



GOAT ISLAND TERMINAL AS PROPOSED IN THE SIXTIES

From the "Map of the region adjacent to the Bay of San Francisco, State Geological Survey of California, J. D. Whitney, State Geologist, 1867."

[1]San Francisco, March, 1913, p. 5. The following quotation refers to traffic congestion on San Francisco streets.

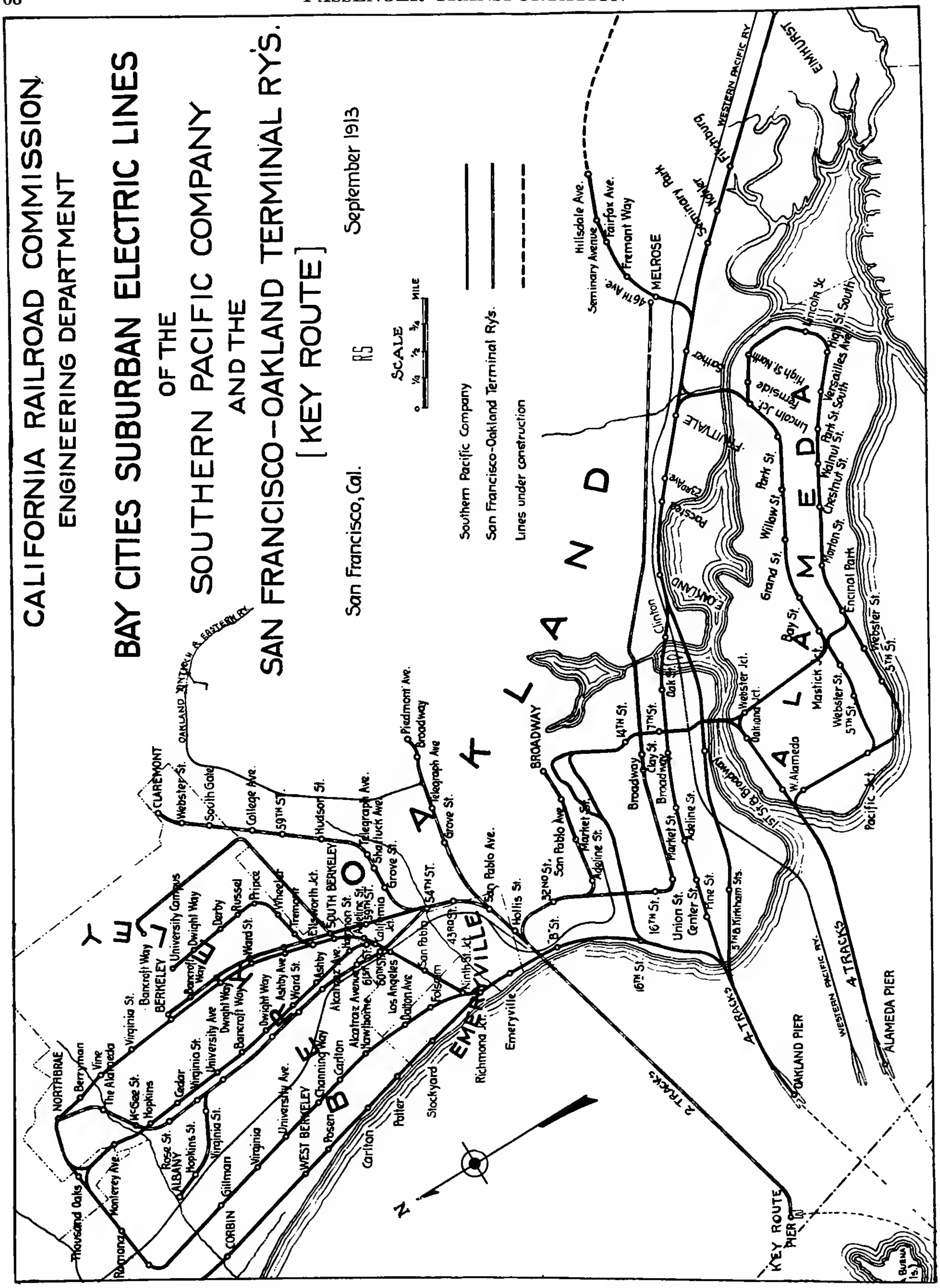


SOUTHERN PACIFIC OAKLAND MOLE

Some study of this picture will give an idea of the complexity of the problems to be solved by the railroad engineer and the co-operation required by him from the city-planner. The daily number of movements directed from the interlocking switch tower, in the center of the picture, is 2260. The highest number of passenger cars handled in one month is 19,232 cars. Beginning at the extreme right of the picture one sees a wagon road, an extra storage yard (in the background) for passenger cars (regular storage is in West Oakland), two main line steam tracks (via Sixteenth Street), four tracks for electric suburban service (in very middle of picture), two main line steam tracks (via First and Broadway), one track (extreme left) to the freight ferry slip, a storage yard for electric car equipment (upper left hand). There are handled daily through this terminal: 635 main line passenger cars, 1200 electric suburban cars, 60 freight cars to Long Wharf (extending into the water in right half of picture; note the masts), 250 cars to car floats in ferry slip. Entrances of ferry boats to terminal slips each way number 53.

channel which now exists between the termination of Long Wharf and Goat Island will be replaced by the harbor channel to be dredged between the end of the broad gauge mole and Pt. Richmond. It is, therefore, a simple and inexpensive matter to widen the southern end of the dyke protecting the Rees channel for a distance of nearly two miles to a point near the shore line of Goat Island, and thus to make it possible to carry the Southern Pacific and Key Route lines on land provided the expensive tunnels under the Rees channel can be built. In this suggestion it is not assumed that any part of Goat Island itself would be used, but that a narrow strip of shallow shoal at present existing north of the island would be filled. The great advantage of this plan would be to divide in half the distance by water between the east and west shores of the Bay. Thirteen ferry boats, costing about $400,000 each, are now in use between San Francisco and Oakland. Their total value is not far from $6,200,000. The plan suggested would either double the efficiency of the boats by dividing the time of transport in half, or would make it possible for one-half the number of vessels to give the same service as at present, with a saving to the railroads of some $3,000,000 when the original investment needs replacement. If the boats of the companies followed each other at five minute intervals a continuous flow of cars could make connections with the boats and, passing through the tunnels, use them to their highest capacity. Under a well organized system of co-operation, two tunnels would be sufficient for a long time. Ultimately, three tunnels might be required. During the rush hours, two of the three tunnels would take care of the loaded trains in the direction of the rush tide, while one tunnel would be sufficient to bring in the half loaded and empty cars which cause less delays.

This Goat Island terminal, only about five or six minutes from San Francisco, with its congested business district hemmed in by hills, would bring to this side of the Bay a larger commuting population than at present. It might, indeed, offset the improvement of rapid transit from San Francisco down the Peninsula, and it would surely make more convenient and accessible the industrial lands controlled by the City of Oakland on the west waterfront. It is furthermore possible that an equitable arrangement might be reached whereby the Western Pacific would also use this union terminal for passenger traffic, em-



By courtesy of the California Railroad Commission *Accompanying Report of Werner Hegemann*

This map shows the remarkable system of suburban electric lines for heavy equipment. The Southern Pacific electric system contains 101 miles of main track, the Key Route 43 miles. This map also shows a few miles of track of the Oakland, Antioch, and Eastern Railway. Street car lines are not shown.

TWO BERKELEY PICTURES TAKEN FROM THE SAME SPOT TWENTY-SIX YEARS APART

Shattuck Square in 1915. On the left Shattuck Hotel, two Southern Pacific suburban electric tracks. On the right two tracks for joint use of Key Route suburban system and street car service. These powerful connections with San Francisco and Oakland, far from having harmed local development, have made possible, first, the building up of Berkeley as a residential city and thereby, second, of the shopping center shown in this picture.

ploying its present ferry terminal solely for freight purposes. The Board of State Harbor Commissioners gives the following recommendations to this transportation union terminal on Yerba Buena Island.[1]

"The Board strongly recommends to the legislature that the United States Government be requested to cede to the State of California Yerba Buena Island, commonly called Goat Island, in San Francisco Bay, the same to be improved and used as a great transportation union terminal, open to all on equal terms. It would be connected with the Alameda County shore by proper bridge and causeway construction, and the ferry service would then extend from the westerly side of the island to San Francisco.

"This great public work has been agitated and discussed, at intervals, for over thirty years, and the time has now come when it should be undertaken and realized.

"The objections urged to the project, when a certain railroad sought to obtain control of it as its own exclusive terminal, of course do not apply to its acquisition and use by the State as a public union terminal, open to all on equal terms, and conducted under public auspices as a part of the State's transportation system in San Francisco Bay.

"This is not the place for extended argument on the enormous advantages to the commerce of the port and the increased safety and speed of ferry passenger service that would follow such an improvement. All engineering authorities agree on its entire practicability and that the cost would be amply and immediately justified by the resultant benefits."

Mayor Frank K. Mott, of Oakland, has expressed his approval of the general idea of a terminal at Goat Island, saying: "A passenger ferry terminal on the island would mean a much shorter trip between San Francisco and Oakland, less time spent on the ferry boat, and consequent reduction of danger to life, and would be a genuine encouragement to people whose business is in San Francisco to reside on the Oakland side of the Bay."

An objection to the Goat Island terminal plan has been stated already (in the Harbor chapter): that tunnels at least as long as the tunnels discussed for the Estuary would be necessary. The very considerable expense of these tunnels, however, could be cut down to some extent by contracting

TWO BERKELEY PICTURES TAKEN FROM THE SAME SPOT TWENTY-SIX YEARS APART

Shattuck Square as it appeared in 1888. The single steamroad track shows the beginning of that railroad system that has built up Berkeley. The picture is exactly in the same scale as the one shown above; note the pointed tower in the center of the picture and which is still seen standing in the upper picture.

[1]Report for the year ending June, 1912, p. 31.

PROPER PLANTING STARTED

Modern traffic street, Brentmoor, St. Louis. Trolley-car tracks on special reservation between two roadways. In this picture are shown the beginnings of planting to screen the tracks and make the street resemble the one shown in the next picture.

the width of the Rees Channel to about 600 feet. This has been discussed in the preceding chapter (p. 41). Another objection that might be mentioned is that the ferries would have to cross the main line of ocean traffic entering the harbor. Colonel Rees, however, in his letter to the Commercial Club, reproduced in *The Oakland Tribune*, Oct. 30, 1913, mentions the Goat Island tunnels as feasible. He says: "A tunnel communication under the harbor channel might also be extended on the dyke to ferry terminals north of Goat Island.

"The island itself is too high and rugged to be available for such purposes, but the shoals north of the island could readily be reclaimed and utilized in this manner."

After the completion of the Rees channel, this danger of the ferries crossing the steamer traffic may diminish because about half of the steamers could use the northern entrance. My personal opinion is that the Goat Island tunnels would be better justified and more useful than the proposed tunnels under the Estuary.

S. P. 14TH AND FRANKLIN TERMINAL.

A strong recommendation for the improvement of the Southern Pacific block between Webster, Franklin, 13th and 14th Streets should be made. In its present state this block is used as a little terminal railroad yard showing on a small scale the harm that originates, as pointed out above, from a terminal scheme instead of through routing methods. If the railroad company could not hold this block practically tax free it would be unable to keep it unimproved, a barricade for the extension of the business district. It is a well known fact that even an ordinary vacant lot, causing a break in the continuity of shops, is a serious detriment to land values. This detriment must be greater still when combined with dangerous railroad crossings.

The Oakland Chamber of Commerce has started a commendable movement for the improvement of the block in question. It will be good policy at the same time to make the railroad company give up the present system of stub end terminals on this block. Instead of terminating in dead ends the different lines passing the station must be hitched together as a through-routing proposition. There is hardly any example of a satisfactory stub end terminal of this kind and where stub terminals exist they are models of how not to do it and will scarcely be copied. There is a single exception in Newark, New Jersey, where the traction interests are planning to spend about $3,000,000 on street railroad improvements, and deliberately enter into the problem of constructing a center city terminal. Most of the experts who have been discussing the matter are yet to be convinced that the steps that are to be taken by that particular corporation will prove to be wise.[1] The Southern Pacific block under consideration would be in the future an important station on the main rapid transit trunk line (elevated) discussed in this chapter (p. 75). A crossing of transit lines in convenient places with comfortable transfer facilities is highly desirable, but any centralization of suburban lines on a terminal plan is costly and creates congestion. It has been stated already that in the suburban service, according to the new capacity studies, the capacity of through stations is from 25% to 35% larger than that of stub end terminals.

BETTER CONNECTIONS BETWEEN EAST BAY CENTERS.

If possible, even more important than the betterment of connections across the Bay, is the improvement of rapid transit between the different centers on the east shore of the Bay. The East Shore cities have unquestionably one of the most efficient suburban transportation systems that exists anywhere in the world in a community of equal population. The primary necessity for swift transportation between the various east shore centers and San Francisco has in some parts of the East Bay provided transportation which can scarcely be surpassed. Four typical examples of

[1]This matter was discussed by different leading traction experts at the 5th National Conference of City Planning, Chicago, 1913. Compare the proceedings, pages 105 and following, especially 121.

PROPER PLANTING ACHIEVED

Modern traffic streets in winter; this scene is in Roland Park, a suburban residential development of Baltimore. It shows the result of planting that effectively screens the tracks of the street-car lines. Compare preceding picture.

the kind of service given, each of a different character, may be mentioned here:

REMARKABLE RAPID TRANSIT FEATURES.

First, the travelling time between Thousand Oaks north of Berkeley and the 16th Street Station in Oakland, a distance of 6.3 miles, is 20 minutes, or a rate of 18.9 miles an hour. This remarkably high speed is due largely to the fact that here the requirements of real rapid transit are actually satisfied; *i. e.*, not only over a portion of this distance do the cars traverse a private right-of-way through streets created by and for the railroad and with almost no cross traffic, but part way they use even the altogether unobstructed railroad highway owned by the Southern Pacific along the waterfront. This is, however, a distinctly San Francisco service and can benefit the relations between Oakland and Berkeley only very little because the business center of Oakland is over twenty blocks away from 16th Street depot. Most of the service given by the Southern Pacific and Key Route is of this kind.

As a second example I mention that the time of travel between the extreme limits of the Southern Pacific electric line at Dutton Avenue in San Leandro beyond the limits of Oakland and 7th and Broadway is 30 minutes for 8.9 miles, or 17.8 miles per hour, a speed which nearly equals that of the best elevated systems of large cities. This also is distinctly San Francisco service, but it benefits the relations between the wide eastern districts and the center of Oakland very materially because 7th Street is the southern edge of the Oakland business center.

Third, the Southern Pacific Alameda and Oakland cars operated on the standard trackage require sixty minutes for the circuit of 10.1 miles from 14th and Franklin Streets around the island of Alameda and back to the point of beginning. This is quite a new service representing a distinct victory of the Oakland business district. The direct outcome is that a large proportion of the out-of-town shopping done by residents of Alameda will turn to Oakland instead of to San Francisco; at the same time Alameda being 10 minutes closer to a considerable shopping center and business district becomes a more desirable "close in" residential district, must build up faster, and develop therefore its own centers more rapidly than would have been possible without this better connection.

Fourth, during the rush hours between 6:09 and 7:54 in the morning and between 4:57 and 5:57 in the evening the street car company runs ordinary street cars as a special express service from the center of Oakland at Washington and 12th Streets to Hayward without intermediary stops by switching the local cars off (at the intersections with cross-town lines) until the express cars have passed. The distance of 14.80 miles is run in 72 minutes. This also, of course, is a distinct Oakland service and a remarkable example of how ordinary street car trackage and equipment can be used for "rapid transit."

THE EXTRAORDINARY RAPID TRANSIT DEVELOPMENT AND ITS NEEDS OF FURTHER DEVELOPMENT.

This all is very remarkable development and the lines mentioned, at least the two first ones, like all the standard connections with San Francisco, though they run on street level, may be called "rapid transit," an honoring term that is reserved ordinarily to service on rights-of-way separated from the street level by elevation, open cuts, or tunnels, thus avoiding all interference by ordinary traffic. The whole East Bay region has developed on the basis of these remarkable high speed lines, be they connections between East Bay centers or rather, as most of them still are, connections with San Francisco. Wide traffic streets with spacious railroad rights-of-way in the middle accommodating not only two, but sometimes four steel tracks; a continual sudden appearance and flying by of those big, vividly colored, sixty-foot steel cars,

often made up into trains sometimes six or more cars long; passing through the streets like herds of gigantic beasts made useful and requiring no cage nor fence; their powerful, far-reaching voices, siren signals which grow from the mellow distance and soften away in space—these all are very characteristic and truly impressive features of East Bay life. These spacious railroad streets are the real streets, *i. e.*, arteries of traffic of the modern city. These streets are the skeleton on which the practically unbroken settlement extending over eighteen miles, or more, along the east side of the Bay, has been built up—a big community which in its whole make-up and texture shows that it has grown after the invention not only of railroads but of electricity.

Here, the railroad, which through serious misapprehension was the *bete noir* of the classically inspired city-builders, has overcome the limitations and redeemed the shame of crowding of the old cities and has secured airy homes and house-gardens to hundreds of thousands.

While thus it is true that Oakland, Berkeley and vicinity have a modern rapid transit system, it is also true that these communities, having been built up by these systems, are very specially and peculiarly in need of such a system, and can develop only if these systems develop. They are extended along a narrow plain, stretching between the Bay on one side, and high hills on the other; and in proportion to their population, the distance to be travelled in order to reach the common center is far greater than in most other cities. The longest street car trip for a five-cent fare in the East Shore Cities is sixteen miles between the San Leandro boundary on the southeast and the terminus of the Arlington Boulevard line of Berkeley.

POSSIBLE IMMEDIATE IMPROVEMENTS.

While the Southern Pacific and Key Route suburban lines provide rapid transit with equipment scarcely to be excelled anywhere, the original planning of these lines to serve the ferries rather than the purpose of transit to the business center of the east shore communities renders necessary serious thought and planning to bring about the highest efficiency of which these lines are potentially capable.

It would appear, however, that with proper pressure by the city upon the Southern Pacific, a few small and inexpensive connections can immediately be made which would permit of a far more efficient service in the East Bay district than is at present available. It is understood that the Southern Pacific Company owns the northeast corner of 7th and Webster Streets, and it is clear that a connection between the east and west 7th Street line and the north and south Webster Street line at this point would permit of the routing of cars from the San Leandro boundary to the center of the city at 14th and Franklin Streets, without the necessity of the construction of more than a few hundred feet of track. A study of the time table of the Southern Pacific shows that this line from near the San Leandro boundary to 7th and Broadway makes a speed of 17.8 miles an hour, which is twelve minutes better than the time of the street cars between the San Leandro boundary and Broadway at Twelfth Street. It is, therefore, apparent that a saving of time between the San Leandro boundary and the center of the city by 10 minutes or over 30% would result from such an arrangement, since from 7th to 14th is only a two minute trip. Experience in other cities has shown that lines which make a saving of this degree draw traffic from wide areas on every side, not only because of the time saved, but because of the added comfort of the faster train and larger cars over the often crowded street cars.

The building of a short connection, a few hundred feet in length, between the line connecting 14th and Franklin with the 16th Street Station on the one hand and the main suburban line from Berkeley to 16th Street Station on the other, would also permit the saving of from 7 to 9 minutes in time between the center of Berkeley and the center of Oakland over the present travelling time on street cars. A still greater saving would be made by residents of the district north of the center of Berkeley along and adjacent to the Southern Pacific line. However, this latter arrangement cannot be regarded as in any wise ideal. The Southern Pacific line from the 16th Street Station to 14th and Franklin Streets is grossly inefficient as a rapid transit line. The distance is 2.2 miles and the time actually consumed is as great as 16 minutes, or slower than the average travelling time of the street cars in the East Bay cities. Some more direct and faster means of transportation between the center of Berkeley and the center of Oakland must certainly be found, and this future problem will be taken up in detail at another place in this chapter (pp. 73 and 75).

THE EAST SHORE-SAN FRANCISCO LINES MUST BE MADE TO SERVE TRAFFIC BETWEEN EAST SHORE CITIES.

The Key Route lines of the San Francisco-Oakland Terminal Railways perform a function only second to that of the Southern Pacific. Unfortunately, however, their service at present is almost entirely confined to travel between East Shore cities and San Francisco. They satisfy in only a slight degree the subsidiary function of serving as well the needs of the business center of the East Shore communities. Furthermore, the Key Route, having been established at a later date, lacks the strategic advantage of such extensive private rights-of-way and franchises over downtown streets, as those which the Southern Pacific enjoys. It appears to be a mistake that the Key Route is prevented from running its standard equipment along 12th Street from Poplar Junction to the east boundaries of the city. The function of streets is to serve travel and the advantages of offering more rapid transit to the entire East 14th Street district would appear to be greater than any disadvantage which might come about from the running of three or four car trains from the

San Leandro boundary westward to Poplar Street. It is of course assumed that were permission granted for the running of such trains, local passengers would be carried for a five cent fare. With the apparently inevitable growth of the business center of the city northward toward its best residence district and the development as business property of the district about 22nd Street, it would also seem most desirable that the 22nd Street line which now terminates at Broadway should be permitted to extend eastward along Grand and Lakeshore Avenues, and along such street extensions as may be made through what is known as the Fourth Avenue district; thence southeastward, tapping the Hopkins Street area, furnishing rapid transit to the district not served by the Southern Pacific electric to San Leandro. This plan involves cutting Grand Avenue through one block to Broadway, a short but very important street opening indeed. In another place has been discussed the advisability of concentrating all main trunk line railways from the north, west of the present Southern Pacific lines, on the filled land adjacent to the Rees Channel, close to the industries to be established on the waterfront (p. 49 f.). If such a plan should prove feasible the future of the present Santa Fe line might well be to provide a third rapid transit suburban service through Richmond to the business center of Oakland. The point at which the Santa Fe crosses San Pablo Avenue permits of various schemes for extension southward by either Union, Magnolia, Chestnut, Linden, or some other of the numerous unused streets to a point within striking distance of the heart of the city.

TO DEVELOP EAST BAY SHOPS AND RESIDENCES ULTIMATE GRADE SEPARATION FOR SUBURBAN TRANSIT NECESSARY.

It can hardly be doubted that the East Bay cities owe their rapid development largely to the excellent rapid transit connection with San Francisco and this rapid development can be kept up only if their rapid transit is kept up not only to the present standard, but somewhat in advance of the desired progress of building. The high speed at which the standard lines of the Southern Pacific and the Key Route are run at present on the street level is possible only because the East Bay communities, especially in their outlying parts, are still far from being built up. All progress in building and every increase in ordinary street traffic is necessarily a danger to the running of high speed trains on street levels. In other words, while improvements in rapid transit will be from day to day more imperiously necessary, every day of building progress will enforce more cautious running, *i. e.*, slower speed of street cars. Rapid connections between the immense residential areas north of Oakland, and San Francisco, can always be kept up by running fast electric trains from the ferries along the waterfront, using the great railroad highway to the north, which necessarily will be always unobstructed. But the connection between Oakland on the one hand and the immense residential areas north of it will be the first to suffer through the impossibility of fast service on street levels.

RAPID TRANSIT BETWEEN OAKLAND AND BERKELEY IMPERATIVE.

It seems absolutely necessary for the continued welfare and growth of the East Shore that rapid transit should be secured and kept up between Oakland and Berkeley and the territory north of it. As has been stated, the travelling time by street car between 14th and Broadway and University and Shattuck Avenues in Berkeley is 35 minutes. The distance is 4.6 miles. This is an intolerable condition, making the development of a shopping center on the East Side impossible, forcing East Bay shopping to San Francisco, and postponing the development of the entire northern area, which might be from ten to thirty minutes nearer a large shopping center. This condition must be remedied. It appears from statements made by officials of the San Francisco-Oakland Terminal Railways that the present plan of running express cars from Hayward to the center of Oakland (by switching the local cars off the main tracks while the express trains pass) cannot be followed on the routes leading from Oakland to Berkeley, because there are at present no, or not enough, switching facilities to cross-town tracks. This deficiency could be remedied with a small outlay of money by creating the necessary side tracks. This should be done immediately and better service temporarily secured thereby. There is, further, the possibility of using streets at present unused for the building of new rapid transit lines, or the opening of new streets for this purpose. There is at present no through-going street connecting the center of Oakland with the center of Berkeley not already used for local street car service. It would need the building of some connecting street links in order to use streets like West Street, Dover Street, Milvia or Fulton Streets for through rapid transit service with no stops between the center of Oakland and Dwight Way or Bancroft Way. The question of opening entire new streets for the purpose of rapid transit will be discussed in the chapter dealing with traffic streets (See p. 86 f.).

The application of the different methods suggested so far for the securing of better connections between Berkeley and Oakland would relieve the present unsatisfactory situation efficiently for quite a number of years until the gradual increase of street traffic, especially of cross-town traffic, cuts down the speed of any line endeavoring to develop high speed at street grade. Meanwhile, new methods of relief must be studied and rapidly worked out. The only possible relief in the long run, *i. e.*, five or ten years from now, will be the creation of a rapid transit highway on an elevated structure. Since a construction of this kind must be prepared for many years ahead, the question of elevated roads in the modern city must be discussed here. Even in California there have ap-

ELEVATED RAPID TRANSIT LINE OVER PARKWAY AT FOREST HILLS, BOSTON

This shows how well an elevated railroad may appear if properly handled by engineer, architect, and landscape architect. Immediately behind this elevated line a well treated steam road overhead crossing may be seen.

peared already in several larger cities advocates of subway fallacy. This is an issue of the first order.

ELEVATED VS. SUBWAY.

The physical conditions in the East Shore Cities with reference to main line and suburban tracks would appear to indicate a general policy looking toward the maintenance of main line tracks at the ground level, and the ultimate elevation of the most important lines of suburban tracks. A hint of this is to be found in recent elevation by the Southern Pacific of its suburban tracks from immediately north of the 16th Street Station to Chase Street between Division and 9th, a distance of 3824 feet, or about three-fourths of a mile. This, the first elevated suburban line in California, suggests the future elevation of the suburban lines of the East Bay cities from time to time as conditions demand it. (Picture p. 42).

The battle between the advocates of the subway and the advocates of the elevated lines has been and is being waged in nearly every great city of the modern world, and from a vantage point it is not difficult to foretell the outcome. Even the most ardent advocates of the subway, even men who have taken part in their construction, are rapidly coming into the camp of those who believe that subways are uneconomical except under extraordinary circumstances. "Construction of subways in a few cities," says Milo O. Maltbie, of the New York Public Service Commission, "has given rise to the idea that every city should have subways, and that all will be profitable. This is a mistaken notion. Subways are easily operated, but they are expensive to construct, and the large cost of construction means large fixed charges. In order to offset this there must be dense traffic or more persons riding short distances. Dense traffic, however, means congestion of population. Areas given over to private houses, each with its own grass plot and gardens, cannot furnish sufficient population to support a subway unless the ride is very short and the rate of fare high." Bion J. Arnold says: "A subway will not pay unless traffic is very dense; consequently from an economical standpoint it is advisable to have subways only in the more congested portions of a city." Henry C. Wright, of New York City, at the National City Planning Conference said: "No city can afford a subway. New York cannot afford one. A subway built in almost any city is such an expensive proposition that you practically are forced to have congestion in order to get enough traffic to pay the carrying charges upon it."

The attitude of the leading German authorities is very similar. The current idea of an elevated road in America is derived from the type of excessively hideous and noisy elevated roads seen in Chicago and New York. But no city need build elevated roads of this type. In Europe it has been discovered that for a little greater cost it is possible to build elevateds with tracks laid on ballast, that are much less noisy, and permit of architectural treatment that makes them not eyesores in the city, but one of its architectural splendors. In America, Boston has shown pieces of artistically satisfactory elevated roads and the West Philadelphia elevated line is well ballasted. (pp. 74-76.)

CALIFORNIA CONDITIONS FAVOR THE ELEVATED.

California has conditions that are powerful reasons for building elevated railways rather than subways. With sunshine nearly all the year, with no snow or ice, the elevated road may be operated for much less than in cities where snow and ice are serious problems in operation and where the subway, for that reason, has some advantages. During a large part of the year, in Chicago and New York, the subway has a certain advantage because of the comfortable temperature maintained in its caves as against the blizzard blasts upon elevated platforms, but no such argument for the subway may be put forward in the East Shore cities. On the contrary, the bad air, dampness and darkness of the subway would only contrast still more sharply with the sunshine, blue skies, wide view, and balmy air that the elevated passenger would for the most part enjoy. In California, at least, the age of caves should give way. The issue today is not noisy, hideous elevateds vs. invisible, noiseless subways, but the congested, expensive, uneconomic subways vs. good-looking, airy, efficient and economic elevated railways.

EFFECT OF ELEVATED ON LAND VALUES.

It is largely assumed that rapid transit lines, either on the street level or upon elevated tracks. decrease the value of property along the streets through which they pass. Such is not the case. To take an example in Oakland itself, it is a fact that the 22nd Street line of the Key Route has increased the value of the property along its course so that the frontage on 22nd Street eastward from Grove is more valuable than frontage on 21st or 23rd Streets.

Richard M. Hurd, in "Principles of City Land Values," says: "Despite the heavy damage paid by the elevated roads of New York it is doubtful whether they injured many property owners. It is certainly noteworthy that over 50% of the property owners affected did not claim damages from the elevated roads, also that the regular scale of damages paid out of court is only $10 per front foot. One beneficial result of the elevated road between stations is in offering shopkeepers along the route an opportunity to display advertising signs and goods on the upper floors. Where the elevated stations are only five blocks apart, as on the Sixth Avenue line in the shopping district from 14th to 23rd Streets, no building being more than 600 feet from an elevated station, the crowds from the different stations intermingle, so that all stores on the short stretch between stations are benefited by the travel."

If the above statement is true regarding the noisy, ugly and dirty elevated roads of New York, certainly a well designed, quiet and cleanly type of structure, following the models of Berlin, Paris and Vienna, should have no bad effect on property values, but rather the reverse. (See p. 87).

The value of the property along the Berlin elevated line increased by 40% during the years 1902 to 1910. Even where the elevated line has been built in an unsightly manner, as for instance the one connecting Philadelphia with West Philadelphia (the line is, however, properly ballasted), the increase of values connected with the construction of the rapid transit line was enormous. The residential area in West Philadelphia directly benefited by the new line increased its assessed values by $138,000,000 from 1900 to 1912. A subway costs from three to four times as much as an equally efficient elevated road. But even so, the price of an elevated road is sufficiently high (being between $300,000 and $500,000 a mile) to prevent its use except where grade separation is absolutely required. According to information from the City Attorney's office of Oakland, there is nothing in the franchises granted to the street car companies to prevent the municipality, or any other corporation, from building an elevated line along the same streets that are at present used by the street car company or the Southern Pacific.

AN ELEVATED CONNECTING OAKLAND AND BERKELEY.

As mentioned before, fast connections between the outlying residential districts and San Francisco can always be made by sending fast trains over the unobstructed railroad highways along the waterfront. But the East Bay region is more vitally interested in securing rapid connections between the centers of these residential districts and the center of Oakland. The need for a rapid transit connection between Oakland and Berkeley on a separate grade will be the first to make itself felt. As a possible route, the following line is suggested: Shattuck Avenue to Telegraph; thence along Telegraph to 22nd; then swinging around the Oakland business district closely paralleling it, by 22nd and Franklin Streets down at least to 7th Street. A single two track structure for joint use by the different companies will accommodate an enormous amount of traffic—as much as is likely to develop for many years.

STATION OF ELEVATED RAILROAD IN FOREST HILL GARDENS, A SUBURB OF NEW YORK

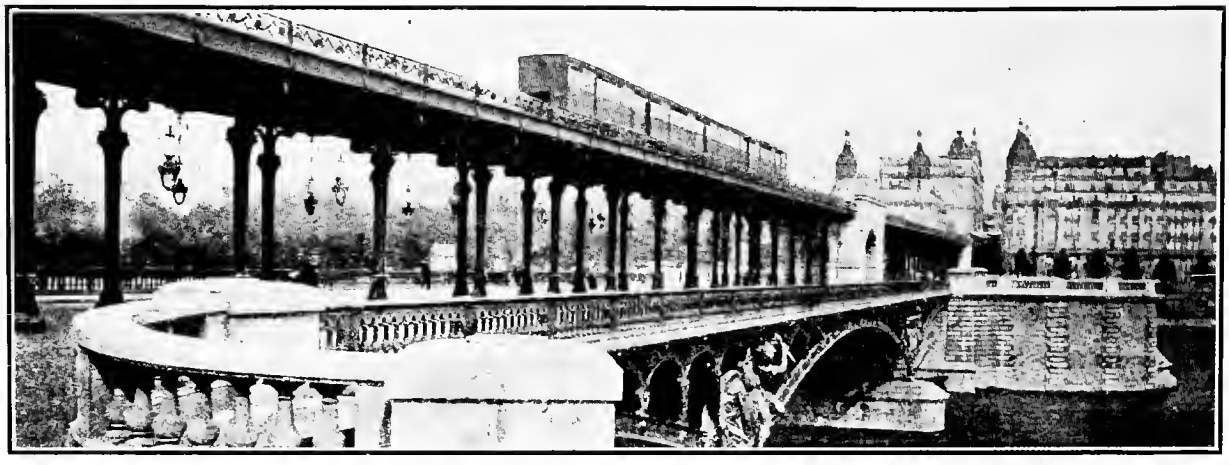
An example of how elevated railroad structures may be made attractive, and what advantages airy and sightly elevated lines have over the caves of the subways.

The advantage of this unobstructed elevated speedway will be such that later, the following arrangement may become advantageous: When the development of cross-town traffic cuts down the speed of the different Southern Pacific and Key Route standard lines like the Ellsworth, the Shattuck lines, and the lines on California and Sacramento Streets, these lines will be able to make higher speed by swinging around on the elevated tracks. This would have several considerable advantages:

First, the whole traffic arrangements destined

PROMENADE UNDER A STEEL-CONSTRUCTED ELEVATED RAILROAD IN BERLIN

Planted on both sides, this railroad through the middle of prominent streets forms an arcaded colonnade agreeable in time of rain or heat.



STEEL-CONSTRUCTED ELEVATED RAILROAD IN PARIS CROSSING A BRIDGE

Showing that elevated railroads, in order to have good appearance, need not be of the masonry or reinforced-concrete type.

for San Francisco would serve the East Bay interests at the same time, and without additional expense; as all Southern Pacific trains from East Oakland and San Leandro on their way to San Francisco pass very close to the business district of Oakland, so all travel from the northeast, east of Sacramento Street would have to touch the very heart of Oakland, giving every traveler the opportunity to choose where to do his shopping. If this arrangement should ever be made, the elevated tracks coming from the north would have to swing to the west on 7th Street.

Second, the feeding of the thus created main artery of traffic, *i. e.*, the elevated structure, would be done by a strong development of cross-town traffic. This would be an especially desirable development since the needs of cross-town traffic at present are very poorly served. In a more distant future, an elevation of tracks on 7th Street to the east, and still later perhaps on San Pablo Avenue for a tapping of the wide northern area, should be considered.

CONNECTION BETWEEN OAKLAND AND ALAMEDA.

The possible ultimate elevation of the Southern Pacific suburban tracks, and the economic impossibility of putting them underground, has to be taken into consideration in connection with the problem of a proper crossing of the Estuary. Some attention has already been given in the chapter on the harbor to the project for a subway between Oakland and Alameda under the Estuary. (Compare p. 31 f. of this Report). In this preceding chapter it is viewed chiefly from the standpoint of the efficiency of the entire harbor, and in the present chapter, therefore, it will be considered chiefly from the standpoint of transportation by rail.

The subway plan which is recommended by such high authorities provides for five separate tubes, three on what is known as the Madison Street alignment for vehicles, pedestrians and street cars, and two entering the Estuary near the foot of Broadway carrying the Southern Pacific trains only. The estimated cost of this project is $10,000,000, an expense to be borne largely by the tax payers of Alameda County, a sum large enough to justify some further investigation of this big project. There have been made two other projects for fewer tunnels, the cheapest of which would cost only $3,000,000, but the latter projects have been discarded as promising no satisfactory solution of the problem.

From the point of view of passenger traffic, it is necessary to call attention to the fact that the proposed tubes for vehicle, pedestrian, and street car service involve a considerably longer course in crossing the Estuary than by way of bridges as at present. In order to reach the great depth of approximately eighty feet below street levels, at which the crossing of the Estuary is made, it is necessary for the tubes to run parallel with the north shore of the Estuary from Webster Street to Madison before crossing. This carries passengers whose business is in the district immediately south of the present bridges several blocks out of their way, and the time consumed is considerable. While an elevator system is included in the plan, not a little time would be consumed in descending to the eighty foot level, even in an elevator and coming back again to the street level.

It would appear that the time lost through the circuitous course and in reaching the level eighty feet below the street would be almost if not quite offset by the time that would be saved by avoiding the delays of bridge openings.

BASCULE BRIDGE.

There is no question but that the present bridges are wasteful and inefficient. The recommendation of the previous chapter is that consideration be given to a single well designed bascule bridge of the most efficient modern type. Such bridges are coming more and more into use throughout the world as may be gathered from the fact that one American company has alone built more than 200 bascule bridges in this and other countries. The grade necessary to reach the requisite height

would begin in the vicinity of Second Street crossing the Southern Pacific tracks at First Street overhead, a distinct advantage over the present grade crossings which are certain to become rapidly more troublesome with the growth of the East Shore Cities. (View p. 30).

The fact has been mentioned already that the streets from the Estuary up to 7th Street and further north rise perceptibly and therefore directly invite to a crossing of the Estuary by bridge, while a tunnel is made expensive because it must make a long approach by reason of this rising grade of streets. Second street is eleven feet above city base. Whenever a general policy of elevation of suburban tracks is carried out the descent of the suburban cars from the elevated structure into the tunnels would be still more difficult.

In this connection, furthermore, the following facts must be considered:

First, it is an open secret that the Alameda Pier as an intermediary for transportation between San Francisco and Oakland is far from being a paying proposition to the Southern Pacific and there is no reason why traffic from San Francisco to Oakland should pass by Alameda when the Oakland pier can very well take care of it.

Second, the Santa Fe railroad has acquired the Adams Wharf and will have to develop a strong car float service between Richmond and Adams Wharf passing under the bridges. Not only, however, could this car float service easily pass without opening under a bridge of sufficient height, but furthermore, as pointed out in this chapter, car float service is very expensive and ought to be replaced soon by the development of an efficient Belt Line.

Third, the main requirement for uninterrupted connection between Oakland and Alameda is expected to come from the development of the Alameda marshes. It must be remembered, however, as has been said in the harbor chapter, that any development that needs absolute and uninterrupted connections with Oakland can settle on the West waterfront. The bulk of the connections between Oakland and the factory sites of Alameda ought to be by lighters and it is to be regretted there have not been provided channels for lighters, cutting up the marshes. The working men in the new establishments in Alameda will have homes, not in the business district of Oakland, but most likely in East Oakland. They will use, therefore, not the bridge on Webster Street, but the bridge over the Tidal Canal where also the freight railroad connections can be made.

Fourth, it seems that all the *future* development can be satisfied without the tunnels; there remain the 8000 people who *at present* live west of Chestnut Street in Alameda, *i. e.*, in that part of Alameda which is served by the Webster Street bridge. These 8000 people would not be able to bear a large share in producing the interest charges on the $10,000,000 tunnels. If these 8000 persons should not be satisfied with a model reorganization of the bridges, it would be necessary to install so-called "closed hours," as in Chicago, where river traffic has to count with the rule that during rush hours the bridges will not be opened.

Under the present state of very unsatisfactory bridge conditions the land east of the bridges has only two-thirds of the value of land west of them. The improvement of the bridges will directly benefit the land east of the bridges and ought therefore, to be largely assessed, on this land. This would be of course still more obviously necessary if the bridges should be replaced by tunnels. It is claimed that this replacement would triple the value of the land. It is doubtful, however, whether the owners of the land east of the bridges would think themselves benefited to any considerable part of $10,000,000, *i. e.*, the cost of the tunnels. A bridge as proposed would cost less than one-tenth this amount. (See pp. 30 f.).

NECESSITY OF A FIRM TERMINAL POLICY BY RAILROAD COMMISSION AND MUNICIPALITIES.

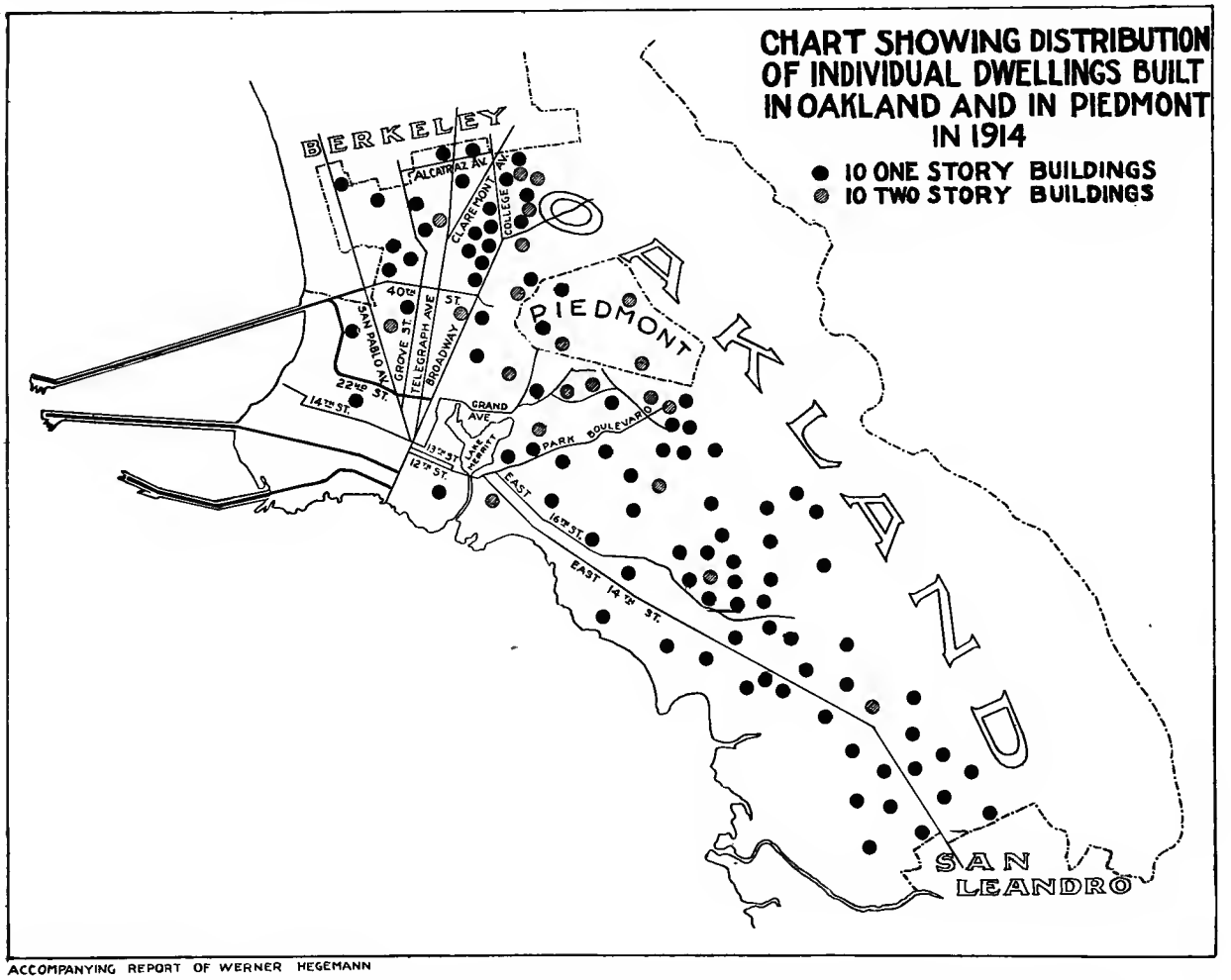
The recommendations of this report necessarily must be of a somewhat general nature since they are based only on a preliminary study. Further and more detailed investigations ought to be started immediately in order to work out a definite plan. A definite plan along the lines suggested must be arrived at very promptly in order to avoid accidents similar to the regrettable granting of the Key Route franchise which bars the harbor development. As soon as a comprehensive plan is agreed upon the cities and the Railroad Commission should grant no more franchises which do not strictly conform to the requirements of the general plan. No ordinance or franchise of any kind should be given to steam railroads or other railway companies unless the ordinance contains definite provisions making the following fundamentals mandatory upon the road or roads benefited by the ordinance: An agreement to cooperate with the other railroads and the East Bay cities in securing comprehensive terminal plan whereby the roads may be systematically grouped with an aim towards highest efficiency through cooperation; this plan must contain the necessary provisions for grade separation where required, for an efficient belt line opening up all industrial areas and giving service to the harbor and all shippers indiscriminately; unobstructed approach to deep water for every road that wants to come in; concentration of long distance passenger traffic; an agreement to co-operate with the other roads in establishing universal clearing facilities for carload and less than carload lots; the acceptance of a just uniform policy regarding switching charges.

NECESSITY OF A TERMINAL BUSINESS ORGANIZATION.

The question regarding the best means of practically carrying out a comprehensive terminal plan needs much discussion and study of analogous examples in American cities and abroad. The belt line and the harbor in San Francisco have set the example of State owned terminal facilities. The new belt line in New Orleans is owned by the city. Also for Sacramento a municipally owned

belt line was agitated last year. On the other hand, every business man knows how highly desirable it is to preserve the commercial spirit in a big business management, especially where big real estate deals are connected with the proposition as in the case in the East Bay Cities. It will make all the difference in the world whether the wide areas reclaimed in building the new harbor and to be served by the belt line are marketed by a public corporation or by an intelligent independent real estate firm. The problem of creating management of big business affairs which shall enjoy at the same time all the advantages of clever private operation with the prestige and cheaper credit of a public corporation has lately been much discussed in Germany.

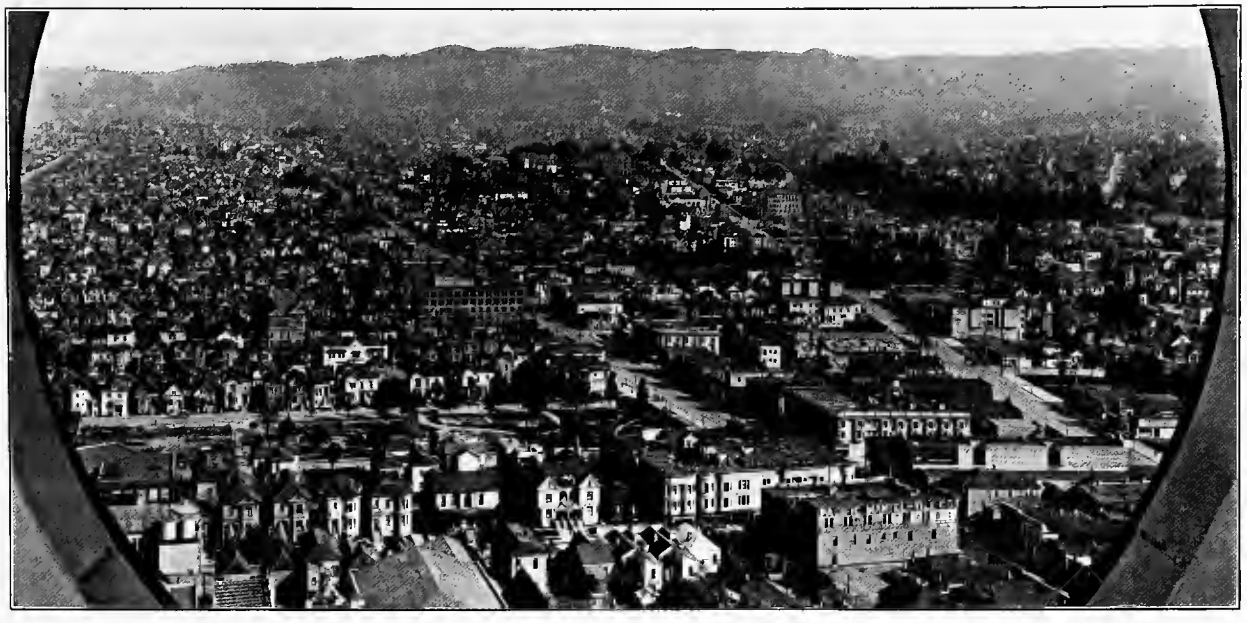
In accordance with the practical and theoretical results of this discussion there may here be suggested the creation of a semi-public corporation (or mixed corporation) in which the East Bay Cities, the railroads and the private investor are equally represented; the management would have to be altogether a progressive business management exactly as in a private corporation. The interest of the public, however, would be safeguarded by a veto power given to the representation of the East Bay Cities and applying only to a limited number of matters of general policy very much along the lines of the supervisory activity of a local railroad and harbor commission; in exchange for securing this veto power, the cities would have to furnish their cheaper credit to the terminal corporation, *i. e.*, a law would have to give power to the cities to issue city bonds against the assets of the terminal corporation. These bonds being highly productive would take care of themselves and would not fall under the borrowing limit. The object of this semi-public corporation would be the securing and carrying out of the best terminal plan and terminal policy that can be gotten anywhere, the management of the harbor, belt line and other terminal facilities, and the leasing of the lands owned by the cities.



ACCOMPANYING REPORT OF WERNER HEGEMANN

DISTRIBUTION OF INDIVIDUAL DWELLINGS ERECTED IN OAKLAND AND PIEDMONT DURING 1914

Each cross-lined circle represents ten two-story houses; each solid black circle represents ten one-story houses. No other structures, such as flats, apartment houses, business or industrial establishments are shown. The diagram indicates the popularity of that part of Oakland lying east of Fruitvale Avenue for bungalow homes. Notice the almost complete absence of two-story houses in this district. West Oakland has become to a considerable degree industrial and few homes of any kind are being erected. On the other hand, a concentration of two-story residences is observable about the head of Lake Merritt and of both two-story and one-story residences in the Lower Claremont district, where the beneficial influence of the Key Route is clearly seen. It is interesting to see, also, how building of dwellings is being stimulated by the Southern Pacific Havenscourt extension and the Key Route, which runs as far as Melrose.



VIEW FROM TOWER OF OAKLAND CITY HALL LOOKING NORTH

Showing the large areas of homes stretching from the Oakland main business center; also the long arteries of main travel sweeping north. In the immediate foreground are to be seen the extremely long blocks which are at present affected unfavorably as regards their residential character by the immediate neighborhood of the extending business district; at the same time they can be turned into business property with advantage only after having been subdivided by a street opening.

STREETS

RADIAL STREETS AND DELIVERY LOOP

THE BEAUTIFUL OLD AVENUE SUPPLANTED BY THE MODERN RAILWAY-STREET.

In antiquity, in medieval times, and until the invention of the railroads, the streets and public places were, except for the waterways, the only means of communication. During these thousands of years of their existence in the cities of the Old World, they have been carried to high perfection. Their beauty was established when the railroads were new and still in a rough state. Therefore, even long after the railroads had become much more important means of urban transportation than ordinary street traffic, they were regarded with great suspicion by many city-planners as infringing upon the previously established standards of street development. Through a curious misapprehension, for a long time it was thought the duty of a true advocate of civic beauty *not* to embellish the city by building railroads that were beautiful, instead of hideous, but to banish railroads altogether, or at least to keep them out of sight as much as possible, thus attempting to handle the problem of communication in the city of today very much in the same way as it had been handled in ancient Rome or in the Paris of Louis XIV or Napoleon III. This tendency was strong not only in Europe, but also in those American cities, the new plans for which were made by men whose training was drawn from Paris. Even today in Paris trolley cars are considered a disgrace unknown to the glorious "city beautiful" of ancient times. A similar attitude may be found all over the continent of Europe. This attitude against the street cars has powerfully influenced the conditions of the cities. While American cities, beginning with the middle of the 19th century, were opening up their surrounding territory by street car lines to the highest betterment of housing and the preservation of larger gardens and parks, in nearly every one of the capitals of continental Europe a successful struggle against transit improvements was organized, which seriously furthered the continuously growing congestion of population in the inner city. Philadelphia, for instance, in the year 1865 had already built 129 miles of street car lines, a mileage that was not reached in Berlin, the capital of Germany, until about thirty years later. This has much to do with the fact that the average population per building in Philadelphia today is 5.2—in Berlin 78. Philadelphia and most American cities are

cities of homes, while Berlin and most European continental capitals are cities of huge tenements.

THE TWO PURPOSES OF THE MAIN ARTERIES OF TRAVEL.

The best possible way of fighting the dangerous and quite antiquated animosity against the railroads is the development of an efficient street system capable of accommodating the indispensable street car lines, and, if needed in the future, elevated railroads also, in such a way that no harm to any legitimate interests results. In inquiring into the legitimacy of the interests opposing the use of streets for street car or elevated lines, it must be kept in mind, however, that the main object of a modern traffic street is, not to correspond to classical ideals developed by ages ignorant of the advantages of railroads, nor to further misdirected hopes of abutting real estate owners, but to take care of the rapidly growing traffic without which the healthful development of a modern city is strangled. It must also be remembered that by far the largest part of this traffic for many years will be handled not in private automobiles nor in subways, but by the means of transportation which, in order to be economic, must be used in common and must avail itself of cheap rights-of-way in the open air, light, and sunshine of the streets. The economic means of common transportation for large masses of people is the street car and, in a more advanced state, the elevated railroad. The development of the street system has as its chief object the accommodation of the great means of common travel, and becomes for this reason a very important and powerful factor in the shaping of a city's destiny.

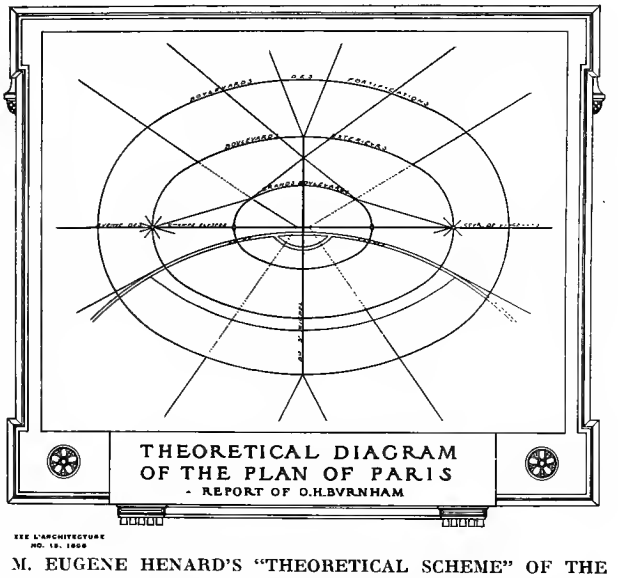
Next in importance to this chief object of accommodating street car lines is the purpose of the street system to create ample fairways for the ordinary vehicles of traffic, especially team and automobile traffic. While the horse team traffic, an inheritance of an older organization of things, is more and more being superseded by direct rail transfers or at least by motor trucks, the automobile traffic is growing rapidly. The recent advances in the automobile industry, combined with a sudden and continuous increase in the number of private machines, restores the individual vehicle to an important role in modern city life and requires special provisions. This automobile traffic deserves special attention, not only because it is growing so rapidly, but also because the fact of its connection with the wealthiest part of the city's inhabitants makes it of special interest to the retail merchant and to the whole character of the retail trade in a business center. The development of the "jitney" emphasizes still more the necessity of careful studies of traffic street requirements.

The danger of approaching the study of the street problem in an attitude that does not do full justice to modern requirements may be shown by a short discussion of an example from the immediate neighborhood of Oakland and Berkeley.

A STREET STUDY ACROSS THE BAY. "THE GENERAL THEORY OF THE CITY" OF SAN FRANCISO.

The most remarkable effort towards producing a city plan ever made around San Francisco Bay, "The Report on a Plan for San Francisco," by Daniel H. Burnham, published by the City of San Francisco shortly before the fire, begins with the pre-railroad basis just mentioned. This report, regardless of the invincible economic objection, banished rapid transit underground because "surface traction renders boulevards less agreeable." After thus having taken away the main object and justification of an expensive street system, this remarkable report says, "A city plan must ever deal mainly with the direction and width of its streets." The report then developes what it calls "the general theory of the city" with the following words: "A study of the cities of the Old World developes the fact that the finest examples—Paris, Berlin, Vienna, Moscow and London—consist of a number of concentric rings separated by boulevards. The smallest of these rings, inclosing the Civic Center—that portion of the city which plays the most important part in civic life—is located at or near the geographical center. This circuit has been named the perimeter of distribution.

"The accompanying diagram shows at a glance this type of city. [Theoretical diagram of Paris referred to later and reproduced here].



M. EUGENE HENARD'S "THEORETICAL SCHEME" OF THE MAIN TRAFFIC STREETS OF PARIS

By this plan the French city-planner attempted to show the deficiencies of the street plan of Paris in that it had no traffic circuit (inner traffic circle) close enough to the center.

"From this inner circuit boulevard, run diagonal arteries to every section of the city and far into the surrounding country. Intersecting in the first place the periphery or outer wall, they traverse in succession the various circuit boulevards, which represent in themselves the successive stages of the city's growth, and finally reach the center or group of centers which in a measure they traverse to

connect with one another and form continuous arteries from one side of the city to the other.

"It is on this study that the proposed system of circulation for a larger and greater San Francisco is based."

The acceptance of this "general theory of the city" in San Francisco, at present the largest city upon the Bay, makes it necessary to investigate the character and value of this theory.

This theory was originated by the French city-planner, Eugene Henard, who, being startled by the growing congestion of the streets of Paris, tried to find an explanation of this appalling condition. M. Henard—a thorough Frenchman, be it well understood—began with the fact that the conditions of communication in Paris are thoroughly unsatisfactory. In order to analyze and make clear their unsatisfactory state he reduced the streets of Paris to a theoretical diagram. This theoretical diagram of unsatisfactory conditions is, very curiously, the same that is represented in the San Francisco city-planning report as the ideal to be imitated. M. Henard then went further; he reasoned that, not having heard so much complaint about congestion in Moscow, Berlin or London, conditions must be better there. This friendly assumption is only partly, if at all, justified. Mr. Henard had never seen those foreign cities, but he assumed that their government and layout, especially the government of Berlin, were thoroughly efficient. Paris, he thought, could cure its own street congestion by copying the city-plans of other capitals where they differed from the Paris plan. It happened, however, that the other capitals, especially those on the continent (the example of London, M. Henard says, is much less clear than Berlin and Moscow), had grown exactly in the same way as Paris; they had been fortified cities for centuries, overcoming only slowly the restraint of their circular fortifications. Circular streets following the fortifications around the congested area were a conspicuous feature in most of them. These circular streets however—and this was forgotten by the French theorist—had never been devised as important means of traffic, but were built after the tearing down of old fortifications, following the line of least resistance over the area freed from military requirements, and were originally designed as pleasure promenades. The only difference between Paris and other capitals was in size. Paris was a big city when the other capitals were still small. The first circle of fortifications therefore, and of streets following them, were large in Paris; in Berlin, Moscow and Vienna the circles were small.[1] The small inner circle of about one mile in diameter was missing in Paris and its absence seemed to M. Henard to be the reason for hearing more complaints about congestion in Paris than in other cities. He thought this inner circle could detour much of the traffic around the congested center. He therefore advocated the creation of an inner circle in Paris and was very confident that this would cure the Paris congestion.[2]

The following objections must be made against the reasoning of M. Henard and his American followers. The recommendation of Paris or even other continental capitals that one hears made so often in America as an ideal for regulation of street traffic cannot always be followed because the physical make-up of these capitals is under the influence of the fortifications and political conditions that do not exist in America. Furthermore, as pointed out in the introduction to this report, the continental capitals have no clearly defined business district, as the Anglo-Saxon cities have, and the whole make-up of their transportation is therefore quite different. In fact, the character of street traffic Henard's theory proposes to take care of is clearly defined by him as a combination of the professional circulation that the businessman in Paris has to make during his business hours, in order to reach the different offices spread all over town and of the fashionable circulation of pleasure vehicles, while the traffic need, by far the most important in the American city, is the connection between the home and the office, a traffic which—strangely enough—Henard says does hardly need to be considered, since it can take care of itself.

AMERICAN ORIGIN OF THE "ROTARY" IDEA.

There are, however, reasons why this attempt to establish a "theory of the city" finds acceptance in America. These reasons lie in the fact that the theory contains two very obviously good ideas, ideas however, which are not derived from the examples of Moscow, Berlin or Paris, but rather from the traffic conditions and regulations of London and New York.[3] The merit of the general "theory of the city" of the San Francisco report and of M. Henard is the emphasis placed on diag-

[1]In London, not having been fortified since the great fire of 1665, circular streets were missing altogether.

[2]If Henard had visited the other continental capitals, or if at least the literature of those cities had been written in French, he would have found that they suffered quite as much from street congestion as Paris, and that the inner circle which seemed so ideal to him was still too large or otherwise unadapted to play the detouring role in the street traffic which is so desirable. His idea about this role was altogether taken from a theoretical study of maps and not from a knowledge of actual conditions or reliable traffic counts. No regulations exist to enforce the use of the detouring circle instead of the shorter cut across the center. The circle being large and affording no time-saving did not of itself invite traffic to use it. Even in his own city of Paris Henard had no actual traffic count at his disposal, but was confined to a very arbitrary guess furnished to him by the police authorities. All that which is deductive in this "theory of the city" has therefore as little foundation as the premises of the theory and is as erroneous as the recommendation of the Paris street diagram as an ideal for San Francisco, particularly since the diagram was made to show the deficiency of Paris conditions.

[3]This fact is not sufficiently recognized. It is interesting to read in this connection the article by Arno Dosch, "The Science of Street Traffic," in the World's Work, Feb., 1914.

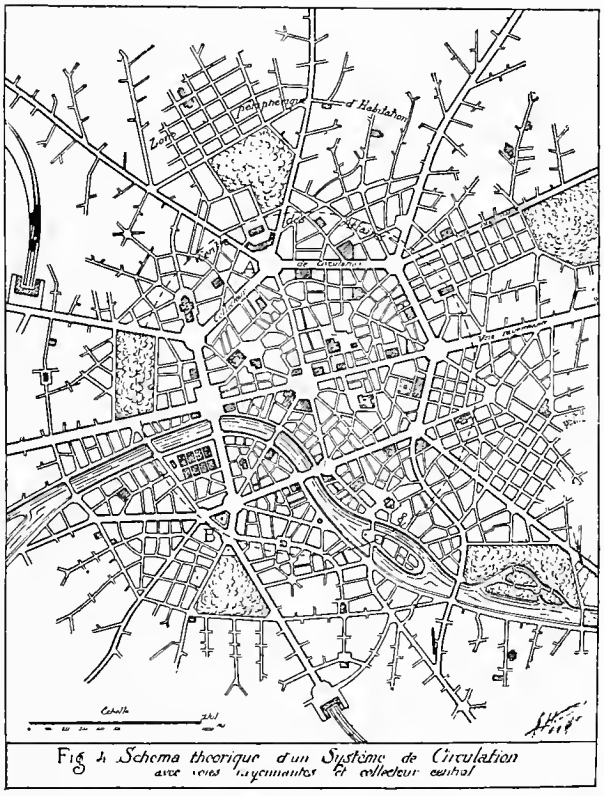


Fig. 1. Schema theorique d'un Système de Circulation avec voies rayonnantes et collecteur central

THEORETICAL DIAGRAM OF A CENTRAL TRAFFIC CIRCUIT (OR INNER TRAFFIC CIRCLE) AS ORIGINALLY PROPOSED BY MR. E. HENARD

onal (or radial) arteries and on the necessity of combining the radial system with a delivery system in the down town or delivery districts. The latter idea is practically an amplification of a well tested New York idea of regulating street traffic. More than twelve years ago Mr. William Phelps Eno of New York had evolved a system of handling traffic at the intersection of streets as a solution of the traffic problem at Columbus Circle in New York. By this so-called rotary system street collisions are prevented by compelling all traffic to go, not through, but around the center where the collision is likely to occur. No matter at what point a vehicle enters or where it is to go finally, it is compelled to enter the rotary stream of traffic and to go sometimes almost completely around the circle in the center of which the danger of collision and congestion would be greatest. This may seem a needless detour, but it has proved to be the only way traffic can be speedily and safely handled. The French police early imitated regulations of this kind. The valuable amplification given to this American idea by the Frenchman Henard is its theoretical application to not only a single intersection of two or more streets, but to the entire congested traffic district of the city; though Henard's proposed circles are too large.

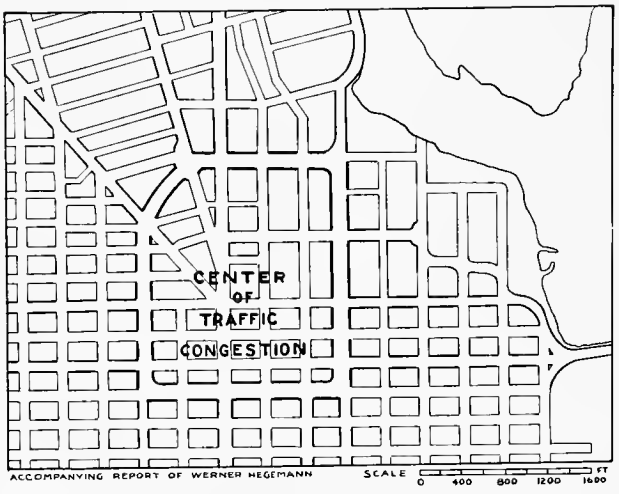
THE "ROTARY" IDEA TRANSPLANTED FROM THE STREET CROSSING TO COVER THE ENTIRE CONGESTED TRAFFIC DISTRICT.

Henard's idea is to forbid any vehicle that wishes to cross the congested center of the city in order to reach some point on the other side of it, to go *through* the congested center. Instead of that he proposes that through-traffic should be *detoured* by a street *around* this center, thus creating a kind of belt line encircling the center of congestion. This belt line intercepts the traffic streams of diagonal (or radial) arteries and acts as a perimeter of distribution, *i. e.*, as their delivery loop. This idea of detouring traffic around much frequented centers is old and has been applied even in medieval city-plans, but the working out and completion of this idea to a clearly defined conception of a delivery system in the shape of a street circle or semi-circle, close around the business district, to distribute the heavy traffic coming in from the radial trunk streets, is new. The idea of preventing congestion in the business district by detouring traffic through a delivery system closely connected with the radial streets represents the valuable part of the French "theory of the city" and deserves careful attention and investigation. The rest of the "general theory" is accidental, and can be understood only in the light of historical reasons ruling the lay-out of old fortified cities and cannot be held up as an ideal for a city growing in absolutely different physical and political environment. This is especially true of what this theory calls "the number of concentric rings separated by boulevards" and the "various circuit boulevards which represent in themselves the successive

THE HEART OF VIENNA WITH THE "RING," A GREAT INNER TRAFFIC CIRCLE OR TRAFFIC CIRCUIT

The planning and building of the famous "Ringstrasse" in Vienna (since 1857) as the outcome of the first Vienna city planning competition is the starting point of the modern city planning movement. On the Ring magnificent palaces, public buildings and business blocks (some of them treated as great units) are grouped along fine planting schemes that change in the different sections of the Ring. Some popular public parks are inserted. The Ring surrounds the Old City, one of the most remarkable collections of refined old architecture. The area thus covered, about 700 acres, is a little too large to be conveniently included in a traffic circuit, making the detour too long; plans for new traffic circuits in other cities must take account of this fact. One mile, the diameter of the Ring, is too much.

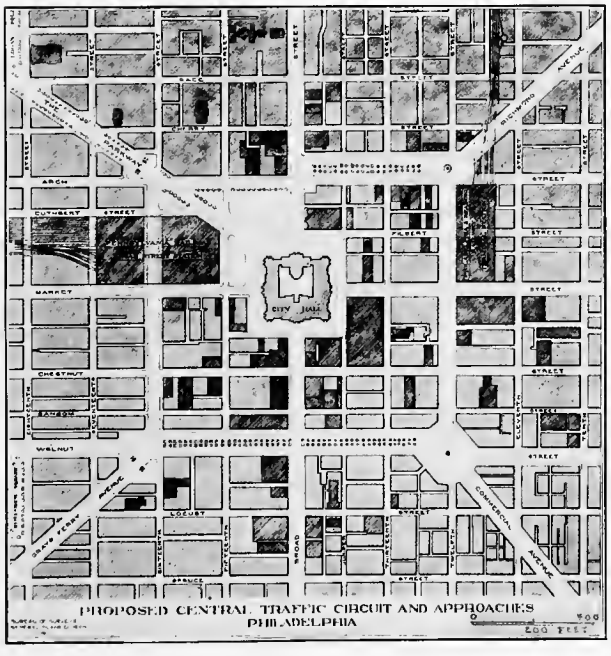
stages of the city's growth." The placing of much emphasis on these circular boulevards is hardly justified under modern unfortified conditions. Concentric boulevards in the outskirts are desirable, but their practicability, as their configuration and location, will depend on physical conditions and they will always carry a traffic that is but very small indeed, compared with the enormous tide of daily travel moving in a radial direction back and forth from the outskirts to the business center of the city. The proper accommodation and distribution of this enormous tide of radial traffic between the residential suburb and the business center is one of the great problems of a modern city-plan. Most cities suffer seriously from an insufficient anticipation of these pressing demands. Either sufficient radial approaches to the business district exist, but, joining in too narrow an area, they develop only a very limited area as a business center, creating at the same time serious congestion in this limited area of junction and not allowing sufficient spreading of the business district; or, again, the lack of radial connections forces traffic into long detours and congests the approaches to the business district because they are insufficient in number. In either case, large tolls must be paid for congestion created by a lack of system in collecting and distributing the radial tides of traffic. The absence of the overwhelmingly important radial connections is the curse of the many American cities that are laid out on a strict checkerboard system. Enormous sums must be expended to cut the missing radial connections through already built up territory. The most striking case is Philadelphia, a typical checkerboard city, where $15,000,000 is being spent at present for a radial connection between the City Hall and Fairmont Park, with a number of similarly expensive projects ahead. By providing radial streets, in many cases distances between two points can nearly be cut in half. Radial streets, therefore, where they exist, are a great asset to a growing city, and wherever they are missing in any part of the street system they should by all means be secured before the progress of building and the development of land values has made it enormously expensive or prohibitive.



THEORETICAL DIAGRAM OF A CENTRAL TRAFFIC CIRCUIT (OR INNER TRAFFIC CIRCLE)

This is based on a street net similar to the street system of the East Bay cities. In view of the rapidly growing importance of automobile traffic, some traffic circuit like this should be developed by a combined policy of street widenings, street openings, street-car routing and traffic regulations.

In San Francisco the Police authorities already have enforced something that resembles a Traffic Circuit by detouring the jitneys at certain hours around the center of congestion at Third and Market Streets, compelling them to leave Market Street at Post and letting them return to Market Street at Grant Avenue.



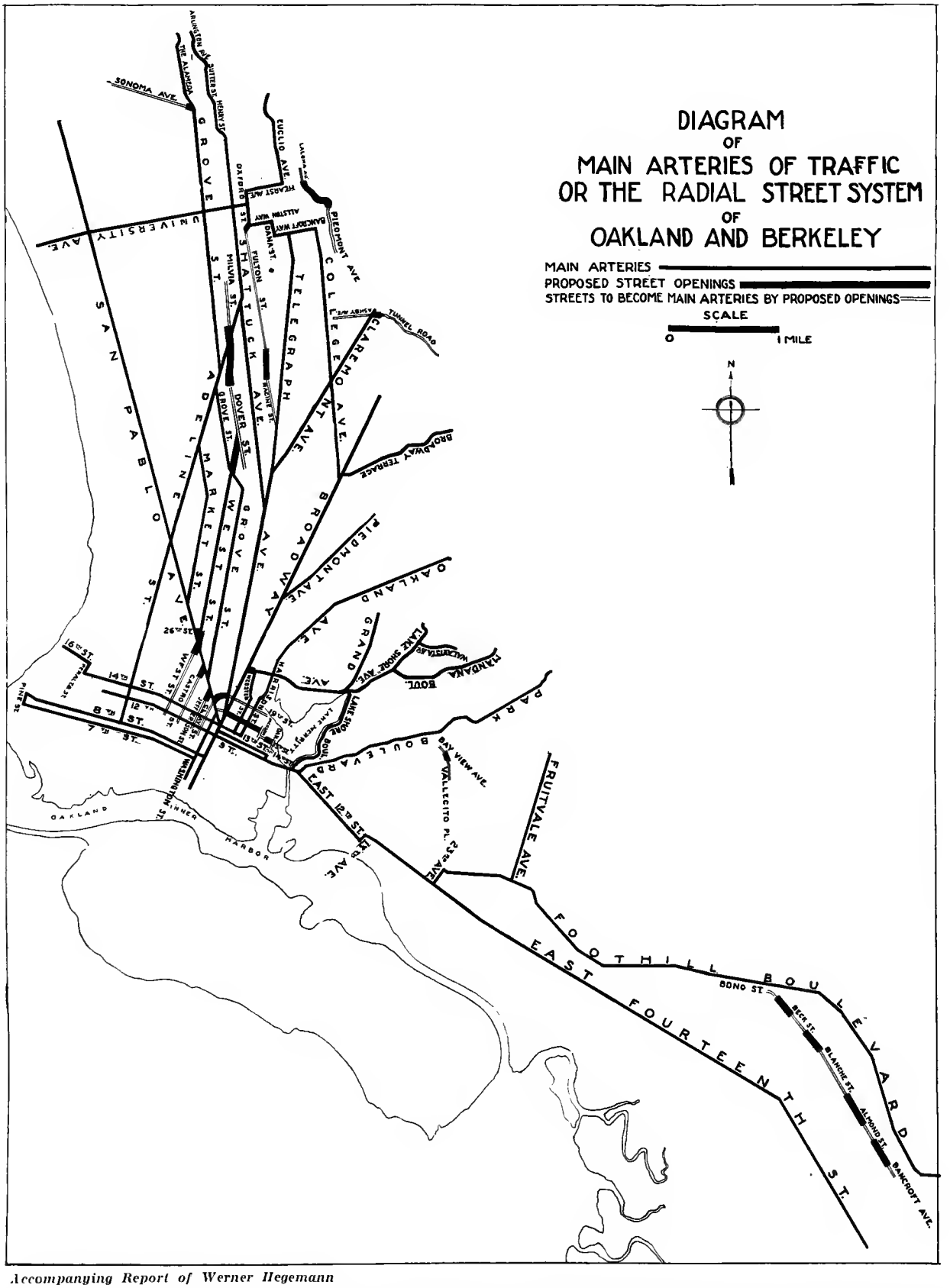
CITY OF PHILADELPHIA—CENTRAL TRAFFIC CIRCUIT AND APPROACHES

Proposed by the Bureau of Surveys of the City of Philadelphia. The Annual Report of this Bureau (1913, page 20) says about this proposal: "Such a circuit would greatly relieve traffic conditions in the center of the city, would break up the present tendency toward centralization and the intensification of the use of land for business purposes, would enhance the value of the property which is now stationary or declining, would aid in the elimination of slum districts and would add a feature of great distinction as well as usefulness to the city." The plan shown above gives the first proposal; its execution has since been blocked by progress of building; the plan had to be changed accordingly. The radial approaches to the circuit as shown in the plan include the famous Parkway, one of the costliest street openings that ever has been undertaken and for which hundreds of buildings have been razed.

THE RADIAL SYSTEM OF THE EAST BAY CITIES.

The map of the East Bay cities, having grown into its present form without any comprehensive preconceived plan, is neither all good nor all bad, but shows in its different parts remarkable features that, by proper planning or by carelessness, may develop either as aids or detriments to the cities' growth.

Radial arteries, which are the essential necessity for the fluid transportation of the street traffic, are conspicuously represented on this East Bay map, and it is not surprising that by far the largest building activities for many years have been carried on close to the common center where these great radial thoroughfares meet. Fourteenth Street in Oakland was the northern boundary line of the district which in the year 1853 was laid out by the surveyor Kellersberger. Kellersberger is



Accompanying Report of Werner Hegemann

The East Bay cities have the advantage of an extraordinarily well arranged system of traffic streets leading towards the center at Fourteenth Street and Broadway. This system has not yet been sufficiently developed and made use of for rapid transit. The connections between Oakland and Berkeley are not as good as the Transbay connections. They must be bettered.

said to have worked in the office of L'Enfant, who designed for President Washington the plan of the National Capital. The plan of the city of Washington is conspicuous for its admirable system of radial streets. Kellersberger, however, had learned little with his famous master, or at least had no occasion to show what he had learned. His survey served only the most primitive requirement of producing saleable lots in square blocks 200x300 feet in size between streets 80 feet in width with the exception of the main street, Broadway, which is 110.2 feet wide. But immediately north of this survey this wide main street was joined by two natural highways, San Pablo Avenue connecting Oakland with San Pablo, and Telegraph Avenue following a telegraph line. The extension of Broadway to the north was laid out at a width of 100 feet, (with the exception of the part between Fourteenth and Fifteenth Streets where it is only 90 feet), San Pablo Avenue is 100 feet and Telegraph north of Twenty-second Street is 100 feet in width (between Broadway and Nineteenth street it is but 80 feet, between Nineteenth and Twenty-second, 90 feet). By these radial streets, the entire northwestern section of the huge East Bay area is opened up in a remarkable way. But all these main arteries meet in one single junction, a situation that has developed the land around this junction rapidly, but which, without proper planning, must very soon bring about serious danger of congestion at this single point; in fact, it has already begun to do so. In order to realize fully the danger, the streets joining in practically a single point will be named in their natural order:

From the west waterfront comes Fourteenth Street, an important street, but needing a rearrangement of its jog at Market Street. The next great radial artery to the north is San Pablo Avenue which extends in an almost absolutely straight line, at its original width, for about eleven miles to and beyond Richmond. This is one of the most remarkable radial streets to be found in any city. Twenty-five degrees further to the north, Telegraph Avenue stretches its 4½ miles of nearly unbroken length almost due north. Only fifteen degrees east of Telegraph Broadway extends for 3½ miles northeast.

But with the streets just named, the remarkable and already dangerous junction of radials at one single point is not completely shown. San Pablo Avenue intercepts the northern traffic of many sub-radial streets, the most important of which are Adeline, Market, West and Grove Streets, all 80 or more feet in width. Telegraph Avenue intercepts Shattuck Avenue and a large number of sub-radials from the east, the most important of which is Claremont Avenue. Broadway intercepts the traffic of a still larger northeast district, the main sub-radials being College Avenue from the north and from the east the traffic of all the streets north of Nineteenth Street. It also drains some part of the Grand Avenue traffic and most of the traffic of Harrison Street and Oakland Avenue, Piedmont Avenue, Grand Avenue and their many hill connections like Lakeshore Avenue and Mandana Boulevard. The existence of Lake Merritt fortunately deviates some of the northeastern radial streets from their course towards the point of junction near Fourteenth and Broadway and shifts their main entrance to the business center south at Twelfth Street. But even so, Lakeshore Boulevard and Park Boulevard, the down town end of which comes by way of Athol Avenue into Lakeshore Boulevard, largely drain into Fourteenth Street. The same is true of all the territory south of Park Boulevard down to the Inner Harbor and Tidal Canal, including the traffic of important radials like East Fourteenth Street and the Foothill Boulevard, which after crossing from East Oakland to West Oakland by Twelfth Street drain at least a part of their traffic to Fourteenth Street and to the dangerous point of junction under consideration.

DEVELOPMENT OF RADIAL STREET SYSTEM ESSENTIAL TO EAST BAY SHOPPING AND RESIDENTIAL AREAS.

It has been pointed out, in the chapter on Rail Transportation, how highly desirable it is for the development of the whole East Bay region that there should be built up at least one powerful business center, strong enough to compete at every point with the shopping district of San Francisco, bringing thereby all those communities on the East Bay that at present are tributary to San Francisco, closer to a life-spreading center of activities and to the advantages connected therewith. It has further been pointed out how this development could be and ought to be encouraged by determining the policy of the different suburban railroad systems. It must be the object of this chapter on traffic streets to discuss the treatment of the street system necessary to further this development.

COLLECTING AND DISTRIBUTING THE TRAFFIC.

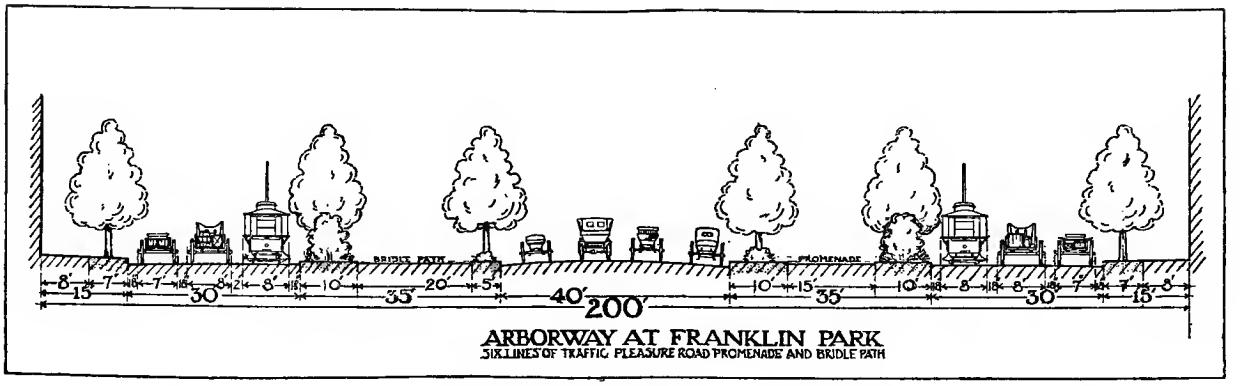
This treatment of the street system must have two objects; the first is the collecting of the traffic originating all over the East Bay section and bringing it to what is called the delivery district, *i. e.*, the district of work, shopping and amusement; the second is, after the traffic has thus been collected, its easy handling and distribution inside the delivery district.

The description of the radial system which has been made shows that the fundamental requirements of radial streets are satisfied in a quite surprising way. The attention in this direction, therefore, will have to center mainly on minor improvements and on the proper care of the great radial system already existing. The minor improvements call for a number of small street openings providing connecting links which are now missing; proper care demands the maintenance or provision of sufficient widths, sub-divisions, paving and planting of the radial streets.

PROPOSED STREET OPENINGS.

WEST STREET.

Regarding street openings: the southwest sec-



ARBORWAY AT FRANKLIN PARK
SIX LINES OF TRAFFIC, PLEASURE ROAD PROMENADE AND BRIDLE PATH

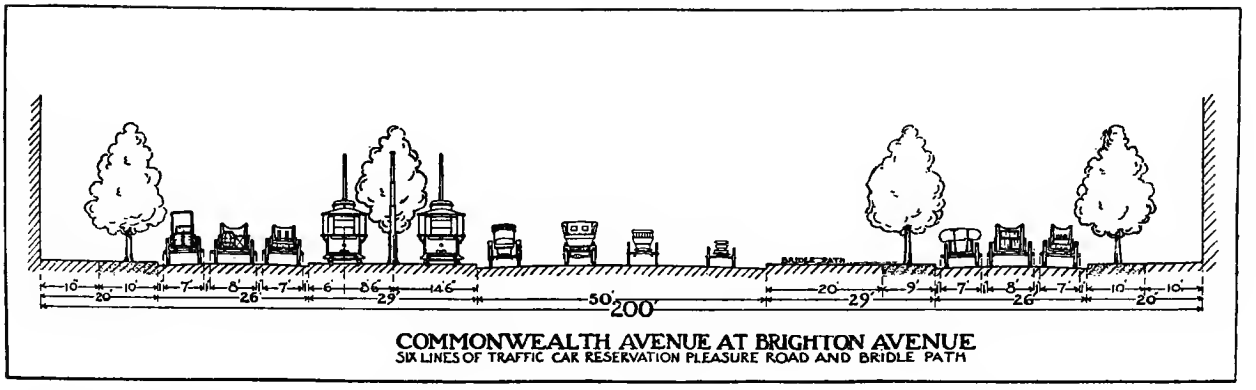
tion of Oakland has no radial connection with the center around Fourteenth Street and Broadway. Some inconvenience will result from this lack; the distance between Fourteenth Street and the waterfront, however, is so short that the cost of a radial street would not be justified. The connection of Grand Avenue with Broadway has already been mentioned as a short but important, because a strategic, opening. The extension of Jefferson Street and Castro Street will be dealt with in connection with the problems of the delivery district, while the opening of West Street across San Pablo Avenue must be dealt with here. This opening of West Street ought to be considered an important move in building up the street system needed for the development of a shopping center on the east side of the Bay. West Street at present is the only northern avenue without street car tracks; this street, therefore, may become a line of least resistance for creating an express service between the northern district and Oakland's center. By using either trackless Eleventh Street or that part of Thirteenth Street that has no tracks as yet, a long passage through the heart of the business center can be secured. After having made stops like ordinary street cars the express service would follow West Street to the north without further stops before reaching Berkeley. On reaching Forty-Seventh or Fifty-Third Street connections with Genoa, or better, Dover Street, and thence with Fulton or Milvia Street, to the north could easily be secured. If Fulton Street is selected either it must be cut through from Allston Way to Home and Walnut Streets, or Fulton Street must be connected with Oxford Street by cutting off a part of the unbuilt-upon (southeast) corner on Fulton Street and Allston Way. This latter course (connection of Fulton with Oxford Streets) seems preferable to me; it is advisable, however, only if Oxford Street will be sufficiently widened as recommended below (p. 97). It is of course assumed that the extension of West Street, providing physical opportunity for a rapid transit line, would prove attractive to either the Southern Pacific or the San Francisco-Oakland Terminal Railways. To assure such a rapid transit line, the cities of Oakland and Berkeley would necessarily hedge about any franchise that might be granted over the new street with careful provisions as to number and locations of stations and rate of speed to be maintained: otherwise the line might degenerate into an ordinary street railway. This franchise ought to be especially strict in regard to forbidding stops for about three miles and only after a better system of rapid transit (perhaps by the elevated line discussed in the previous chapter) has been secured, would the West Street surface line be turned over to ordinary local street car service. A similar service in accommodating a new rapid transit line might be played by a street opening connecting the present north end of Clay Street with Dover Street. This opening involves other questions and will be considered later on (p. 92 f.).

EAST TWELFTH STREET.

Another important opening of a radial street will be the connection of the different limbs of East Twelfth Street and its linking up with Tevis Street, Hawley Street, Blaine Street and further continuance to the east. Streets like Beck Street, Blanch Street and Bancroft Avenue in East Oakland ought to be connected into a continuous radial line. The same is true of any series of streets able to open up the country in a radial sense. In no street opening in the future should this point be lost sight of. In Berkeley a linking together of the radial system may become necessary in the eastern part of the Campus of the University where an artery at an easy grade should connect with the northeast extension of College Avenue or of Piedmont Avenue. The more local problems of Berkeley traffic streets will be touched upon in a special paragraph below (p. 95 f.).

WIDTH OF MAIN TRAFFIC STREETS.

It will be very important to insure a proper width for all radial streets. There is hardly a single street in the whole East Bay region which can be compared in width with the big arterial roads created in some of the European capitals and which have become a standard object of admiration for the Anglo-Saxon visitor, not to speak of historical streets like the Champs Elysees in Paris, 230 feet wide, and Unter den Linden in Berlin, 193 feet in width. The measurements of a new street, Kaiserdamm in Berlin, may be mentioned here as an example; this street is 180 feet wide; each of two sidewalks with their



ARBORWAY AND COMMONWEALTH AVENUE, BOSTON

American examples of wide and highly subdivided main arteries of traffic. They are missing altogether in the Bay cities street system.

spaces for grass and trees is 18 feet; parallel to each sidewalk are two roadways 18 feet in width for slow traffic; in the center is the main roadway of 36 feet and between the main road and the two slow roads three more spaces for trees and grass, a bridle pathway 18 feet in width and a special grass planted reservation of 36 feet for street cars is provided. The question of width for main traffic streets was lately most carefully considered by the Dusseldorf authorities, in connection with the recent town planning competition, and after much deliberation they definitely advocated the following type of road, viz: a central street car reservation (16 feet), promenade with trees on each side (12 feet each), a roadway of 18 or 24 feet on each side and sidewalks with tree reservations of 18 feet each. This gives an entire width of 112 or 124 feet. The street car tracks in the center are separated by hedges from the promenades (see p. 88).

MAIN TRAFFIC STREETS AS FUTURE CARRIERS OF ELEVATED SPEEDWAYS.

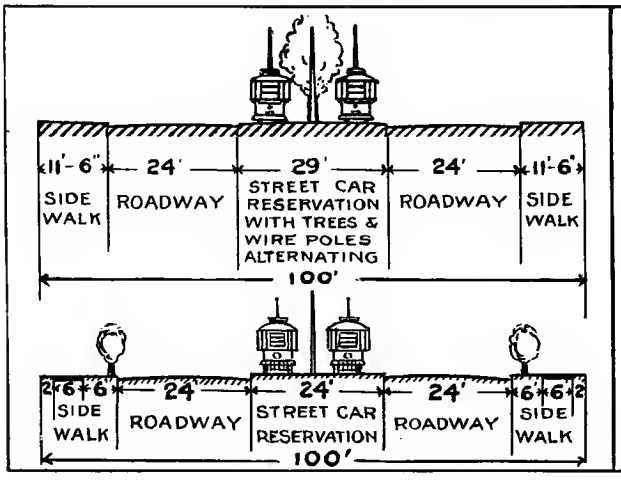
It would be practically a hopeless undertaking to attempt any general widening of the main radial arteries in the East Bay district. There are a few examples of very wide streets, but only for short distances, the most remarkable being Adeline Street in Berkeley with a width of 180 feet, and Shattuck Avenue with varying widths reaching in some parts 133 feet, 157 feet and 166 feet. These exceptional widths are due to the railroad rights-of-way thrown into these streets, as is the width of 110 feet on Sacramento Street. Together with the regulation of the rapid transit conditions discussed in the previous chapter, a new treatment of these wide streets on the lines of the two German examples would transform these streets into specially attractive arteries of traffic. Shattuck Avenue, because of the extraordinary width it has north of Ward Street, is especially capable of a splendid and detailed subdivision scheme and of carrying rapid transit even in the form of an elevated road, not only without detriment, but to the highest advantage to the abutting property. Any street 100 feet in width is sufficiently wide to do this. In addition to what has been said in the previous chapter about the advantages accruing to a street from an elevated line, a new authoritative statement of the experience in Philadelphia which has just been published by the Transit Commissioner of Philadelphia may be given here.[1] "The construction of the elevated railroad not only caused no decrease of values but actually stimulated the increase beyond that of neighboring streets. The total increase on Market Street (upon which the elevated railroad is located) from 1900 to 1912 was 84%, while on Chestnut Street and Arch Street which are parallel and a block distant it was 68% and 9% respectively." Market Street is 100 feet wide; the width of Shattuck Avenue north of Ward Street would guarantee an even more stately and successful accommodation for rapid transit; south of Ward Street to its junction with Telegraph Avenue, Shattuck Avenue is only 66 feet wide, but the property development abutting it is of a very cheap character and would be materially benefitted by an elevated rapid transit line even without further widening. Widening of course would be desirable and cheap, especially if negotiated for in exchange for the increment values to be anticipated from the rapid transit line construction. With Telegraph Avenue, again, a fairway of 100 feet is reached.

Every single one of the radial streets must be subjected to a special study (which will not be attempted in this report) in order to determine what the most desirable treatment of the different roads may be, having in consideration the special kind of traffic that is chiefly using them. The following points should be observed in this study:

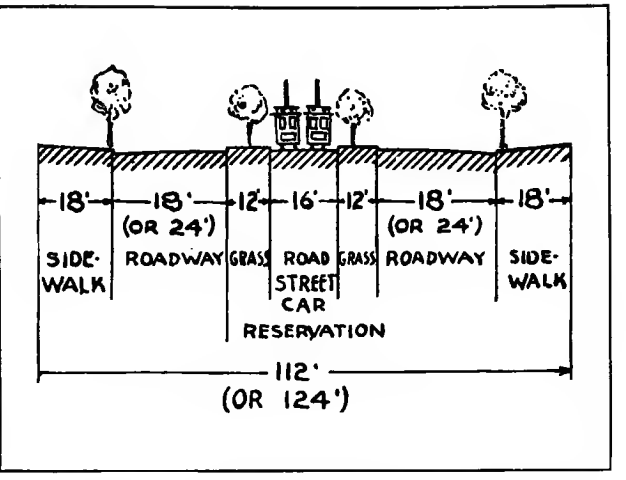
THE MAIN STREETS NEED BETTER SUBDIVIDING.

First, the present treatment of most of the streets is unsatisfactory because lacking in proper subdivision. The following measurements have given good results for 98 foot streets. Street car reservation in the center, 26 feet, paralleled on

[1]Report of Transit Commissioner, City of Philadelphia, July, 1913, Vol. 1, page 103.



SUBDIVIDING AND PLANTING SCHEME PROPOSED FOR THE MAIN TRAFFIC STREETS IN OAKLAND AND BERKELEY OUTSIDE THE BUSINESS DISTRICT.



ORDINARY WAY OF SUBDIVIDING TRAFFIC STREETS IN GERMAN CITIES

each side by a 24 foot roadway for three vehicles and a sidewalk of 12 feet; this, however, gives no room for trees. The street car reservation on Commonwealth Avenue in Boston, with the trolley poles alternating with trees in the middle is 29 feet, the sidewalks on Arbor Way in Boston are 15 feet wide including 7 feet as tree reservation. This shows that it would be easy to work out some subdivision for 100 foot streets leaving sufficient room for at least one line of trees. The special arrangement would have to depend on present conditions regarding front gardens and already existing trees which if at all well developed must be specially looked out for in a new street subdivision scheme. A system of subdividing the streets, at least the ones of 100 feet in width, as suggested above, would insure a constant clear right-of-way to the street cars. This right-of-way should be planted with grass, the care and watering of which would be cheaper than the very expensive up-keep of pavement close to the tracks[1]; the general appearance of the streets would be much more pleasant; the street cars having to look out for interference by cross traffic only at corners could travel much faster. Owing to the grass, even an increased speed would make less dust. The whole street would be divided in two, therefore preventing erratic diagonal movements of vehicles. On both sides of the grassed street car reservation would be enough room for three lines of vehicles. The wear and tear on these two paved roadways would not neccssarily be greater than on the present undivided roadway of greater width. On the contrary, the investigations conducted by Commissioner of Streets William I. Baccus have shown that in Oakland there is an actual decrease of horse traffic and a steady increase of motor traffic. Mr. Baccus has shown that on San Pablo Avenue, already 41.5 per cent of all traffic is motor traffic; that its proportion on Telegraph Avenue is 51.1 per cent; and on Broadway 72.3 per cent. This motor traffic has the excellent influence on good pavements of rolling them down, and keeping them in better shape if the roadway is narrow than if it is wide.

OCCASIONAL INEXPENSIVE WIDENINGS OF MAIN STREETS AND STREET-CROSSINGS SHOULD BE SECURED.

Second, in a number of cases, inexpensive widening like that of College Avenue, for instance, should be contemplated by immediately fixing building lines behind the property lines. Many buildings at present are 5, 10 or more feet behind the property line and it would be bad policy to let them rush to the property line at a time when the increase in traffic will make widenings desirable and beneficial for the street as a whole. It is not necessary that these widenings follow uniformly the whole building line the full length of the street. The improvement will go far enough if all the land which at present is still available without great expense is secured. Even occasional widenings are very desirable from a traffic point of view and combined with some artistic treatment give special character and attractiveness to the street. The leading English city-planner, Mr. Raymond Unwin,[2] emphasizes the point that, where junctions of important roads occur, space for the circulation and spreading out of vehicles should be provided to facilitate passing and crossing, and also that at all road junctions the buildings should be set back at the corners to enable approaching vehi-

[1]In this connection an interesting statement was made lately by Prof. Chas. Gilman Hyde of the University of California, an authority on street paving matters. According to this statement, the daily watering of the grass, even with the high prices paid at present for water (35 cents for 1000 gallons), would be cheaper than interest, depreciation and maintenance of the pavement. The great savings possible in the original investment are referred to in the chapter on residential streets. Eventually Oakland and Berkeley will secure water at 20 cents for 1000 gallons as San Jose already does. This is very important. New Orleans offers fine examples of many grassed street car reservations.

[2]Compare, for instance, his paper before the London Society reproduced in the Journal of the London Society, January, 1914.

cles to be seen at a sufficient distance from the meeting point. There are a great number of important street junctions in the East Bay region where an understanding between the private owners around the junction before the new buildings go up, would lead to inexpensive but very characteristic and highly profitable treatment in the shape of little circular places or squares. Observation of a certain uniformity in the buildings, at least in general outline and in material, would add greatly to the appearance of these points. It is another point strongly emphasized by Raymond Unwin that the beauty of streets of all kinds depends largely on the form of the road junctions and the treatment of the buildings there.

TREE-PLANTING REQUIRED.

Third, special attention will have to be given to the planting of the main traffic streets. This point will have to be taken up more fully in the chapter on parks and pleasure drives. Here it may be stated only that the absence of parks and especially of fine drives, under which the East Bay suffers, is a serious handicap, and could be offset to some extent by providing space for and planting shade trees on the streets. The character of the streets one has to travel through every day is a powerful factor in either attracting to or repelling from a center of business, shopping and amusement. (For pictures of well planted traffic streets see pp. 9, 71).

GRADUAL STREET WIDENING.

Fourth, regarding the widening that is necessary in streets like College Avenue or any other street, the example of Philadelphia, where a scheme has been successfully adopted under which there is very little interference with property or business interests should be mentioned here. Through the establishment by a city ordinance of a new building line and the gradual condemnation of the property as new buildings or new fronts to old buildings were erected, the expense of acquiring the additional strip of land was spread over so long a period as to make the burden on the public treasury almost negligible. Thus the paramount rights of the public are recognized and the city is empowered to set aside private property for public use on giving bond to cover such damages as shall be awarded after the land has been actually appropriated; *i. e.*, the city has the power to place proposed streets and new building lines on the city-plan, the effect of which is to put all affected owners on notice that if they erect buildings on the lands embraced in such proposed street widenings or openings, they do so at the risk of losing the money so invested when condemnation proceedings are instituted to construct the new or wider street which has been plotted on the city map.

THE DOWNTOWN OR DELIVERY DISTRICT

THE DELIVERY DISTRICT OF THE RADIAL STREETS.

A stronger effort than for the development of the radial streets will be needed for the improvement of the streets in what may be called the delivery district, *i. e.*, the district of shopping, business and amusement into which the loads of passenger traffic gathered all over the East Bay region must be delivered speedily and conveniently. The description of the radial streets converging at Fourteenth Street and Broadway made it obvious that the East Bay section is creating a serious traffic problem around this junction. According to the traffic expert, Mr. Wm. P. Eno, it is the ideal that not more than two ordinary streets should meet in a single point. The situation at the crossing of Fourteenth Street and Broadway where practically the whole East Bay region is beginning to deliver its traffic to a single point, is far from this ideal. In regard to such a problem two courses can be taken, the one is to let matters drift along as a more and more serious handicap to the development of the East Bay and its prosperity, a plan that will finally make necessary a cure that will cost many millions. The other is to foresee the difficulties and their possible solution, applying the cure at a time when it is still cheap, and does not demand the destruction of costly investments. The first course is easy but expensive; the second course requires a great outlay of energy, but is cheap from a financial point of view. The name of the first course is carelessness, the second is called efficiency.

In considering the possible means for establishing an efficient street system in the delivery district in order to facilitate the easy distribution of the rapidly growing traffic and prevent its congestion, especially around the junction of the great radials near Broadway and Fourteenth Street, a number of local street problems in that same neighborhood must be considered. These problems are:

LACK OF CROSS STREETS.

First, the lack of cross streets in the blocks between Fourteenth Street and Nineteenth Street and Franklin and Oak Streets; here the blocks are about 1300 feet long, compared with a length of 300 feet in the ordinary Oakland business block. The extraordinary length of the blocks mentioned, and still more so of the blocks between San Pablo and Telegraph Avenues referred to below, is due altogether to the fact that they practically never were laid out as urban property; lying north of the original Kellersberger survey, and not as yet having been needed for business purposes, these blocks have always remained in the agricultural and then semi-urban state in which they still are today. A look at old pictures and maps of Oak-

OAKLAND'S BUSINESS DISTRICT FROM AN AEROPLANE

View taken in 1913 before the building of a number of the new skyscrapers. This picture, like the one on page 79, shows the extraordinarily long unrelieved cross streets immediately north of the business district between San Pablo and Telegraph avenues.

land shows clearly this pre-urban state of affairs. (Compare maps pp. 4, 5, 6, views pp. 79 and 90).

This extraordinary length of blocks is a serious matter not only because it makes it much harder for these blocks, having so few corners, to get a start as business property, but also because it forces a large amount of travel to points east of Broadway, such as Lake Merritt, the new municipal auditorium and points in East Oakland, as far south as Fourteenth Street, contributing thereby to the growing congestion around Fourteenth Street and Broadway. A similar problem is presented by the unusual length of the blocks between San Pablo and Telegraph Avenues and by the narrowness of the streets separating these blocks. The shortest block north of Seventeenth Street is more than twice as long as an ordinary business block in Oakland and the blocks further north are three or four times as long.

DIFFICULTY OF TOO LONG BLOCKS.

The mere length of a block does not necessarily make it unusable for business purposes. It is true as has been stated by Mr. Richard M. Hurd in his standard treatise "Principles of City Land Values" that "blocks having a depth of over 200 to 250 feet involve a waste of laud at the interior of the blocks owing to inaccessibility. Salt Lake City with blocks 660 feet square furnishes an aggravated case of loss in value of land by bad platting. The short-sightedness is due to a supposition that the value of retail business land is based on area instead of on frontage." This truth, however, does not apply to the two series of Oakland blocks considered, because, in spite of their

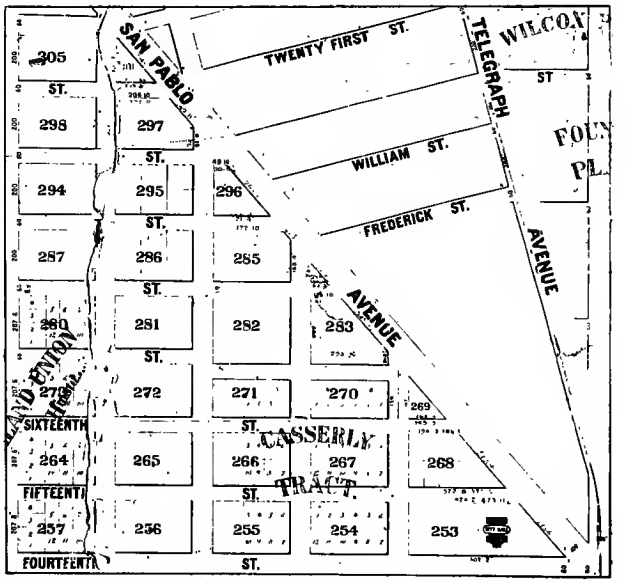
extraordinary length, the blocks between San Pablo and Telegraph Avenues are only 200 feet deep and even the much longer blocks between Franklin and Oak Streets, have a depth of less than 250 feet. These blocks might be useful enough for business purposes, provided there was enough traffic passing these extraordinarily long frontages. In fact, as soon as the character of a business street is thoroughly established and a continuous stream of shoppers through it is secured, its long uninterrupted frontages are rather an asset because they present a continuity of shops without breaks in the cohesion of the chain of attractive show windows and inviting doors. They also protect against dangers and interference by cross traffic and create a security equally welcome to the walking and carriage trade. The continuous stream of traffic necessary for a business street comes, however, as a rule, only to a street that lies in the direction of the traffic movement. If the direction of the street is opposed to accommodating the radial flow of daily traffic—and this is the case with the streets between Telegraph and San Pablo Avenues—a shortening of the blocks is needed. And even though the streets like Franklin and Webster are parallel to the direction of traffic it is hard for blocks as long as the ones under consideration to get their first start as business property without more frequent cross streets, which create valuable corner lots and facilitate circulation. It is not surprising, therefore, that several movements have been organized among the property owners in the two districts mentioned, (*i. e.*, between Fourteenth and Nineteenth Streets, Franklin Street and Lake Merritt and in the angle between San Pablo Avenue and Telegraph Avenue) to open up new streets. These local demands no doubt have just foundation in the unusual conditions prevailing in those neighborhoods.

LOCAL DEMAND FOR STREET OPENINGS MUST FIT IN A GENERAL PLAN FOR TRAFFIC ACCOMMODATIONS.

The object of a comprehensive city-plan, however, is less to satisfy such local demands than to bring them to a compromise with the more general necessity of the business district as a whole, and its transportation needs. From a general point of view, it can be said that no street in or near the business district should be opened which does not promise to satisfy the rapidly increasing demands for easier circulation in the business district as a whole. This is especially true with new street projects in the neighborhood of the point in danger of congestion at the junction of Fourteenth Street and Broadway. It has been sufficiently pointed out how, by a curious configuration of the East Bay street map, practically the whole East Bay section is more and more delivering its traffic through the junction under consideration. All contemplated street openings should take note of this danger and should be planned in such a way as to alleviate it. It has further been pointed out in the first part of this chapter, how the application of the practical traffic ideas of Mr. Wm. P. Eno in their development by M. Eugene Henard present the possible means for the alleviation of the danger of traffic congestion (pp. 82 and 83).

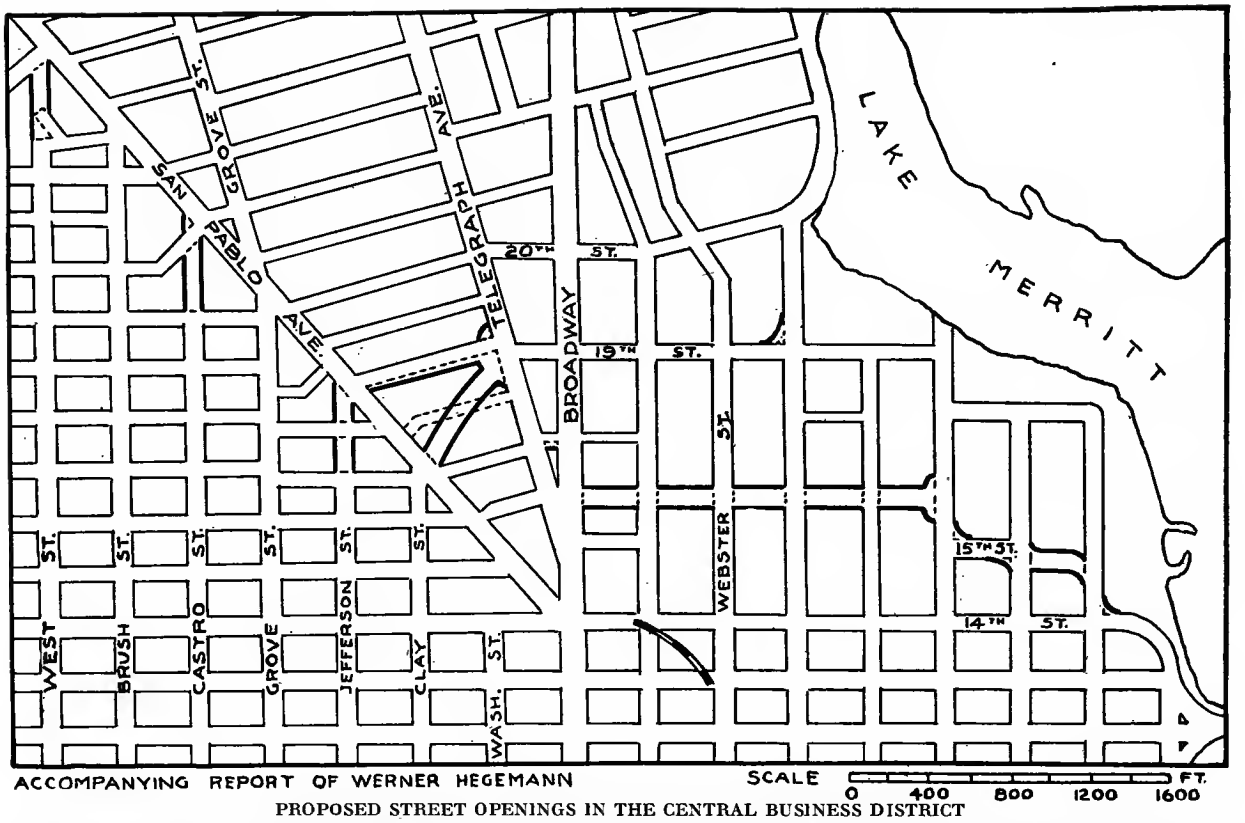
TO GET AROUND THE CONGESTION POINT.

The solution referred to calls for the creation of streets capable of detouring as much traffic as possible around the junction point in danger of congestion. There must be at present a certain amount of traffic which passes through the point in danger not because it wants to get there, but because it wants to reach some place beyond, which cannot more easily be reached by another route. As an example to make clear this proposition, the recent opening of Washington Street in front of the City Hall may be taken. Before this opening was perfected, a certain amount of traffic from the north that at present leaves San Pablo Avenue by Washington Street could not leave it before reaching Broadway and thus congested the dangerous point under consideration. A street opening of similar importance has already been advocated in this report: it is the through routing of West Street across San Pablo Avenue, and the same may be said about Castro Street, and Jefferson Street. All these openings would deflect growing masses of traffic from the Broadway and Fourteenth Street junction. These street openings would be especially important and inviting to traffic approaching the business district because this approaching traffic would find these street openings at the right hand, *i. e.*, the traffic could enter them without crossing and interrupting the main traffic



JEFFERSON STREET "OPEN" SINCE 1868

Cut made from part of the old Boardman map of November, 1868, showing the plan of streets as adopted and approved by the City Council, November 16, 1868, and showing that already in 1868 it was intended to open up Jefferson Street. The map shows the connection with old Frederick Street, *i. e.*, Nineteenth Street. The map now is cracked and faded, but Jefferson Street is still blocked.



PROPOSED STREET OPENINGS IN THE CENTRAL BUSINESS DISTRICT

Proposed street openings and widenings shown by heavier lines. Dotted lines represent streets to be closed or street lines to be changed. The various proposals are discussed on this and the following pages (see also p. 91). The openings recommended here cover to some extent the lines of the purely theoretical diagram of a central traffic circuit shown on p. 83. The entrance (from Telegraph Avenue) to the crescent-shaped connection between Nineteenth and Clay streets is illustrated by the drawing of Architect L. C. Mullgardt, p. 93.

stream on San Pablo Avenue. As many such deflections of traffic as are possible from San Pablo Avenue to the southwest should be created from Telegraph Avenue and Broadway. In this connection, a widening of Sixteenth Street between Broadway and San Pablo Avenue and of Seventeenth Street between Franklin and San Pablo Avenue would be desirable. While it is already too late for the widening of Sixteenth Street between Telegraph and San Pablo Avenue and of Seventeenth Street between Franklin and Broadway because modern expensive improvements have already been made on these streets, the widening of Seventeenth Street between Broadway and San Pablo Avenue can still be accomplished.

SEVENTEENTH STREET MUST BE WIDENED.

The widening of Seventeenth Street between Broadway and Telegraph Avenue would be especially short and cheap and would have a very beneficial result in deflecting traffic from the congestion point at Broadway and Fourteenth Street. The little oblique inclination, though it is not quite strong enough a deflection to the south, which is found in the cross streets between Telegraph Avenue and San Pablo Avenue, especially the course of Sixteenth Street and Eighteenth Street and even more in Seventeenth Street between Franklin and San Pablo Avenue, looks very much like the start of half circular detouring streets around the dangerous point of junction, in the sense of the French theory referred to above. Any emphasis that could be given to this intimation of delivery loops (perimeters of distribution) by further developing these potential detouring streets would have far reaching results for the easier distribution of traffic and building up of the business district.

THE "CARRIAGE TRADE."

It is in this light that both the private demands for a rearrangement of streets between Telegraph Avenue and San Pablo Avenue on the one side and the demand for facilitating communication between the northeastern district of residences and the southwest district of business should be considered. In the northeastern residential districts, including all the expensive residences in the hills between Lake Merritt and the University Campus in Berkeley, originates quite a considerable amount of that trade which is of some special interest to the retail merchants. The interest in this growing amount of so-called carriage trade is due, perhaps not so much to the fact that it represents a large purchasing power, as to the curious suggestive influence it has on the character of a business district in setting its standard and pace. To divert this kind of trade from San Francisco's retail district to the East Bay would have high commercial results benefitting all the large ma-

DESIGN SHOWING TELEGRAPH AVENUE ENTRANCE TO PROPOSED CRESCENT CONNECTING NINETEENTH STREET WITH CLAY STREET

In this design Mr. Louis Christian Mullgardt, the architect, has given a suggestion of how the entrance to the important street connection proposed in this Report may appear if artistically treated in combination with the entire new street. The desirable connection between the East Bay shopping center and the residential areas north of Lake Merritt can be efficient only if it is attractive and psychologically forceful. The large triangular block created by the proposed street would give occasion for the building of an ideal high office building which set back from its base would possess adequate light and air and be secured forever against blanketing. The base of this office building would be treated as a uniformly arched colonnade, one side of which would follow the outline of the new crescent street.

jority of buyers who so eagerly in modern countries combine their democratic ideals with invincible admiration for fashionable and expensive social standards. Whatever the economic and moral aspects of these facts may be, they are sociological, and it would be a vain attempt to prevent enterprising business men making the best of them. From the point of view of the East Bay business man, and therefore of the whole East Bay section, it is highly desirable to create intimate connections between the residential hill districts and a prosperous business district. There ought to be some splendid drives leading directly into the best shopping district and some of the streets blessed by the neighborhood of Lake Merritt may by careful treatment finally develop into something that suggests the splendid approaches that one finds in the old carefully planned cities. These avenues, like Grand Avenue and Harrison Street, must have easy and direct outlets into the business district. My proposal therefore, is to connect the northern end of Clay Street by an 80 or 90 foot street in a northeasterly direction with any street that may act as an inviting outlet for the streets carrying the radial traffic from the northeast residential district. Since this connection is intended to deflect vehicle traffic from the junction of Fourteenth Street and Broadway and to act as an inviting course for fashionable motoring, the proposed street ought, if possible, to connect streets which carry no street cars. This kind of most desirable connection between the residence and shopping district could be secured by widening (taking the front gardens only) and connecting Nineteenth Street with the present north end of Clay Street which has already, especially in its upper end, made such a rapid start towards becoming an ideal shopping street somewhat like Grant Avenue in San Francisco. Clay Street is close to the center of town, and, without having a street car track of its own, it is served by every means of transit close by.

VIEW OF A HIGH GRADE SHOPPING STREET (CLAY STREET, OAKLAND) KEPT FREE FROM STREET CAR TRACKS

This picture shows at the end of the street the point where would begin the proposed crescent-shaped connection of Clay Street with Nineteenth Street and the residential districts north of Lake Merritt. A high building built in connection with this crescent-shaped street (as shown on p. 93, design by L. C. Mullgardt) would just appear in view looking north on Clay Street, *i. e.*, at the end of the vista shown here.

The proposed street opening would be identical with the change in the direction of Eighteenth Street between Telegraph and San Pablo Avenues, that is to say, the old course of Eighteenth Street could disappear or be narrowed to an alley without detriment to anyone. If the difficulties presented by this change in the course of Eighteenth Street should be too great, a more northerly connection must be taken, *i. e.*, connection between Clay Street and Twentieth Street, thereby conserving the present Eighteenth Street. Carrying the idea of connecting Clay Street with Nineteenth Street a little further, it would be desirable in the course of reconstruction to widen Nineteenth

ARCHED COLONNADE AROUND AN OFFICE BUILDING, HOUSTON, TEXAS

Colonnades like this or rather placed under the second story (instead of being placed outside the ground floor as shown in this picture) were very common not only in cities of Southern Europe but even in Northern France and Germany. The East Bay cities have an ideal climate for this attractive arrangement by which not only protection against sun and rain is secured for the sidewalks—a great attraction for the shopping public—but by which in critical cases essential street widenings can be effected. Present sidewalks can be thrown into the roadway, new sidewalks being built under the second floor of abutting buildings.

Street (between Telegraph and San Pablo Avenues) to the south; thereby Nineteenth Street would become the direct continuation of Nineteenth Street east of Telegraph Avenue and, in connection with the already discussed opening of Jefferson Street, act as another much-to-be-desired outlet for the movement from the northeast residence district. If anything like intelligent co-operation between the property owners south of Williams Street could be secured, this widening and street opening ought to be combined with the creation of an effective half circular place, the axis of which would be Telegraph Avenue. Here is one of the few chances to adorn the East Bay down town district with a somewhat spectacular improvement, the effect of which would be the greater and the more beneficial the further could be carried the architectural co-operation of the property owners in the streets to be constructed. This suggestion of an extension of Clay Street in a northeastern direction seems preferable to me to the extension of Clay Street in a northerly direction parallel to Telegraph Avenue, as has been proposed by others. This does not mean, however, that I am blind to the advantages which even the latter opening would have compared with no opening at all.

APPROACH TO AUDITORIUM.

An idea similar to the northeastern extension of Clay Street could be successfully applied to the area east of Broadway and north of Fourteenth Street. In this area it would be desirable to make the approach of Nineteenth Street easy and wide. This would require, beside the acquisition of the front gardens, chiefly the cutting of one corner, *i.* e., the northwest corner of Nineteenth Street and Harrison Street in order to make an easy turn around this corner. The main problem in this district, however, as mentioned before, will be the creation of a street connecting the northwest section with the new municipal auditorium and East Oakland without passing through the junction of Broadway and Fourteenth Street. At present, Webster Street, leaving Broadway south of Twenty-Sixth Street, to a certain extent serves this purpose. This course of travel could be improved by connecting Webster Street with Oak Street by extending Eighteenth Street for two blocks with a connection to Lake Street. This, however, would not sufficiently solve the problem of the too long blocks refered to. Another course therefore may be proposed here: starting from Sixteenth Street and Telegraph Avenue, cutting through the blocks east of Broadway, and reaching Fifteenth Street between Jackson and Madison Streets. By changing slightly the course of this short piece of Fifteenth Street by widening it half to the north and half to the south, and swinging around to Fourteenth Street, the whole would be one continuous sweep without sharp corners or breaks.

South of Fourteenth Street the circulation for a long time will be comparatively easy because of the shortness of blocks and width of the streets. In order to secure a satisfactory co-operation between the many lot owners in the different districts affected by the proposed street openings it is recommended that local building associations or syndicates be created for the special purpose of carrying out the street opening along lines equally satisfactory from an economic and aesthetic point of view. As an interesting example of a similar procedure, the case of the German city of Elberfeld may be quoted, where the official city-planning office of the city succeeded in combining all owners affected by an economically difficult strect opening into a co-partnership. In the specific case under consideration, the municipal savings bank, upon recommendation of the city authorities, lent the amount of two million three hundred thousand marks to the lot owners' co-partnership, the city guaranteeing the interest. The tearing down of the old houses and the building of the new ones was thus carried out speedily and with great economic success in accordance with the plans worked out by the city.[1]

The problem of the congestion of streets by automobiles standing at the curbs will not be discussed here but the final necessity of *municipal garages* can hardly be doubted.

APPROACHES TO SHATTUCK AND UNIVERSITY AVENUE CENTER.

Special consideration, independent of the *general* problem of the radial connections with the main business center around Fourteenth and Broadway, must be given to the question of good connections with the growing business center around University and Shattuck Avenues in Berkeley, which is developing into an important subcenter of high value to East Bay progress. Much can be done for the development of this center by a proper policy of street car routing to be enforced from the street car companies, but additional impetus should be given by providing those radial street connections to the center which are lacking, and which can be created without much cost. Especially should connections be created which will make some of the particularly fine streets of the northeastern and northwestern part serviceable to Berkeley interests. A better connection can and should be made between Sonoma Avenue and Marin Avenue which without doubt one day will become in their entire length part of the street system of Berkeley proper. If Sonoma Avenue in turn is better connected either with Grove Street, or, preferably, with Shattuck Avenue, these streets will together form powerful drains for the traffic of the greater portion of the northwest sections toward the business center of the city. If that cannot be done, Marin Avenue connecting with The Alameda and a widened Grove Street might serve the purpose. Grove Street deserves special attention because it is the one through level street from Oakland into North Berkeley. From Adeline Street to Hearst Avenue Grove Street is eighty feet in width; from Hearst to Yolo Avenue it is only sixty; beginning with Yolo Avenue it appears as The Alameda, a spacious one-hundred-foot avenue making several important connections. The importance of the entire group of streets makes the widening of Grove Street from Hearst to Yolo Avenue imperative and a better intersection of Grove Street, The Alameda, Sonoma and Yolo should be arranged for.

The difficulty of securing proper main avenues from northeastern Berkeley, particularly from the Cragmont district, is increased by the hilly character of the land in that direction. Euclid Avenue north of the Berkeley city line and Spruce Street, forming the city line for some distance, may be counted on to drain this section, but it would be well to bring them to the business center by easier grades. This could best be accomplished by feeding them into Shattuck Avenue at some convenient point; the best point for the purpose probably would be at Rose or Vine Streets between which Shattuck Avenue widening to 133 feet forms a Place. Shattuck Avenue, the most important artery of Berkeley, ought to be widened

[1]For further information look up the official publication of the Prussian Department of Public Works *i. e.* Centralblatt der Bauverwaltung, March 7th and 16th, 1907.

from Vine Street to University Avenue to a width sufficient to provide for a double track rapid transit line with wide vehicular traffic roadways and tree lined sidewalk areas on either side. Probably a width of from 110 to 120 will be necessary. West Berkeley, so far as connection with the business center is concerned, is well taken care of by University Avenue. West Berkeley has in Sacramento Street an Avenue of extraordinary width by reason of land given for the Key Route franchise. Sacramento Street was made 110 feet wide to Rose Street; from Rose to Hopkins Street it is but 60 feet wide, and should there be widened in order to secure the use of this street in its entirety as a traffic street or parkway. Hopkins Street is 66 feet wide from San Pablo Avenue to its intersection with Sonoma Avenue where it becomes 100 feet wide. Since it carries the tracks of the Key Route, it should be made at least 100 feet wide above Sacramento Street, and possibly for its whole length. The Claremont district in Southeastern Berkeley is not yet properly connected with the business center around Shattuck and University Avenues. As connecting lines, I suggest a comprehensive development of Durant Avenue, a widened College Avenue and Ashby Avenue opened into the Tunnel Road. If that is not feasible, Durant and Piedmont Avenues, Warring and Derby Streets, Claremont Boulevard and (with the widening of Russell Street east of Claremont Avenue) a connection with The Tunnel Road thereby. College Avenue, as stated before, should be widened. Also for Telegraph Avenue north of Dwight Way, the Philadelphia scheme recommended above, of establishing a new building line, is advocated. Although the structures now built on Telegraph Avenue north of Dwight Way are expensive, they will some day have to be torn down and at that time the new building line should be enforced. In favor of this opening it is to be said that the main entrance to the University from the south requires a greater width than the present 60 feet available in that part of Telegraph Avenue, which lies between Dwight Way and the Sather Gate, in contrast to the rest of Telegraph Avenue which is 100 feet wide. On the other hand, the importance of this Telegraph Avenue widening is not to be overestimated because it must be kept in mind that Telegraph Avenue, in its northern end, is *not* intended to carry through traffic.

"SHATTUCK SQUARE."

On Shattuck Avenue between Bancroft Way and University Avenue Berkeley has what may be styled its local down-town problem, though its aspects of course are different from and less complicated than the down-town problem of the entire East Bay section around Fourteenth and Broadway. The present congestion on the east side of Shattuck Avenue between Bancroft Way and University Avenue becomes increasingly greater and more dangerous. The Key Route trains should run from Bancroft Way, or even as far south as Alcatraz Avenue over the Southern Pacific tracks and stop in the present yards of the Southern Pacific Company, a scheme more feasible as soon as the Key Route line is extended and through routing to further outlying points takes the place of the present stub-end terminal arrangement of the Key Route. This will come in connection with or independent of a scheme of co-operation for an elevated structure. The present duplications of terminal facilities is unnecessary and undesirable—a handicap brought about by ill-applied competition at a point where co-operation ought to be enforced by the authority of the City or Railroad Commission. Shattuck Avenue, 157 feet wide as far as Allston Way, near this junction point with University Avenue widens out to a real Place (Stanford Place, view p. 69) which, with proper architectural treatment, will have a splendid future as an attractive basin for gathering a large part of the commercial activities of local Berkeley. A serious effort should be made to enhance the attractiveness of this Berkeley business center. The recommended subdivision scheme of the wide area of Shattuck Avenue should terminate in this widened place with a parking scheme studied as a terminal feature. From this point of view, as from the architectural one, and still more so from the commercial one, it does not seem desirable to me to open up Walnut Street as a full-fledged street. These are the points to be considered in this connection. The necessary radial connections to the north and northeast can be made as pointed out without opening Walnut Street, provided Shattuck Avenue is widened from University to Vine Street. Opening Walnut Street would not correspond to a necessity of traffic, but would break up one wall of the basin represented by what might be called Shattuck Square in which the commercial activities of Berkeley should be collected in a powerful unit. If too many streets open up from this Square the shops are in danger of frittering away in the different directions without giving the decisive impetus to one locality without which no real attraction can develop. From an aesthetic point of view, also—and this must be considered in building up the psychology of a business center—the conciseness necessary for creating an attractive Place or Square effect is destroyed if too many streets tear holes in the walls of the Square or Place. I therefore recommend the connection of Walnut Street with Shattuck Square by an arcade for foot passengers only. Thereby Walnut Street will become a most desirable place for high class apartment houses, in immediate walking connection with the largest center of traffic and shopping, but cut off from the noise, danger, and dust of teaming and through traffic, and insured against the encroachments of business developments which put property in a kind of intermediary state of hesitation and doubt. Walnut Street should become a through-traffic street only if its connection with Fulton Street should prove necessary. That is to say only in case Oxford Street should not be widened sufficiently to take care of the growing traffic that feeds into it.

The role of Oxford Street is important because it is the first street south of the Campus; the entire traffic between the districts east and west of the Campus must take this course and the mere fact that the street not only faces the most important architectural scheme of the city but is destined to accommodate the most important entrance gates to this University, ought to be sufficient reason for increasing its present width of 60 feet or less (with a roadway of only 36 feet). In order to give Oxford Street a roadway of at least 50 feet (two street car tracks at present crowd the street and must be taken better care of) the 10-foot sidewalk along the Campus side of the street should be thrown into the roadway and a part of the front gardens of the houses on the west side should be taken. The planting of the street must be carried on inside the Campus line as described in the chapter on drives (pp. 135, 155). It also will be necessary to eliminate the hump which at present defaces Oxford Street between Center Street and University Avenues. This change of grade need not have any undesirable consequences for the University grounds and its architectural jewelry provided the main axis of the architectural scheme (which axis in its course from west northwest meets Addison Street just in the middle of this objectionable hump) is treated—as intended—only as a great ideal feature, not as a main traffic street. The entrance to the University grounds from Addison Street can be developed as a beautiful scheme of marble steps (*i. e.*, a foot, not vehicle entrance) rising from what might be called "University Circle" (a plaza at corners of Addison and Oxford), while the vehicle traffic would use the easier grades of Center and University Avenues, as at present, rising to the University level by ramps imbedded behind the marble stairs. By this arrangement of stairs the steep grade of Addison Street between Oxford and Shattuck can be lowered and it becomes less necessary to carry Addison Street across the tracks of the Key Route and Southern Pacific towards the west of Shattuck Avenue. If in some future time the traffic of the East Bay section becomes heavy enough to bring elevation of the main rapid transit lines it will be an easy matter to carry Addison Street across Shattuck under the forthcoming elevated structure. For vehicles the main entrances should always remain University Avenue and chiefly Center Street. The latter is perfectly adapted to the role of a main entrance not only by its width and easy grade but even more so by the grandiose silhouette of the Campanile which perhaps nowhere more beautifully sends its stirring call over the foliage to a southern sky. This —in the true sense of the word—enormous feature of the Campanile rules Center Street and makes it the ideal connection between the Campus and Shattuck Square and especially with the Civic Center, which latter will remain altogether under its power if only the Civic Center Buildings—every single one of them—are placed with due regard for the Campanile, this svelt East Bay giant, capitalizing his strength for the glory of *West* Berkeley *also*. A single building stupidly placed west of the Campus can blanket the tallest building of the Campus and can take its beauty away from the citizens of West Berkeley. The grouping of the buildings around and on the proposed civic center therefore must take its inspiration from the mighty neighbor and have him present in all the vistas, in all the windows facing east and on the doorsteps of the city hall and of important new buildings. This is discussed p. 148 f. In connection with the University plans it is highly desirable to change slightly the course of Addison Street, at least between Oxford and Shattuck, (as shown on map p. 152) in order to emphasize the great University axis and help link it to the Golden Gate.

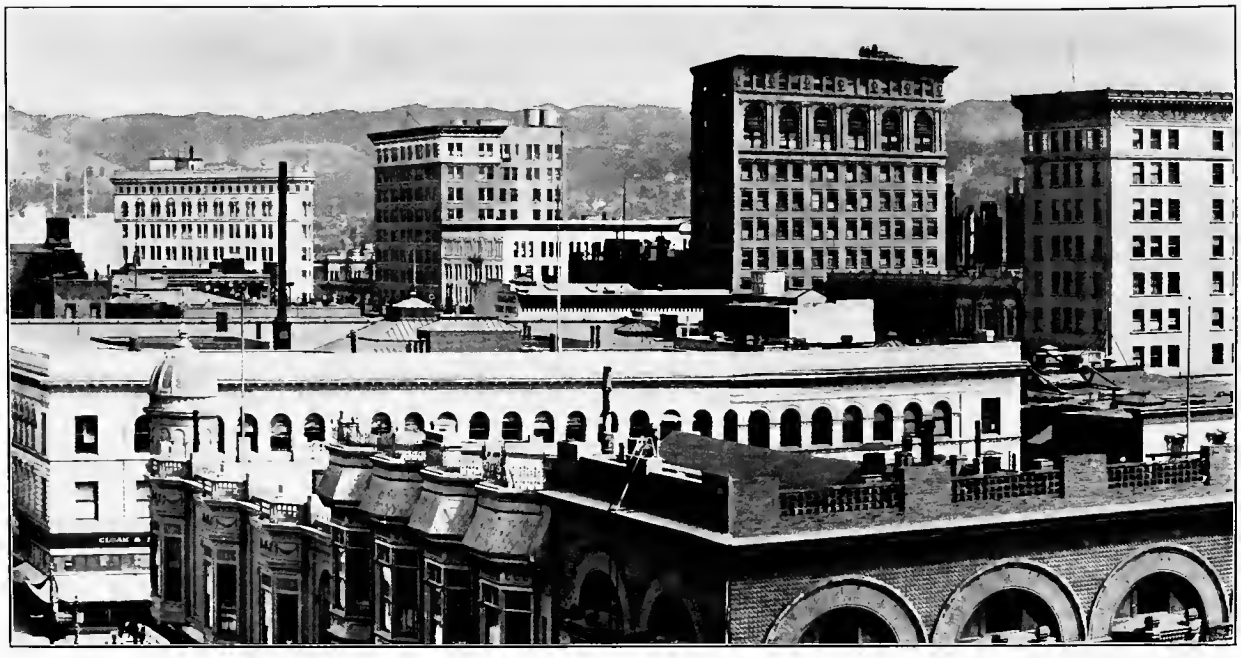
THE CAMPANILE, RULING CENTER STREET, SEEN FROM SHATTUCK AVENUE

This is the vista, the preservation of which, as far down as Grove Street, is urged in the proposals for a Berkeley Civic Center (compare last chapter of Report).

I suggest the submission of the entire proposition of what I call Shattuck Square, including the present and future improvements of the rapid transit arrangement, the station, parking, the architecture of the surrounding buildings, and their desirable limitations, to a comprehensive planning study. This will be in some sense a more important "Center" than the center of administration and education in front of the Berkeley City Hall. The connection with this contemplated "Civic Center" and the connection with the University campus according to the newest plans for the axis and approaches to the University must both form important items in the working out of the future of Shattuck Square. Business Center, Civic Center and Campus, if well connected and built in harmony, can develop into one of the most inspiring trinities of artistic city-planning. At present they merely drift along without consideration for each other. The working out of detailed plans for specific improvements such as those under consideration cannot be a part of this general report, the main object of which is to point out the possible lines of further study.

BUILDING REGULATIONS

A problem of vast importance connected with the development of the business district is the



SOME OF THE BROADWAY GIANTS

Showing an almost ideal spacing between skyscrapers. If nothing is done to make this state of things permanent the building

proper limitation of the heights of buildings. The heights of buildings must be in close relation to the width of streets for two reasons: First, because as buildings grow larger and house more tenants they necessarily produce more traffic until finally the street is not capable of handling it; congestion must result and finally expensive street widenings will be forced upon the city. Second, only if height of buildings and width of streets are in proper relation can sufficient light and air be secured in the buildings. All European cities are very strict on this point. None of the famous European capitals with their millions of population have buildings as high as some of the office buildings in Oakland or Berkeley. Berlin has no office or apartment buildings higher than six stories; *no new* buildings of this character can be built higher than *five* stories. In America, also, the necessity of regulations is becoming more and more recognized and careful investigations into this matter have multiplied in the last few years, the most notable one being the report of the Heights of Buildings Commission to the Committee on the Heights, Size and Elevation of Buildings of the Board of Estimate and Apportionment of the City of New York, delivered December 23d, 1913. This report which represents the best examination into this matter that has been made up to the present time, had its impulse in the fact that there are considerable sections in the borough of Manhattan in which large numbers of buildings, because of lack of light and air, are no longer reasonably profitable. Many lofty buildings which, when first erected, were highly profitable, are unprofitable today. These small returns on the investment are largely due to the fact that two-thirds of the offices require artificial light at all times. In order to avoid the repetition of similar calamities, the Heights of Buildings Commission recommends that the city should be divided into districts and the restrictions for each district worked out for the particular needs and requirements of that district. A set of restrictions is to be worked out with a view to securing as much light. air and relief from congestion and safety from fire as is consistent with a proper regard for the business requirements and existing land values. Similar steps are absolutely necessary in every modern city and must be taken before they work hardship on values that have developed irrespective of common sense and human needs. The American skyscraper more and more is recognized as being able to produce architectural effects of the highest value and a most fascinating skyline; if treated properly it can be developed into a great asset.

AIR AND LIGHT TO BE SOLD ON THE REAL ESTATE MARKET.

Many efficient schemes of building regulation have been proposed that force the builder of high buildings to provide every window with a sufficient amount of air and light falling into it at a satisfactory angle. It would be especially desirable, and would bring the most satisfactory results, if real estate owners could more and more be induced to have their plans for new office buildings (or apartments and tenement houses) made with reference not alone to their single lot but to the whole block, even if owned by different owners. It will more and more prove profitable to secure such comprehensive plans. Made on a co-operative basis, these plans should combine the different narrow court-yards in the interior of a block into one big one capable of some planting in the center. Towers should be permitted only on those

OVERLOOKING THE OAKLAND ROOFS

of new skyscrapers will produce unsatisfactory conditions in regard to light and air, as bad as in San Francisco if not New York.

lots which are really adapted to the purpose. By this co-operation, the possible maximum of light, air and truly rentable floor space will be secured on an equitable basis. The man who is permitted to build higher than his neighbor should pay him for the guarantee of unobstructed air and light; air and light will be on the real estate market like land; air and light in shape of easements will be bought, sold and leased. It is a mere business proposition to exchange desirable conditions for the most unsatisfactory dark results produced by individuals blanketing each other.

ENTIRE BUSINESS BLOCKS AND STREETS BUILT UP ON COMPREHENSIVE PLAN.

The districting of the city of course will have not only to apply to the business district, but as well to the industrial and residential districts (map p. 55), the latter being divided into districts for private residences, apartment and tenement houses. The use of private restrictions is so common around the Bay, and the necessity of supplementing and superintending the too short private restrictions (which in many cases are about to expire, thus endangering the values of the neighborhood) by community restrictions has been acknowledged so often by prominent real estate men that no new effort will be made in this report to elucidate this point. Co-operation between different property owners will be necessary also for securing satisfactory building exteriors. Famous business streets, like Regent Street in London, Place Vendome and Rue de Rivoli in Paris, owe their beauty to uniformity in their building lines. Other examples are found in Vienna. The newest example, however, is a very remarkable instance in Berlin where a great department store is gradually acquiring building after building, tearing these buildings down, even if quite new, and replacing them by a splendid-looking seemingly endless row of beautiful uniform pilasters. Oakland contains a very successful example of the harmonious treatment of a whole block in the Hotel Oakland (p. 101). Similar good results securing the highest amount of light, air and rentable floor space, combined with pleasing architectural appearance, can very well be secured by co-operation of lot own-

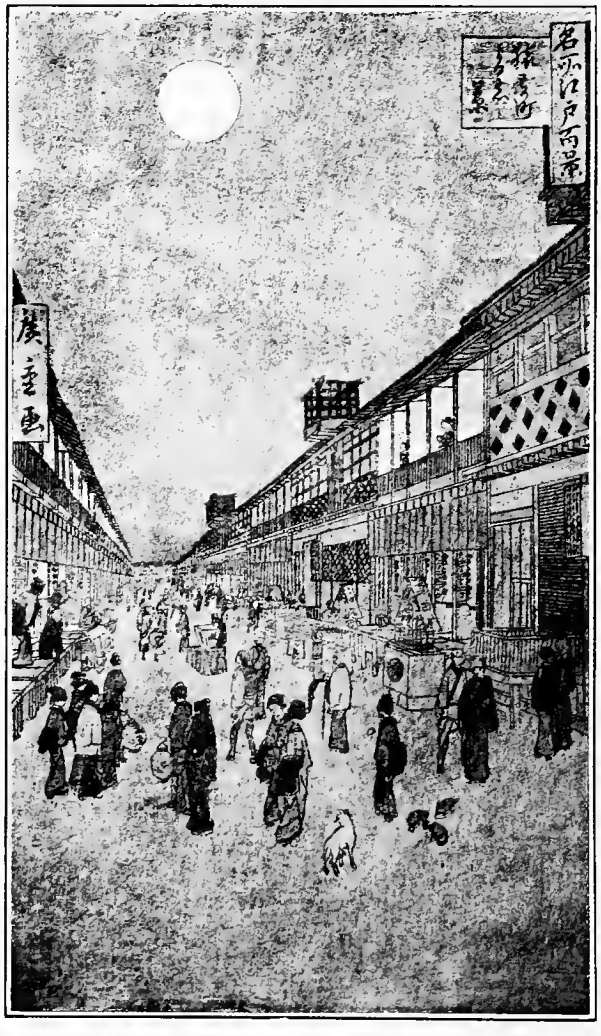
OAKLAND CITY HALL ON CHRISTMAS EVE

The picture shows clearly how the upper part of the building is set back from the street lines—an ideal arrangement not only for public, but for private skyscrapers. The carrying into effect of this principle would altogether assure tall buildings against being blanketed by tall neighbors.

THE CLAUS SPRECKELS BUILDING, SAN FRANCISCO
On Market Street (120 feet wide) and Third Street (100 feet).

This is in several respects an ideal skyscraper; it is situated on a corner lot, thus securing permanent air and light on at least two sides. It is architecturally developed on all four sides showing thereby the intention of the owners that it should not be blanketed by neighboring buildings, one of which is under the same control as the skyscraper. This building at present impressively dominates Market Street and the vista from O'Farrell, Kearny and Third streets. Buildings as high as the Claus Spreckels Building on either side would destroy its distinction and seriously diminish its renting value. Here is indicated the necessity of proper spacing of skyscrapers by a sensible plan for restricting the height of buildings.

ers even in cases where different purposes have to be served on the same block. Co-operation between the lot owners would also prevent the most unpleasing exteriors that come about through high buildings exposing their interminable and blank party walls for decades, sometimes forever, seriously defacing thereby the appearance of the city. Typical cases of this can be found in Oakland and Berkeley. The University Campus for decades is defaced by the aspect of such blank party walls of adjoining buildings, higher than the highest buildings of Berlin or Paris. The beauty of Lake Merritt will be injured forever, if apartment houses are indiscriminately permitted to go on exposing their heedless party walls. I refer particularly to apartments on the south side of Grand Avenue with their rear walls facing the lake. Land lying in a city, especially land lying in the business district, should not be handled in the same way as agricultural land where everybody may grow what he wants without regard to his neighbor. The present state of Broadway in Oakland is very remarkable in that it contains a series of high office buildings standing out very much like towers, and all surrounded by light and air. This state, if it could be made permanent, would be near the ideal, but of course there is nothing to guarantee its permanency, and



JAPANESE SHOPPING STREET

From a color print by the famous Hiroshige, showing that the harmonious effect achieved so commonly in Europe by uniform cornice lines is known also to the Japanese city-builders. Uniform shopping streets as shown here can be seen in Japan wherever cheap Westernism has not yet lowered the older standards of good taste.

A FASHIONABLE HOTEL

This is NOT from the jungle of downtown Manhattan, but the rear of a highly fashionable hotel in San Francisco, showing by the naked exposure of its bare party walls, expectation of having its narrow light shafts blanketed and light shut out altogether. Here is a demonstration of the dangers of unregulated skyscraper building. This example is especially disheartening because the hotel was built for, and is used by, people who should know better, and who ought to enforce higher standards. What will be the conditions with respect to light and air in the fair city of San Francisco when the many unbuilt-on lots in the central districts are covered with buildings? Note: The unbuilt-on lots in this picture are its only relief.

other high buildings will be erected and will crowd the older ones and each other. (Views pp. 98 and 99).

THE MAJORITY OF REAL ESTATE OWNERS ARE INTERESTED IN RESTRICTION OF BUILDING HEIGHTS.

A few lot owners may be largely benefited by this system, at least temporarily, but for the large majority of land owners this indiscriminate elevation of buildings means a serious menace. The high building where it stands acts as a dangerous suction pump of values. This danger may be best illustrated by New York conditions where the land on Broadway rises as high as

SHATTUCK HOTEL, BERKELEY

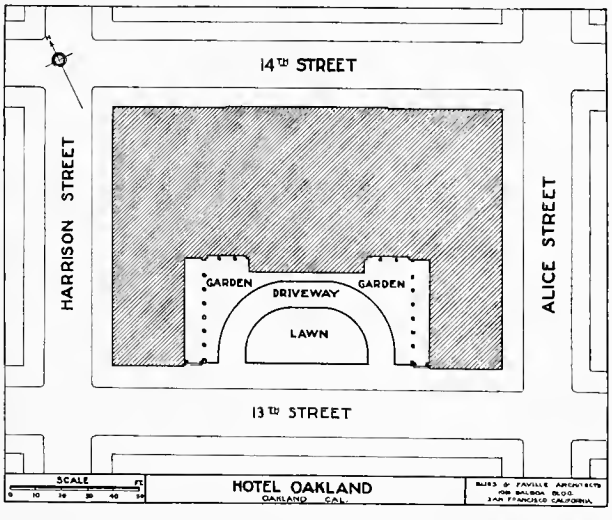
Showing the harmonious effect resulting from the treatment of an entire block front according to a uniform architectural plan. The ground floor is used by different shops, showing that uniform architecture does not exclude varied uses. The comprehensive treatment of one or two fronts of a block is, however, no guarantee against such rear views as that shown in the preceding picture. Comprehensive planning of the entire block (as shown in the next picture) is the end to be aimed at.

HOTEL OAKLAND

An example of an entire block treated according to one comprehensive architectural plan—a guarantee against unpleasant reverses of an economic, hygienic and aesthetic kind. By placing the open space toward the street a kind of court of honor is created agreeably augmenting the volume of street space and varying the street aspect. There is no reason why entire blocks should not be treated thus comprehensively even when owned by various interests. By pooling their holdings the various owners in a vacant block suitable, for example, for apartment houses, could substitute one splendid well-designed structure for a dozen ill-lighted small ones, not only obtaining a vastly more rentable and valuable building, but eliminating a host of items of cost—party walls, fire escapes, elevators, offices and lobbies, heating plants, etc. Only by co-operation can highly economic and aesthetic results be achieved. This applies equally well to office and varied business blocks.

HOTEL OAKLAND HAS NO REARS

View of Hotel Oakland looking west; corner Alice and Fourteenth streets.



The court in front of the hotel is considerably larger than appears on this plan of the ground floor. The second story sets back, overlooking a wide balcony formed by the roof of the projecting ground floor.

$22,000 per front foot for a lot 100 feet deep; for some corner lots to the tremendous height of $1,250,000 for a lot 25 feet wide by 100 feet deep. These values drop inside of one thousand feet to the east down to $25,000 a lot, *i. e.*, to one-fiftieth. As Mr. Lawson Purdy, the President of the Department of Taxes and Assessments in New York City, has pointed out, "If we could have made suitable regulations thirty years ago, there probably would be no lot worth a million and a quarter, but there would be no lot in that territory worth as little as $25,000. The values would have spread. . . . We would not have had such dense crowds on the few streets and those streets too narrow to carry the people."

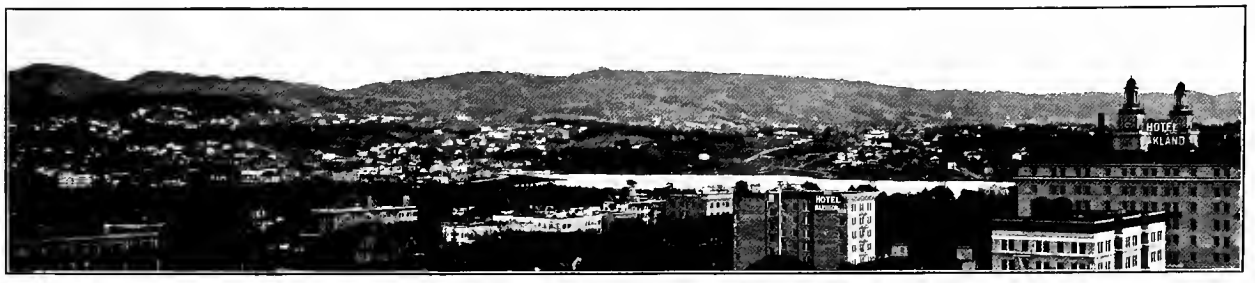
The detailed working out of the different districts, and the formulation of restrictions governing them, will be an important part of the work of the City Planning Commissions to be appointed in Oakland and Berkeley. The local interests should be heard in every case.

Regarding the artistic as well as the technical and hygienic side of the problem (appearance, combining of individual court yards, uniformity of cornice and rooflines, angles of sunlight, even the laying down of rear building lines) much is accomplished in German cities not only by stricter building laws, but by the institution of Municipal Bureaus of Building Advice which, by convincing suggestion, persuasion and intelligent manipulation of the building police, succeed in protecting the individual builder and contractor against hundreds of senseless aesthetic and economic blunders, thereby transforming advantageously the character of entire neighborhoods. Remarkable examples are to be found in Essen, Cologne, Bremen, Germany; but also in Gothenburg and Stockholm, Sweden, through the Municipal City Planning Bureaus.

Courtesy of W. H. Weilbye

OAKLAND'S BUSINESS DISTRICT LOOKING ACROSS THE LAKE FROM LAKESIDE PARK

This fine "many-towered Camelot" appearance will be destroyed if wild building of high structures is permitted without logical protections and regulations regarding height of buildings and proper spacing of sky-scrapers. Already two types of improvements appear; the first architecturally well developed towers, the second party walls, water tanks, and a jungle of steel and stone.



THE RESIDENTIAL DISTRICTS IN THE EAST BAY HILLS—IN THE FOREGROUND LAKE MERRITT

Where the roses flower two weeks earlier than on the level land and where Nature provided protection against interference from freight railroads and terminals.

RESIDENTIAL STREETS

SAVINGS TO BE EFFECTED BY PROPER PAVING OF RESIDENTIAL STREETS.

The streets that have heretofore been considered were the traffic streets, the roadways of which can seldom be too wide and too well paved to serve their purpose. A very different treatment must be given to streets that serve only residential purposes. Large sums of money can be saved by giving up the mistaken idea which still prevails that residential streets ought to look and be paved like traffic streets. These large savings can be effected in the residential streets by paving roadways from 18 to 20 or a maximum of 24 feet only and by parking the rest of the street with the exception of turning points for vehicular traffic which should be provided where necessary. Even if under the California climate the cost of watering and upkeep of the parked spaces should be nearly as high as the repair of the pavement, there still would be great advantage in favor of parking because the original outlay would be much smaller, not to speak of the undebatable fact that the attractiveness of a well-parked residence street is much greater than that of a street with wide glaring, hot and dusty pavements. The upkeep of the grass, however, according to a statement of Prof. Chas. Gilman Hyde (page 88, note No. 1) would rather be cheaper. The water mains, gas mains, and wire conduits may then be placed under the grass instead of under the pavement, the latter being thereby protected against expensive cutting. The cities of Winnipeg and Kansas City have made extensive and satisfactory experiments with much narrower roadways than are common in American cities.[1]

WASTE OF WIDE, EXPENSIVE, GLARING PAVEMENTS IN RESIDENCE STREETS.

The enormous savings that can be made by more sensible paving methods may be illustrated by the following calculations made by Mr. C. L. Huggins, the former city engineer of the city of Berkeley:

October 23d, 1913.

Dear Dr. Hegemann:

At your suggestion I have made a rough calculation of the effect of the adoption by Berkeley of a scheme of confining wide roadways to those streets that are required for through traffic, and narrowing all residence roadways to a width of twenty-four feet, a width sufficient to carry all necessary traffic and one that would add to the quiet and beauty so much desired in residence sections.

It was impossible for me to cover the whole city. I, therefore, took what seemed to me a typical section, namely, that bounded by Dwight Way on the north, Telegraph Avenue on the west, the south boundary line of Berkeley on the south, and Claremont Avenue, with an extension north to Dwight Way, on the east. The area of this section is about 1/15 of that of the whole city.

I also made a calculation of the cost of the permanent paving of these streets on the theory that the heavy traffic roadways require a heavier paving than those used for residence traffic only. The result of my calculations is as follows:

Total area of existing roadways, 2,688,400 sq. ft.
Cost of paving same at 20c per sq. ft., $537,680.
Area of proposed roadways:

1st class	807,000 sq. ft. at 20c	$161,400.00
2nd class	579,600 sq. ft. at 15c	86,940.00
3rd class	910,800 sq. ft. at 10c	91,080.00
	2,297,400	$339,420.00

Reduction in square feet of roadways, 391,000 square feet; saving in cost of paving, $198,260.00.

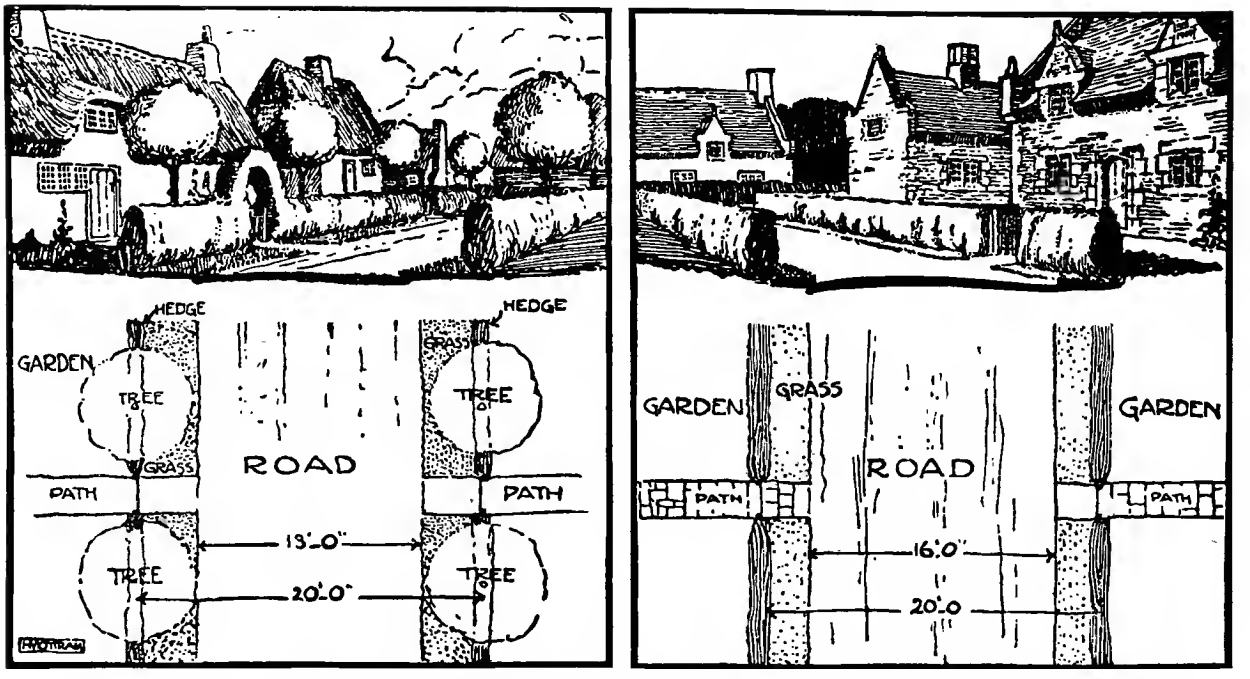
Multiplying these figures by 15 in order to apply them to the whole of Berkeley, including the territory about to be annexed on the north, we have the following result:

Reduction in amount of roadway to be paved, 5,865,000 sq. ft. Saving in cost of improvement, $2,973,900.00.

Yours very truly,
(Signed) C. L. HUGGINS.

This enormous possible saving is based on roadways as wide as twenty-four feet. I believe in even much narrower roadways with occasional widenings for the turning of vehicles. These enormous savings in the original cost of paving must be considered in connection with the savings in the cost of upkeep which would be smaller if parking instead of paving is applied as pointed out in the chapter on Traffic Streets. The hygienic and aesthetic advantages are obvious.

[1]Mr. Fred Gabelman, Engineer of the Kansas City Park Board, gives figures on the Kansas City experiment in an article in the October number of the "American City," 1912.



TYPICAL RESIDENTIAL STREETS IN A MODERN GARDEN CITY, ESPECIALLY CHARACTERISTIC OF MR. RAYMOND UNWIN'S WORK IN HAMPSTEAD, LETCHWORTH, AND EARSWICK

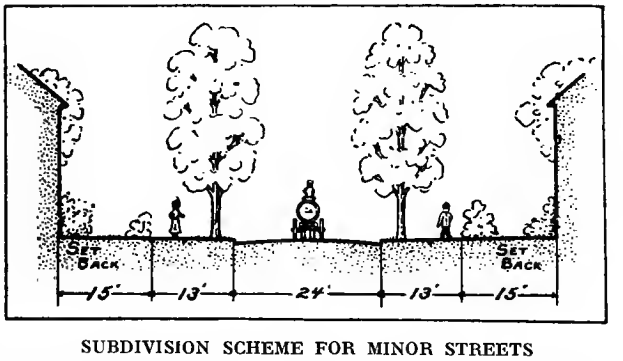
The traffic in these short streets of simple residences is so light that sidewalks are not required and the large amount of space saved is thrown into the front gardens. Narrow roadways do not mean that building lines should be close together.

TREE PLANTING CONVERTS CITIES INTO PARKS.

The increased parking space produced by a reduction in the roadway permits of street beautification through planting of trees and shrubs which was impossible when but two or three feet separated the sidewalk from the curb. Proper planting of these parkways will delight the eye of residents and visitors, give additional privacy to the homes on either side and provide a restful antidote for the rush and noise of the business districts. Indeed, by lining their residence streets with shapely and uniform avenue trees and planting the parkways between to shrubs or grass and flowers Berkeley and Oakland may make great parks of themselves. The value of such planting was long ago recognized by real estate operators who have made their residence parks more attractive to buyers by the planting of street trees, the creation of small parks at street intersections and the use of shrubs or great masses of brilliant geraniums. Oakland and Berkeley should take a page from the real estate men's books and make their residence sections as a whole more attractive to prospective residents. There is just as much competition for residents between cities as between real estate operators and it is the city that makes itself most attractive that wins. Cities as a whole, or districts within cities, have recently been given the machinery with which to carry on this work of beautification. The Tree Planting Act of 1913, (amended in 1915) and the new Tree Planting act of 1915 provide a simple procedure for the formation of districts either for planting trees and parkways or for their maintenance or both. This should be supplemented by giving to the Park Commission the duty of caring for trees and parkways on all streets. This is sometimes undertaken by the Street Department, but its interest is rather in problems of engineering than in beautification. If the Park Department, as in Pasadena, maintains a nursery, trees and shrubs can be propagated at a fraction of their cost from commercial nurseries and the cost of beautification can then be reduced to a very small amount for each individual lot owner.

NARROW ROADWAYS VS. NARROW STREETS

Ample space between building lines, however, in spite of narrow roadways, is highly desirable. But this space between houses should not be wasted on expensive wide roadways in places where traffic does not demand them; but should, on the contrary, be devoted to parking the street



SUBDIVISION SCHEME FOR MINOR STREETS

As recommended by Doctor John Nolen in his latest city-planning report (Bridgeport, Conn., 1915).

and enlarging the front gardens of the houses. Only in special circumstances are narrow streets (in contrast to narrow roadways) desirable. Such is the case with a street on a steep hillside, where a wide street would too badly cut into the contour line. A still more important instance is where cheap homes have to be provided for the smallest incomes and where the price of land has already reached too high a figure. There the building of wide streets, where they are not needed, simply means higher rents and leads to crowding and still higher rents as a consequence. There the wide street, especially when wastefully paved, makes the ground unfit for the building of individual homes and becomes the forerunner of the tenement or apartment house. Houses of a little more expensive character on lots not cut down to the dire minimum, but of some size, may advantageously break away from any reference to building lines. They should be located in view only of the character of the lot, its trees or rocks, its exposure to the sun. Any tribute paid to the appearance of the street should be rather in the character of good planting than in an effort towards architectural showiness except perhaps for certain exposed corner lots. For merely residential streets instead of harsh street lines nothing more need be left than light lanes among bungalows rambling over the ground and following intimately and deliciously its nature and its moods. Even in Japan, where this system has produced such delightful results, such lanes in spite of being lined with high wooden enclosures, are most interesting for the many occasional glimpses one gains into charming gardens and courts under overhanging trees. Such informal lanes can scarcely be too narrow.

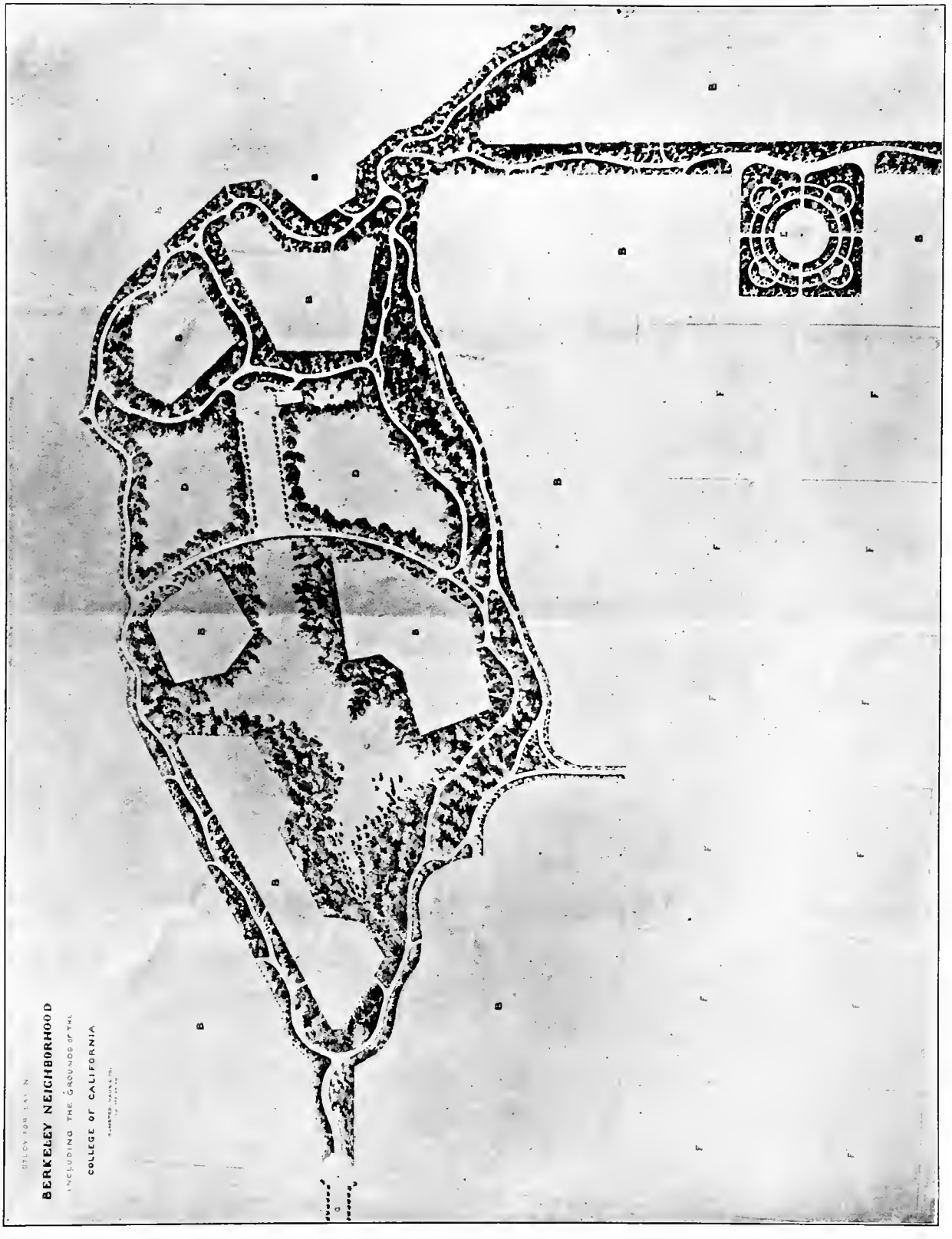
HIGH GRADE RESIDENTIAL AREAS.

The new residential subdivisions, especially in the hill sections all over the East Bay region, very happily have broken away from the unfortunate old rectangular street system by which San Francisco and the lower parts of the East Bay have been chopped up. The problem of securing worthy homes is important in every community; it is specially important in the neighborhood of a great State University. Frederic Law Olmsted, the elder, the American genius in matters of landscape architecture and home planning, has expressed himself about this point not only in general terms, but with special reference to the possibility of the hill neighborhood of the University of California, and every word he has said applies to the entire hill section on the East side of the Bay of San Francisco, *i. e.*, on the happy slopes of Oakland, Berkeley and Piedmont where the roses bloom two weeks earlier than on the level land just below. The opinions expressed by this truly great man have the character of a confession of principles. Because of the quality of the writer they are of national significance, but they are still far from being sufficiently appreciated. Copies of Olmsted's report which contains them are scarce and it will be the privilege of the present report to revive them and bring at least some of their most salient features before a wider public.

THE GENIUS OF AMERICAN LANDSCAPE ARCHITECTURE ON POSSIBILITIES OF THE BERKELEY AND OAKLAND HILLS.

In the year 1865, Frederic Law Olmsted, shortly after having laid out the famous Central Park for New York, was called upon to report upon a possible improvement of the new estate of the College which had just been founded. In that neighborhood of Oakland, which has later been given the name of Berkeley, the College authorities secured a site which in 1862 comprised 124 acres valued at $18,600 and they hoped that "a dollar invested there today, will bring better usury when the Lord's Kingdom has fully come, than one hundred cents laid out in any other place." The idea was to sell a large part of this land for residential purposes in order to raise the necessary funds for the college. Before the advent of Frederic Law Olmsted, the trustees had already laid out in the old unfortunate fashion a number of rectangular blocks and streets and sold them in lots. Frederic Law Olmsted's report contains a marvelously written argument for the necessity of better planning in order to make ideal homes possible; every word of this argument is still of the greatest actuality and deserves closest attention in planning the existing subdivisions of Oakland and Berkeley and in laying out new ones. The following are Olmsted's own words in which he described what he considered essential for a University neighborhood and for any section devoted to the higher class of refined homes:

HOW MORE PARKING AND LESS PAVEMENT BENEFITED A ST. LOUIS STREET



PLAN OF FREDERICK LAW OLMSTED, THE ELDER, FOR THE UNIVERSITY NEIGHBORHOOD
"Study for laying out the Berkeley neighborhood, including the grounds of the College of California.
Olmsted, Vaux & Co., Landscape Architects." Report dated June 29th, 1866

The top of the page is pointing east. The rectangular blocks, "F. F, F Village Lots," are 600 feet square. This furnishes a scale for the map.

For key to map see adjoining page.

BUSHNELL PLACE, BERKELEY

Immediately adjoining the University Campus. Bushnell Place is one of the oldest and best planted (Black Acacia, evergreen) residential streets. Here the last President of the University lived. The roadway is thirty feet wide with sidewalk reservations of fifteen feet on either side. Dish gutters are used (instead of the ordinary curb gutter of the city street), preserving the rural appearance. The houses, furthermore, are set back forty feet, securing privacy and quiet.

No stronger contrast to the architectural ideals of the old centralized city and its stone beauty could be imagined than this kind of a residential neighborhood, where the walls and roofs of human shelter have returned to Nature under the influence of modern rapid transit and modern ideas about hygienic life.

EXTRACTS FROM F. L. OLMSTED'S REPORT

THE ATMOSPHERE OF STUDY-REFINED DOMESTIC LIFE.

"It is desirable that scholars at least during the period of life in which character is most easily moulded, should be surrounded by manifestations of refined domestic life, these being unquestionably the ripest and best fruits of civilization. The first requirement of a plan for the improvement of the locality is that it should present sufficient inducements to the formation of a neighborhood of refined and elegant homes in the immediate vicinity of the principal College Buildings.

"The second requirement of a plan is that, while

KEY AND EXPLANATIONS TO OLMSTED SR.'S PLAN ON ADJOINING PAGE

The map is taken from the report: Berkeley neighborhood—Report upon a projected improvement of the estate of the College of California at Berkeley, near Oakland. By Olmsted, Vaux & Co., Landscape Architects, New York, 1866. Key: A—Site for College Buildings; B—Ground for Residences; C—Public Grounds; D—Ground reserved for College purposes; E—Public Garden; F—Berkeley Village Lots; G—Avenue to the Landing. From the report the following explanations regarding the letters given on the map may be taken:

Regarding A, Site for College Buildings, it appears that Olmsted figured on two buildings, later to be increased to three, to be placed upon an artificial plateau at the head of a well turfed dell connected by a strip with the central College building. The axis of this strip was planned "in the line of the Golden Gate." The proposed site, Olmsted says, "while moderately elevated, yet appears slightly embayed among the slopes of the hills on all sides except that toward the park over which the outlook to the westward is unconfined and reaches to the horizon of the ocean."

Regarding B—Ground for Residences—Olmsted says that the divisions shown on the map are "each of such a form that it could be easily subdivided by simple lines into lots, each of one to five acres in extent, of suitable shape and favorably situated in all respects for a family home. The relative position of the houses erected and trees grown upon the different lots may be such that the best view from each site will remain not only uninterrupted but rather improved by that below it. The divisions are separated one from the other by lanes bordered on each side by continuous thick groves, and access to each private lot from these lanes is arranged by short approaches branching from them. The area of ground contained in these divisions is 195 acres (including nearly 90 acres belonging to private owners between the college property and the adjoining public roads) and might with advantage be occupied by from 50 to 100 private families.

"The lanes are arranged for with reference to continuations to the northward and southward should additional accommodation of the same character be hereafter found desirable.

"Connection is also made by shaded roads with the village already laid out in the vicinity and (E) a public garden, containing a children's playground, with a series of shaded walks and arbors about it, is provided for, adjoining this village."

Regarding C—Public Grounds—Olmsted says: "A tract of low, flat ground, 27 acres in extent, pleasantly surrounded on three sides by moderate elevations is proposed to be formed into a small park or general pleasure ground." Olmsted is very emphatic about the necessity of taking special precautions for getting good lawn, also for the grounds described under D.

For D—Ground Reserved for College Purposes—Olmsted prefers good turf as more beautiful and directly useful to the students rather than a scientific or ornamental flower garden.

E—Public Garden (in the lower right corner)—is described at the end of what is said under B. It is interesting to note that Olmsted, as far back as 1865, should have thought of children's playgrounds, an idea that has dawned on the rest of the world so much later.

F—Berkeley Village Lots are the blocks of land laid out and partly settled upon before the coming of Olmsted.

G—Avenue to the Landing, "to be approached by a projected street railroad and also by a direct avenue from the proposed steamboat landing at that point of the bay which is nearest to the property."

The slightly winding avenue leading south at the right side of the map is the connection with Oakland planned by Olmsted. (Today Piedmont Avenue and part of Highland Drive, compare pictures, p. 113.)

PART OF HOUSE GARDEN ON A HILLSIDE OVERLOOKING LAKE MERRITT, OAKLAND

presenting advantages for scholarly and domestic life, it shall not be calculated to draw noisy and disturbing commerce to the neighborhood, or anything else which would destroy its general tranquillity. . . . Perfect shelter at all times and as free a supply of fresh air and sunlight as is desirable to be used by every human being at intervals, is impossible. Yet, as their use seems to be always free to the poorest and least intelligent of men, it seldom occurs to such as are intent on making good provision in other respects for the comfort of their families, to take great care to make the use of sunlight and air easy and agreeable. The consequence is that their houses are really no better in this respect than those of careless and indolent men; often not as good, the advantages of the latter in this one particular being sacrificed by the more prudent to more complete arrangements for accomplishing the primary purpose of shelter. (View of St. Francis Hotel, p. 105).

"More unhappiness probably arises from this cause, in houses which are in most respects luxuriously appointed, than from any other which can be clearly defined and guarded against.

OPEN AIR APARTMENTS.

"*Attractive open-air apartments*, so formed that they can be often occupied for hours at a time, with convenience and ease in every respect, without the interruption of ordinary occupations or difficulty of conversation, are indeed indispensable in the present state of society to the preservation of health and cheerfulness in families otherwise living in luxury. The inmates of houses which are well built and furnished in other respects, but in which such apartments are lacking, are almost certain, before many years, to be much troubled with languor, dullness of perception, nervous debility or distinct nervous diseases. . . . In America the 'garden' and 'grounds' are regarded merely as ornamental appendages of a house, marks of the social ambitions of the owner, like the plate and carpets within, rather than as essentials of health and comfort, like the beds and baths. Yet the frequent action of free, sun-lighted air upon the lungs for a considerable space of time is unquestionably more important than the frequent washing of the skin with water or the perfection of nightly repose. . . .

MAKE THE EAST BAY MORE ATTRACTIVE THAN ANY SUBURB OF SAN FRANCISCO.

"If you can make your neighborhood positively attractive in other respects, especially if you can make it in important particulars more attractive than any other suburb of San Francisco, you can offer your land for sale, for villa residences, in lots of moderate size, with entire confidence that you will thus cause to grow up about it such a neighborhood as is most desirable, with reference to your first purpose. (*i. e.*, the University).

PLEASANT APPROACHES.

"What, then, are the requisites (exterior to private ground) of an attractive neighborhood, be-

THIS IS NOT THE ENTRANCE TO THE CASTLE OF THE SLEEPING BEAUTY, BUT JUST THE GATEWAY OF AN EAST BAY GARDEN

sides good neighbors, and such institutions as are tolerably sure to be established among good neighbors? The most important, I believe, will be found in all cases to be that of good *out-goings* from the private grounds, whether with reference to social visiting, or merely to the pleasure and healthfulness of occasional changes of scene, and more extended free movement than it is convenient to maintain the means of exercising within private grounds.

"For this purpose the common roads and walks of immediate neighborhood, at all times of the year, must be neither muddy nor dusty, nor rough, nor steep, nor excessively exposed to the heat of the sun or the fierceness of the wind. . . .

POINTS OF SOCIAL RENDEZVOUS IN EASY REACH.

"The desideratum of a residence next in importance will be points in the neighborhood at which there are scenes, either local or distant, either natural or artificial, calculated to draw women out of their houses and private grounds, or which will at least form apparent objects before them when they go out. It will be all the better if many are likely to resort to these points and they thus become social rendezvous of the neighborhood.

WELL BALANCED LANDSCAPES AS VISTAS.

"Next to points at some distance from a house commanding beautiful views, it is desirable to be able to look out from the house itself upon some interesting distant scene. . . . It is not desirable to have such a scene constantly before one. If within control, it should be held only where it can be enjoyed under circumstances favorable to sympathetic contemplation.

"The class of views most desirable thus to be had within easy reach is probably that which will include all well-balanced and complete landscapes. The general quality of the distant scene should be natural and tranquil; in the details, however, there had better be something of human interest. But whatever the character of the distant outlook, it is always desirable that the line or space of division between that which is interior and essential to the home itself and that without which is looked upon from it, should be distinct and unmistakable.[1] That is to say, whenever there is an open or distant view from a residence, the grounds, constructions, and plantations about the house should form a fitting foreground to that view, well defined, suitably proportioned, salient, elegant and finished. . . .

"Of these three desiderata, the first only can be supplied by private effort. A site for a residence, therefore, should be selected, if possible, where the other two are found ready to hand. . . .

LEROY AVENUE NEAR RIDGE ROAD, BERKELEY
EXAMPLE OF "GOOD OUTGOINGS"

Live oak preserved in center of street, giving interest and character to the street and its refined architecture.

CLIMATIC ADVANTAGES OF THE EAST BAY FOOTHILLS OVER SAN FRANCISCO.

"In respect of soil, exposure, natural foliage and water supply, your ground is, to say the least, unsurpassed in the vicinity of San Francisco.

"There are few, if any suburbs which command as fine a distant prospect. The undulations of the ground and the difference of elevation between the upper and the lower parts give the advantage of this prospect in its main features to a large number of points of view, so situated that the erection of buildings and the growth of trees at other points will be no interruption to it.

"With respect to climate and adaptation to out-of-door occupation, persons who had resided upon the ground or who had had frequent occasion to

AMERICAN ELMS, UPPER PORTION OF DWIGHT WAY, BERKELEY—EXAMPLE OF "GOOD OUTGOINGS"

Beautiful, well cared for planting like this can redeem almost any architecture. Combined with good types of the new California home architecture such as one may see about the Bay, most delightful effects can be achieved.

[1]Here Olmsted puts himself willingly in a splendid opposition to the older school of landscape architects, which, with its master Humphrey Repton declared: "One of the fundamental principles of landscape gardening is to disguise the real boundary of the premises." Compare page 7 of the new American edition published by John Nolen.

It must be remembered, however, that Olmsted (like Repton) speaks of somewhat large estates. Much can be said in favor of the American way of having the front gardens of small lots without fences and practically forming part of the street. This is rather a fine expression of community spirit.

LITERALLY MILLIONS OF ROSES BLOSSOM THE YEAR AROUND IN THE GARDENS OF EAST BAY HOMES

cross it, having stated that the sea-winds which nearly everywhere else near San Francisco are in summer extremely harsh, chilling, and disagreeable to all, and often very trying to delicate persons, were felt at this point very little. I gave this alleged advantage particular consideration.

"During the month of August I spent ten days on the ground, usually coming from San Francisco in the morning and returning at night. The climate of San Francisco was at this time extremely disagreeable, while that of the College property was as fine as possible. One morning when I left San Francisco at 9 o'clock, though the air was clear, a light but chilling northwest wind was blowing. At Berkeley the air was perfectly calm. Ascending the mountain-side a few hundred feet, I again encountered the wind. Descending, it was lost, and the air remained calm until I left at 5 in the afternoon, the temperature being at the same time agreeably mild. During all the day I observed that San Francisco was enveloped in fog and that fog and smoke drifted rapidly from it over the bay. At 5 o'clock, on returning to San Francisco, after driving two miles toward Oakland, I had need to put on my overcoat. At San Francisco I found a blustering, damp wind and my friends sitting about a fire. The following day there was in the morning a pleasant, soft breeze at Berkeley, but late in the afternoon it fell to a complete calm. I determined to remain on the ground for the purpose of ascertaining whether this would continue or whether it preceded a change of temperature and a visit of the sea-wind after night-fall. At sunset the fog clouds were rolling over the mountain tops back of San Francisco gorgeous in rosy and golden light; the city itself was obscured by a drifting scud. At Berkeley the air remained perfectly serene, and except for the fog banks in the southwest, which soon became silvery and very beautiful in the moonlight, I never saw a clearer or brighter sky. It remained the same, the air being still of a delightful temperature, till morning, when the sun, rising over the mountains in the rear, gave a new glory to the constant clouds overhanging the heights on each side of the Golden Gate. Going back in the afternoon to San Francisco, I again found the temperature in contrast to that of Berkeley disagreeably chilling, though the day was considered there an uncommonly fine one and the wind was less severe than usual.

"SERENITY, CHEERFULNESS AND HEALTHFULNESS."

"I have visited the other suburbs of San Francisco and studied them with some care, and I think that I am warranted in indorsing the opinion that the climate of Berkeley is distinguished for a peculiar serenity, cheerfulness, and healthfulness.

"I know of no entirely satisfactory explanation of the fact. But it may be observed that it lies

ROSES, BECAUSE OF THEIR RAPID AND STURDY GROWTH, ARE AMONG THE MOST ECONOMICAL AND SATISFACTORY MEANS OF BEAUTIFYING THE EAST BAY GARDENS

to the northward of the course of the northwest wind which draws through the Golden Gate and which sweeps the peninsula to the southward of the city and the contra costa country, and that there are to the northward and northwestward of it several spurs of the Mount Diablo range, the form of which is calculated to deflect currents of air setting down the bay from the northward. The form of the trees on the top of the nearest of these hills indicated an upward deflection of the northerly wind.

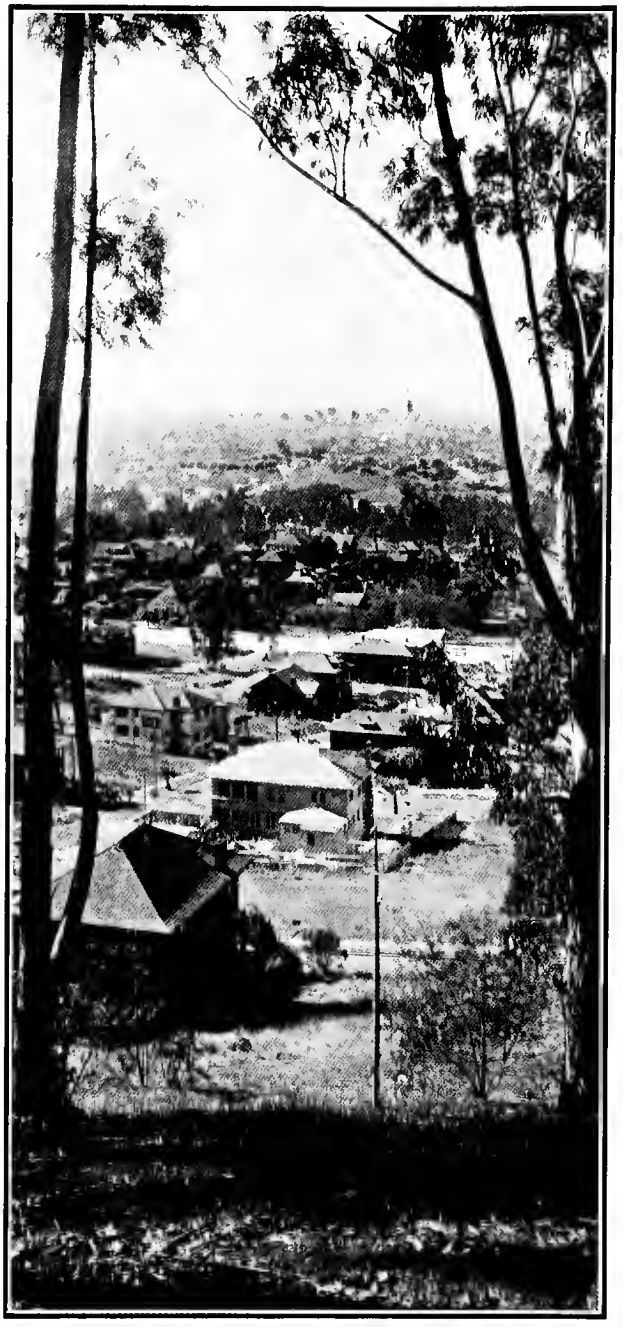
"It will be seen that the natural advantages which led to the choice of the locality for the College, adapt it still for a neighborhood of luxurious family residences. . . . If what is proposed to be accomplished is modestly conceived, and the requisite effort is made and sustained for a sufficient period, it is unquestionable that the more uninviting elements of the existing scenery may be reduced in importance, and its more attractive features presented to much greater advantage than they are under merely natural circumstances, or under any artificial conditions yet in existence. It may also be confidently anticipated that the result will be peculiarly home-like and grateful in contrast to the ordinary aspect of the open country of California.

"FOREGROUNDS OF RICH AND CAREFULLY NURTURED FOLIAGE."

"For instance, if we imagine the greater part of your property to have passed in tracts of from two to five acres into the possesion of men each of whom shall have formed, as a part of his private residence, a proper foreground of foliage, to his own outlook, it follows, from what I have before argued, that one of the chief defects of the scenery would be in a great degree remedied; for these bodies of rich and carefully nurtured foliage would form part of an artistic middle distance to all other points in the vicinity which would overlook them, and would so frame under the more distant prospect from these exterior points of view that a strong gradation of aerial perspective would occur. And the fact will be observed that if the range of the eye is thus carried but to a certain distance, especially to the westward or southward, the view is everywhere exceedingly beautiful, both in respect to the form of the hills and their beauty of color and tone, under all atmospheric conditions.

"VIEWS OF GREAT DEPTH."

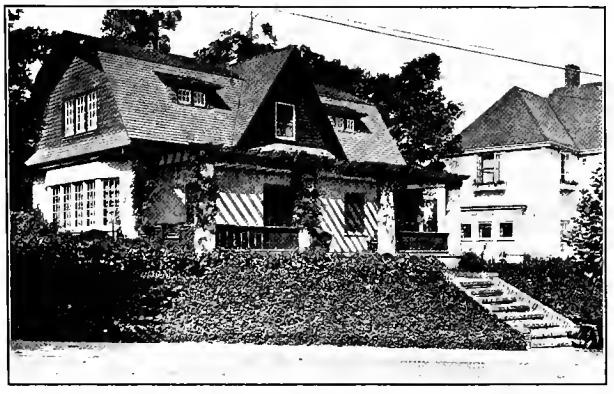
Even in stormy weather there is a great grandeur in the movements of the clouds rolling over their somber slopes and declivities; and I remembered a single scene of this kind as one of the most impressive that I have ever witnessed. But on ordinary occasions the view to the westward, if the eye does not regard the dullness of the nearer part of the landscape, while it is one of great depth and breadth, is also one of peculiarly cheerful interest.



VIEW FROM AN EAST BAY GARDEN—THE OAKLAND CITY HALL ON THE HORIZON

This realizes the "command of distant views" set down as desirable by the elder Olmsted. Note how much the view would gain if "a proper foreground of foliage would frame under the more distant prospect," as suggested by Olmsted, instead of the less interesting houses of the immediate neighborhood.

"The main requirements of a plan, then, for the improvement of this region, with reference to residences, must be, first, so to arrange the roads upon which private property will front as to secure the best practicable landscape effects from the largest number of points of view; second, so as to arrange the roads and public ground as to give the owners of the private property satisfactory outgoings in respect, first, to convenience of use; second,



CLAREMONT DISTRICT HOMES

"Roadside closely lined and draped over with living foliage." "There should be no raw banks." This picture shows a modern East Bay realization of suggestions made for the same neighborhood by the famous landscape architect, Frederick Law Olmsted, Sr., as far back as 1865.

to attractiveness in their borders; and third, to command of occasional distant views and complete landscapes.

"THERE SHOULD BE NO RAW BANKS" BUT "LIVING FOLIAGE."

"To meet the second of these requirements, the borders of the road should be absolutely neat, or even nice. There should be no raw banks or bare, neglected-looking places, nor drifts of rubbish by their side.

"This, in the climate of the locality, implies one of two things, either that the whole roadside is watered daily during several months of the year, or that it is closely lined and draped over with living foliage.

"The latter might be undesirable if there were pleasant open scenery along the road; but where, as it must be supposed will be the case here, there will generally be within a distance of a hundred feet or more of the road only a choice between a harsh, brown surface as at present, or a private garden (it may be a vegetable garden) or a continuous grove, it will be the more agreeable as well as much the cheaper arrangement.

"I can think of nothing to which the imagination turns with more eagerness in the bleak and open scenery, and the exceeding and all pervading lightness of the daylight of California, than to memories of shady old lanes running through a close and overarching bowery of foliage, and such an ideal should be fixed before whoever is placed in charge of your improvements. . . . The relative position of the houses erected, and trees grown upon the different lots, may be such that the best view from each site will remain not only uninterrupted, but rather improved by that below it. The divisions are separated one from the other by lanes bordered, as already explained, on each side by continuous thick groves, and access to each private lot from these lanes is arranged by short approaches branching from them."

THE HIGHLAND DRIVE RECOMMENDED BY THE ELDER OLMSTED.

The remaining part of Olmsted's report is dedicated to the recommendations regarding the setting of the College buildings, grounds and walks and drives into the canyon and its preservation, and especially also to the creation of a pleasure drive between Berkeley and Oakland somewhat on the line of the Highland Drive recently defined and marked by columns. The northern part of this first conception of the Highland Drive by Frederic Law Olmsted the elder, has been actually built; it is Berkeley's Piedmont Avenue forming one of the most pleasing parts of the present Highland Drive. The first plan made for it forms part of Olmsted's Berkeley project as reproduced p. 106. It is the slightly winding and thickly planted road close to the top of the page. Two views of this drive, as it looks today, are reproduced on the following page, 113.

RELATION BETWEEN REFINED HOMES AND THE REALIZATION OF GREAT CITY PLANNING IDEAS.

Olmsted's ideal was the formation of a neighborhood of refined and elegant homes in which he saw the ripest and best fruits of civilization. He had before his eyes the high standards of refined life in the splendid country estates of England which covered many hundred of acres each. An

TWO OTHER EXAMPLES OF BEAUTIFUL TREATMENT OF ROADSIDE BANKS

In the foreground a small retaining wall with flowers and living foliage; in the background a sloping lawn. (The picture is to show a good treatment of the roadside bank. It may be mentioned that the space for street trees between sidewalk and curb is not half wide enough.)

EXAMPLE OF ROADSIDE BANK TREATED WITH LAWN AND FLOWERS

The picture is to show a good treatment of a roadside bank. It may be mentioned that a better street effect would be attained by substituting stately arching trees for the palms, which are not suitable for sidewalk planting.

imitation of these grand estates he judged impossible in America, but semi-urban homes with from two to five acres of garden seemed a possible ideal to him. He spent the rest of his life in Boston and found similar conditions around Harvard, the oldest National University, and the refined spirit the old New England families represented found a remarkable exponent in Olmsted's great disciple, Charles Eliot, the son of the famous University President, Charles W. Eliot. This young Charles Eliot and the splendid response he found in many of the most influential old families are directly responsible for the creation of the Metropolitan Park System of Greater Boston, one of the greatest city planning achievements of all times, and the most splendid and everlasting realization of the best in the teachings of Olmsted the elder. It is important to note this relation between carefully planned homes of refinement and general city and park planning.

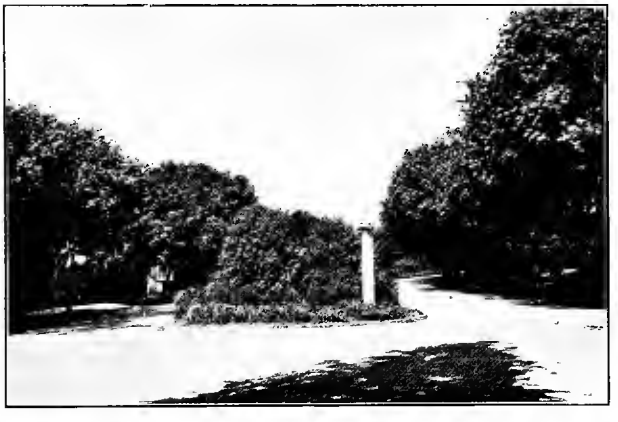
RAPID TRANSIT MUST HELP TO REALIZE OLMSTED HOME IDEALS.

As mentioned above, the value of the land at the time when Olmsted started his work for the College of California, was about $150 an acre, and the upkeep of a three acre estate was chiefly a question of securing sufficient help. Today the land for which Olmsted had planned could hardly be bought for a hundred times its value in 1862. Only very few estates of two acres or more are left and they are in immediate danger of being subdivided. There are five or more lots to the acre (including streets) on most of the land around the university. The maintenance of a two acre estate requires an income of at least ten thousand dollars, while the great majority of the house owners around the university have an income averaging little over three thousand dollars a year. The small number of people who have large incomes and keep larger estates live in more distant suburbs, but even there the land today costs

VIEWS OF THE TERRACES AND NEIGHBORHOOD OF THE SAME HOUSE

EAST BAY HILL ARCHITECTURALLY MASTERED

This much-photographed house in Berkeley is one of the finest examples of how an architect can make his work a part of the landscape. The house and its terraces are no longer an element foreign to the soil, but are the natural crowning feature of the hill and its oaks, the precious stone of human art in its natural setting.



VIEWS OF PIEDMONT AVENUE

This Berkeley street adjoins the University and owes its beauty to the plan made as far back as 1865 by the elder Olmsted (compare the plan, p. 106). It is a fine example of what Olmsted calls "good outgoings." Note how the roadways to the right and left of the central planting follow different levels, thus taking account of the hillside. The white column is one of the columns marking the Highland Drive. That intelligent effort toward beautification brings rich returns in cold cash is indicated by the fact that Piedmont Avenue, remote as it is from any business center, shows the highest front-foot values for purely residential property in the entire extent of the East Bay cities.

PLEASANT APPROACHES AND "GOOD OUTGOINGS," NORTHBRAE STATION, BERKELEY

Built by the owners of a subdivision at junction of Key Route and Southern Pacific suburban lines. Compare picture of Monterey Station. Both these pictures are good illustrations of what "good outgoings" required by Olmsted, Sr., should include under modern conditions. In other cases waiting rooms in the East Bay cities have been treated artistically and placed in a central plot with entrance roads to the subdivision on either side or waiting rooms matching each other have been placed on either side of the street.

over twelve thousand dollars an acre. If the lofty home ideals of Olmsted are to be carried out for any perceptible part of the people, land must be taken that still has its agricultural value only. With the modern means of electric transportation fortunately such land always can be reached. The building of the new Oakland & Antioch Railway, for instance, again brought land into the reach of city dwellers at prices not much higher than the ones paid in 1862 by the College of California. Cheap land of this kind will be necessary for realizing Olmsted's ideals of semi-rural homes. Similarly cheap land will also be necessary for the purpose of housing the increasing number of laboring men; this point will be taken up later.

THE IMPORTANCE OF LARGE PRIVATE GARDENS AND THEIR TAXATION.

In this connection must be emphasized the great importance which large estates with private gardens have for the community as a whole. Even if these large gardens are not open to the public they are a great factor in making a city healthy and beautiful. It seems shortsighted to me to tax these gardens out of existence. The following method of taxation would be equitable and still take due account of the high hygienic and aesthetic value of private gardens. Any land that is kept as a private garden should he assessed at its full value like ordinary city land, but the payment of the accruing taxes should be suspended as long as the land is kept for garden purposes, *i. e.*, the owner would pay taxes only on a semi-agricultural value of the garden land until he should decide to subdivide his land; then he should have to pay the full amount of taxes and interest thereon accumulated during all the preceding time. This would have the three-fold advantage of first affording a strong incentive for keeping city land as gardens because of the saving of taxes; second, of affording a strong deterrent against subdividing gardens because that would mean a sudden large outlay for taxes; third, the city in securing a public park always would have a great advantage over any private purchasers of garden land, because the city always would secure private gardens, which are ready to be sold, at the market prices minus the amount of accumulated taxes. Any new city, especially cities in so happy a climate as California, must be real garden cities instead of repeating the congestion of houses of the old cities.

MONTEREY STATION, BERKELEY

This picture and the one of Northbrae Station are good examples of co-operation between railroad and real estate enterprise.

IN NORTHBRAE, BERKELEY

NEAR INDIAN TRAIL, THOUSAND OAKS

Two East Bay residences showing the possibilities of romantic setting among eucalyptus and oaks. This picture suggests ideas about adapting architecture to the surroundings. Value of residences between $7500 and $9000 on land nearly $70 per front foot; size of lots about 100 x 125 feet. Much of the romantic beauty of settings like these will disappear with the building up of the neighborhood, especially if inharmonious types of houses should be permitted.

TYPICAL EXAMPLE OF EAST BAY ARCHITECTURE
A building of wood construction overlooking a hill luxuriously planted

MEDIUM PRICED AND CHEAPER HOMES.

The importance of large estates for their gardens as well as for the example they should give of good taste and refined development can be hardly overestimated, though of course only a very small percentage of the people can themselves live in these pretentious estates. Leaving aside the most expensive residential sections, the largest part of the people living in the residential districts of the East Bay will not pay more than three thousand dollars for a lot; many will pay less. For the maximum price of $3000 under the present state of values, they can secure lots only fifty feet wide and one hundred and twenty feet deep. The exterior and general character of the newer subdivisions is determined by the quality of the improvements put on these lots, the houses costing between five and six thousand dollars. The figures just mentioned again are very much above the prices that can be paid by that part of the population which, with the industrialization of the East Bay, will more and more become the most important, and therefore the most interesting for the city planner.

THE HOUSE OF THE WORKINGMAN.

The labor conditions around the Bay have been rather favorable to the workingmen, a large proportion of whom have been able to enforce the comparatively high union wages. This fact finds its expression in the wide stretches of pleasant bungalows covering the lower foothills, the prices running from $350 to $750 for the lot and $1500 to $2500 for the house. With better planning, bet-

EAST BAY SHINGLE HOUSES WITH RICH GROWTH

The shingle house introduced to the East Bay by Architect B. R. Maybeck and his followers has proved most successful in shaping the artistic appearance of the East Bay garden cities. The brown of the shingles goes well with the luxurious green of the near-by planting and the brown and smoothly moulded hills in the distance. Some real architectural style is growing out of the soil (compare views, p. 144); it is a real calamity that cheap plaster imitations of stone kill it. The two houses shown here, when they they were built in the '90s, cost $1500 and $2000 each.

ter planting, more uniformity in material and architectural aims, and with the enforcement of satisfactory restrictions and protections, these sections will gradually be able to satisfy the highest ambitions of the great world movement towards "garden city" ideals.

The comparatively high wages which make these promising developments possible have been mentioned many times as a serious handicap to the industrial development of the Bay section and if the hopes which large interests set upon the Panama Canal are realized, then large industrial communities will spring up on the East side of the Bay in which thousands and perhaps hundreds of thousands of working men will need homes for which they cannot pay more than ten dollars a month. Ten dollars a month corresponds to a $1000 investment at a 12% rate; 12% is not too high a return if taxes and the large depreciation which goes with the renting of cheap homes is considered. Since the cheapest lot which at present can be had is hardly under $300, there would remain only $700 for the house, *i. e.*, hardly sufficient to build satisfactory quarters for a workingman's family with children. Surely nobody should conclude from these figures that the present real estate conditions of the East Bay section make it impossible to house the huge masses of comparatively cheap labor, which, under present competitive conditions are necessary for the upbuilding of a large industrial community. But earnest thought must be given to the problem of housing them.

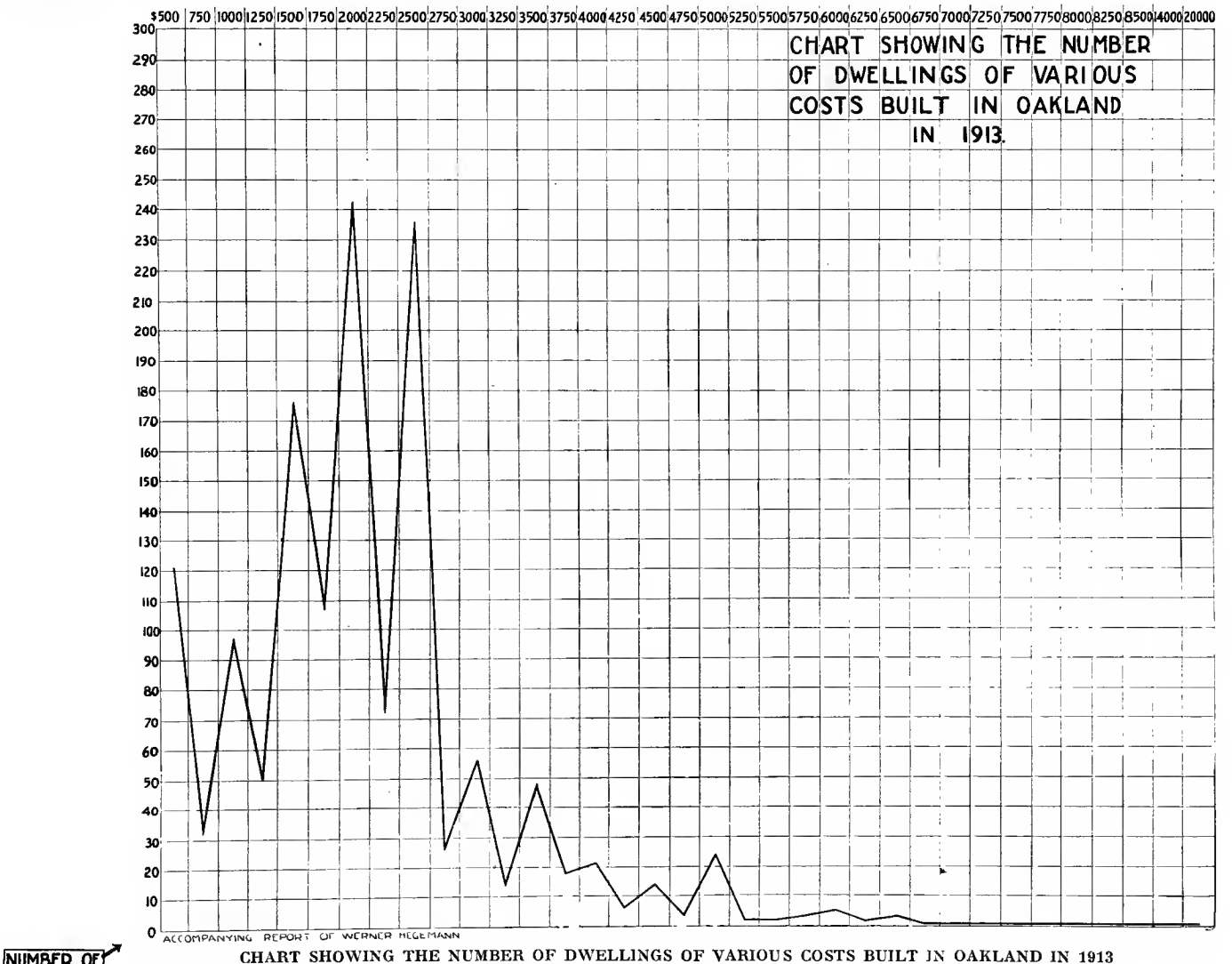


CHART SHOWING THE NUMBER OF DWELLINGS OF VARIOUS COSTS BUILT IN OAKLAND IN 1913

The points of the ascending and descending line indicate in each case the number of dwellings built in 1913. For example, the highest point of the line is in the $2000 column above the number 240, indicating that 240 $2000 dwellings were erected in Oakland in 1913. The chart clearly shows that an overwhelming proportion of dwellings cost $2500 and less. Dwellings costing $2500 and less in 1913 represented 82.4 per cent of the total number of dwellings. In 1913 permits were asked for more individual dwellings costing $500 and less than $5000 and over. The chart emphasizes what has already been pointed out, a contention of the report, namely, that the housing of the great bulk of the population who must live in inexpensive dwellings is of the highest interest to the city-planner; far more so than the housing of the comparatively small number of the well-to-do who, by the conspicuousness of their dwellings, attract a disproportionate share of the attention of the real estate operator and subdivider.

THE DANGERS OF CITY GROWTH MAKE CITY PLANNING IMPERATIVE.

In the housing of the workingmen it is very common to find somewhat better conditions from many points of view in the smaller cities than in the big cities. It may almost be called a rule that certain conditions (lack of space, lack of parks and playgrounds, crowding on the acre and in the rooms, crowding of offices, lack of ventilation, etc.,) grow worse the larger the city grows; *i. e.*, the badness of conditions is often relative to the size of the city. If the future of the East side of the Bay is to be anything but a shameless repetition of the intolerable conditions of the old cities, a system of city-planning must be developed that insures the maintenance of these better conditions, as far as they exist. Looking at the present conditions in California cities there is little promise that their present advantages over old towns will continue if there is no determined effort made to secure this result. The housing of the workingman has yet been given very little attention. The dangers which have to be looked for may be illustrated by the example of the city of Sacramento which compared with Oakland or Berkeley has done more and very commendable work in the investigation of this field. Already, though Sacramento has to house a population of less than 100,000, the investigations made by Mrs. Von Wagner, 1912, and by Miss C. Schlief in 1913, show that any amount of bad housing can be found in Sacramento and of course there is every reason to assume that conditions are even worse in the larger California cities.

At the Oakland City-Planning Exhibition, 1914, Dr. Carlton H. Parker, Professor of Political Economy at the University of California, and State Immigration Commissioner, pointed out:

"In San Francisco where more than 35,000 people live in tenements and filthy lodgings, there is not a single inspector to see that the law is enforced.

"Oakland is full of unlovely tenement houses, of

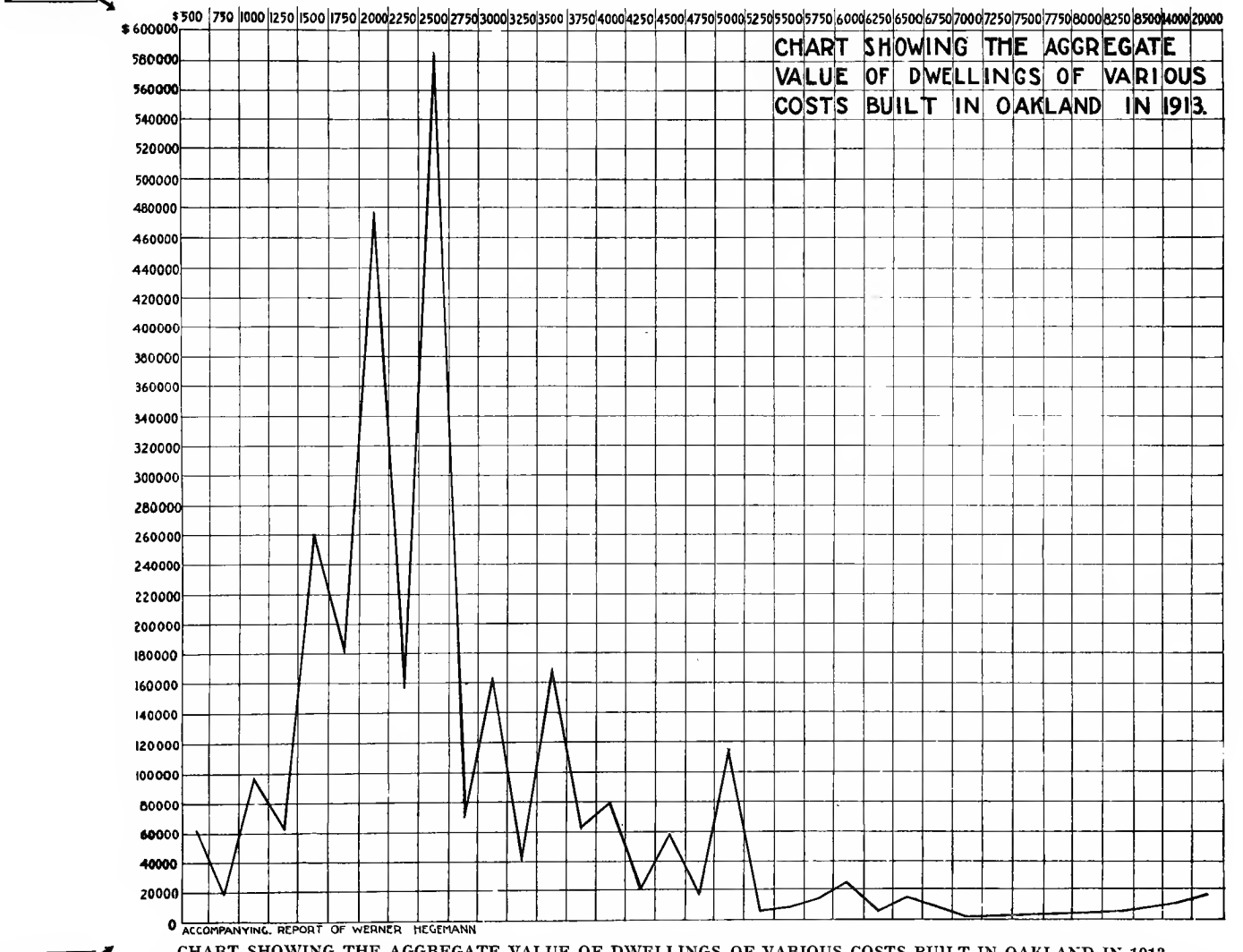
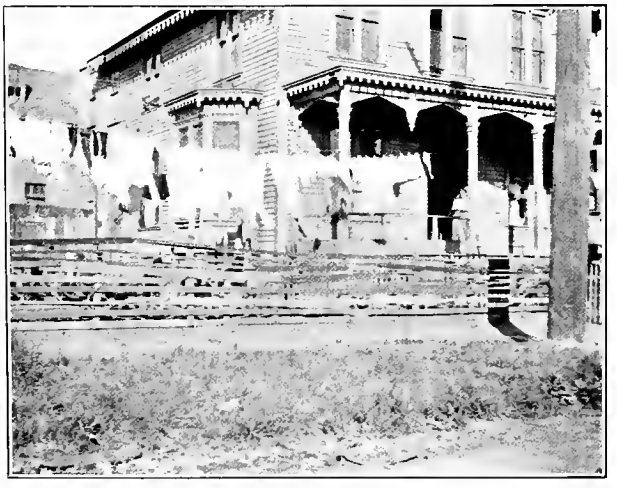


CHART SHOWING THE AGGREGATE VALUE OF DWELLINGS OF VARIOUS COSTS BUILT IN OAKLAND IN 1913

This chart represents, in a slightly different manner, the same facts set forth in the chart on the preceding page. The points of the ascending and descending line indicate, not the number of houses of each cost, but the aggregate value. Thus the aggregate value of houses costing $2500 built in Oakland in 1913 was slightly in excess of $580,000, while all the houses costing $6000 each only totaled $24,000. The same conclusions can be derived from this chart as from the preceding one.



CONGESTION

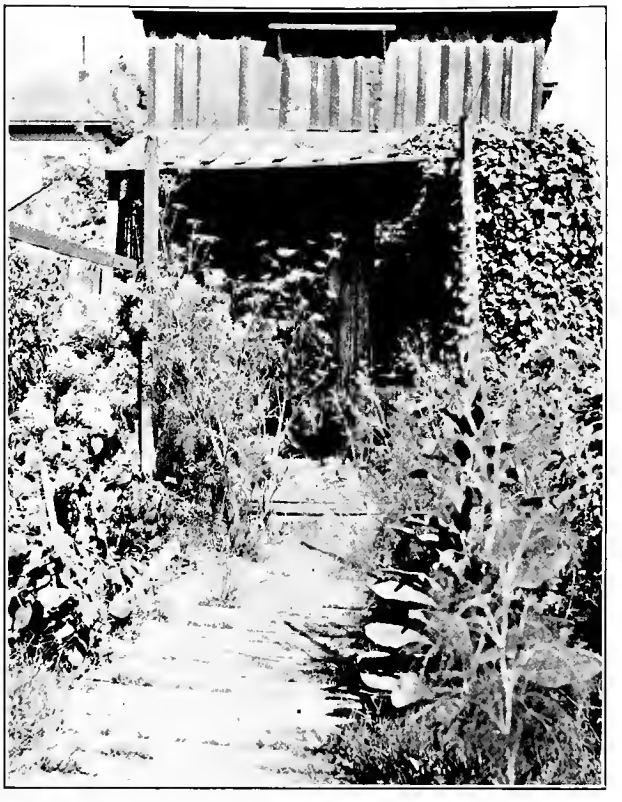
Eight Italian families live in this old house (not to mention lodgers) with an average of two rooms to a family. Rent, $8 a month.

vermin infested lodging houses which produce crime, prevent the development of a healthy population, and create perverts."

It will be necessary to investigate by careful statistical work what the extent of the undesirable conditions in the housing situation of the East Bay cities is and how far the bad conditions are rather the exception than the rule. However large the percentage may be, the fact remains that bad conditions already exist and that they continuously grow worse, and also that the life of the whole community not only is endangered by these bad conditions, but actually is based upon them.

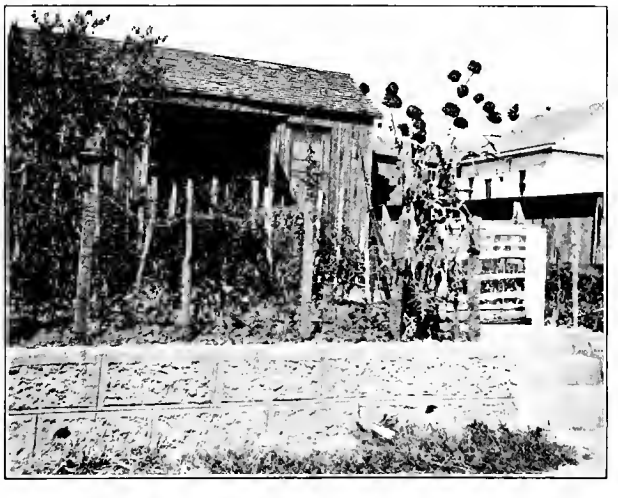
THE MAJORITY OF THE PEOPLE HAVE COMPARATIVELY SMALL INCOMES.

Even now while the evil is still in its infancy, it



Sunlight, fresh air and garden space, though not in good repair. $4 a month for two rooms.

is very difficult to figure out what would happen to any part of the community, if this whole stratum of population should suddenly disappear, a population that at present is shamefully housed, but that performs necessary services in the community and pays the rents on large investments of money —investments that are closely correlated with many other investments.

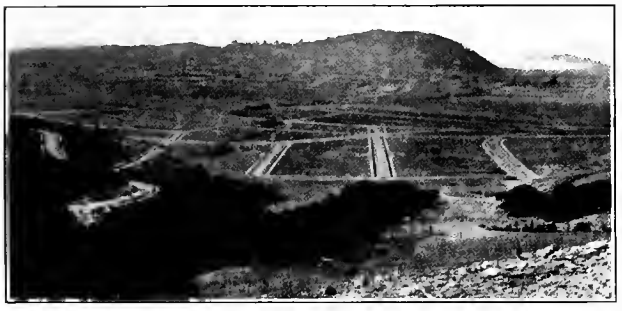


The home of a thrifty Italian family being bought on installments. The garden supplies the family with vegetables.

A rear court used by six families. Conditions speak for themselves. Rent, two rooms, $6 a month.

EXAMPLES OF BAD HOUSING CONDITIONS

From a large series exhibited by the Oakland Associated Charities at the last State Conference of Charities and Correction in San Francisco, with the captions as exhibited by the Associated Charities. The conditions have not improved since. The planting in two of the pictures seems to prove that the inhabitants of these houses have an appreciation of better surroundings and would live up to better conditions if they were put into reach financially.



VIEW FROM THOUSAND OAKS (HILLS TO THE LEFT) TOWARDS CERRITO HILL

Showing the enterprising activity of the subdividing real estate operator opening up with his new streets wide plains and adjoining hills as new residence districts.

Since the wiping out of this stratum of the population even cannot be thought of, everything must be done in order to raise its standard of life and its housing conditions. No doubt the social conditions, the habits and methods of life of the people living in poor houses need uplifting and education, but much of the situation dangerous to health and morals can directly be traced back to defects in the planning of the cities.

The width and paving of the streets, the size of the lots, the type of the buildings and the laws regulating them and their continuous inspection, the transit connections with the places of work—all these were not designed with special reference to the needs and pocketbooks of the workingman. Considerable elimination of waste and other improvements over old haphazard methods have been realized wherever the matter of cheap but efficient housing has been taken up seriously by private or public enterprise. A special discussion of the many points to be considered in this connection cannot be attempted here; persons interested in the matter must be referred to the large housing literature and proceedings of the Housing Conferences all over the world.

"WHAT HOUSE CAN ONE GET FOR $10 A MONTH?" THIS IS THE MOST IMPORTANT QUESTION IN CITY PLANNING.

There are now thousands of families, and there will be very many more, whose work the community needs, but pays for in a manner which does not permit these families to pay more than ten dollars a month for their shelter. The question immediately arises, What can these families get for ten dollars a month? It is a widely current but mistaken notion that families of this type can select the type of dwelling they want. On the contrary, these families, often coming in as suddenly as the growth of industries demands, simply have to take what they get and what they get is largely, if not wholly, determined by the prevailing methods of building and developing the city. There are two alternatives; the one leads to overcrowding in unhealthy tenements; the ideal in the other direction is healthy homes, ample room, privacy, light, air, home-gardens and public parks and playgrounds within walking distance.

FROM THE AGRICULTURAL TO THE BUILDING STAGE.

No attempt will be made in this report to unfold the entire housing situation and its possibilities on the east side of the Bay, but a short survey must be made of the present system of handling land from the moment it ceases to be agricultural until it reaches its ultimate use as of furnishing the basis for a workingman's home. The agricultural value of the hill land in the neighborhood of Oakland and Berkeley is normally less than one hundred dollars an acre; level land, southward toward Niles, especially such areas as are in orchard, reach values of one thousand and over per acre. In order to secure cheap homes for the workingman, it would be not only desirable, but for the industrial supremacy of the East Bay absolutely necessary, to transform agricultural land as

CHARMING GARDENING BETWEEN $2500 BUNGALOWS IN NORTH OAKLAND

To permit this kind of gardening there should be at least a ten-foot space between houses. If space is less than eight feet only unpleasant gaps appear and grouping of houses in solid rows (terraces) is preferable (compare next picture).

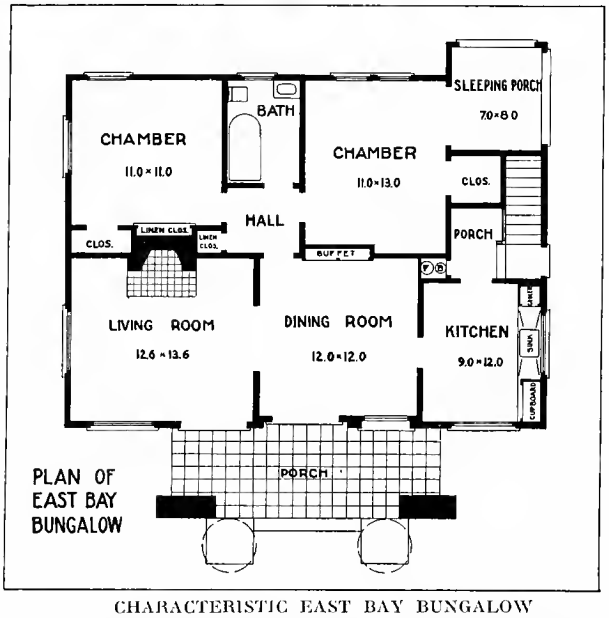
SMALLEST TYPE OF HOMES WITH GARDENS GROUPED IN ROWS (TERRACES), HELLERAU-DRESDEN

This arrangement in many ways is considered as the last word in Germany wherever cheap quarters on comparatively dear land have to be provided. This grouping in continuous rows is more satisfactory than the leaving of gaps measuring only a few feet between party walls. The individual frontages of the unit in these rows should not be less than sixteen feet. This is also a typical example of very cheap houses by an architect of national reputation (Professor Hermann Muthesius), compare p. 121.

TYPICAL ROW OF MODERATE-PRICED HOMES (COSTING ABOUT $2500) ON 40-FOOT LOTS AS FOUND IN NEW EAST BAY SECTIONS

Neighborhoods of this kind would gain immensely by grouping the houses instead of lining them up and by proper planting of the street, leaving narrower roadways.

rapidly into building lots as can be done with a fair return to the enterprising subdivider willing to assume all the risk accompanying such an enterprise.



CHARACTERISTIC EAST BAY BUNGALOW

This typical bungalow stands on a 40-foot lot in a district protected by restrictions for ten years. It fronts on a 60-foot street, of which the roadway constitutes 26 feet; the gutters, a total of 6 feet; planting spaces, each 3 feet; the sidewalks, each 6 feet; while a width of 5 feet intervenes between the sidewalk and the property line. The roadway is paved with macadam about 4 inches thick. This typical bungalow sells at about $2750, on terms of $275 cash, balance $27.50 a month, including interest at 6 per cent. The planning, building, and protection of homes selling at about this price ought to be of fundamental importance in determining the city plan and the character of the city, as the following figures will prove: Nearly four times as many one-story houses as two-story houses have been erected in the last nine years in Oakland. For the period 1906-1914, inclusive, the figures are: One-story houses, 8936; one and a half-story houses, 1137; two-story houses, 2661. Assuming that the average one-story house occupies a 40-foot frontage, over 67 miles of such houses have been built in Oakland in the last 9 years.

WASTE IN SUBDIVIDING IS A TAX ON INDUSTRIES.

If more than the fair return for this important work of subdivision has to be paid, it simply means a tax on the workingman which he, under the conditions of the American labor market, can largely shift on the manufacturer. *It therefore means less efficiency in home industries, a very serious matter, a very real and direct handicap in the development and the prosperity of the East Bay.* Going with this fact in mind over the records, one finds that large bodies of land which were finally subdivided into the smallest of lots 25x100 feet, for the workingmen's use, were not secured by the subdivider at prices somewhat above the agricultural value, but at from $1000 to $1250 an acre, *i. e.*, with an increase over the agricultural value of 400% to 600%. After a subdivider has thus been handicapped by a high purchase price his work for the cheapest kind of lots expresses itself in the following figures:

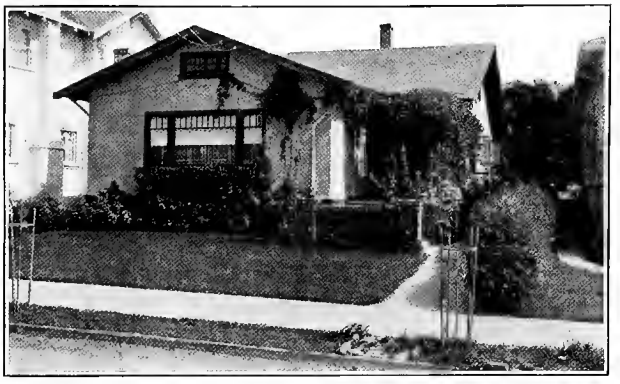
First cost of land for small homes	$1000 per acre
Cost to grade, sewer and macadamize streets, (no sidewalks)	1000 " "
Interest and taxes for 5 year period, (calculated on ½ of the investment since sales go on during the whole period) *i. e.*, 8%	400 " "
Incidental expenses	100 " "
Cost to subdivider	$2500 per acre

One acre produces twelve lots 25x100 feet. After the lots are sold on the monthly payment plan (without making a charge for interest and even taxes) as it is done, a price of from $300 to $335 per lot net corresponds to an advertised selling price of about $400. This produces $4220 and leaves a gross profit of $1720. The cost of collecting the money and still more so of selling the lot have become greater and greater since about 1905, when the competitive subdividing of the East Bay section began. While the standard commission is 5% on general property it has increased in some instances to 20% and more on lots in subdivisions. The combined cost of selling and collecting is at least 25% and in most cases today nearer 30 and 35%, but counting even 25% only there remains in the above example only a net gain of $665 per

acre or 33%, which under present competitive conditions is barely sufficient to cover the risk and professional labor connected with the work of subdivision, especially if compared with the profits which can be realized in more expensive subdivision schemes.

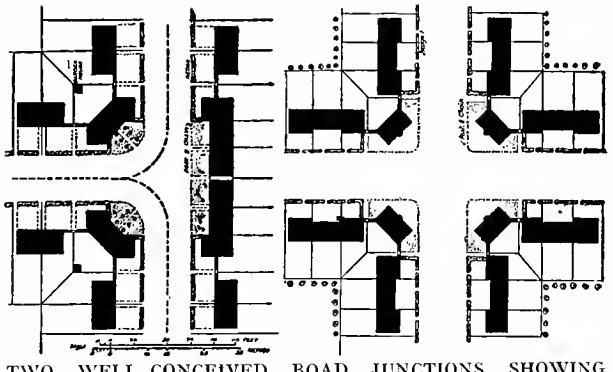
RESPONSIBILITIES OF THE REAL ESTATE SUBDIVIDER.

The duties and responsibilities which fall upon the modern subdivider can hardly be overestimated. They are especially comprehensive in the American city, which, unlike the German city, does not closely supervise the subdividing activities (city-planning), but leaves all responsibility with the private individual. To lay out a subdivision of any grade in a satisfactory way from the many points of view that have to be considered, including all the questions of transportation, proper type of streets, width, planting, paving, sewers, wires, etc., the proper size of lots, artistic and pleasing lines for the streets and their grades, the proper grouping of the lots in order to make architectural effects possible, the question of proper restrictions and their enforcement, the supervision of the architecture, not to speak of the complicated, economic and legal side of the whole process, and the ingenuity and push needed in order to successfully market the property—this all demands a very high degree of skill, experience, imagination and enterprise. First class service and the best expert advice in this field will always call for high remuneration. Unfortunately, the profit that can be made on more expensive developments compared with the cheap lots considered in the above example is disproportionately much larger. This is very unfortunate for the small lot because it means that the best professional intelligence available necessarily must be inclined to turn to more expensive development and neglect the socially so important cheap subdivisions. Every effort therefore must be made to cut down avoidable expenses in the development of the home site for the workingman.



INEXPENSIVE EAST BAY BUNGALOWS. COST ABOUT $2500 EACH. MATERIAL (UPPER PICTURE), PLASTER; (LOWER PICTURE), WOOD

Charming little houses like these, if well grouped and protected against inharmonious types in the neighborhood, produce in well planted streets very beautiful effects.

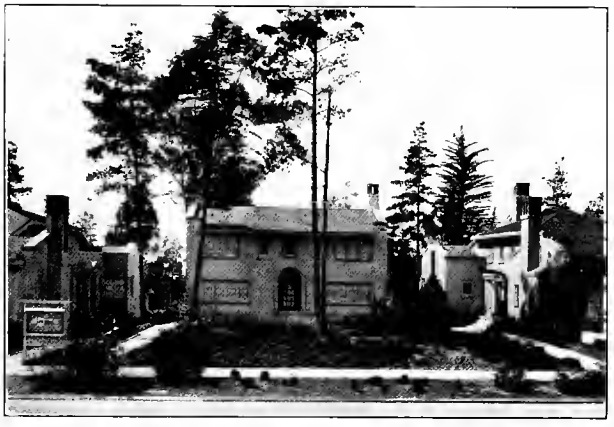


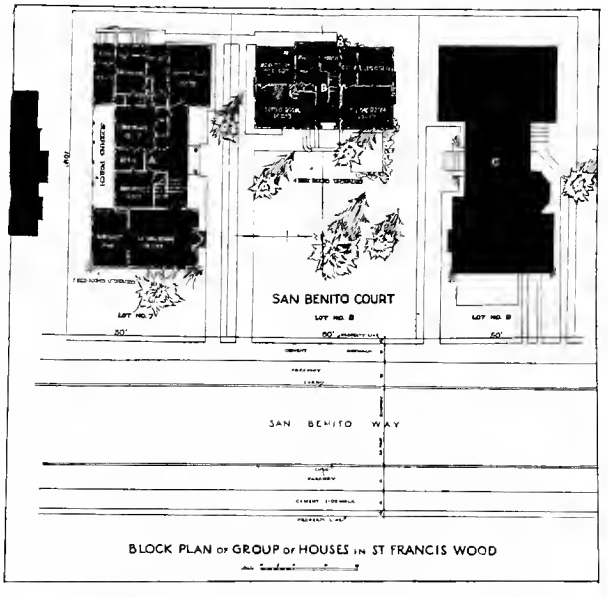
TWO WELL CONCEIVED ROAD JUNCTIONS SHOWING PROPER PLANNING OF THE BUILDINGS ON THE CORNER LOTS

This diagram shows what is understood by "grouping of houses" instead of "lining them up." A number of the buildings are grouped to form an architectural unit. Furthermore they are brought into relation with neighboring units and a balance and harmony attained between the buildings that face each other across the narrow roadways. Little squares and interesting road junctions are formed, giving character to entire streets. These examples are taken from Mr. Raymond Unwin's book, "Town-Planning in Practice," and illustrate what this master-builder has many times carried out in Hampstead, Letchworth, and other garden cities. This and much similar work was inspired by examples from city building of older times, especially as practiced in Germany.

WHERE SAVINGS MUST BE MADE.

There are at least three items in which considerable savings can be made. One of them is the extremely high commission which goes to the salesman. This 20 to 35%, which is the cost of advertising and selling, is largely necessitated by the attitude of the public. It is true of the buyers of all classes of home sites that their lack of confidence in their own judgment, their timid distrust, make them prefer not the best lots on the market, but the lots that are best advertised. Not the quality of the land, but the personality of a shrewd salesman makes a sale. This undebatable fact has made it possible that, strangely enough, the increased competition between real estate firms, instead of highly benefiting the public, has benefited the shrewd salesman, who has raised his commission by several hundred per cent. The gradual establishment of higher and higher standards on the part of the subdividing firms so as finally to command absolute confidence even with the most suspicious buyer, and on the other side the education of the buyers to desire a good home, to know what they desire and to be able to find it for themselves, must change the situation





EXAMPLE OF GROUPING IN SAN FRANCISCO
(Photo and plan)

The necessity of grouping houses in order to achieve architectural harmony has led to the creation of this little "court of honor." Note how the depth of the flanking residences (see plan), instead of being disagreeable, is made an advantage by the grouping around the garden-court. The size of the lot in the middle is 60x100, of the two lots on either side, 50x100. The street is 55 feet wide.

and dispense with the at present so necessary, but expensive, rulership of the educating salesman. In the case of the workingman's homes, the situation will be somewhat different. The demand for workingmen's homes will be sudden and will very soon be standardized. The salesman may thereby lose in importance.

WILL THE AMERICAN WEST ESTABLISH NEW STANDARDS?

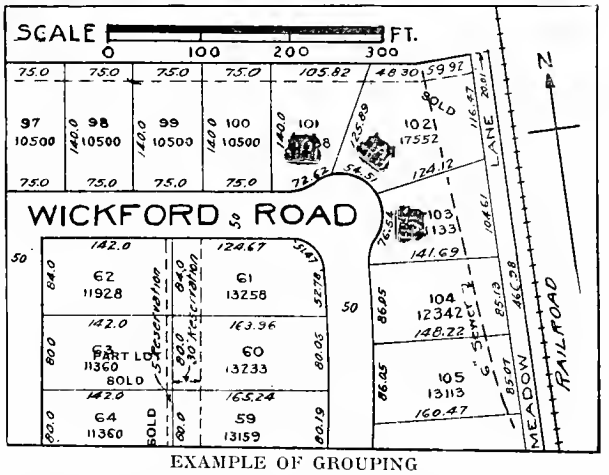
The time when these standards for cheap workingmen's homes in the American west are set will be a period of the very greatest importance in world's history. If the sudden wholesale demand for workingmen's homes is not met by wise planning, but leads to crowding and low standards, the social and political make-up of the western cities, and the health of their future generations, will be corrupted forever. If, on the other hand, desirable homes with home gardens within walking distance of playgrounds and parks can be secured as fast as a demand arises, the slums of Europe and eastern America will be doomed in a happier west, where a new and better standard ought to be set.

THE EDUCATION OF THE BUYER.

Since the commissions of the salesman is an item on which considerable savings can be made, the role of the salesman as an educator of the hesitating buyer to home ideals, must be taken over by public opinion and semi-public agencies. Like the cities of Europe, the American cities, or semi-public bodies for them. must contribute to the establishment of healthy home standards. One of the ways in which this can be done is by the establishment of a public or semi-public agency for reliable information about homes available for rent or purchase. The character of this agency must be so high that its passing upon and offering of a certain unit type of home will be sufficient to destroy suspicion in the mind of the home seeker.

300 TO 400% LOST IN INTERMEDIARY STAGES.

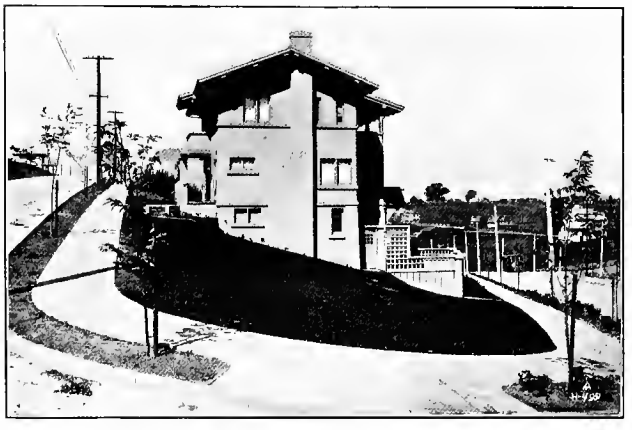
Another item where savings can be made is in the original purchase price paid by the subdivider for the land. Subdivision enterprises



EXAMPLE OF GROUPING

Showing private residences in Roland Park, Baltimore, grouped after a fine English model (Hampstead) around the blind end of a residential street. An effective way of eliminating noise, dust and the expensive paving connected with through traffic, and relieving, with interesting variety, the monotony of houses lined up in rows.

HOW TO DO IT



HOW NOT TO DO IT

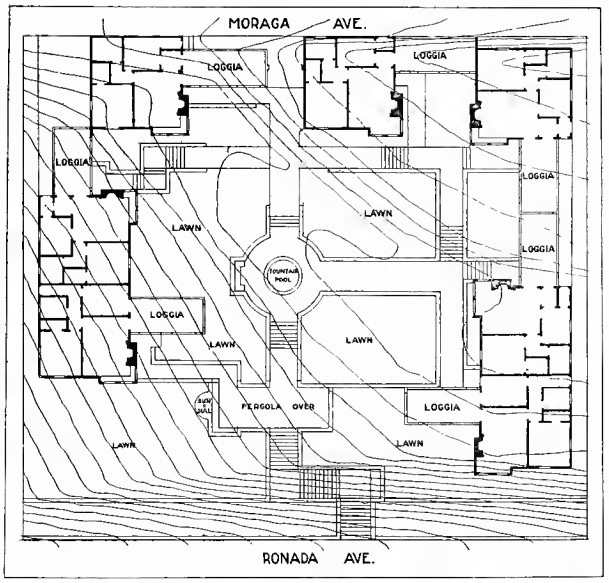
PLACING BUILDING ON CORNER LOTS—EXAMPLES TAKEN FROM EAST BAY CITIES

Buildings on corner lots are seen from many angles and therefore determine largely the character of the streets. Great care must be taken to select proper types of buildings and to place them properly. The building on the corner lot somehow acts as the speaker for the whole street and must be able to live up to this duty. A building that might be fine if set somewhere in the street is not always fit for a corner. The nearly blank side of the one building gives you, as it were, the cold shoulder, while the attractive front of the other, in a friendly way, meets you face to face.

must be encouraged which take the land for workingmen's homes directly from its previous agricultural state instead of permitting it first to go through all the intermediary stages of prospective city land with the increase in value from three to four hundred per cent connected therewith. While land finally destined for business property or even high class residences can stand this increase without too much harm to the final home builder, the land for workingmen's homes cannot stand it without danger to the efficiency of the industrial community. Land in a still agricultural state as to use and value can always be reached with modern methods of transportation. It needs, however, an enterprise managed on a very large scale, and with an extraordinary amount of skill, in order to make land of this kind marketable. If it is done on a small scale, not only the effect on the general housing situation will be small, but also the suspicions of the small buyer, against moving into a still agricultural area which does not sufficiently flatter his speculative instincts, are unsurmountable. Any private or semi-public enterprise willing to apply modern methods in order to create marketable workingmen's homes, really cheap and in the reach of the masses, ought to find the highest encouragement from all sides, *i. e.*, from the city's authorities, manufacturers, transportation companies, banking institutions, labor unions and especially from the civic organizations.

4% LOANS ON WORKINGMEN'S HOMES.

Another important item where large savings in securing the small home can be made, is the interest on the money. The minimum the workingman has to pay is 6%. The policy of the Savings Banks and of the institutions for life and old age insurance have led already, in many examples in



COTTAGE-APARTMENTS

View and plan of Ronada Court, an interesting East Bay experiment in combining the advantages of the apartment house (central management, central plant for hot water and heater, caretaking, and gardening by one employee) with the ideal features of the individual home cottage (separate entrance, closeness to ground and garden, natural surroundings). The apartment house makes housekeeping easier, but if built with many stories in city-like surroundings it is the enemy of the children, who especially when quite young live a kind of secluded prison life in the upper stories of city apartment houses. Individual cottages under central management may be grouped around gardens, playgrounds, little plazas, and with proper planting produce beautiful effects. This picture shows a successful East Bay experiment situated on two streets separated by very steep ground.

Europe to lending money for home purposes at 4% or less. The American Postal Savings Banks which collect the savings of the small investor ought to do similar work. The city might also lend its guarantee to bonds issued by co-operative building societies, thus securing to them a low rate of interest. Several Australian states started most successfully on these lines; I had occasion to inspect the gratifying results of the South Australian law modeled upon the New Zealand act.

THE HOUSING INDUSTRY RETAINS SMALL METHODS OF 500 YEARS AGO. MODERN WHOLESALE METHODS ARE NEEDED.

There are other items not connected with the marketing of the land alone, in which savings in the cost of workingmen's housing can be made. Such an item is the cost of the building. If building is undertaken on a wholesale basis by the builders of small houses, making use of best professional advice and applying wholesale methods of producing all the different parts of the houses in a satisfactory way, great savings can be made thereby. Powerful movements in the applied arts in Germany have made it a very common thing for the large wholesale producers to employ artists of national reputation for designing the original pattern for the thousand different objects which are turned out by the wholesale methods of modern machinery. If this idea is applied to the output of some of the leading Western lumber dealers and factories, and to the entire process of building cheap houses, then it will be possible to produce highly satisfactory units which can be assembled into houses suiting individual taste, and the clever grouping of which on well platted lots facing decently planted streets and squares, will surpass everything that can be seen in the often fancy-stricken lanes of wealthier suburbs, with their hodge-podge mixture of styles. The most inexpensive workingmen's streets of famous garden suburbs like Hellerau near Dresden, or Hampstead near London, often set the highest architectural standard, which the wealthier parts of the same suburbs have to live up to. The skillful combination of large building enterprises of the kind described with a progressive policy of real estate development is necessary to get satisfactory results from every point of view, especially from the selling point of view. The profits on the buildings will be only from ¼ to ⅓ of the profits to be realized from the real estate operation. But the combination of the properly superintended building and loan with the real estate operation, will guarantee marketability.

Furthermore, the fact that a man lives in his own house instead of a rented one permits a decrease of the depreciation allowance by about 2%; *i. e.*, a monthly outlay of $10 for housing will correspond to at least a $1200 investment, instead of $1000; leaving $900 for the house instead of $700 as calculated above for a rented house. With a reduction in the interest charges by the intervention of cheaper loans by the Postal Savings Bank, the sum available for the house can be increased to the neighborhood of $1200.

In order to secure permanently a satisfactory aspect to the housing of the workingman in the East Bay cities much more attention must be given to the problem of the cheap lodging house. The City of Oakland has made a small attempt towards a municipal lodging house, but though this seems to be conducted with admirable skill and true devotion by the people in charge who try to make the best of the small resources at their disposition, it must be said that the whole enterprise in its present state is not yet worthy of a large city like Oakland and that more serious and more dignified efforts are necessary in view of the large problem than the use of a mere shanty. The authorities in sociological questions have strongly expressed themselves that satisfactory quarters for the workingmen living single must be provided in order to protect the homes from the calamities connected with the sub-letting of rooms or beds to lodgers who intrude into family life, lowering its standards, create the basis for overcrowding, and the rents drawn from this evil.

Good housing in the amplest sense of the word is the ultimate aim of city-planning.

The whole matter of housing can only be slightly touched upon in this very general report. Housing is nevertheless of the very greatest importance, the very basis in every serious pursuit of city-planning. The settlement of the problems of housing for the masses of the population in the long run determines the fate of a city, its health, beauty, civic spirit, political texture and its future; especially the commercial supremacy of a community in the long run depends upon the quality of the human material which can be raised under the more or less favorable conditions of housing which, again, so largely depend on the policy of city-planning in its connection with transportation, designing of streets, lots and methods of subdivision.

EAST BAY SUGGESTION FOR ATTRACTIVE GROUPING OF SIMPLE HOMES ON A CURVING ROAD

The two gables that are brought so well into view by the turning of the street are parts of the same body of houses.

VIEW OF THE NATURAL STAGE IN INDIAN GULCH (SOMETIMES CALLED SATHER PARK), AT THE TIME OF THE MAY DAY FESTIVAL

PARKS, PARKWAYS AND PLAYGROUNDS

San Francisco has 1648 acres of parks; Tacoma, 1020; Seattle, 1688; San Diego, 1465; Los Angeles, 4100; Portland, 653; Oakland, 190; Berkeley less than 30 acres.

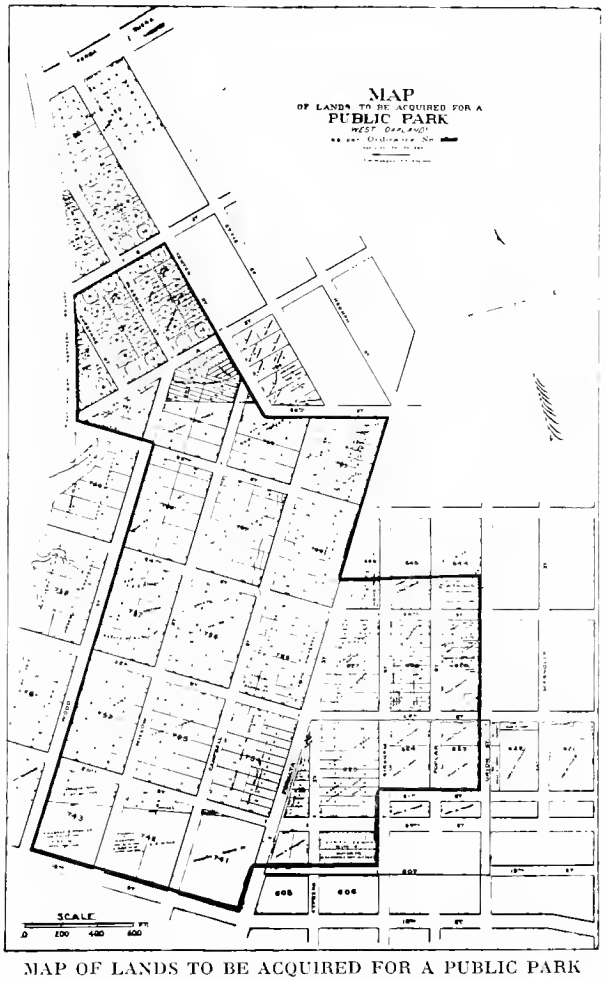
A SAD STORY.

Regarding the solution of its park problems the East Bay section is in the same situation as many young cities of rapid growth: there are enormous possibilities, but practically nothing has been accomplished yet. Oakland owns only about one-tenth of the park area it should have according to good American standards, and Berkeley has only about one-sixth of the Oakland park acreage. This backwardness is especially hard to understand because these cities in their early youth have had the great fortune to feel the influence of Frederic Law Olmsted, the elder, the great American genius of park-culture. The entire absence of parks in Berkeley, this lagging behind any conceivable minimum standard, is the more surprising because Berkeley is benefited by the influence of a State University. Universities in other cities have had a very decided influence in fostering park movements and sharpening the community conscience in this very important matter, the most famous case being the University of Harvard and the cities of metropolitan Boston. The University of California has not yet influenced the different East Bay cities in this regard. On the contrary, the existence of the large University Campus and the fact that the College authorities originally contemplated the laying out of a large part of their grounds as a public park (the elder Olmsted dissuaded them) have been taken again and again as a poor excuse for acquiring no municipal parks. Since the University Campus is the oldest, and even in its present already advanced state of building progress is still the largest, piece of garden-like grounds on the east side of the Bay, a few words regarding its park features properly belong at the beginning of this chapter. The citizens of Berkeley in the meetings of their civic bodies often dwell on the commercial value of the University to them. In matters of park policy, however, this hanging on the coat-tails of the State University surely proves to be bad business, having retarded the necessary park purchases and made them needlessly expensive. The building up of the University Campus progresses rapidly, and the growth of the cities makes park reservations at the same time both more urgent and more expensive. The fact that the people of Berkeley and of the whole East Bay used the University Campus somewhat as a public pleasure ground curiously did not make them think of furnishing out of the municipal treasuries the money for at least properly developing the park features of the grounds which they enjoyed without having paid for. Instead of that, decades have gone by since the original appearance of the great Olmsted, during which decade the leading names of American landscape architecture were

never more heard of on the college grounds. Until only a very short time ago even the venerable live oaks which are the glory to the campus lacked the most elementary care; the creek was used as a dump and backyard; and even today there are parts of this creek where its great natural beauty is degraded and preparations apparently made to transform it into a storm sewer. The lawn projects which the elder Olmsted so heartily recommended have not been carried out. While the realization of one of the most ambitious architectural plans ever conceived is carried on in erecting the educational buildings, the landscape treatment, which is of the very greatest difficulty in connection with such a big and novel plan, is handled as an incident; after the leading firm of the country had once been consulted its further co-operation was not secured, the reason adduced being lack of funds. This, of course, is not only a very undignified state of affairs in the case of an institution of national significance, but also means a serious loss to the final beauty of the whole architectural plan. The passive attitude of the East Bay in this matter, especially of Berkeley, is altogether untenable. There has been a long series of attempts to secure on the east side of the Bay something that in some way might compare with the parks of other cities, as Golden Gate Park in San Francisco or Balboa Park in San Diego. Because of the sluggishness of the voters and lack of energy of the supporters the story of these attempts is disheartening; since it is of little value to review these futile attempts only a few remarks regarding them will be made. One of the official maps of Oakland prepared in the year 1889[1] is interesting because it contains a "Proposed Park of 188 Acres." This park was located on the western waterfront between 16th and 36th Street, stretching east as far as Adeline Street. It would have been an enormous factor in building up the western part of the city. Among the various parksites agitated in following years the so-called Simson Tract deserves mention because of the fact that it comprised one thousand acres, which were offered at $160 an acre, Colonel Simson being willing to take bonds of the city for the purchase price.[2] A park of one thousand acres would have been a park worth while and given the city an asset like Balboa Park in San Diego. Later unredeemable mistakes were made in not acquiring the Indian Gulch in Oakland and the Indian burying ground (Thousand Oaks) in Berkeley, both of which parksites of unique qualities were offered cheaply to unintelligent or even

OLD LIVE OAKS IN "THOUSAND OAKS," BERKELEY

Thousand Oaks is the old Indian burying ground, one of the finest imaginable groves of live oaks, once offered to the city as a park, but through civic indolence not acquired. The picture shows how the subdividers have done what was in their power to preserve the natural features of the ground. It is as if the outlines of the oaks had suggested the curve of the street and the forms of the large vases shaped in concrete after a pattern designed by Maxfield Parrish, the painter. A good example of landscape work that has the "feel of the land."



MAP OF LANDS TO BE ACQUIRED FOR A PUBLIC PARK (WEST OAKLAND)

As per Ordinance No. 1810.
Approved October 30, 1890.

This map shows one of the many park projects for Oakland that were "almost" carried out.

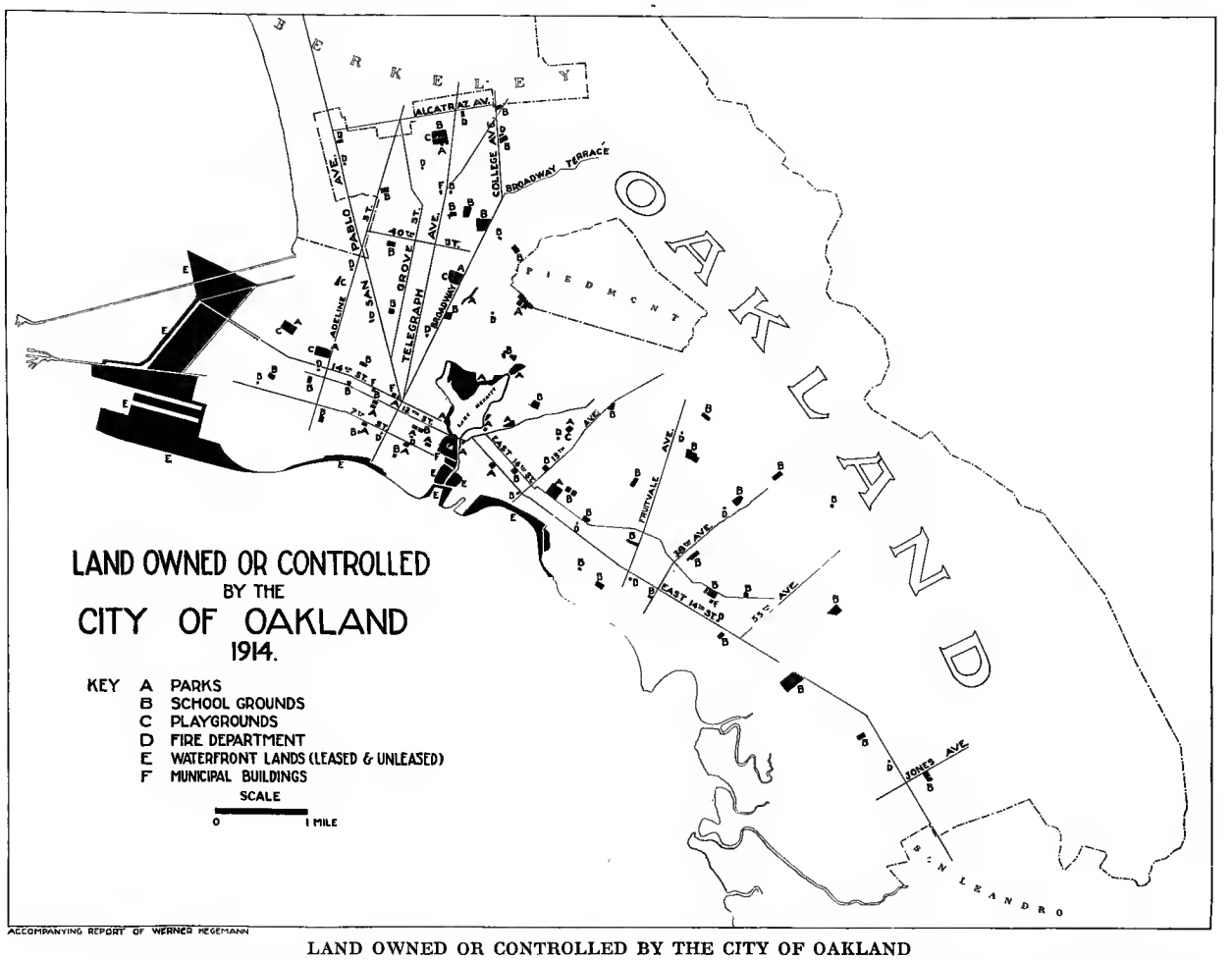
[1]Map of the City of Oakland to accompany the Report of T. W. Morgan, city engineer, and G. P. Allardt, consulting engineer, to the Board of Public Works, dated July 18, 1889.

[2]Compare the little pamphlet, "A Park for Oakland," being No. 1 in "Pamphlets on Oakland" of the Bancroft Library, University of California.

venal administrations. The Indian burying ground has been subdivided and sells from 10 to 16 times the price at which it was offered to the City of Berkeley. Indian Gulch, the parksite especially recommended by Charles Mulford Robinson, is not subdivided yet, but has considerably increased in value. (Pictures pp. 125 and 129).

THE VALUABLE SUGGESTIONS OF THE ELDER OLMSTED, CHAS. MULFORD ROBINSON AND OSCAR PRAGER.

In considering the park problem of the East Bay Cities I had the good fortune of finding a good deal of the work already done. The great Olmsted in his report to the College authorities of 1866 has made some suggestions regarding the park possibilities, which are of the greatest and most general value for the whole East Bay region. In the year 1906 Mr. Charles Mulford Robinson, the eminent American exponent of the city beautiful idea, made a fine survey of the park possibilities in Oakland, slightly touching also the neighboring cities, and after him the landscape architect of the Oakland park directors, Mr. Oscar Prager, has given much expert thought to the mat-



LAND OWNED OR CONTROLLED BY THE CITY OF OAKLAND

This map shows how the municipality, as an owner of real estate, is concerned with every part of its area. The need for additional land for various purposes is increasing rapidly. Only by timely purchases can the city secure sites best suited for its purposes at reasonable prices. In making these purchases the needs must be estimated with a city-planning eye. Certain sites are suitable for public buildings only if later extensions of such buildings can well be grouped in the immediate neighborhood. Sites for schools must be in close relation to playgrounds; playgrounds are benefited by the neighborhood of a park. In order to buy intelligently, from a city-planning point of view, municipal governments in Europe, especially in Germany, have special land departments with ample discretionary powers and funds to operate on the real estate market. Something similar ought to be established in every American city that contemplates city-planning work and that has an honest government. The imitation of this European practice, however, is recommended in this report only for the acquisition of those lands that will be needed for public purposes, as shown in this map (especially parks) and possibly for the development of a model experiment for workingmen's homes. Operations on the real estate market for merely speculative purposes as practiced by German municipalities and as has been recommended by American admirers of Municipal Socialism in Germany is not recommended by this report for the reason that American conditions are essentially different. German cities, operating on the real estate market, do so in order to secure the so-called unearned increment of land values for the city treasury, thereby lessening the taxes on income and industries, which taxes are the main reliance of the city treasury in Germany. There are no taxes on land and houses worth mentioning. Land taxes have lately been increased, but even then and including the much mentioned unearned increment tax they amount only to from 5 per cent to 25 per cent of the property taxes customary in American cities. The American city is much more fortunate than the German city in the real estate field. While the German city, in order to get anything from the increasing value of land must speculate and take chances, the American city by its system of taxation without assuming any risk, is the quiet partner in every ownership of land inside the municipal boundaries. The American city raises taxes from every piece of land according to the selling value of the land. If the value increases, taxes increase. The city practically is the owner of a mortgage on all land, a mortgage representing about one-fourth to one-third of the actual value of this land, and as a rule increasing with every new assessment. In an American city to buy land wholesale, as German cities do, would mean killing the goose that lays the golden eggs. All the American city has to do is to make timely land purchases for parks, playgrounds, street openings, public buildings, and for the rest to enforce equitable tax assessment.

ter and has in papers and addresses put before the people the necessity of comprehensive park development. The work of Olmsted, the elder, will be referred to later. A few of the splendid suggestions of Charles Mulford Robinson have been carried out; for some others, which have unfortunately been disregarded, it is now too late forever. By far the largest part of Robinson's park program, however, still stands today as it did eight years ago, as the very best advice that could be given under the circumstances with the only difference that today it will be more expensive to carry out. Every year it will be more urgent and much more expensive.

The following short abstracts from Robinson's report, "A Plan of Civic Improvement for the City of Oakland, California," 1906, are still apropos today, and deserve much better publicity than they had when I came to Oakland and found a large number of public spirited citizens who were unaquainted with Robinson's report:

EXTRACT FROM MR. CHARLES MULFORD ROBINSON'S REPORT

ADVANTAGES OF LOCATION AND CLIMATE.

"In approach to Oakland from the bay, one sees a city stretching far along the waterfront and back over the flat plain, until the houses begin to climb the foothills. These, lying in rolling terraces beyond, promise views of rare majesty and beauty. The air at every season is soft and mild, the skies are blue, even often when fog hides the bay's other shore, and the homes are separate houses, embowered in roses and wistaria and rising from gardens of lilies. What a place this appears, naturally and sociologically, for parks!

LACK OF PARKS ON WATERFRONT AND IN THE HILLS.

"And yet to their glorious waterfront on one of the most beautiful bays of the world the people of Oakland have no access. There is not a spot on all the long bay and estuary frontage where they are free to watch the ceaseless panorama of the shipping. And on those hills, with their noble views and romantic glens, there are no free pleasure grounds to which they have inalienable right; no walks and drives save the lines of direct travel; no seats; no lovely site, except the highways, which private ownership may not, if it pleases, fence off from public trespass, or use for the erection of signs that with hideous commonplaceness would unescapably dominate the town."

CONSIDERABLE PARK ACREAGE REQUIRED.

"In a city such as Oakland an obvious requirement is a considerable park acreage that shall satisfy the community's desire for pleasure out of doors. To do this the parks, or at least one of them, must be not only of large size, but readily accessible and the park possessions must present, in their entirety, a variety of attractions to suit the varied tastes of the community's members. There should be opportunity for driving, for walking, and if possible for boating; there should be places for picnics, for meditation and for games; the landscape work should include, if feasible, both the natural and the artificial, or formal, styles; and it would be desirable to have the scenery comprise at once the picturesque and the rugged, the pastoral and the romantic, the closed-in picture and the extended view, so that all the various prejudices of good taste may be gratified, and the community as a whole take pleasure in the scenery publicly possessed. If these varied attractions cannot be included in one park, it will be well to have a series of public reservations of which each unit shall represent a distinct type and serve a distinct function. But if they can be brought together in a single holding that shall be sufficiently central there will obviously be a gain in economy of administration and in largeness of effect."

INDIAN GULCH AS A PARKSITE SECOND TO NONE.

"Lake Merritt Park . . . will be a most attractive and serviceable little park; but it is by no means sufficient to satisfy the requirements of the city.

"Reaching the Lake Merritt tract near its northeastern corner is romantic Indian Gulch, with a parklike road overhung by great trees, following the stream far on its further side. I understand that some years ago there was a project before the people for the purchase of this gulch and road, with the land between and enough on either side to frame properly the picture, the whole strip, known as the Sather tract, amounting in its considerable length to some 300 acres. (Views pp. 125, 129).

"I know nothing about the reasonableness or otherwise of the proposed price, but I am sure that in not securing this land in some way or other there was made a mistake. It is so nearly a park now, thanks to the taste with which the road was laid out and to the preservation of the scenery's natural charm, that there will be need of very little expenditure beyond that required for the purchase of the land. And it will offer one of the most picturesque and romantic walks and drives that can be found near any large city of my acquaintance in this or other countries. Considering its availability—in convenience of access, in ease of grade, in opportunities for pleasant return by another route, in suitability of extent—*I think, in fact, of no park drive of similar nature to which it is clearly second;* and as an adequate municipal park system necessarily includes provision for driving and for those who like beautiful

VIEW OF THE NATURAL AMPHITHEATER IN SO-CALLED INDIAN GULCH AT TIME OF MAY DAY FESTIVAL

Live oaks and eucalyptus. A part of the tract, the acquisition of which was urged by Mr. Chas. Mulford Robinson

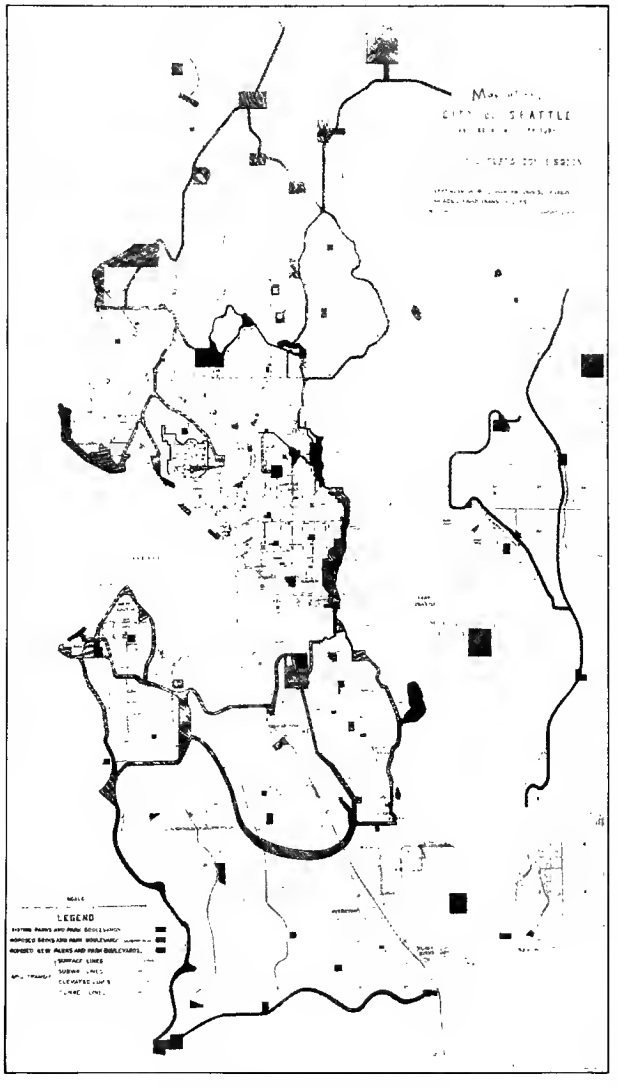
walks, I must urge the people of Oakland to obtain this property. That it will fit in so well with the proposed Lake Merritt Park, offering a delightful objective to the suggested bridlepath on the east shore boulevard and to the boulevard itself, is an added reason for obtaining it—as is the possibility of its service as a connecting link in making convenient and beautiful circular drives, or parkways.

INDIAN GULCH ROAD AND DIMOND CANYON

"The Indian Gulch road already connects at its upper end with Dimond canyon, and the road through the latter, with its contiguous land—beautiful in scenery and a popular picnic and walking tract even now—should be acquired by the city, that the return route may be worthy of the going, and that the east, or Brooklyn, section, of Oakland may have as convenient and lovely a park approach and drive as will the central. In fact, as in the case of the Lake Merritt tract, this will be something more than an approach or avenue of exit. It will be in itself and in its use a park. . . .

"If the loop drive thus offered by Indian Gulch and Dimond canyon has any esthetic fault it is that for nearly the whole distance it is too shut in to offer long views. Although the grade of both roads rises steadily, until at about their point of meeting a considerable elevation has been reached, there is very little chance to enjoy the superb prospect of cities, bay, hills and islands that is spread out below the vantage points at Oakland's back. The little glimpses that are offered from the road are tantalizing in their reminder of what one misses even while it is realized that the picturesqueness of gulch and canyon is in itself complete."

SCENE IN ONE OF THE EAST BAY CANYONS



PARK SYSTEM OF SEATTLE

Seattle, like Los Angeles, builds a park system worthy of a Western city. Even so, it will take time before Pacific Coast cities will equal or surpass the achievements in the creation of parks of cities like Boston, Chicago, Kansas City, Philadelphia, Minneapolis, and many others.

PARK DRIVES COMBINING HIGH AND LOW LEVELS.

In order to overcome this disadvantage Mr. Robinson proposed here and in other localities a system of drives offering circuits that will combine roads at high and low levels, views shut in and extended, picturesqueness and inspiration. For some of his proposals it is unfortunately too late now, the propitious moment having gone by unobserved by the citizens of Oakland. A little suggestion of Charles Mulford Robinson's plans may be found in the charming piece of a drive following for a short distance Glen Echo Creek under the name of Richmond Boulevard; though this has been carelessly handled by crossing the creek in some places by crude solid fills instead of light bridges, the elegance of a drive along a creek bordered by live oaks in contrast to the baseness of the use of the stream as a storm sewer is very convincing. (View p. 133).

Speaking about this "remarkably favorable" opportunity of a drive developed strictly as a parkway on the model of Boston's Fenway—an opportunity largely destroyed today at least in this specific location—Robinson says: "The new drive should not only be a park approach, but a park link. The Thorn [Moraga] road, leading up to Piedmont Heights, is in itself a beautiful drive. To be sure, the cemetery is at one side; but at an increasing distance from the road and shut off from it by the tall and stately eucalyptus and finally by a depression that becomes almost a ravine, and the planting can, if desired, be made yet thicker. Meanwhile attention is distracted from the cemetery by the view on the other side, the road clinging to the side of the hill as it climbs at easy grade. This road, by designation as a park road and ultimately by some further planting, ought to be made an extension, or perhaps more strictly the goal at this end, of Glen Echo drive; reaching Piedmont Heights by its means, connection can then be made by an existing street, well paved and attractively built up, with Piedmont Park, or back and around the contour of the hill with Indian Gulch and Dimond canyon roads. The latter connection should be made, as it easily can be, via the town side of the hill, instead of behind it as at present, so that the noble view may be enjoyed. Thus Indian Gulch will have its loop to the west side as well as to the east, or a grand outside circuit, via Dimond canyon and Thorn road, may be made; and east and west sides will have parkway connection without the necessity of going through the city.

"There is opened thus an astonishing opportunity for the creation of a country park in unusual proximity to the city, and with approaches from all sections; the opportunity is too good to ignore.

PIEDMONT PARK.

"Beginning with the acquisition of Piedmont Park—since it is ready made—the city should if possible screw up its park enthusiasm and its confidence in the future to the point of acquiring also the open tract between Piedmont Park and the Indian gulch tract boundary. Those takings would give point to the extended Pleasant Valley boulevard, and would create a magnificent country park—of which the Indian gulch road would be only a side drive, and in which Thorn and Dimond canyon roads would be approaches—that would thrust its way, in a beautiful great gore, almost to the center of the city, the lake and the playground being its southern terminus. Then Oakland, with a park to be proud of, would thereby take high place among cities and its attractiveness to home-builders would be enormously increased.

OAKLAND'S DUTY.

"Nor would the city be doing more than it ought to do, with such an oportunity, with its large and destined to be larger population of householders,

and with the constancy of its out-of-doors weather. The acquisition of all except the lands between the proposed line of the Sather tract and Piedmont Park is the minimum that the city can consider doing.

"It is widely held that Boston, with its very fine park system, sets the standard for the country. Boston's situation, too, is not dissimilar to that of Oakland—with the bay in front and hills at the back. Such, however, is the park acreage there that the population averages only 42.2 persons to the acre of park. A like proportion here would give to Oakland about 2,400 acres for parks—and the Boston parks are out of use in a popular sense five months out of the year, while here there is no month when the parks would not attract. . . . The big park suggested would add, I suppose, a possible 640 acres, leaving an enormous margin for other park reservations. Thus Oakland need not be afraid of overdoing the matter in creating this park. And to refer to the West coast instead of to the East. Los Angeles, Portland and Seattle have already had the courage to do and plan much more."

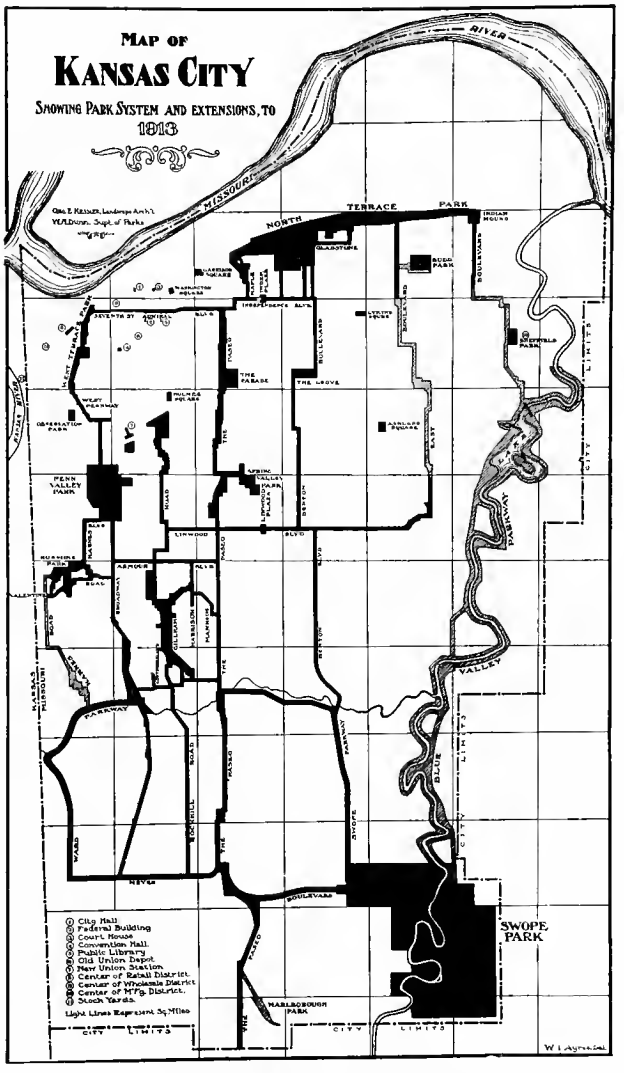
WISE CO-OPERATION BETWEEN OAKLAND, BERKELEY AND VICINITY. COUNTY SCHEME.

"No one can go over these and neighboring tracts without realizing the wisdom of co-operation, in the matter of park development at least, among the several communities that make up the greater Oakland. . . . .

"Were such co-operation secured there would be no need to change in any respect the great park as I have sketched it. Topographical and social conditions would make it naturally the central feature of a county scheme, the latter mainly concerning itself hereafter with the opening of scenic drives into and along the hills, with the acquisition for the public's enjoyment of striking vantage points here and there, and with the broadening out into local parks for Berkeley and Alameda of the chain of public reservations.

TYPICAL EAST BAY LANDSCAPE

Live oaks couching themselves in the little valleys formed by small intermittent streams. This type of landscape has a very special charm; its development to the highest possible perfection is the sacred duty of the Californian municipal landscape architect. Copies, *e. g.*, of continental or English parks, seldom have zest; here is a chance for original work nourished from the breast of Mother Earth.



PARK SYSTEM OF KANSAS CITY

One of the inspiring examples of American enterprise as regards parks. Over 2000 acres of park land and fifty miles of boulevards and parkways were acquired by power of eminent domain under the special assessment plan.

"For example, Moraga or Thorn road, after passing Piedmont Heights, winds on into the hills. Following a picturesque gulch, of which the high slopes are covered with a most beautiful wild growth that it will be a shame for the community to lose, Bellevue Avenue is reached at last. From this there is lovely town connection, via the Claremont Country Club roads, while the drive itself may be continued and made scenically splendid by extension on a viaduct over the reservoir valley to connect with the Tunnel road. So passing the site of the new hotel, it would have direct connection with Oakland's Broadway and with Berkeley.

"Although this is only one of the many possibilities of the suggested county park system, Oakland, with its other more pressing park requirements, can hardly undertake it now by itself. Unless a co-operative system can be arranged, we must close our eyes to all this and similar opportunities."

SCENE IN LAKESIDE PARK, OAKLAND

A successful effort to preserve a typical Californian landscape in the heart of a great city. The flowers in the temporary bed in front are later to be replaced by California perennials.

Hereupon Robinson speaks about the advantages realized by co-operation as exemplified by the successful county park systems of the Middle West and especially of Essex County near New York; also by the great co-operative park systems of the cities around Boston and Providence. The necessity of a similar co-operation between the cities of the East side of San Francisco Bay can not be emphasized strongly enough.

THE ELDER OLMSTED ON AN EAST BAY CANYON.

There are mainly two points in the work of Charles Mulford Robinson, which he considers of special importance to the East Bay section: *i. e.*, the creation of a large park and the creation of good approaches to this park in the form of parkways following as much as possible the lines of natural beauty offered by nature in the canyon and along the creeks. The fundamental necessity of these two points today remains unchanged, as it was not only eight years ago but as long as American park history reaches back. The great Olmsted—this is very interesting to consider—when he visited the East Bay section in 1865 emphasized the importance of the canyons. Olmsted wanted one of the neighborhood lanes of his plan "extended eastwardly to the mouth of the valley or gorge in the mountains, which is a part of the property of the College. This lane is extended up the gorge, first, however, crossing to the other side. Thence it is intended to follow up the course of the brook, as close upon its banks as is practicable, until the point is reached at which the branch enters from the left. There the lane should fork, being carried up the branch to the left with such curves as will be necessary to reach the small table land. From this it would return on the left bank of the southerly branch of the stream to the main stem, crossing near the fork by a bridge. There should be a convenient stopping-place for carriages upon the table-land from which a walk should be formed to the highest point of the knoll around which the lane passes. At this point there is a very interesting view through the gorge and out upon the Bay, and it would be a suitable place for a small summer-house or pavilion. The lane within the gorge would have to be formed by excavation on the hillside and a thick plantation should be carefully established on the upper slope so as to confine attention to the damp ravine below and the opposite bank, which to a considerable height is abundantly covered with native foliage of a very beautiful character.

"As this road follows a stream of water from the open landscape of the Bay region into the midst of the mountains, it offers a great change of scenery within a short distance, and will constitute a unique and most valuable appendage to the general local attractions of the neighborhood." Those are Olmsted's own words. What he said properly applies to nearly everyone of the beautiful East Bay canyons and represents a typical model for the method in which everyone of them without exception should be treated to become an invaluable asset for the communities.

This idea of properly developing the canyons and their creeks has been taken up afresh by the landscape architect of the Oakland park directors, Mr. Oscar Prager, and some new and valuable studies of the possibilities of these canyons have been worked out. The following is the practicable way in which Mr. Prager presented the matter in one of his addresses:

GLEN ECHO CREEK.

"Let us take Cemetery Creek, or better, Glen Echo Creek, as a concrete example. For the greater part of its course the creek in its present state is a nuisance. It is a collector of dirt, refuse, tin cans, and all kinds of waste from the whole neighborhood and a constant menace to health. For sanitary purposes only, Oakland should own a hundred-foot strip on each side of the Creek and construct a boulevard along one side of it.

"This would give us a parkway with Lakeside Park at one end and Mountain View Cemetery at the other. The creek ends in the reservoir of Mountain View Cemetery. Mountain View Cemetery must eventually become a City Park. Even now it is surrounded by subdivisions and as it cannot be enlarged it is only a matter of filling it up. We may all have to do our individual share toward this end, but, just as Daniel Burnham while designing the plan of San Francisco, included Laurel Hill and Odd Fellows Cemeteries, both in the western addition, as parks, and just as old cemeteries have become delightful parks in many European cities, so Mountain View Cemetery must ultimately become a park. The very fact that many burial plots are sold now with the provision of perpetual care will make it impossible for the stock-holders of the association to cut the property up into subdivisions.

"With Mountain View Park at one end and Lakeside Park at the other, this boulevard would also be an important continuation of Moraga Valley road, which would join the Boulevard near the Cemetery. Moraga Valley road, if widened and improved, would compare favorably with the Foothill Boulevard; even now it is a favorite route for pleasure travel.

THE IDEAL PARKWAY RUNS ALONG A CREEK. SAVING OF STORM SEWER EXPENSE.

"The city would in this case control the beginning and ending of the creek and between two strips of parking the creek would be a sanitary, wholesome flow of water. Now the property along the Creek is very cheap, the assessment values are on the average from one-fourth to one-fifth those of property on both sides 100 feet away. Sewerage is entering the creek surreptitiously and contaminating both creek and lake. Some unconnected culverts have been built by private parties, but are inadequate and flooded every winter. In the near future the district will be confronted with the necessity of bonding itself for the purpose of building a storm-sewer, which would cost from $15 to $18 to the running foot, an expense which could just as well and more advantageously be borne by the district for the purpose of purchasing the strip for the boulevard along the creek, which would of course make a storm-sewer unnecessary."

In other words, by preserving the creek in its natural state it will take care of water and the boulevard will be secured in addition.

"Another district which has the same opportunity to profit by a creek instead of as now suffering in consequence of its existence, is North Oakland with Temescal Creek. Where the creek begins in the reservoir of the Peoples Water Company at the foot of Tunnel Road, the Boulevard could easily connect with Tunnel Road and another beautiful driveway would be added to our park system. With the reservoir as source the water of the creek would be absolutely pure.

Mr. Prager continues:

"A boulevard along Sausal Creek, connecting East 14th Street and Dimond Canyon, would be the parkway for East Oakland. Here conditions are exceptionally favorable for a quick realization of the project. The expense of an otherwise necessary storm-sewer could be saved and—as the property along the creek is still held in large parcels by a few owners, who are ready to subdivide—a little forethought and intelligent co-operation is all that is needed to secure a strip of 100 feet on each side of the creek for a parkway from East 14th Street to Dimond Canyon."

GLIMPSE OF GLEN ECHO CREEK

This is the southern part of Glen Echo Creek, where it bears the name Richmond Boulevard and where it represents one of the very few bits of care given to East Bay creeks. The creek there for a short stretch is preserved, roads built on either side, the little bridge was erected by the Oakland Park Directors (Oscar Prager, architect). The creek during the dry season looks a bit rugged, seeming to require the planting of more living foliage. But even as it is, this bit of California landscape with its oaks gives an indication that most charming results could be achieved if due recognition was given to the really great assets represented by these creeks—honoring them with loving care instead of degrading them to ordinary sewers.

THE ELEMENTS OF EAST BAY PARK SYSTEM; THE BIG PARK; THE CANYONS; THE WILDWOOD PARKS; ISLAND PARK; MIDWAY PLAISANCE; SKYLINE BOULEVARD AND HIGHLAND DRIVE.

But a park system consisting of this big somewhat centrally located park as proposed by Charles Mulford Robinson, and made accessible and supplemented by the parkways along the creeks up into the canyons as recommended by Olmsted, Robison and Prager would still be far from exhausting

VIEW OF FRESH POND PARK, CAMBRIDGE, MASS.

Cambridge, a University city like Berkeley, has transformed a lake owned by the water board of the city into a beautiful park and a fine part of the unique park system of Greater Boston.

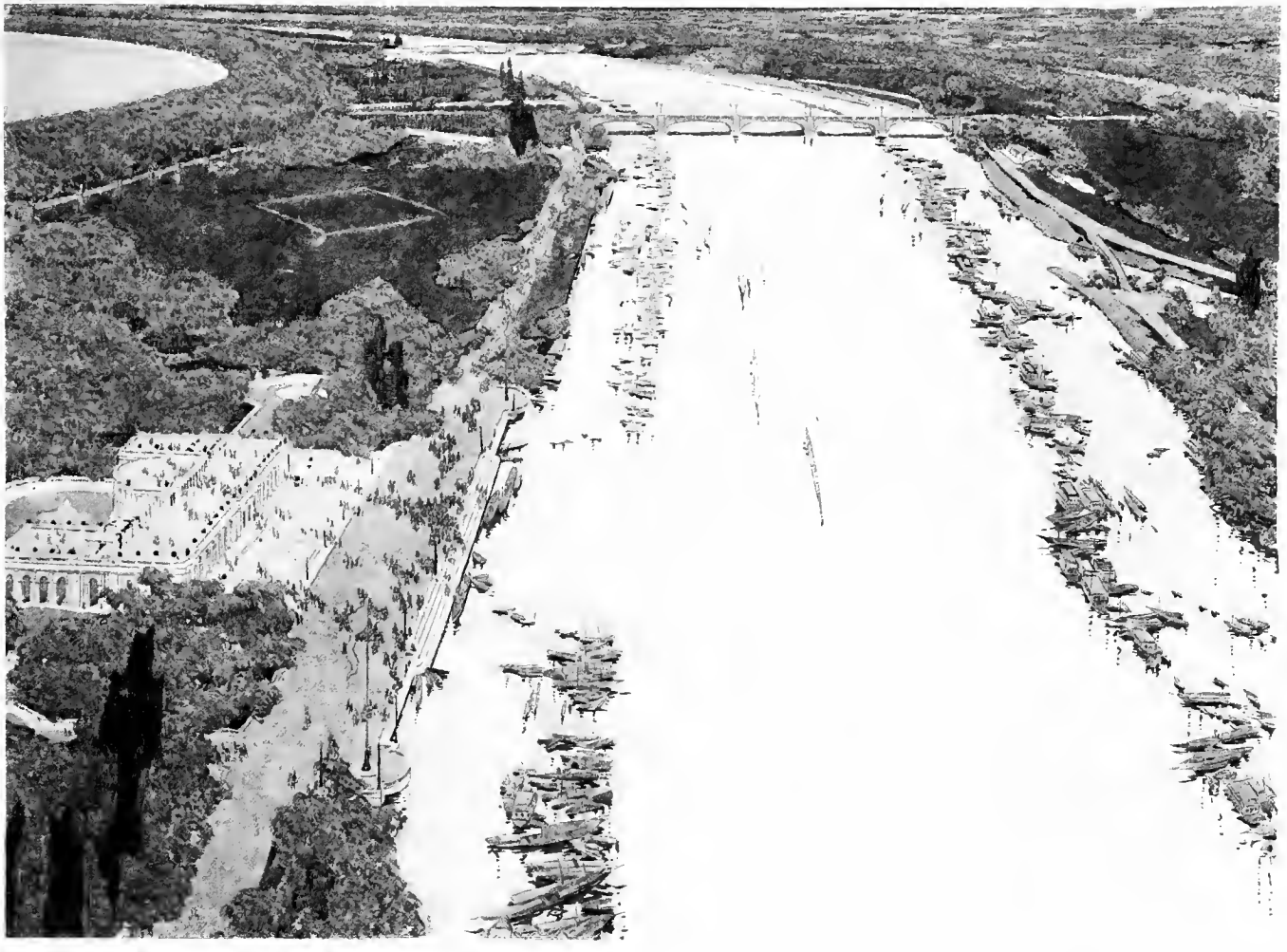
the marvellous possibilities of the East Bay region. The park map of the East Bay Cities, besides *the big park*, besides *canyons*, *creeks* and *glens* with their parkways should contain a large *Island Park* along the waterfront, a *Midway plaisance* halfway between waterfront and foothills, the *Skyline Boulevard* with a chain of *Wildwood Parks* on the top of the hills and a considerable improvement of the present *Highland Drive*. All these ideas are far from being new; a few words only need to be said in explanation of those that have not yet been discussed in the preceding paragraphs:

THE ISLAND PARK.

From the point of view of the recreational city every observing visitor regrets—so did Mr. Robinson very emphatically—Oakland's lack of access to its waterfront. Mr. Robinson proposed some small reservations on the waterfront; but since then a new extraordinary possibility has presented itself with the plan for the new harbor on the East bay shore mapped out by U. S. Engineer Colonel Rees. This island park plan and its indorsement by Colonel Rees has been referred to in the chapter dealing with the Harbor (p. 40 f.). A plan for the park—very tentative, just in order to suggest the possibilities of endless romantic waterways for canoeing, a long straight and absolutely quiet regatta course for the University, any amount of play ground desired, a beautiful yacht harbor, just in front of the Golden Gate and opening its arms towards it, as a great symbolic gateway to the continent with a splendid location for an ornamental piece of gigantic sculpture—all these mere suggestions have been exhibited in the large harbor model at the Oakland City-Planning Exhibition. The park would have the advantage of being able to be created slowly as demand arises and money is available. The cost would be only from one-tenth to one-fifth the price of ordinary reclamation work, because from 9-10 to 4-5 of the park area should be kept as water. The connection with the land would be secured by small pleasure steamers, so popular in Continental harbors. If the Goat Island project is realized, connection will be still easier. A visit to Shellmound Park or the parks on the Alameda waterfront will convince one how fine big trees may grow on the waterfront. Good fertile ground would be brought as to the World's Fair in San Francisco by barges down the Sacramento River at comparatively small expense. One of the most important things about this Island Park would be its stamping forever a pleasant character on the East side of the Bay as seen from San Francisco. This is very important at a time when large projects for rapid industrialization and reclamation for industrial purposes endanger the attractiveness of the East side as a city of homes. It will have a strong psychological influence on the commuter if he has to travel through the noise, smoke and smell of extended factory areas, instead of over the long stretches of quiet waters crossed by the Key Route pier today. The character of the city will be determined if a fine park with high eucalyptus stretches along the waterfront screening off the intestines of the huge industrial organism. A garden as gateway to garden cities.

MIDWAY PLAISANCE.

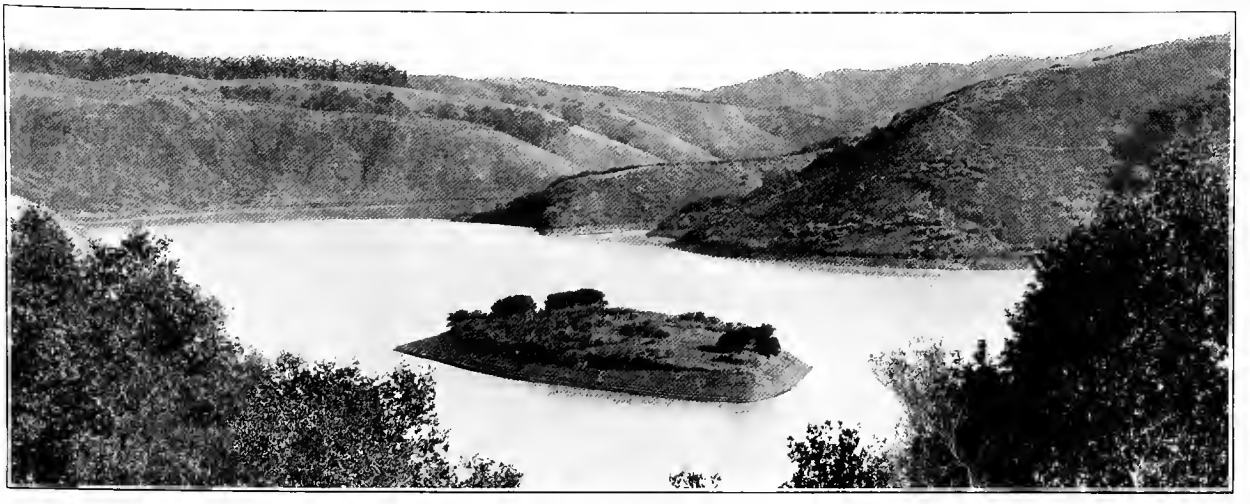
By the name Midway Plaisance is meant a chain of parkways, playgrounds and parks to stretch without interruption from the Key Route's wide and unused right of way (proposed Key Route Boulevard) north of Berkeley and east of Masonic Avenue through the western part of Berkeley, where there are still large areas of unbuilt property, making connection with *the* park of Berkeley, *i. e.*, the 13 acres of San Pablo park, and further south with a connection to Shellmound park and as far as possible into the heart of West Oakland at any rate at least to 16th Street. An inspection of the map, p. 138, and the map showing the progress of building in Berkeley (p. 137, also 55) shows that the area contemplated for this chain of parkways and strips of parks is still very little used for building purposes; the same is true to a large extent in West Oakland. It would be entirely possible to carry through this territory a chain of pleasure grounds varying in width from one hundred to five hundred feet. The undetermined state of the whole area would be broken and a definite advance towards industries west of the park strip and towards more residential development east of it would be made. This part of the city in Oakland and even more in Berkeley must receive some definite and considerable improvement; this is an admitted fact. The park would effectively screen towards the east as the Island Park would towards the west whatever undesirable feature, may come with the advance of industries on the waterfront.



CHICAGO. VIEW LOOKING SOUTH OVER THE LAGOONS OF THE PROPOSED PARK FOR THE SOUTH SHORE.
Copyrighted by the Commercial Club of Chicago. Original Painting by Jules Guerin.
From the Collection of the Chicago Plan Commission.

Six major fundamentals in the Plan of Chicago are well on the way to early realization. They are: (1) the creation of a traffic quadrangle encircling the heart of the city, (2) the creation of the proposed lake front park and waterway development, (3) the creation of a splendid new terminal system on the West Side of the city, (4) the establishment of a "civic center" on the western boundary of the quadrangle, (5) the creation of large forest park areas outside the city limits, (6) the establishment of the foundation of the street circulatory plan through the widening and improvement of a number of thoroughfares.

The lake front plan provides for the creation of 1550 acres of park land through the utilization of Chicago's waste material, of which there is an annual amount sufficient to build 100 acres of park per year. In connection with this park development there will be created motor-boat and rowing regatta courses, yacht and motor-boat harbors and numerous bathing beaches, baseball fields, tennis courts, promenades and a shore drive extending for five miles along the water's edge and directly connecting Jackson Park on the south side with Grant Park in the center of the city.



VIEW OF LAKE CHABOT

This lake, with the lands surrounding it, is a part of the 40,000 acres of East Bay land controlled at present by the People's Water Company, part of which is shown on plan, page 44. A co-operation between water and park authorities similar to that illustrated in the preceding picture ought to lead to the inclusion of important parts of these water-land reserves in the East Bay Park system and its control by the landscape architect. Among the canyons that thus should be preserved Wildcat Canyon deserves special attention. These reserves should be linked together with the Park system.

THE WILDWOOD PARKS AND SKYLINE BOULEVARD.

The Wildwood Parks with the Skyline Boulevard connecting them will represent for the East Bay cities a scheme similar to the famous green belt "Street of the Heights" of Vienna, the Austrian capital. Mr. Walter Manuel and the other park directors of Oakland have already made an energetic start in putting a chain of wildwood parks before the people; the logical completion of these plans is a chain of park-reservations to be kept in a wild state and securing to the people forever as much as possible the splendid rim of the amphitheatre around the East Bay, the connection to be made by a long drive with alternating views down in the valleys of both sides of mountain slopes. This will be perfectly splendid, and if it were not for the historic background that gives a peculiar greatness to similar enterprises of the old world this East Bay Skyline might become more glorious than any rival. The plans for this chain of wildwood parks and connecting boulevard must be considered an intimate part of the entire settlement of the water supply problem. The vast properties owned in the hills by the Peoples' Water Company or allied interests, including beautiful sites like Wildcat Canyon, must be held in part forever in a natural state and should, as in Metropolitan Boston, serve the people in two ways, *i. e.*, for securing water and park reservations; in any transaction with the Water Company this must be kept in mind. (Compare chart showing land controlled by Public Service Corporations, page 44).

HIGHLAND DRIVE RECOMMENDED BY THE ELDER OLMSTED.

The Foothill Boulevard and the Highland Drive must be mentioned in this connection. Both have a great future as attractions for the East Bay. The Highland Drive or something very similar to it was already recommended by the older Olmsted in 1865. He wanted as one of the entrances to the College "a new road which I recommend should be laid out as a pleasure drive from Oakland." He made a description of its course; present Piedmont Avenue in Berkeley is a part of it realized according to Olmsted's proposal and a part of Highland Drive today. Olmsted concludes: "Such a road would form a drive much more attractive than any now in use out of Oakland, and would lay open a most desirable region for residences all along the foot of the mountains." Since only a very small part of Olmsted's excellent plan has been carried out the present Highland Drive had to be created by the joining together of a great number of individual streets. This drive needs a great number of improvements. At present its only physical connection is the chain of columns placed along the entire course. The physical continuity of the drive needs further emphasis by a more uniform treatment of the entire drive; occasional widenings and even relocations of the course are necessary. I shall not attempt to examine the whole drive in this sense, but the discussion of a short piece of it will give a sufficient idea what I have in mind.

Taking as an example that piece of Highland drive that lies in Berkeley, the following changes are recommended: A better connection between the Tunnel Road and Claremont Boulevard is necessary and can easily be accomplished; the drive where it encircles the Institute of the Deaf and Blind can easily be widened and given a much more stately appearance by eliminating the sidewalk near the Institute's grounds, planting avenue trees within the Institute's boundary line, and throwing the space formerly occupied by the sidewalk into a widened roadway and a much widened side-walk area on the other side of the drive on which avenue trees should also be planted. The

streets around the University grounds should be treated in a similar way. After reaching Piedmont Avenue, the Highland Drive should continue by this beautiful street and cross the University grounds by its prolongation proposed in the chapter on streets. This prolongation to be opened up would have to cross Strawberry Creek by a light and elegant bridge and pass close to the Greek Theatre (see p. 152). On Saturdays and Sundays, when the college grounds are open for vehicular traffic, the Drive should go across the grounds showing their beauty to the visitor and proceed to the north by Bushnell Place (p. 107), a charmingly planted old street, continuing by Cedar and Spring Street, passing close to the People's Water Company's reservoir. Liberal treatment in cutting corners (for instance the northwest corner at Cedar and Spring should be cut) and occasional widenings are required.

Without going over the entire course of Highland Drive, which thus needs comprehensive and uniform treatment, it may be emphasized that the splendid steep heights north of Richmond, falling directly into the ocean from a great altitude and giving such a glorious view over the Bay, should be made a part of a drive scheme of the East Bay, a fact not to be lost sight of in a plan of co-operation between Oakland and Berkeley with the communities to the north.

THE DANGERS OF POLITICAL MINORITY RULE IN PARK MATTERS.

The different features of a comprehensive park-scheme for the East Bay cities, *i. e.*, the Big Park; the canyons, creeks and glens; the Island Park; Midway Plaisance; Skyline Boulevard and the Wildwood reservations, and the improved and extended Highland Drive plan to be supplemented by a good playground system as referred to later, form together a park program that may startle the minds of those East Bay citizens whose only interest in park matters to date has consisted in faithfully voting against any park proposition coming up. The opposition of people of this kind is a serious matter because the present constitution of the East Bay cities gives a kind of veto power to a one-third minority very similar to the much condemned Prussian three-class vote which puts the political power in the hands of a minority of a sometimes reactionary character. This short-sighted opposition against every form of improvement, which is found so largely with a certain class of half-educated people, must not be considered however as a matter which will forever bar any improvement not directly related to sewers and water supply. Even the youngest city gradually developes a larger and larger nucleus of people who have traveled, have seen what other cities do, and who gain a vision for the possibilities of their own town. The curious methods of reasoning ruling the mind of uninspired people break down sooner or later and their untenable ridicule becomes obvious. The argument used over and over again by the penny wise and pound foolish one-third minority of voters that either the proposed improvement must be bad and must be voted down accordingly, or that the proposed improvement is good but that the administration in office cannot be trusted with its execution—this argument must be met by a good city plan, which has the indorsement of the leading citizens of the community and of the best experts of the country; a plan to the gradual execution of which every administration in office must pledge itself.

COMPETITION BETWEEN DIFFERENT POTENTIAL PARK AREAS TO BRING DOWN PRICES.

In the matter of parks, some comprehensive program is of special value because its adoption enables the administrations and park boards to use a much freer hand in buying property for park purposes. If a sufficiently large park program is mapped out, *i. e.*, a system with prospective park property all over town, and if then it is left with the discretion of a confidence inspiring Park Board or City-Planning Committee to acquire out of annual appropriations that part of the large and widespread properties under contemplation which offers itself at a price nearest to the assessment value, then a healthy competition among sellers of park property would stimulate the development of the park system.

PARK ASSESSMENTS ARE INVESTMENTS, NOT TAXES.

There have been other American cities in the West where the problem of acquiring the necessary park system seemed to have become absolutely hopeless in view of public apathy and private avarice and with a debt making-power having reached the legal limit, but where the introduction of new methods adapted to the local situation has worked a sudden and marvelous change. A famous and inspiring example is the case of Kansas City, where, in view of difficulties that seemed unsurmountable, the system of creating local park districts all over town with a proper application of the special assessment idea, made it possible to acquire by the power of eminent domain over two thousand acres of park lands and fifty miles of boulevards and parkways, to the greatest satisfaction of the formerly opposing citizens, who found that the payments they had to make under the assessment plan were not taxes but investments and highly profitable ones (map p. 131). The California "tree planting act of 1913" makes a very similar procedure in the East Bay cities possible.

An interesting description of the Kansas City procedure, together with the views of a number of leading citizens of that city, may be found in the 1913 proceedings of the Fifth National Conference on City-Planning, pages 140-162.

GLEN ECHO CREEK AS A PRACTICAL EXAMPLE.

Taking a practical example of Oakland conditions, Mr. Oscar Prager said in one of his addresses: "As illustration of the practicability of this, I offer the following figures on the boulevard

By courtesy of Mason-McDuffie Company

MAP OF BERKELEY SHOWING PROGRESS OF BUILDING TO 1914

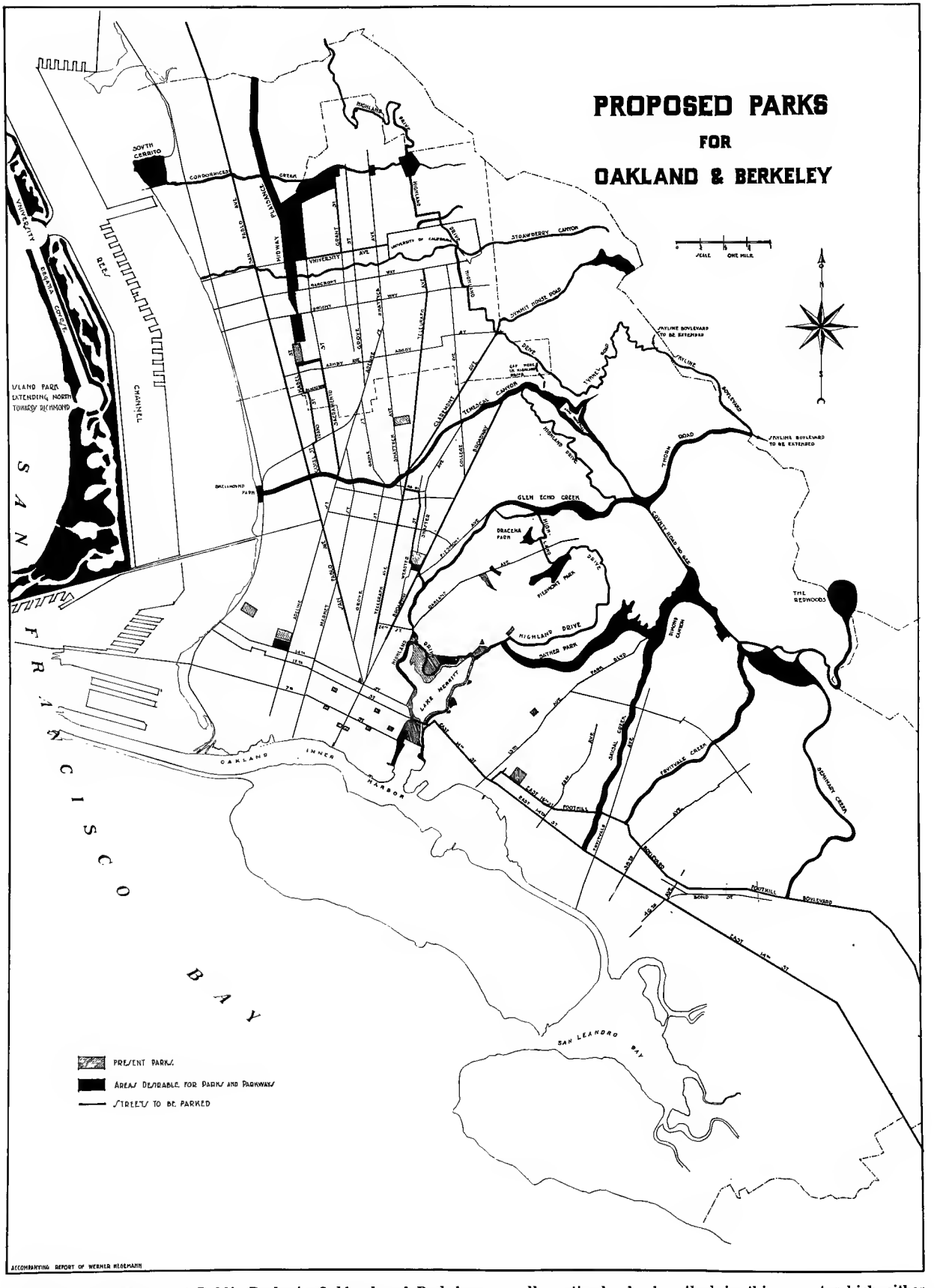
The lots shown black are built upon, the remainder are free from construction. A glance at the strip of unbuilt-upon land running from north to south and dividing the city clearly in two sections convinces one that Berkeley still has a chance to screen off by a parking scheme its rapidly growing industrial districts in the western part of the town from the residential districts in the east. Compare the industrial map of Berkeley, page 55. The parking scheme proposed here is described in this report under the name "Midway Plaisance." Compare Map of Parks, Parkways, and Playgrounds, p. 138.

scheme along Glen Echo Creek. My calculations, based on the assumption that you can purchase the necessary property for three times its assessed valuation, would give the following assessments for the first five blocks on each side of the Creek, the assessment being based on a 10 year bond issue at 5%. For the first block $2 for every $100 assessed valuation; that would be the block directly opposite the new park. The second block $1.75, the third, $1.25, the fourth $1, and the fifth 50 cents. If one should add other blocks the assessments would be reduced accordingly; if I have erred at all in my estimates I have erred in making the assessments too high."[1]

MAP OF POTENTIAL PARK AREAS.

In order really to make the payments for parks investments instead of taxes they must be expended for a well-connected, well-balanced and comprehensive park system, not for fanciful purchases in various localities. As a possible basis for such a comprehensive park plan, which will re-

[1]An amendment to the so-called Vrooman Act, permitting the bonding of districts for park purchases would have to be passed by the state legislature.



Map showing present Public Parks in Oakland and Berkeley as well as the lands described in this report which either should be acquired or from which selection should be made by an active municipal park policy. In some cases immediate action is imperative. The park policy of the East Bay cities is behind that of many other progressive American municipalities.

DE FREMERY PARK, TYPICAL OAKLAND PLAYGROUND

Old live oaks and lawn. Looking toward Poplar Street from the east side of the playground proper. The poplars in the background have been cut down since this picture was taken.

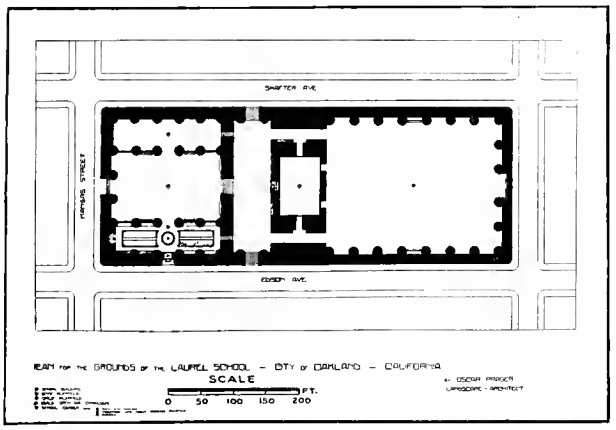
quire much additional study, I have in co-operation with the landscape architect of the Oakland Park Directors, Mr. Oscar Prager put on one map all the many different park possibilities of the East Bay section as mapped out in this report. I beg that it be understood that the map is not intended to mean that all the land is to be acquired; but all the land that should enter into competition for park purchases is shown. As soon as the work has been started, the sellers of park land on the one hand and the members of special assessment districts on the other, will recognize the enormous benefit accruing to their properties, and the work will progress rapidly and enthusiastically. The time will have gone by when timid men without vision managed to bar the East Bay cities from the rank among American park cities they deserve by their unheard of possibilities of using their parks all the year around and of blossoming not during one or two months but every month of the year. The East Bay cities must not be built in the old fashion of the congested city without sufficient breathing space—the old type of the city to die in—but they must be a place—a foremost example of the modern city—an enchanted place to live in.

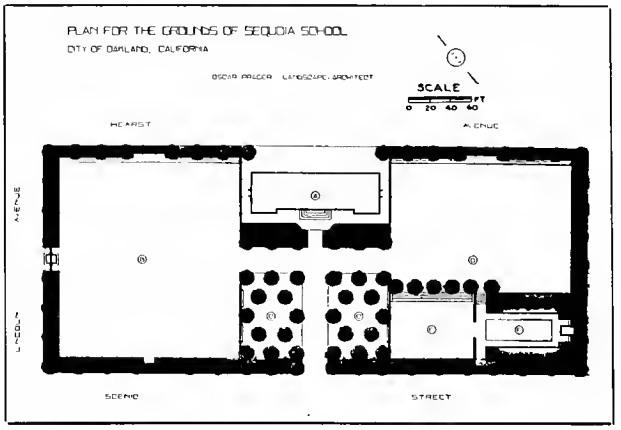
THE PLAYGROUNDS.

The playgrounds, so far as possible, should be worked into the park system in order to give them the pleasant neighborhood, better air, and calm of the parks. More important, however, is it to have the playgrounds really within walking distance of every home. Little needs to be said by me in this connection.

THE LACK OF PLAYGROUNDS IN BERKELEY.

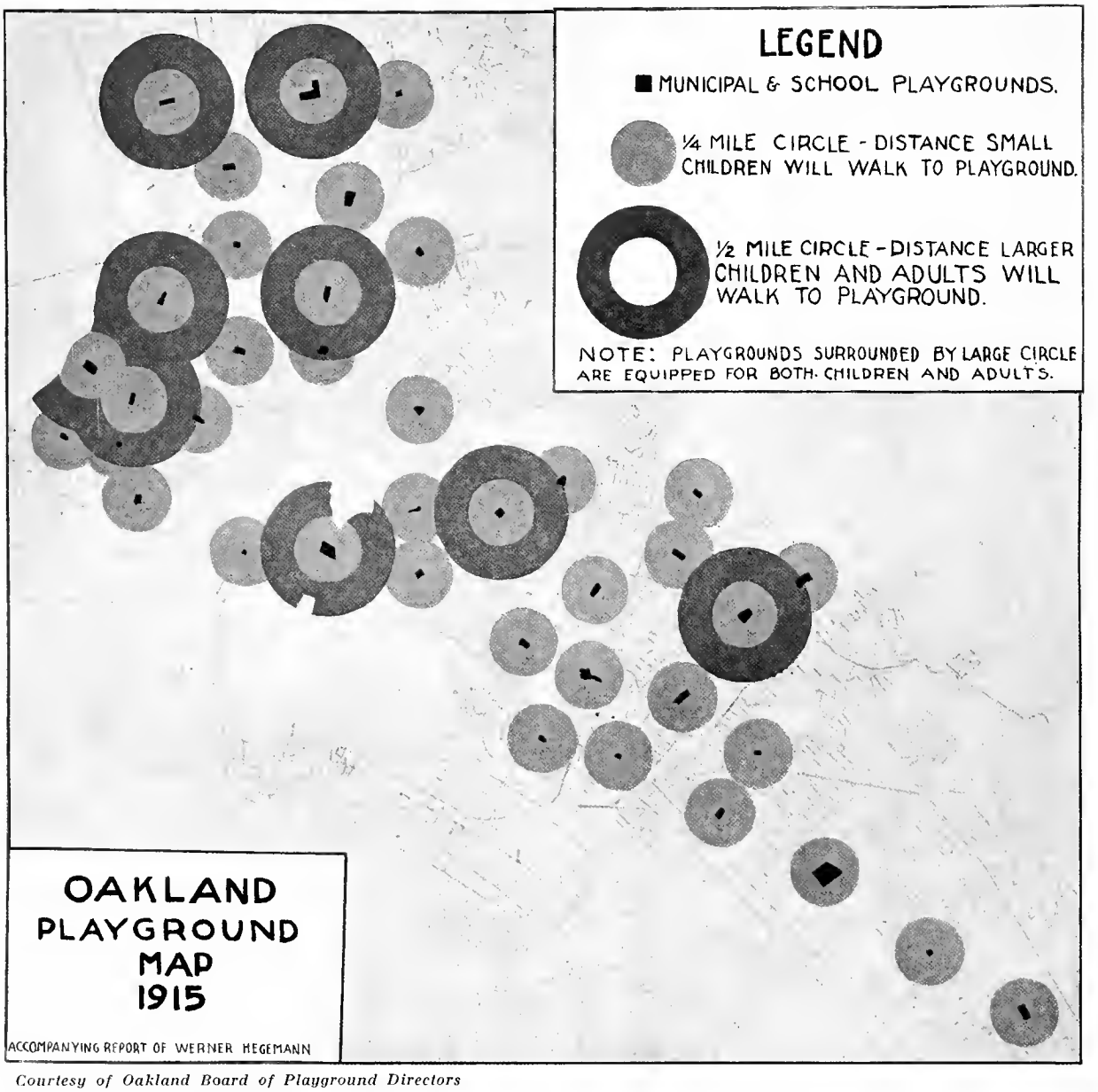
For Berkeley a playground program was worked out in detail several years ago and was voted down like all park propositions in that University town. The program must be carried out and enlarged upon. All schools ought to be surrounded by sufficient play spaces. In most cases, this is still possible, sufficient unbuilt on land being available near most schools. What is required is that the stinginess with which Berkeley children are treated publicly should be overcome. Where the empty lots available are separated from the schools by streets it will be necessary in several cases to change the street course of the side street in such a way as to have it go around the school plus the lot to be added. There is no reason why streets of a residential character must be straight. As an example, take the Emerson school, which at present is so close to the street that its windows have to be guarded by iron bars like a prison. Piedmont Avenue (which terminates within a short distance) could very well, between Forest avenue and Garber street, curve to the west and throw the there available lots and the present street area into the school site. Also the parking of the streets, especially of Forest avenue, would add greatly to the character of the school.





TWO EXAMPLES SHOWING SCHOOLS AS IMPORTANT FACTORS IN THE PLAYGROUND SYSTEM—SEQUOIA SCHOOL AND LAUREL SCHOOL, OAKLAND

Every foot of space is made efficient use of and the various wants of the children supplied. A—School Building; B—Boys' Playground (Baseball Diamond, Basketball Court, Apparatus); C—Small Children's Playground (Sand Boxes, Ball Playground, See-Saws); D—Girls' Playground (Tennis Court, Volleyball Court, Ball Playground, Apparatus); E—Basketball Court; F—School Garden with Wall Fountain. School grounds like these combined with proper use of school buildings out of school hours make schools real neighborhood centers.



Courtesy of Oakland Board of Playground Directors

Though Oakland's playground situation is far superior to Berkeley's, there are still large areas, the children of which are outside the efficient range of playgrounds. The boy without a playground is the father of the man without a job. The playground situation in Oakland at present is worse than might appear from this map. The playgrounds appropriation was cut down in 1915 and playgrounds are closed for lack of funds.

OAKLAND'S PLAYGROUNDS

Regarding the schools of Oakland, great admiration must be expressed for the one story schools originated in that city. Oakland has a school system really worthy of a modern well decentralized city. Also, in the matter of playgrounds, thanks to the untiring work of some prominent citizens, Oakland is far ahead of Berkeley. But further advances are needed. The following recommendations, as worked out in co-operation with the superintendent of Oakland playgrounds, Mr. G. E. Dickey, seem conservative:

"The accompanying map of the City of Oakland shows the location of 9 Oakland Municipal Playgrounds and 31 School-yard Playgrounds, in which supervision is maintained by the Board of Playground Directors. Around each Playground is drawn a circle with a radius of one-quarter mile, which is the average distance the small children will travel to the playground. Around the larger playgrounds, those equipped with athletic fields, are drawn circles with radii of ½ mile, which is the average distance older boys and girls will travel to a playground equipped to meet their needs.

"All those portions of the map (shaded area), which are not included in the circles represent the sections of the City not served by any playgrounds.

"The Southern half of Peralta Park in rear of

the Municipal Auditorium site is marked on the map as a recreation center. This is not now in operation, but it has been planned to set aside this land for a large municipal recreation center, which when completed will include a stadium, trotting track, running track, and athletic field, in addition to other recreational features.

RECOMMENDATIONS.

First, That the southern portion of Peralta Park (12th and Fallon streets, in rear of the municipal auditorium) be set aside as a play and recreation center.

Second, That play and recreation grounds be selected in the center of residence districts not already served by these facilities. The minimum size of such grounds should be ten acres, where possible.

The most urgent needs are in the following locations:

A. District south of Twelfth Street and west of Market Street. This district includes the former 4th ward and a portion of the former 6th ward. The population of these two wards is 28,858 and there is no adequate playground in all the district.

B. District between Southern Pacific Railroad tracks and Estuary extending east and west from Twenty-third Avenue. This is the vicinity of the cotton mills, and a large population of working people without a park or playgrounds.

C. District north of Lake Merritt from Vernon Street to Lake Shore Avenue and north to the Oakland City line. This is a rapidly growing district and now is the time to make provision for a playground.

D. District surrounding the Bay School (62nd Street and San Pablo Avenue). An appropriation has been made for part payment on the purchase of the playground in this locality. It is urgent that the land be secured as soon as possible.

E. District between Harrison Street, San Pablo Avenue, Twenty-ninth Street, and Twenty-second Street.

F. District between Fourteenth Avenue, Twenty-fifth Avenue, East Twenty-eighth Street, and East Twelfth Street.

G. District bounded by Hopkins Street, Trestle Glen, Piedmont City line, and Sausal Creek. (Dimond Canyon).

H. District bounded by Shafter Avenue, Forty-second Street, Fifty-ninth Street, and Rockridge Park.

I. District bounded by Fruitvale Avenue, High Street, East Twelfth Street, and Congress Street.

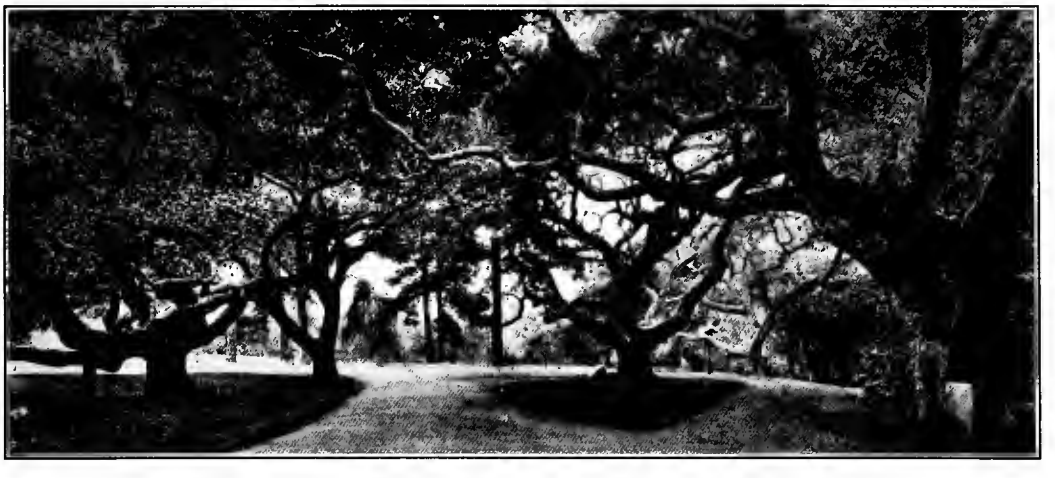
Third, That the seventeen acres of City property adjacent to the Lockwood School (East Fourteenth Street and Sixty-eighth Avenue) be equipped as a public playground and recreational center.

Fourth, In the annexed district and elsewhere there are large areas which are not yet built up with residences. These districts will be populated in the future. Now is the time to set aside space for parks and playgrounds in the vacant areas."

Berkeley is almost wholly lacking playgrounds. In addition none of its schools has sufficient play space. Curiously enough the greatest lack of play space is in the higher class residence districts. In that city a complete playground system should be secured at once before all the available land is built upon.

PLAYGROUNDS AND INDUSTRIAL EFFICIENCY.

The playgrounds have also to be considered as a part of the East Bay cities scheme for industrial efficiency. It is a mistake to think of playgrounds as a matter of philanthropy. They are an essential piece in the equipment of the East Bay sections industrial and commercial supremacy: "The boy without a playground is the father of the man without a job."



OLD LIVE OAKS ON THE UNIVERSITY CAMPUS, BERKELEY

These are landscape effects possible on East Bay soil. Oakland derives its name from the oak trees and should conserve some fine groves that will to our children assume the venerable air of these trees. The entire Park and Playground system should be under the "sign of the oaks."

THE CAMPANILE IN THE VISTA OF TELEGRAPH AVENUE

A rare example of a building powerful enough to master the expanding vista of a modern traffic street. Telegraph Avenue near the Campus slightly changes its direction. It is interesting to see how thereby the Campanile, which would be too gigantic for the street at so close a range, disappears, and the University Library surprisingly replaces it at the end of the new vista.

CIVIC ART AND CIVIC CENTERS

"They shall be simple in their homes but splendid in their public ways."

There was a time not long gone by when people thought city-planning could beautify a city by the mere adding of artistic ideas without considering the basic necessities expressed in the systems of transportation, parks and playgrounds, and in the housing of the people. Today everybody knows that a really beautiful city can be created only by considering right from the beginning the proper co-ordination of all the needs and ideals of civic life and its physical expression.

MINOR IMPROVEMENTS, REMOVAL OF WIRES, ELECTROLIERS, STREET SIGNS.

There are of course many minor improvements which, without being part of an organic scheme of city-planning, can always be made with great advantage to the appearance of the city. For instance, it will be always safe to urge the desirability of the removal of overhead wires in the business portions of a town and in those residential districts which aspire towards some beauty out of the ordinary. Oakland has made some progress in this direction; Berkeley lags behind. The wires should be carried in conduits at least in the business district while in the residence portions of the city, if the companies cannot afford to put them into conduits, they should at least be removed to an easement to be furnished by the property owners at the rear of the lots, connections across streets being made underground. Sewer, water and gas connections should be made with every lot from the street mains where permanent paving is done. Similar matters of common agreement are recommendations regarding satisfactory, characteristic and possibly artistic systems of marking the streets of a city and of lighting it with well placed electroliers in combination with or independent from the street signs, the trolley and telegraph wire poles. Some cities have developed very elaborate and attractive schemes. In Vienna, the electroliers carry great baskets of living flowers, in Berlin and other cities, the street signs being placed not only on one but on all four corners of a street crossing, indicate, besides the name of the street, the specific numbers of the houses to be found in the next block. Other cities have made their streets a living lecture on world history by giving in small print with the name of a street the derivation of the name with the merits and the year of birth and death of the man whose name honors the street. It is a question of individual taste how far one wants to go, but the present state of very poorly marking the streets, or of not marking them at all; of having streets lighted with many different kinds of electroliers erected without any consideration of beauty, as one often finds in the East Bay section, should not last. A more efficient and aesthetically satisfying scheme under the supervision of a Civic Art Commission is necessary.

THE GAY POSSIBILITIES OF STREET ADVERTISING.

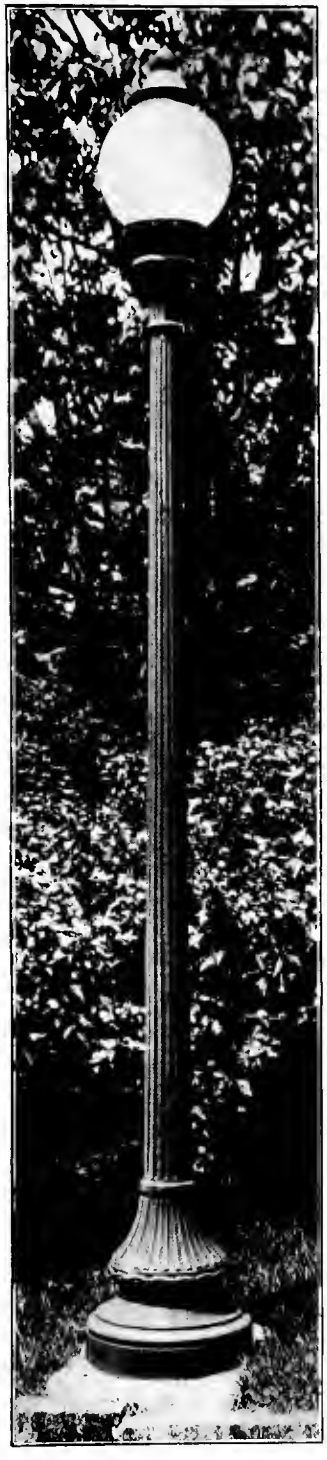
A similar, but even more serious problem, presents itself in the billboard nuisance—a specific American disease—which has caused so much discussion that it does not need to be entered into here. The cities of Europe by taxing, municipalizing and standardizing all street advertising draw a handsome revenue from it. The advertising columns placed by these cities on the street corners are indispensible sources of information to everybody, and under the powerful movement in the applied arts, especially in Germany, have given rise to a real art of designing and printing artistic

posters which, with the help of the leading painters of the nation, has made the advertising column of the street corner one of the gayest and most charming features of city life. The American billboard in its exaggerated size is a calamity, financed expensively by the consumer.

The planning of parkways or residential streets with trees, shrubs, flowers and grass is perhaps the least expensive and most effective method of beautification within reach of the East Bay cities. This has been gone into fully in previous chapters. (pp. 103 f., 71, 86 f., 133 f.).

MAJOR MATTERS. THE SUBLIME EFFORT TOWARDS CIVIC BEAUTY.

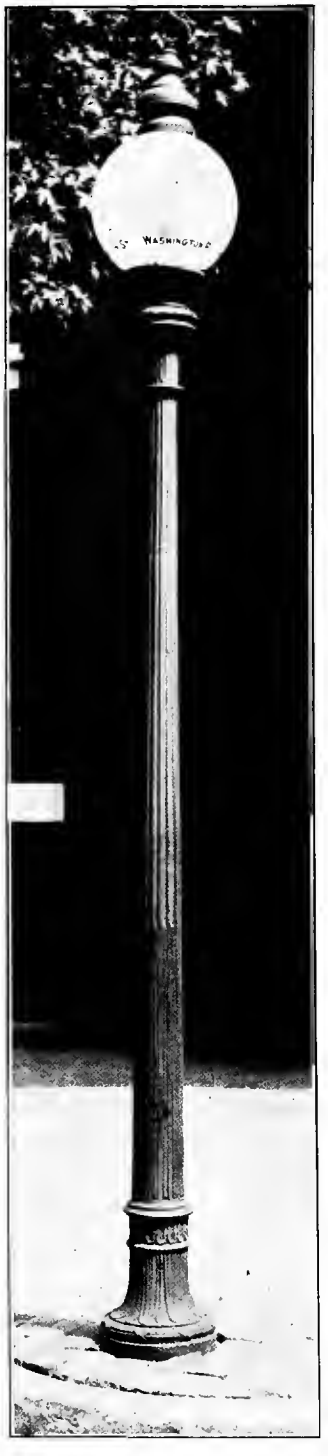
The different factors of beautifying a city named so far, though they tell a story about the spirit prevailing in a town, are minor matters compared with greater aesthetic features as represented in properly treated streets, in the schemes of parking and of private and public landscape architecture, in the architecture of the private and public buildings, and finally, and most gloriously, in the great combinations of public buildings with public landscape architecture grouped in a great spirit and surrounded by decent private grounds and homes. All the thousand necessities of city-planning if properly satisfied, all the civic problems if properly solved, find the highest expression of this satisfaction and of their solution in a really great effort towards a civic center, the community effort towards civic beauty.



WELL DESIGNED ELECTROLIER AS USED IN STREETS OF WASHINGTON, D. C.

THE CALIFORNIAN STYLE IN HOME ARCHITECTURE.

In the introduction to this report a word has been said about the change which has come about in the ideas regarding civic beauty since it has become more and more a democratic affair instead of being the satisfaction of the personal ambitions of a ruling dynasty. The modern democracy, in building up a newer and more promising type of civic beauty, begins its work by properly laying all the necessary foundations dealt with in the previous chapters—foundations without which even the most ambitious dream of civic beauty breaks down. A great asset to the American city in its march towards a new civic beauty is the high standards of home building found in America. Here types of homes have been developed which promise to be fine units in building up the modern "City Beautiful." The East Bay section deserves high praise in advancing this great work. A number of inspired artists have co-operated to create entirely new and pleasing solutions of the home problem. The work of men like Bernard P. Maybeck and Louis Christian Mullgardt—to mention only two names which are universally recognized—indicates the existence of real home-building spirit which must lead in the end to the building of what will deserve to be called a city beautiful. It will be the privilege of all the civic elements, which are interested in true city-planning, to further the happy co-ordination of the many promising individual efforts and also to spread the good results achieved by individuals in order to let an increasing number of individual home builders benefit thereby. The creation of a high class criticism and understanding of good home architecture can and ought to be encouraged by local exhibitions, by local literature, by competitions, and by the distribution of yearly prizes



WELL DESIGNED GAS LAMP WITH STREET NAMES ON GLOBE USED IN BALTIMORE

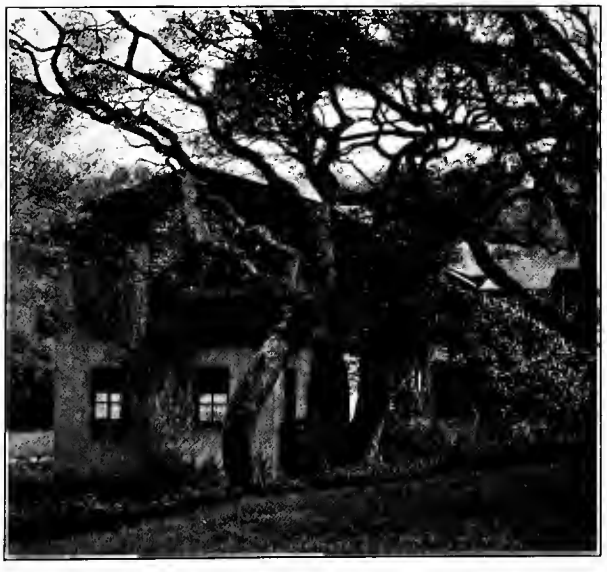
to the most successful effort of the year, and by achieving more and more a common basis and reasoning along these architectural lines. This is especially necessary just now because the success of the charming wooden, shingled bungalow which has given the character to many of the residential streets of the East Bay section, seems to be doomed by the attempt to imitate masonry in a very cheap and perishable form of stucco construction.

NEED OF ARTISTIC CO-OPERATION AMONG HOME BUILDERS.

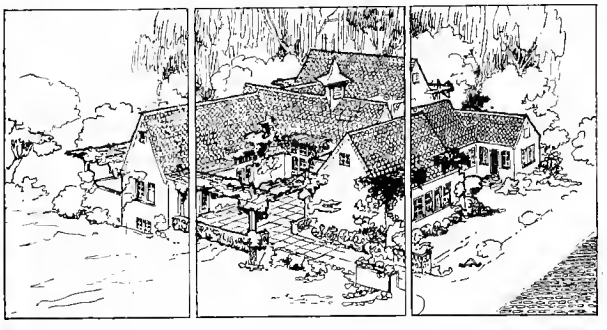
This state of transition to a new, not yet fully digested material, is a danger menacing the cosy charm of entire neighborhoods. It needs the leadership by the best and the understanding following of a sympathetic and educated public to reach a new climax.

FACULTY CLUB, BERKELEY

Plaster and wood construction among oaks. Another fine example of architecture grown out of local conditions, *i. e.*, real art.



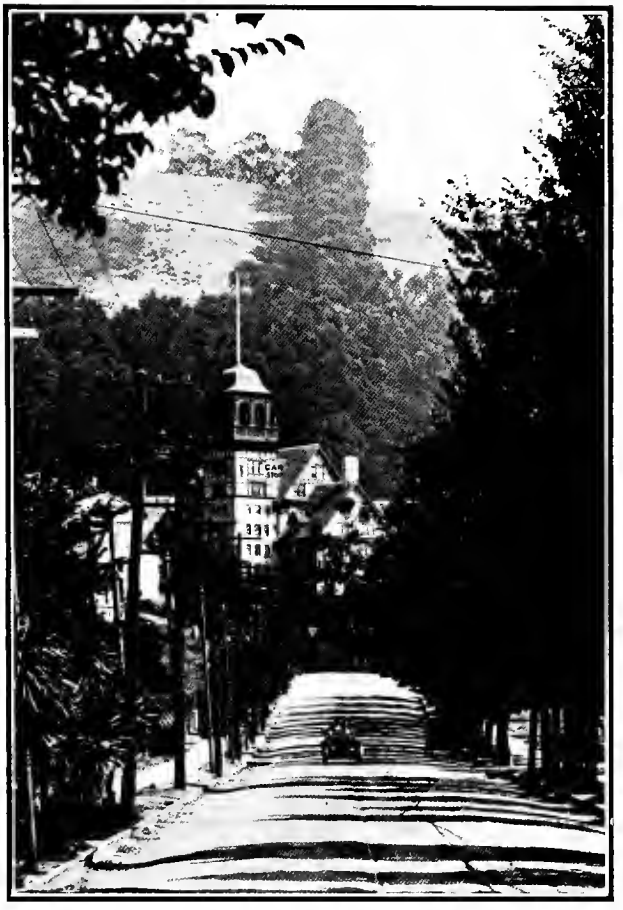
FACULTY CLUB, BERKELEY—ANOTHER VIEW



PHOTOGRAPH AND BIRDSEYE VIEW (DRAWING) OF A PRIVATE SCHOOL, BERKELEY

This building is an excellent example of the adaptability of wooden (shingle) construction to East Bay surroundings and uses. Compare view of shingle homes, p. 115.

The happy results achieved in East Bay home architecture nearly all suffer from their being restricted to individual efforts, while the idea of correlating individual houses in order to secure heightened effects by intelligent teamwork is still comparatively new and little tried. Progress in this direction is absolutely necessary. The finest layout of a subdivision, giving splendid views before houses went up, becomes a mess as soon as private owners indulge in ill advised orgies of individualism, killing each others' architecture by heterogeneous materials and mistaken choices of forms and colors. As soon as the victorious pride of the selfmade money maker, who feels like urging his independence upon his neighbor, gradually is subdued by manners and good fellowship, civilized people reach an understanding about how they will meet not only on social but also on architectural and landscape architectural grounds. Then the splendid effects of friendly co-operation in private planting and building can be reached, effects which form the necessary introduction and approach to the still higher efforts in the grouping of public buildings. Special attention, as pointed out in the chapter on "Streets," must be given to the street junctions and the treatment of build-



THE CLAREMONT HOTEL CLOSING THE VISTA OF RUSSELL STREET, BERKELEY

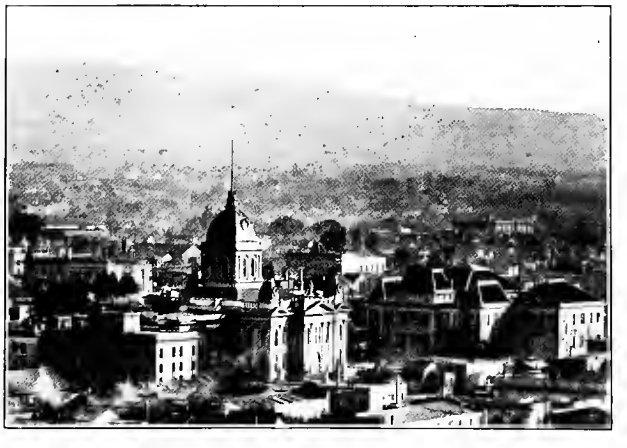
The contours of the tower are amusingly reproduced in a row of trees following a property line across the hill.

ings there because they are the strong factors determining the appearance of the streets. (Plan p. 121, views p. 123. Examples of grouping p. 122).

TWO EXTRAORDINARY POINTS OF VISTA ON THE EAST BAY.

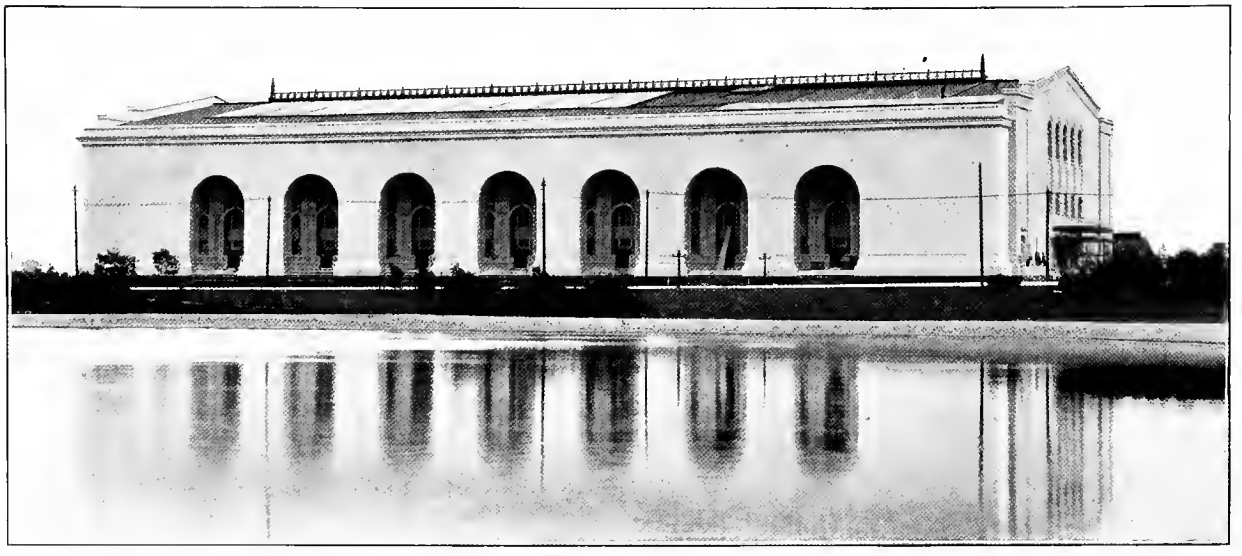
Also the placing of high public buildings in such a way that they fall into the main axis of streets and form vistas, plays a large role. The East Bay enjoys some splendid examples of this fact. The powerful tower of the Oakland City Hall for miles rules the axis and the physiognomy of East Fourteenth Street; and the new Campanile of the University in the same way masters Telegraph and a number of other avenues. Also the tower of the Institute for the Deaf, Dumb and Blind at the head of Parker Street, and the tower of the Hotel Claremont at the head of Russell Street, are remarkable examples. The two latter ones are not very unusual; though the fact that the towers stand on a hillside gives added power to their appearance; but the two first-named examples promise to be very extraordinary in the world for many years. As a rule, the vistas intended to master the picture of a modern street either fade away—as soon as the street stretches over any considerable length—take as a nearby example the tower of the Ferry Building looking like a toy from any distance along Market Street so overpowering is that thoroughfare. Sometimes fine vistas can be enjoyed only for a short distance; often very surprisingly at a sudden turn of the street. But in the Oakland City Hall (337 feet) and the Berkeley Campanile (302 feet) two buildings have been created which are of such enormous size that they successfully rule the full length of a big straight modern traffic street in eternal omnipresence. (View p. 142).

Both buildings referred to are important parts of Civic Centers of the two communities. A few words regarding the Berkeley Civic Center problem have been said in the chapter on Traffic Streets (page 97). I shall not attempt to exhaust this large subject in this report and only a few additional remarks will be made in this chapter. The City Hall of Oakland, in spite of much justified criticism of its architectural details, is one of the most remarkable public buildings in the world for the twofold reason that it frankly breaks away from the idea of making every public building somehow recall the Parthenon or the Pantheon, or if possible, the Pantheon piled on top of the Parthenon. On the contrary, the Oakland City Hall really tries to appear as what it is—a modern business building, efficient and powerful. And at the same time this huge official skyscraper gives just that new type of sensible skyscraper which surely must win out in the building of office structures, *i. e.*, the skyscraper which by retracting the base of its tower behind the box of the ground floor is forever assured of having all the light and air needed in its hundreds of office rooms. While the Oakland City Hall deserves to be quoted as a model in the two respects named, it has not been placed in a neighborhood which makes the development of a civic center in the accepted sense of a grouping of the different public



EARLY ATTEMPT IN OAKLAND AT GROUPING PUBLIC BUILDINGS

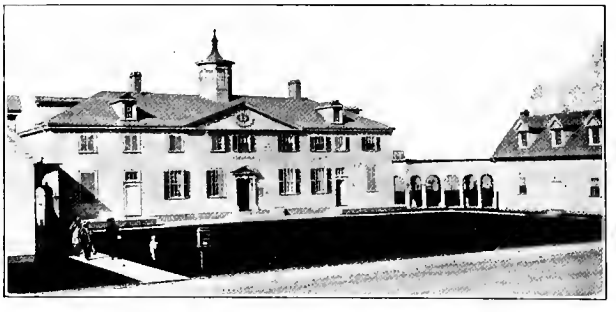
The County Court House and the Hall of Records face each other symmetrically, separated by Broadway. But in order to achieve an architectural effect of ensemble it is not enough to bring public buildings together. In this case the width of the separating street (110 feet) added to the distance which the buildings are set back from the street line is sufficient almost entirely to destroy the cohesion. Only a point as high as the one from which this picture was taken shows the two buildings in any proper architectural relation.



OAKLAND CIVIC AUDITORIUM

This building of steel, granite, and concrete was erected by the City of Oakland 1913-1915. The structure is 198 by 400 feet; it contains a complete theater seating 1989; the auditorium proper seats 3728 in the balcony, 3958 on the main floor, 508 in boxes. The arena floor is 117 by 212 without boxes, 96 by 212 with boxes. The auditorium contains many other rooms, the largest of which are the art gallery, 36 by 109; ball room, 39 by 78, and two committee rooms, 22 by 60 and 24 by 30 respectively. Cost $1,000,000. This costly monument of civic enterprise with its simple form like a great tent of concrete—a real structural form rejecting classical masquerade or gingerbread—may become the nucleus of the future Civic Center. If new public buildings are placed in immediate neighborhood care should be taken that intimate architectural connection with the auditorium should be planned for in time; the mere placing of buildings symmetrically establishes no architectural unit. Together with a scheme of flanking the auditorium with new buildings, the course of Twelfth Street in front of them should be changed so that it may be parallel to the facade of the auditorium. Ample room is left for the creation of a plaza with formal stairs leading into the water. A small part of the lake adjoining this plaza could be treated as a formal basin with a fountain in the center. The change of the course of Twelfth Street is equivalent with the extension of Thirteenth Street across the Lake.

buildings, possible. As ground values are, there is no hope nor is it even desirable from a business point of view, of ever surrounding the City Hall with well-conceived public buildings. The City Hall forever will be a busy business building among private business structures, a splendid expression of busy East Bay life. What the business men of Oakland can and ought to do for the greater glory of their City Hall, is to watch every building going up in the neighborhood, its height, size, lines, colors and material and, in no way to permit anything harmful to the appearance of the City Hall; no water tanks too much in view on neighboring structures, or red brick buildings; or any structures so high as to make the City Hall appear small. The triangular place close to the City Hall has great architectural possibilities. If the civic spirit of the town should become strong enough to subject these possibilities to a study by some great architect, the general outlines of what kind of buildings are desirable around the triangle to give the highest effects, the materials to be recommended, the heights permissible, the subdivision of the place and its planting, could be determined and gradually something surprisingly beautiful would work out, worth while and honorable to the East Bay. For the grouping of new public buildings which gradually will become necessary, another place must be found. The new municipal Auditorium indicates the direction in which to look. From an aesthetic point of view it may be said that the auditorium, in its present location, like the new boat landing at the northern end of Lake Merritt, obstructs the main north-south axis which instead of being obstructed by buildings placed across, should have been emphasized by buildings placed parallel to it in order to preserve the feeling of free connection and continuity between the water of the Harbor, Lake Merritt and the Parks adjoining, or to be added at the head of the Lake and towards the northeast. If, therefore, the adding of further public buildings to the auditorium should be found inadvisable, this would not altogether be regrettable. Another and better site for a powerful grouping of public buildings on the lake should be found on the west shore of Lake Merritt, where there is still a considerable body of land in private hands which under all circumstances ought to become publicly owned. The Auditorium, however, represents such a considerable investment that it may

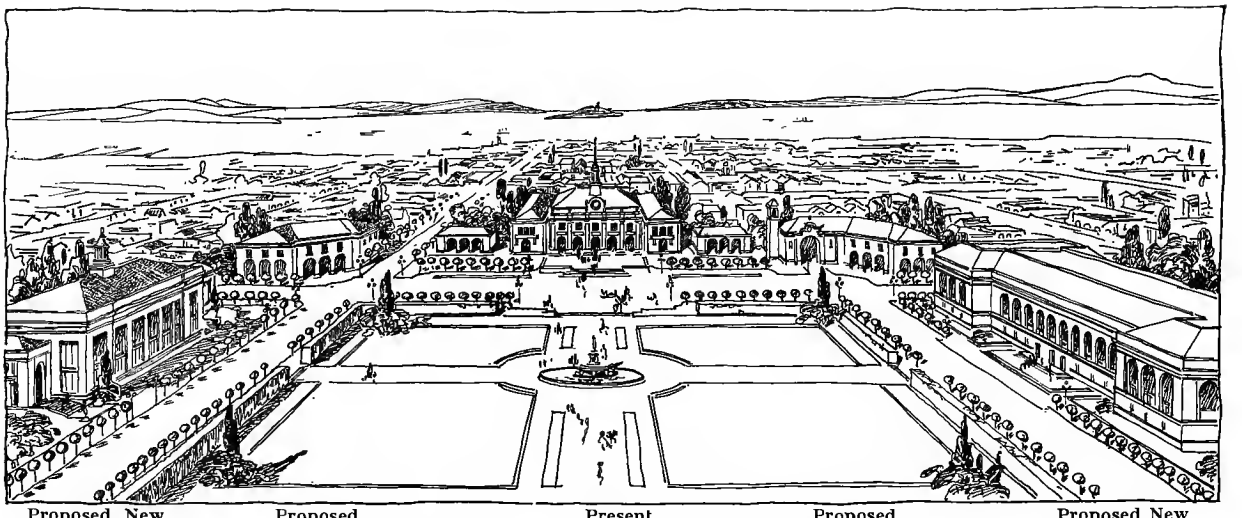


FRONT OF PRESIDENT WASHINGTON'S HOME

As seen at the San Francisco World's Fair. The little arcade between the main and side buildings is a charming and quite naive expression of the architectural necessity for creating some kind of a connection in order to create an architectural ensemble. Arcaded colonnades in case of larger buildings are seldom sufficient to produce unity and to create a self-consistent volume of space inclosed by architecture. More organic connection is needed.

BIRDSEYE VIEW OF THE SAN FRANCISCO CIVIC CENTER

Plan by John Galen Howard, Frederick H. Meyer, and John Reid, Jr. The realization of this Civic Center will be one of the great modern achievements in ornamental city planning. Work is well under way. The point of departure was the demand for a new City Hall covering two city blocks and costing $3,400,000. Before placing this enormous structure sufficient land was acquired to secure adequate sites for a dignified grouping of public buildings in immediate neighborhood of the City Hall, the entire expense for City Hall and land acquired being $8,800,000. Of the buildings to surround the central plaza the City Hall is almost completed. The Auditorium has been constructed by the Panama-Pacific Exposition Company; it seats 10,000 people in the main hall and cost $1,200,000. The Public Library, costing $1,120,000, is under construction. The bonds ($1,000,000) for the State Building have been voted. The buildings on the other sites are not started yet or not determined upon. Headquarters for the City Health Department, Central Fire and Police Stations and a municipal Opera House are considered. An important feature of this plan is to be found in the fact that it gives special attention to the treatment of the buildings in the corners of the plaza. The importance of buildings thus placed in the corners of a formal scheme has often been overlooked in other schemes. The character of these corner buildings is essential in determining the entire aspect. Three of the corners have been acquired; the fourth one still is to be secured. Even the acquisition and harmonious treatment of these corner sites will hardly be sufficient if wild commercial building should be permitted to go on on the sites immediately adjoining. This danger of inharmonious building in the neighborhood can be averted by either regulating their architecture or by closing the vista, *i. e.*, by closing or bridging the street or by making it turn in a curve. The City Hall, itself, as it appears from Market Street at the end of the contemplated new street, for which some buildings have already been razed, is a fine example of a building closing a vista entirely and powerfully. In acquiring the land for this Civic Center many private buildings had to be razed, including a number of steel-frame constructions. A large school building, steel framed and brick, previously on this land has been moved bodily to another site at an expense of $105,000. In the streets the street car tracks have been rearranged, spreading them and placing all trolley poles between tracks. The number of poles thereby has been decreased and the introduction of ornamental poles thus prepared. The railroad and the city divided the expense.



PROPOSAL FOR A CIVIC CENTER IN FRONT OF THE PRESENT CITY HALL, BERKELEY

Line drawing of a rendering exhibited by Messrs. Lewis P. Hobart and Chas. H. Cheney, Associate Architects, at the Oakland City Planning Exhibition, March, 1914, showing the block between Milvia, Grove, Allston, and Center Streets, looking west from Milvia.

be considered as a sufficient nucleus for a further grouping of buildings around it. In regard to the possible grouping of further buildings and especially in view of the plans which already have been exhibited for such grouping, I suggest the treatment of the buildings not as independent units but as a connected ensemble.

IF FORUM EFFECT IS DESIRED GAPS BETWEEN BUILDINGS MUST BE AVOIDED.

In other words, there should be no gaps between the buildings because these gaps very seldom leave any but an unsatisfactory impression, cutting the architectural ensemble into pieces; as a rule they form a nearly unsurmountable difficulty. On the contrary, if the new buildings are placed in organic connection with the auditorium, a satisfactory "place" or "square" can be created, which, with the addition of land originating from the extension of Thirteenth Street across the Lake, and with stairs leading into the water, will form a beautiful open air room of the city. Also the borders of the Lake as far north as Fourteenth or Fifteenth Street should be treated in a formal manner, adding thus a strictly formal water basin to the formal architectural square in front of the auditorium. The center of the formal basin would be the place for a powerful and high fountain, again treated very formally with electric illumination at night, if desired, as on the Schwarzenberg Platz in Vienna. I further recommend the restriction of all formal and architectural treatment to the southern end of the Lake; it would then be like a beautifully carved handle to the remainder

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ALTERNATIVE PROPOSAL FOR A BERKELEY CIVIC CENTER IN CASE THE LAND ADJOINING CAN NOT BE ACQUIRED FOR PUBLIC BUILDINGS

Compare birdseye Sketch and Key on next page (149), also Sketch, p. 150.

In case part of the block in front of the Berkeley City Hall should be needed for Public Buildings this report proposes a grouping that takes special consideration of the Campanile Vista and of the difference in level between Milvia and Grove Streets. This difference amounts to 16 feet and desirable effects can he gained if this difference is not smoothed over but emphasized. Regarding the Campanile Vista, I propose to permit none of the new buildings to come out far enough to obstruct this vista. (The angle is determined by the private property on Milvia and Center Streets.) Regarding the difference in level referred to, I propose to create four levels distinctly different and producing a kind of terracing effect like foothills leading up to the great Berkeley feature, the Campanile, ruling architecturally as a glacier rules the mountains.

The highest level (B) is created by an open air reading room of the proposed new library. The next lower level (C) is an oblong bosquet (shown here by two high hedges) leading to the stairs connecting with the third level (D), a sunken garden, which on its western edge connects with the fourth level, (E) a large plaza in front of City Hall. This last and largest level is to be treated, in contrast with the others, without any planting—purely a large expanse of colored paving or red gravel, surrounded by architecture.

This plaza will be the point at which to collect and start civic parades and for occasional civic demonstrations and open-air meetings. The buildings surrounding it would be to the west, and as the main feature, the City Hall; to the south, a building housing archives and a police station; this building must bridge Grove Street, the effect of space and the feeling of the volume of the plaza can not be secured when this volume flows away in every direction through street openings. This building bridging Grove Street must be very simple, not higher than two stories, keeping lower than the City Hall in actual height as well as in spirit. Compare the proposal for its outlines in the sketch (p. 150). To the east the plaza would be inclosed partly by the proposed new high school, partly by the balustrades of the sunken garden, and especially by the feeling of beautiful inclosure created by the mounting terraces, preparing for the high hills to the east and their dominating guardian, the Campanile. To the north the plaza and Center Street should be lined with a row of one-story business houses, simple in architecture, so as not to take away attention from the public buildings.

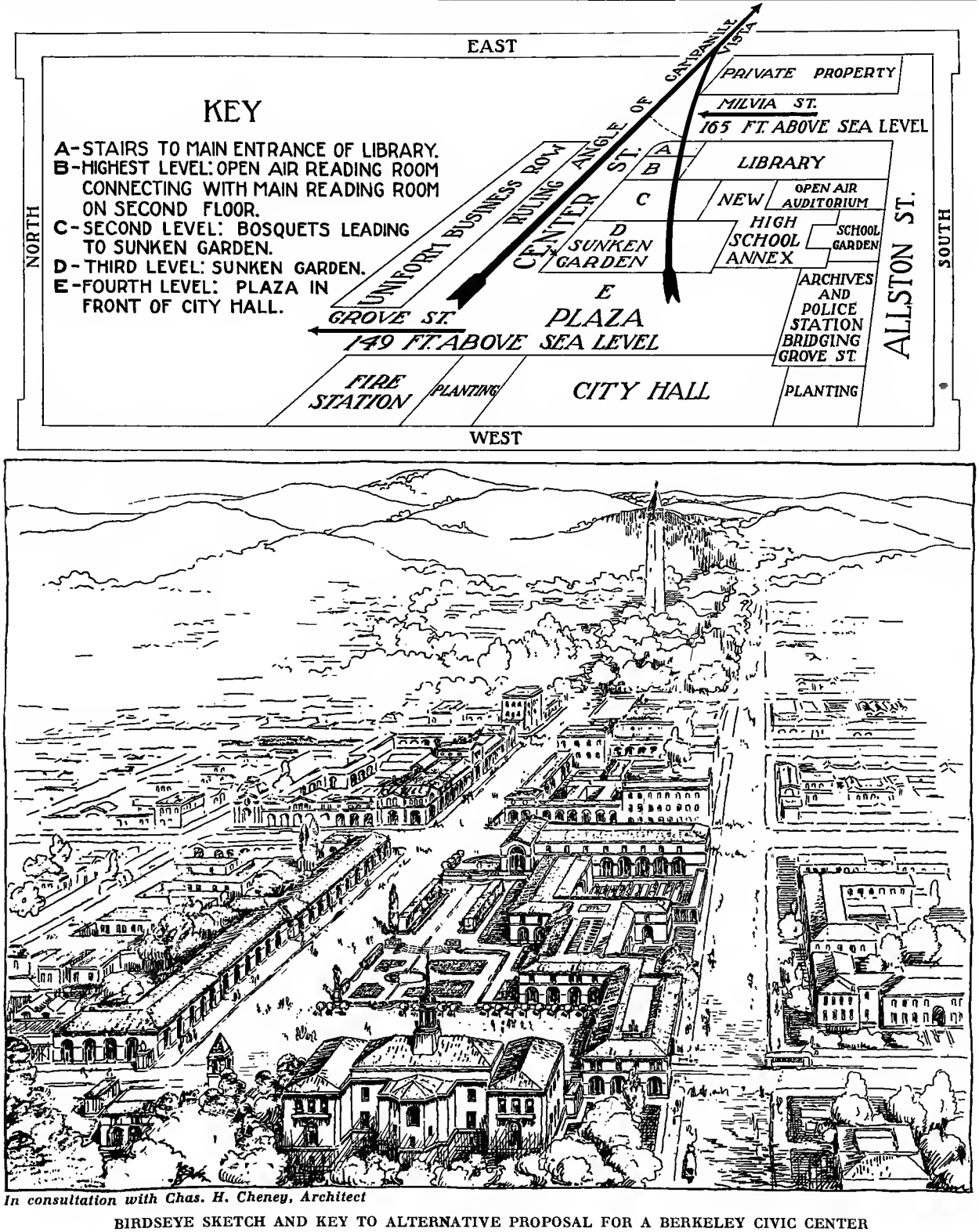
Where the ends of the levels B, C, and D protrude pointedly into the silhouette of the street, ideal locations for the placing of statuary may be found (emphasized in the sketch by a cypress and a monument.) Monuments placed that way have the double advantage of being prominent in the vista of any one moving along the main streets, also of being in a place to be contemplated in quiet from the terraces of the gardens. The architecture of the public buildings can be accentuated in such a way that every one of the different levels is felt as a unit or as an individual room in the group of gardens, terraces, and plazas. In the retaining wall backing up the highest level (B, open-air reading room) a little fountain is proposed, to send a slender stream of water through the entire length of the second level to a pool in the center of the sunken garden (D, third level); this little play of water is indicated on the sketch; benches may line the high hedges on either side. The proposed high school annex contains a large open-air auditorium such as every California school ought to have; this is not the foggy North. What is termed "school garden" forms "court of honor" with the old high school building opposite the street.

of the Lake, the northern part to be treated entirely in a natural and romantic manner with the avoidance of concrete or plaster work of any kind.[1]

THE BERKELEY CIVIC CENTER.

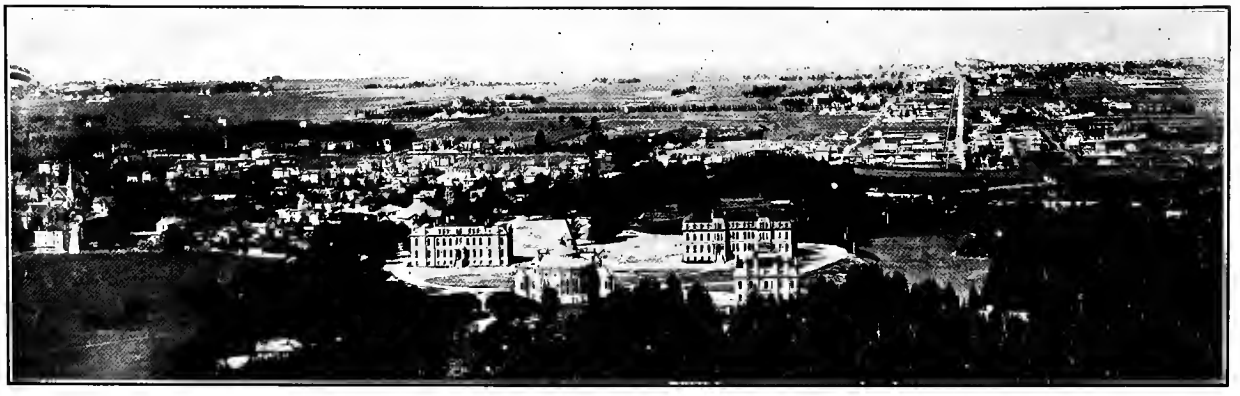
The so-called Civic Center of Berkeley presents a very different problem. If the City should suc-

[1]Regarding the desirability of avoiding gaps between the buildings, the visitors of the Panama-Pacific Exposition will have noticed the harmonious joining together of the buildings and the effort made towards closing in even every street axis by terminating the vista with a monument.



In consultation with Chas. H. Cheney, Architect

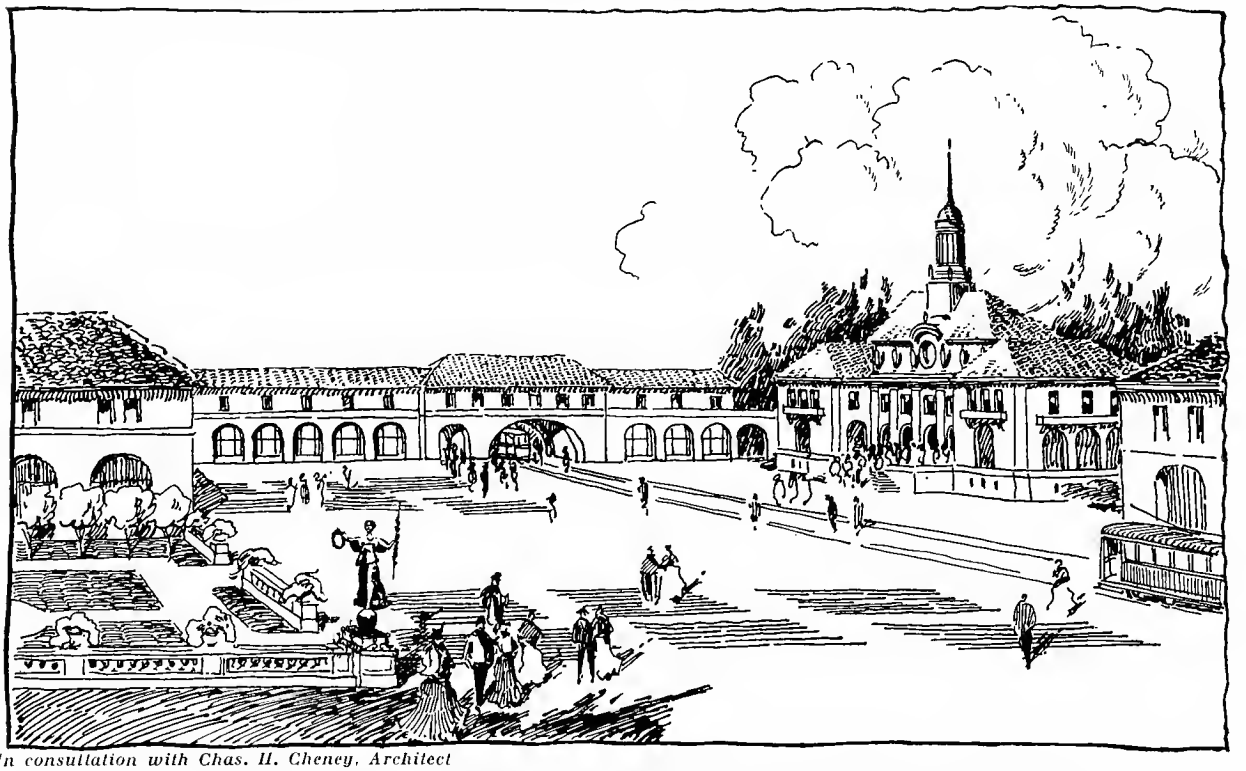
BIRDSEYE SKETCH AND KEY TO ALTERNATIVE PROPOSAL FOR A BERKELEY CIVIC CENTER



OLD VIEW OF THE UNIVERSITY CAMPUS AND BERKELEY

Looking west, one sees in the foreground the first grouping of University buildings along the axis proposed by the elder Olmsted, *i. e.*, before the conception of the Phoebe Apperson Hearst Plan (which in order to gain space shifted the axis further north; both axes, however, point to the Golden Gate). All these buildings have to give way to the new plan (see p. 152). Behind the University buildings the almost unbuilt upon site of Berkeley appears. What a site for a great city!

ceed as hoped in acquiring the land in front of the Berkeley City Hall containing no buildings of considerable value, a great possibility of gradually grouping all public buildings would present itself. Various courses could then be pursued. The public buildings, as has been proposed, for instance, by the architects Hobart & Cheney in their fine perspective view (p. 148), could be placed *around* the area, which, with the area of the adjoining streets, corresponds to a surface of about 650 by 350 feet, *i. e.*, over 5 acres Additional land would have to be acquired *around* the so-called Civic Center block in order to secure the building sites. In this case, the area between the buildings is so large that it cannot be treated as an architectural square or place, but it will form a small park, which can stand a good deal of planting. This planting, being so close to architecture, of course must be formal. This formality of course does not exclude the use of the park for many civic or playground purposes; on the contrary a formal treatment makes an almost mathematical use of every square foot possible, as many of the schoolground plans of Mr. Prager for the



In consultation with Chas. H. Cheney, Architect

THE PLAZA, SKETCH OF THE ALTERNATIVE PROPOSAL FOR A BERKELEY CIVIC CENTER

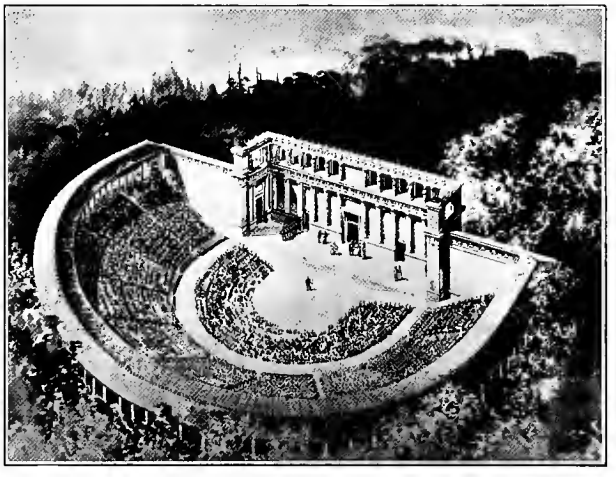
Sketch showing view from Center Street looking south across the plaza towards the building proposed as a bridge over Grove Street south of the City Hall. In the left foreground part of the proposed sunken garden (D) and of the proposed high school annex. The little arrow pointing south across Center Street on the preceding diagram gives the point from which this picture is supposed to be taken. For explanation see p. 148, footnote.

UNIVERSITY OF CALIFORNIA, HUMANITIES GROUP

Looking east— the Campanile in the center. Showing how the somewhat small units of the individual buildings are brought into composition by planting and balustrades and by harmonious horizontal roof lines mounting in terraces. For the very small units on the right side a little arcade is proposed to make the necessary architectural connection and avoid the effect of "spottiness."

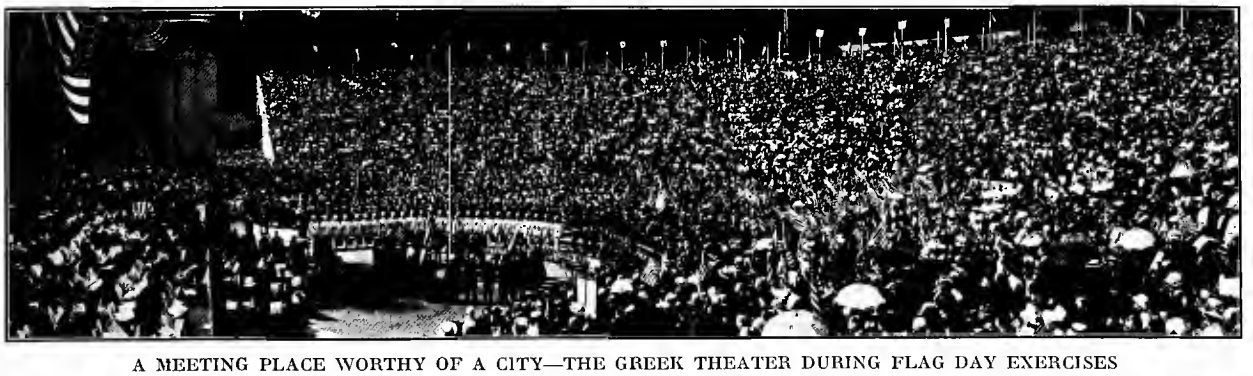
City of Oakland have proved (p. 139). In order to secure satisfactory effects, it will not be sufficient to build satisfactory facades on the four sides of the park, but it will be absolutely necessary to exert a strong influence on the buildings on the corners, as was very properly planned in connection with the new civic center in San Francisco (see p. 147). Otherwise the finest aspirations of the architects building the facades immediately adjoining the little park would be annihilated by disproportionate and inconsiderate building on those corners.

Another procedure could be followed if Berkeley should be able to secure sufficient parks in other localities as suggested in the chapter on Parks. In this case the area between Grove, Milvia, Center Street and Allston Way could be treated in an architectural way; *i. e.*, the public buildings could be placed on the edges of this territory with facades not only towards the streets named but also and especially towards a square to be reserved in the center which, with entrances under arcades on the style of Place des Vosges in Paris, could become one of those fine beautifully set jewels—an open-air room with the sky as an ever-living ceiling—which are among the best architecture can produce. Since Berkeley is very slow in acquiring land, and since the latter procedure requires less land and is cheaper, it may have more hope of realization. Both procedures will have as much merit as the architects and landscape architects called upon. Either procedure, if it means nothing but a haphazard lining up of



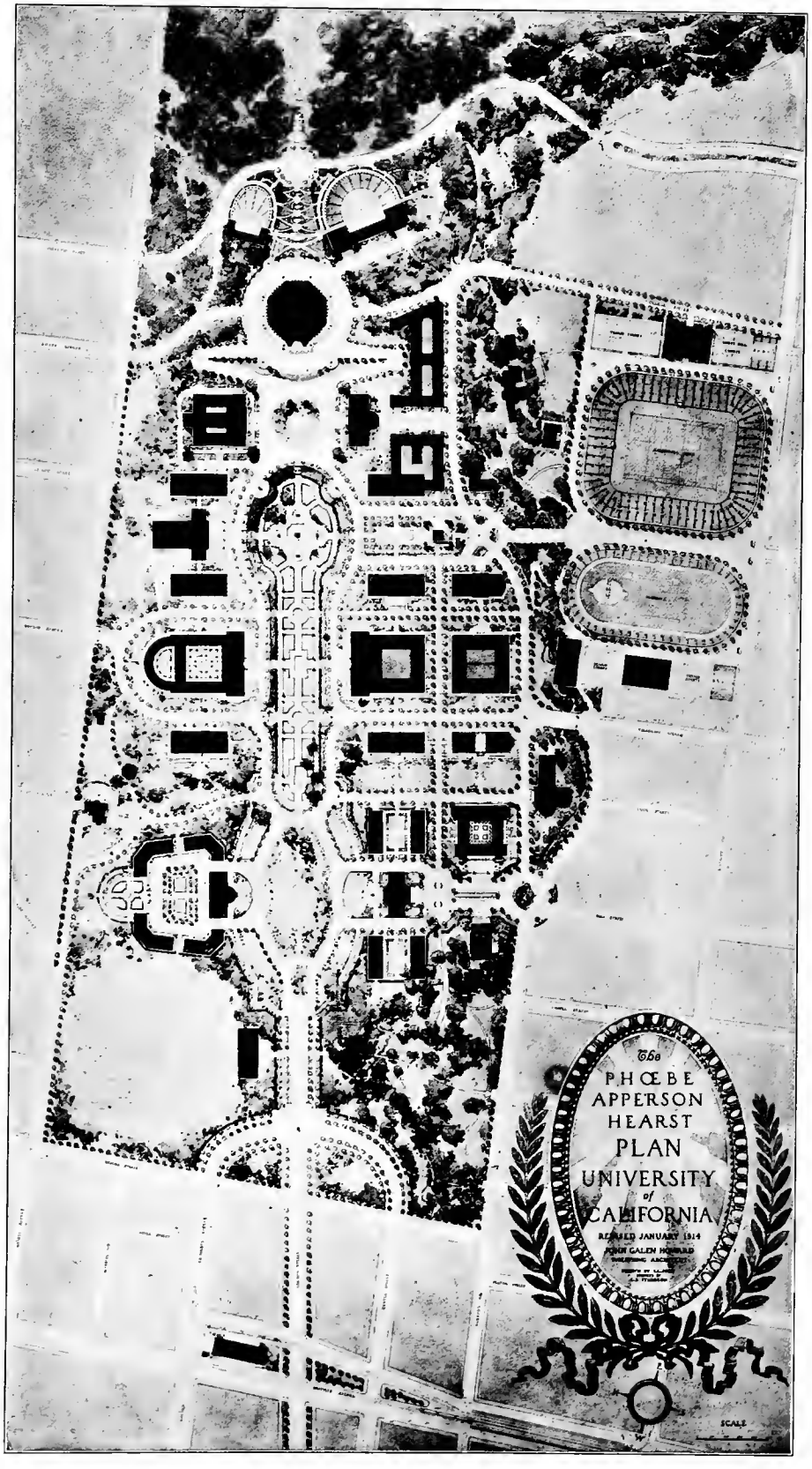
BIRDSEYE VIEW OF THE GREEK THEATER AS IT IS TO APPEAR ULTIMATELY

The Greek Theater of the University, in spite of its having given the impetus to quite a development of open air theaters in this country represents in its present state (compare adjoining picture) not much more than the mere foundations of the building ultimately planned for. The present concrete structure will be covered with marble, three more rows of seats, and a peristyle will be added; the present structure, beautiful as it is, is but a sketch of the ultimate appearance.



A MEETING PLACE WORTHY OF A CITY—THE GREEK THEATER DURING FLAG DAY EXERCISES

The Greek Theater, which ordinarily seats 8000 people, may seat 10,000 when use is made of stage and orchestra, as shown on this picture. The building of large cities brings great masses of people close together. To create dignified meeting places for festive occasions and provide suitable approaches, is a worthy object of architect, landscape architect, and city-planner. California is blessed with a climate that permits open-air meetings all the year around.



"CITY OF LEARNING"—THE PHOEBE APPERSON HEARST PLAN, UNIVERSITY OF CALIFORNIA

As revised January, 1914. Scale in right corner measures 250 feet.

This plan is the outcome of two international competitions. Both were judged by five representative architects from San Francisco, New York, France, Germany, and England. The following are abstracts from the "preliminary prospectus," published 1897:

"The purpose of the competition is to secure a plan to which all the buildings that may be needed by the University in its future growth shall conform. All the buildings that have been constructed up to the present time are to be ignored and the grounds are to be treated as a blank space, to be filled with a single beautiful and harmonious picture as a painter fills in his canvas.

"In fact, it is a city that is to be created—a City of Learning—in which there is to be no sordid or inharmonious feature. There are to be no definite limitations of cost, materials, or style.

"There will doubtless be developments of science in the future that will impose new duties on the University, and require alterations in the detailed arrangement of its buildings, but it is believed to be possible to secure a comprehensive plan so in harmony with the universal principles of architectural art, that there will be no more necessity of remodeling its broad outlines a thousand years hence than there would be of remodeling the Parthenon, had it come down to us complete and uninjured."

In the first competition, Antwerp, 1898, 105 plans were submitted, 11 premiated. The premiated architects entered a second competition, judged 1899, in San Francisco, in which five prizes ranging from $1000 to $10,000 were awarded. The first prize was given to Emile Benard, Paris. His drawings, preliminary sketches only, formed the basis for the studies which have been made since 1902 under direction of Professor John Galen Howard, another one of the premiated architects. The rapid growth of the University and the constantly changing conditions have inevitably resulted in considerable modifications of the preliminary scheme. The plan, while thus elastic, remains a unified scheme taking its title from the benefactress whose munificence has made it possible. The individual buildings of the revised scheme erected to date are: Mining Building, Greek Theater, University Library (in part), California Hall, Boalt Hall, Agricultural Hall, Sather Gate, and Sather Tower.

The bond issue recently voted for new buildings has provided funds for completion of the library and erection of a large classroom building, a new building for the College of Agriculture, and a wing of the proposed new Chemistry Group.

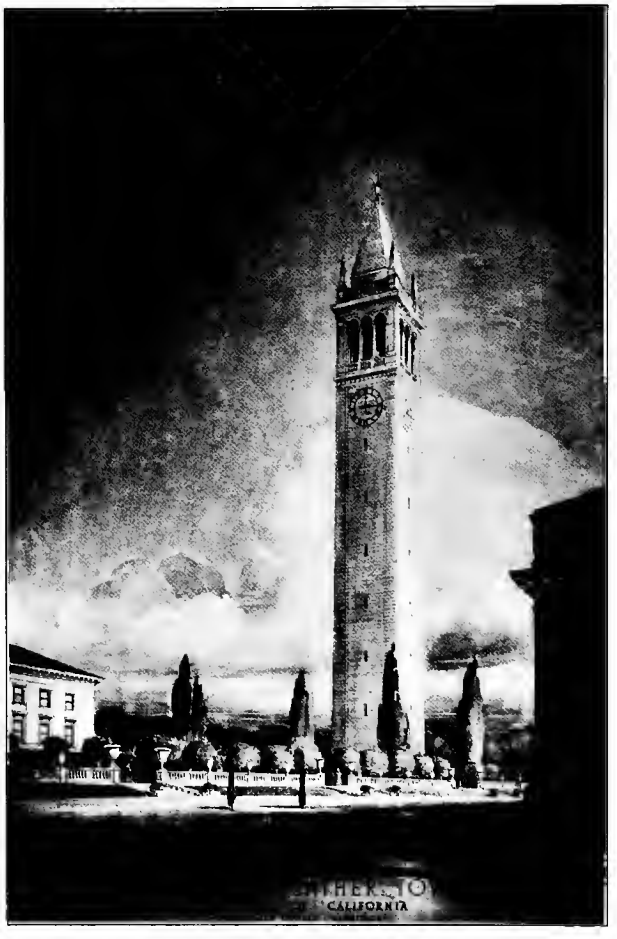
An essential change of the plan premiated with the first prize is to be found in the orientation of the axis. While Emile Benard made the continuation of University Avenue the axis of the University, Professor Howard has reverted to an axis almost parallel to the one proposed by the elder Olmsted in order not only to conform with the configuration of the soil but also to satisfy an ideal requirement emphasized by Olmsted, *i. e.*, having the axis pointing directly to the Golden Gate, thereby bringing the University Group into ideal relation to the entire Bay of San Francisco. This should lead to a slight relocation of Addison Street. (Compare p. 97.)

public or semi-public buildings in varying styles, heights, materials and sizes, will have little value. Compare sketches pp. 149, 150, and footnote p. 148.

A CALIFORNIA STATE CENTER; THE CAMPUS OF THE UNIVERSITY.

Whatever the individual communities of the East Bay may be able to produce in the line of happily grouped public buildings they will not be able, and ought not to be able, to surpass the greatest civic center not only of the East Bay section, but of the entire State, *i. e.*, that tremendous group of buildings which, measured by quality and cost must surpass even the Capitol Grounds of the State in Sacramento, namely, the University of California. To have this unique group of buildings, as it is planned, in its midst, is one of the highest privileges of the East Bay; and any East Bay community outside of Berkeley which should consent to consider the Campus as a mere Berkeley affair instead of seeing therein the pride of the entire East Bay section would be altogether too unassuming and very shortsighted. From the broadest point of view the plans for the University of California represent one of the most interesting and largest attempts in the world towards dignified and effectual grouping of public buildings. It is not the object of my report to go into a discussion or rather appreciation of these plans, which are in the best possible hands, and are prominently before the eyes of the public at large. I beg to make two observations only regarding them: In order

PROPOSED TREATMENT OF LEVELS AND PLANTING SCHEME AT BASE OF THE CAMPANILE



JANE SATHER TOWER, SO-CALLED CAMPANILE

This tower is 303 feet high, 34 feet square at base, 30 feet 6 inches at the top. The lantern is 610 feet above sea level. The tower is set on a grillage of steel beams encased in concrete 8 feet thick 18 feet below ground. The tower, therefore, is like a lily on a heavy bulb, and is thereby insured to some extent against possible effects of earthquakes. The steel-frame structure is faced with granite. Chimes in the tower play at hours and quarters.

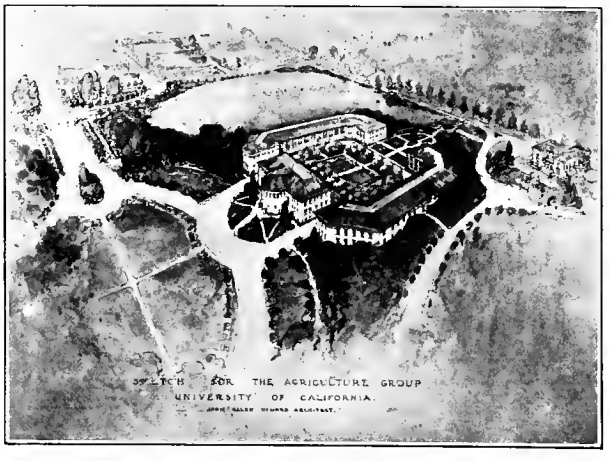
Apropos of the discussion which has been started by the erection of this powerful building chiefly as an ornament, the following authentic story of King Frederick Wilhelm of Prussia (1713-40) is of interest. This King, father of Frederick the Great, was a most economical and spartan ruler, abhorring the pompous inclinations of the European despots of that time. This saver of pennies wrote to his architect (in a state document November 10, 1730), "To your request regarding the tower of the Petri Church, I reply that this tower shall be built so high and possibly even higher than the Cathedral steeple of Strasburg and I will pay for the cost thus increased." The steeple of Strasburg was then the highest tower in existence. This spartan King built a number of other churches on a quite new style—simple round meeting halls without having towers, but he seems to have felt that a shaft if inserted at one appropriate place would have great inspirational value.

THE NEW CLASSROOM BUILDING—BENJAMIN IDE WHEELER HALL

The so-called library annex (south of the library), under construction and built around an auditorium to seat 1000 people.

to realize the tremendous size and ambition of the great architectural plan of the University, it is interesting to compare it with the views which were held by the great Olmsted on the same subject. This is what he said in his report of 1866: "I should contemplate the erection of no buildings for college purposes, whether large or small, except as detached structures, each designed by itself, and as would be found most convenient for the purpose to which it was devoted. In other words, I would propose to adopt a picturesque, rather than a formal and perfectly symmetrical arrangement, for the two reasons that the former would better harmonize artistically with the general character desired for the neighborhood, and that it would allow any enlargement or modification of the general plan of building adopted for the College, which may in the future be found desirable."

This statement of the elder Olmsted is interesting not only for what it says, but becomes of increased weight from the fact that he made it, though in his wildest dreams he did not think of an institution that would ever be as large as this great institution has become today. In other words, a formal and symmetrical arrangement of the College buildings which seemed to him "a cause of great inconvenience and perplexity" has become a much more difficult undertaking with the unheard of growth of the needs of the College. Considered in this light, one realizes the enormous task represented by the present formal arrangement based upon the results of the international competition of 1899 and modified by the architect of the University, Professor John Galen Howard; and in view of the arising difficulties one admires the successful progress of this great work. The enormous difficulty of the undertaking as foreseen by Olmsted justifies the precautions with which every step in the building of the Campus is taken. There are two serious doubts and dangers connected with this work both intimately connected with each other. One of them is expressed by the question: "Will not the development of the needs of the College break down the frame of the great formal scheme, however ambitious and big it may have been conceived.?" The other question: "In view of the menacing lack of space, is it possible, and also is it artistically desirable, to try the difficult experiment of basing the final formal effect upon grouping of detached buildings?" Some answer to this question may be found in the way that the size of the new buildings under construction and proposed has increased compared with the smaller units built or planned previously. If the plan for each individual building is made in such a way as to allow for an organic and individual extension of each building as soon as the need arises in the case of every individual building, then a large margin is left, and at the same time the entire plan will in the course of time bend to a final connected grouping, the latter being architecturally more promising because its effects have been tried out by generations of the greatest architects. The difficulty of artistically grouping detached buildings and of overcoming the undesirable gaps between them can in many cases be tempered by luxurious planting; but in order to do so, more space is needed than is available between some of the University structures. If planned for in advance it is comparatively easy to transform a scheme of individual buildings into a scheme of physically connecting buildings creating thereby considerable additions. While if the scheme is composed of small and independent



SKETCH FOR THE AGRICULTURAL GROUP

The building in the center is standing. Originally four smaller buildings were proposed around it. Later (see plan, revised January, 1914) it was proposed to group these four buildings behind the main building; the sketch reproduced here goes one step further, showing only two buildings; they will flank the main building and form a fine cohesive group, a unit in itself and an effective part of the larger scheme. In connection with this development compare the buildings proposed in the plan revised 1914 (eastern part). They are to form with their facades part of the necessarily somewhat rigid formal central axis and to give by the flexibility of their courts possibility for large extensions.

units like Boalt Hall or California Hall organic connections and extensions are hard to make. No architectural beauty in the world would be considered as a recompense for lack of space and crowding of students and professors.

A scheme of individual buildings among trees would be especially beautiful if plenty of space for intervening gardens was available. But this unfortunately is not the case. In spite of the fact that most of the finest architectural effects in the world are based upon the grouping of connected or seemingly connected buildings, I should prefer the present plans for the development of the University with detached buildings, provided, of course, it can be carried out without shortage of available ground for buildings. The idea of having the buildings all detached is more worthy of California where the climate makes every walk from one building to another a real delight. If this plan of grouping detached buildings is adhered to, regardless of the scarcity of ground, then all the connecting links which the eye requires between the different buildings have to be made by the landscape architect. His task will be at least as important and as difficult as the work of the architect and it therefore *must* be given into the hands of a man as competent and as great as the architect in charge of the buildings. It seems a serious matter to me that the lack of funds seems to have delayed this necessary cooperation (compare p. 126).

NEIGHBORHOOD OF UNIVERSITY.

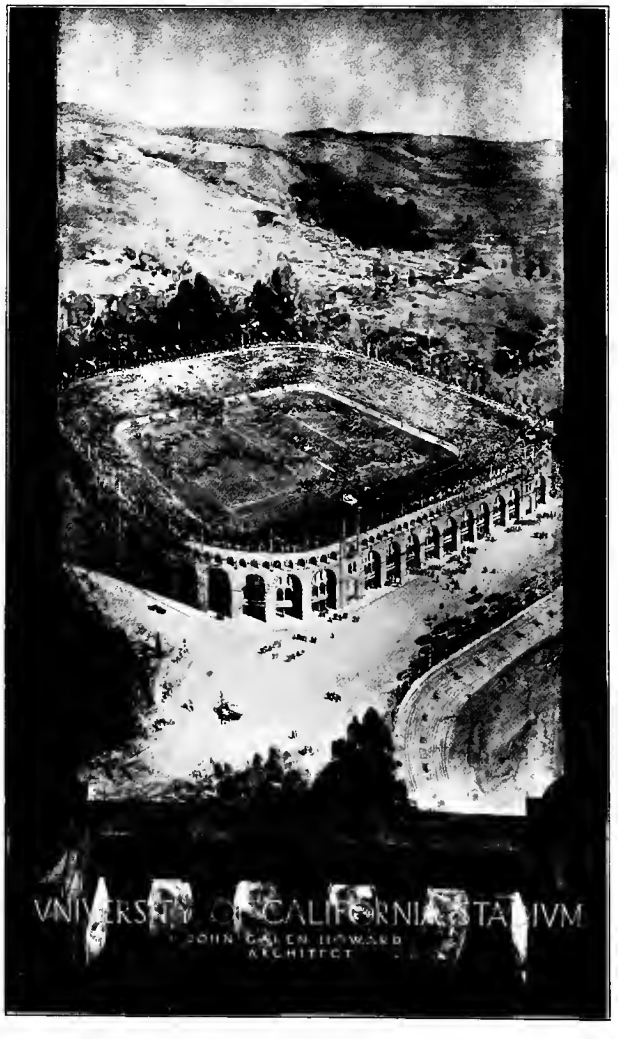
Also the streets on the three sides of the University grounds should be made more impressive avenues. This can be done to some extent by eliminating the sidewalk next to the Campus, planting uniform avenue trees within the University boundary line, and throwing the space formerly occupied by the sidewalk into a widened roadway and a much widened sidewalk area on the other side of the street, on which trees should also be planted; where street car tracks occupy these streets the city must also add to their width (pp. 97, 135). There should be no pedantism about sidewalks, where they are not required. A similar case presents itself in roads through parks as, for example, in Lakeside Park; there it is pedantic to carry a street of the paved city type with uniform sidewalks and curbs among lawn and trees as if they were houses. An independent foot walk following the street at some distance, as in Lakeside Park close to the water, would be more interesting.

It also will be necessary to reach some understanding about height, material, color and style of all buildings facing the college grounds; and even of those buildings which somehow are in view from the grounds, in order to form a dignified setting of the jewel in their midst. Since the college buildings are white, I would suggest the avoidance of white in the surrounding buildings for the sake of contrast and also modesty; private buildings in no way should compete with public ones.

Another important matter is the proper connection of the Campus with Shattuck Avenue. Since the axis of University Avenue, as originally proposed by the winner of the first prize in the international competition had, in view of the contours of the college ground, to be changed to a line pointing exactly into the Golden Gate, a slight change of the course of Addison Street at least between Oxford and Shattuck, as shown on plan p. 152, is desirable. This matter has been touched upon in a previous chapter (p. 97). If the citizens of Berkeley really appreciate the great privilege of having the University, they will not let values increase to a prohibitive point before reaching some agreement equally satisfactory to Town and Gown thereby doing their small share for the greater glory of the State Institution. This matter should be studied, as mentioned in another chapter, in connection with the organization of "Shattuck Square" and the "Civic Center."

CLOSING REMARKS

A great number of various phases of city-plan-



SKETCH FOR THE STADIUM SEEN FROM CAMPANILE
A reinforced concrete structure to seat 40,000 people.

ning have been more or less slightly touched upon in this Report, many of which are of vital importance to the East Bay cities. The writer hopes that his Report will convince a sufficiently large body of East Bay citizens that these matters cannot further be let drift along without serious damage to the East Bay property. I think every careful observer will agree with me that the City Councils, both of Oakland and Berkeley, should be advised to adopt an ordinance providing for the appointment of a City-Planning Commission at once. The various City-Planning Commissions of the individual East Bay cities must often sit in common; their permanent secretaries must be posted about every move intended by the sister committee. Special arrangements are necessary to make hearty co-operation in all matters of mutual interest between the East Bay cities easy and even obligatory. These commissions must be composed of active and progressive men ready to give continuous thought to these matters, but these commissions also must have sufficient funds at their disposal not only to employ permanent secretaries but also outside expert advice on important issues in the solution of each of their particular problems. The creation of better maps, showing contours, streets, buildings, population and the like will be one of the first requirements. In gathering information about the progress of other cities the commendable work of the Oakland Municipal Reference Library and its start toward a fine collection of municipal literature will be of great help.

Gradually general lines of city-planning procedure must be agreed upon and a city-plan, very flexible in detail but firm in all matters of principle, must be worked out and safeguarded and made efficient by legislative acts, ordinances, funds and daily practice. It is for the preliminary work of these city-planning committees that this report (completed 1914) may prove of value as a starting point for discussion.

ACKNOWLEDGMENTS.

No funds have been available to obtain perspective drawings that might give an inspiring idea of how some of the things suggested by this report would look if carried out. Drawings of this kind are valuable in order to visualize the ends to be aimed at and I am greatly indebted to the architects, Messrs. Louis C. Mullgardt, Lewis T. Hobart, and Charles H. Cheney who, by very kindly volunteering their co-operation, made possible the production of at least a few sketches. I believe an inspiring set of birdseye views showing the proposed park system, grouping of public buildings and various features of transportation, streets and street junctions should be secured at an early date.

In closing this report I beg to express my very sincere appreciation and gratitude for the unceasing patience, with which I have been supported in the course of my investigations by so many East Bay citizens. Besides the many persons mentioned in the body of the report I am greatly indebted to various city officials and the members of the various co-operating committees: the City-Planning Committee of the Oakland Chamber of Commerce and Commercial Club, composed as follows: W. H. Weilbye, chairman, W. H. Leimert, A. S. Lavenson, Joseph H. King, C. W. Dickey, C. H. Cheney, Executive Secretary; the City Club of Berkeley, T. H. Reed, President, F. T. Robson, Vice-President, J. R. Douglas, Secretary; and, during the publication of the report in 1915, the Civic Art Commission of the City of Berkeley, Duncan McDuffie, President, R. W. Osborn, Vice-President, B. J. Bither, B. D. M. Greene, J. W. Gregg, J. C. Merriam, A. T. Sutherland, J. J. Jessup, City Engineer, W. H. Ratcliff, Jr., City Architect, Chas. H. Cheney, Secretary and Consultant.

I am greatly indebted to the many who have kindly loaned photographs from their collections. These include a number of hitherto unpublished plans and drawings for the University of California secured through the courtesy of Mr. John Galen Howard, Professor of Architecture.

I have to thank especially the members of the Committee of Publication of the Oakland Chamber of Commerce and Commercial Club, Harmon Bell, Chairman, M. J. Laymance, H. C. Capwell, Duncan McDuffie, Prof. J. C. Merriam, W. H. Weilbye, Walter H. Leimert, Owen E. Hotle, Joseph E. Caine, H. A. Lafler, Secretary.

Had it not been for the most patient and kindest devotion of Mr. McDuffie and Mr. Lafler to the idea of a plan for the East Bay cities this Report could never have been brought to completion.

WERNER HEGEMANN,

Care of the People's Institute, 70 Fifth Avenue, New York.

THE END

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