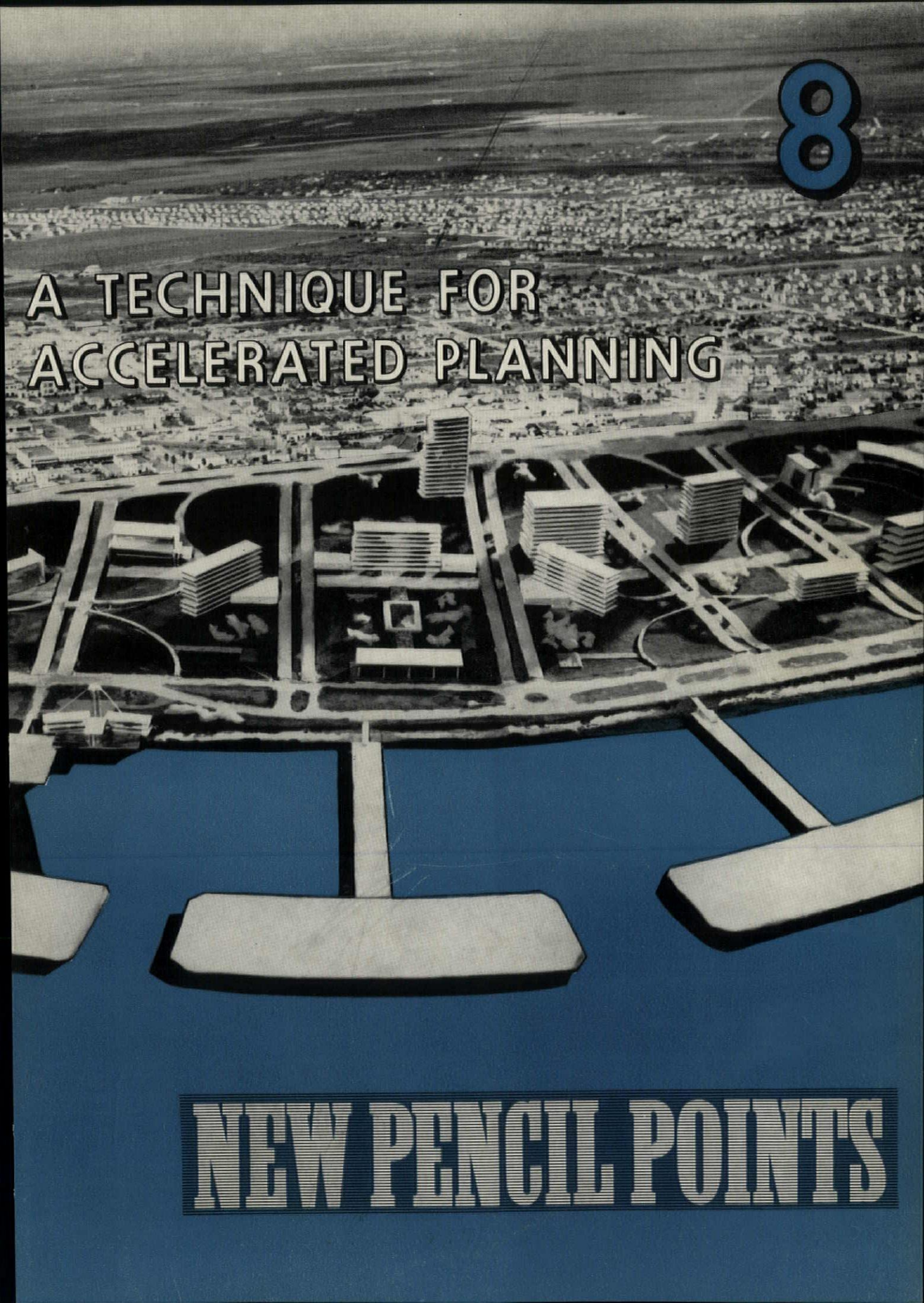


NEW PENCIL POINTS

Is His "Case of Sniffles" A Clew to Better Post-War Windows?

Anyone who has ever caught cold from sitting too near a drafty, heat-leaking window, will answer "yes!" The No. 1 requirement in post-war window design is *weather-tightness*—ability to reduce wind infiltration and heat loss.

Designing that kind of window isn't simple. It takes elaborate testing equipment, extensive laboratory facilities. It takes years of research and field experience.

Curtis has made this investment in time and research.

Consider, for example, the Curtis Silentite window. It represents the first basic window improvement in 300 years. It is a complete pre-assembled unit—factory-fit for extreme accuracy. It is made of wood—a non-conductor of heat and cold. It operates without weights or pulleys—and hence with no cuts in the jamb to allow heat leakage. Its efficient weatherstripping is built-in, an integral part of the unit.

But what about the window of tomorrow? We can say only this: Curtis research is still going on . . . still centered on making even further improvements in window weather-tightness.

Whatever tomorrow may bring, Curtis will continue a leader in better window design . . . with *weather-tightness* a primary Curtis advantage. Curtis Companies Service Bureau, Dept. PP8S, Clinton, Iowa.

Here is one of the famous Curtis Silentite window designs. It's an insulated, *pre-fit, pre-weatherstripped window . . . free of weights and pulleys, free of sticking or rattling. It's a typical Curtis achievement in designing windows that keep heat inside—and bar out cold.*

1865 CURTIS WOODWORK
SILENTITE
PRE-FIT
the "Insulated" window

TOMORROW'S WINDOWS WILL HAVE GREATER WEATHER-TIGHTNESS

A Technique for Accelerated Planning

The National Resources Planning Board, after a useful life of ten years (in one form or another), has now passed into history—killed by Act of Congress in June, 1943. During these years it was the only federal agency consistently carrying on comprehensive studies of our national resources and their conservation and development for the general welfare. Congress acted, apparently, with a feeling that planning at the federal level was somehow a threat to the democratic process and to local self-government. At least it has made no subsequent move to replace NRPB with any other adequate national planning agency. As a result, the all-important job of preparing for the economic shock that will come with peace, when it will be necessary to provide civilian employment for 25 million or more workers now in war industry or the armed forces, is being left hanging in mid-air as far as broad leadership by a national agency is concerned.

In calculating the length of the war, the military general staff cannot afford to count on fortuitous events that might shorten the time for final victory. It must coldly and objectively figure on the time necessary to prepare and apply the power of its men and machines in preponderant numbers, to keep these forces supplied, and to do the actual hard fighting until the enemy has been driven back and annihilated on its own soil. The predictions of the military men, therefore, tend to indicate a long war and we hear them talking of 1945, 1947, and even 1949 as marking the date of ultimate victory over Germany and Japan.

The post-war planners, however, must count on being ready for the application of their plans whenever the war ends and cannot safely assume that it will last for years and give them ample time. They must be prepared for the possibility that the Axis might crack sooner than anyone expects—and from their point of view must plan on a short war. Getting ready for the Peace is urgent—not to be postponed for a year or a month or even a day longer than necessary. The blindness of Congress to this urgency is hardly statesmanlike. It is the same sort of blindness which led it to turn down the proposal to fortify Guam as a naval base several years before the Japs struck.

In the light of Congressional apprehension, it is ironic that one of the last works to be completed by NRPB before its death—namely, the Progressive Urban Studies of Tacoma, Washington; Salt Lake City, Utah; and Corpus Christi, Texas—was conceived and executed in the most democratic spirit imaginable. The studies rested upon the principle that the cities should do their own planning for the future, organizing for the purpose the efforts of not only the civic officials but those of all the responsible groups and especially qualified individuals that go to make up a community. A technician, supplied in each case by the Urban Section of NRPB in response to invitation from the local officials, contributed technical and organizational guidance, information, and advice. He put at the disposal of the city easy access to the vast and valuable reservoir of data that lies in the files of various federal departments—the Census Bureau, Bureau of Labor Statistics, Department of Commerce, War Department, etc.—serving thus as an efficient link between the local planners and the central and regional federal offices whose program affected the cities.

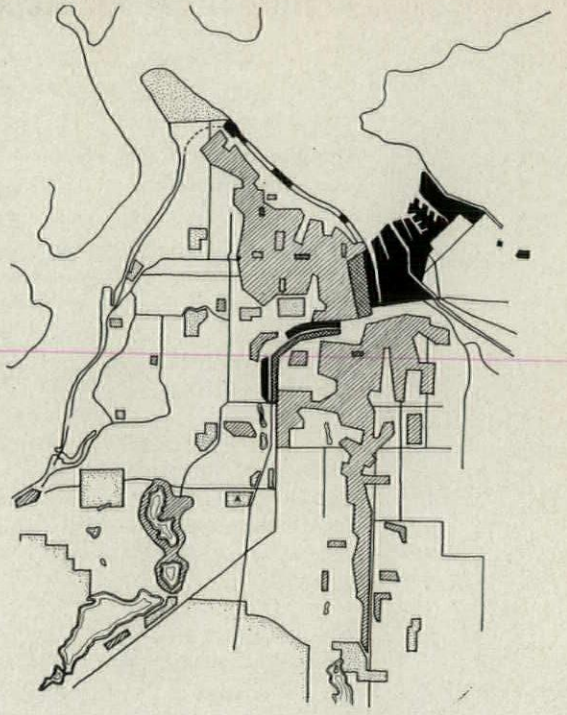
The people of each demonstration city, aided by the federal technician, organized and carried out the production of a "Sketch Plan" in which the main outlines of a comprehensive scheme for the community's future growth were set down as a guide for further action.

Through the process, a broadly diversified group of responsible people in each of these communities have come to know their city as never before, have learned that they can in large measure control its future development by continuing their planning studies, and have developed an enthusiastic understanding of planning that has seldom been attained elsewhere. Who is there to say that this is not the essence of democratic procedure? And who will deny that the citizens of these communities will be more intelligent voters as each proposal for future projected change comes before them?

—K. R.

These studies have provided a demonstration of tremendous importance to all American cities and towns that are awake to the urgent necessity of providing for their future development and economic health. More and more communities are becoming aware of this need every day. For their benefit, a Community Planning Manual based on the NRPB experience with these urban studies will shortly be published by the Public Administration Service under the sponsorship of the American Society of Planning Officials and other such organizations. The method and techniques developed by the studies and described in the Manual will enable the speeding up of the process of planning and promise to insure, where they are applied, the continuing active interest and participation of leading citizens and civic groups. This is an important item in effectuating any plans that may be developed.

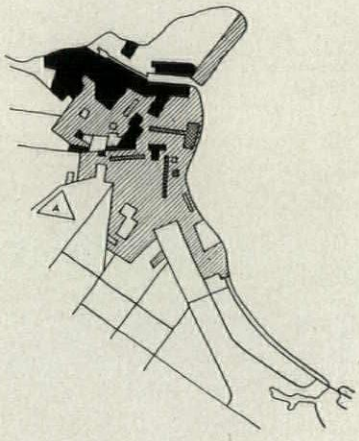
Genesis of the NRPB Demonstrations



In the summer of 1941, in anticipation of the need for preparing a substantial volume of public works projects to absorb an appropriate part of the unemployment that will come with the end of the war, the Public Work Reserve was set up. It was instructed to build up a national "shelf" of useful work programs which local and state agencies felt were needed in the public interest. Local officials of cities, towns, counties, and states were asked to recommend lists of projects of all types that would be needed in their areas for the six years following the war. Included were such items as roads, schools, parks and playgrounds, hospitals, airports, sewage disposal and water supply systems.

It soon became clear that in order to determine upon a sound program for any locality, more than just a list of projects was necessary. Since public money was to be required, there should be some way of determining the relative importance of the different proposals and the way they were related to proper and sound growth of the areas concerned. Few localities, however, had anything that could be called a comprehensive master plan and few had time, money, or facilities for preparing one. Furthermore, there just weren't enough trained planners to go around.

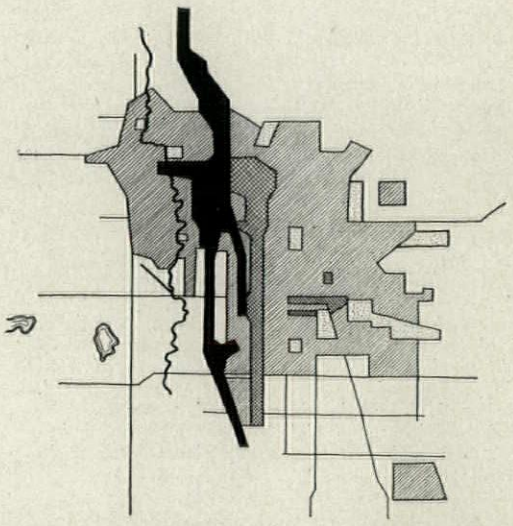
Faced with this difficulty, the planners of the Urban Section of NRPB set out to develop a method of overcoming it. Another reason for doing this was that they were inclined to believe that the rehabilitation of American cities after the war by both public and private enterprise working together will constitute a volume of economic activity far greater than any conceivable public works program. This made it all the more desirable that all cities should without delay develop comprehensive plans for their economic and physical growth.



It was decided to conduct an experiment to try out the possibility of speeding up the process of planning so as to sketch out at least the broad outlines of a sound general plan for a city within a period of a few months, rather than years. With such a start, the city would be in a position to carry on thereafter, filling in the details and continuing the studies to keep itself up-to-date and adjusted to changing factors.

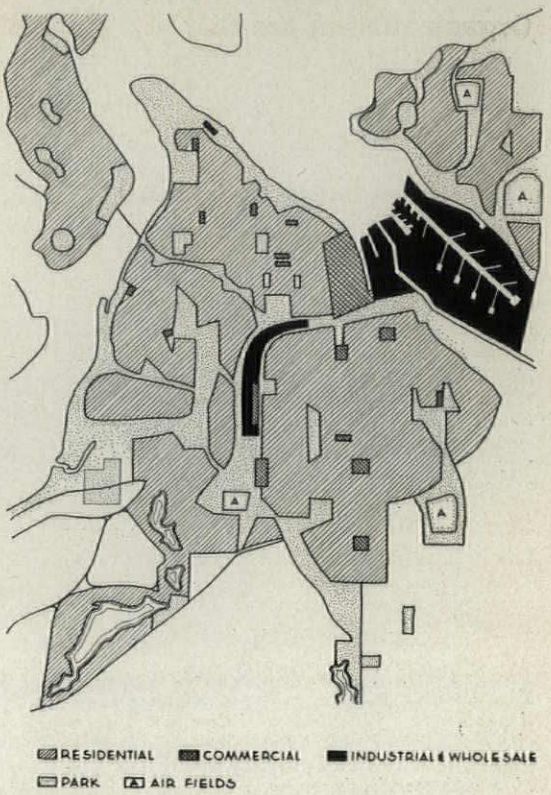
The NRPB and its urbanists, moreover, believed that the central questions for the postwar planning of the war-torn American community were: How are people going to make a living there after the war? How many of the war migrants can or should stay? Can war plants be converted? Only if the community faced these basic questions could it think intelligently about its future pattern. These questions call for the best thinking not only of "planners," but of industrialists, civic leaders—every group in the community.

Out of a number of cities considered, three were selected—Tacoma, Salt Lake City, and Corpus Christi. In each case, the city itself, through its Mayor, asked to be used as a guinea pig. NRPB Planning Technicians Arthur McVoy, John Hyde, and Sam Zisman were assigned, respectively, to each of the cities to demonstrate what could be accomplished in about six months. McVoy went to Tacoma in June, 1942, Zisman to Corpus Christi in September, 1942, and Hyde to Salt Lake City in October, 1942. The experiment was under way!



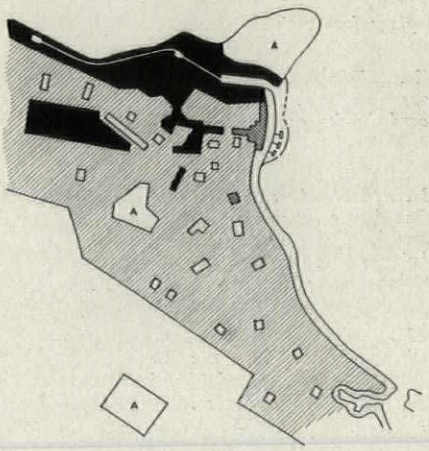
TACOMA, Washington—A growing city on southern end of Puget Sound. Population in 1940 listed as 109,400, representing 2.4 percent increase over 1930 census. The war has inspired a substantially higher rate of increase. An economically diversified and well-balanced community in which activity pattern departs only slightly from the average of all U. S. cities. Manufacturing, Wholesale and Retail Trade, Transportation and Communication, Professional, Personal Services, and Construction were the leading prewar sources of employment. Much undeveloped land within city limits and good opportunity to redevelop depressed areas because of low land prices.

Long range plan, as sketched, provides for development of new residential section for industrial workers northeast of industrial area and development of transportation facilities, both water and land. New airports are provided for in sufficient number to take care of foreseeable needs. Future depends on development of new industries to fill in place of declining lumber mills. Impregnated woods, plastics, plywood, shipbuilding, aluminum, magnesium, alcohol, textiles, etc. are mentioned as among the possibilities. Some thought has been given to combinations of agriculture and part-time industrial work as feasible by use of agricultural land just south of new industrial area.



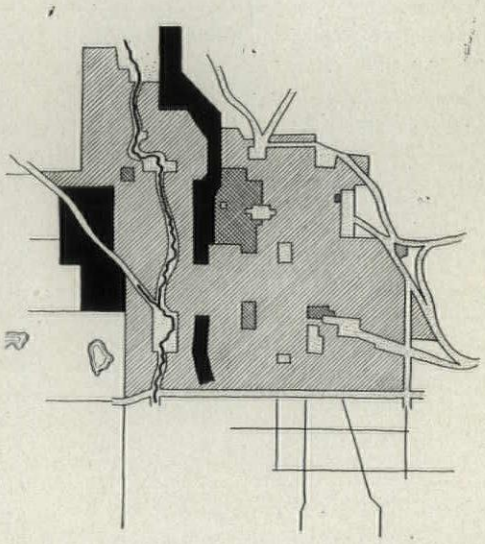
CORPUS CHRISTI, Nueces County, Texas—on the Gulf Costal Plain—bounded on the north by Nueces Bay, on the east by Corpus Christi Bay, on the south by a broad agricultural belt, on the west by oil and gas fields and large farms. Present population estimated at 100,000—calculated to grow to 125,000 by 1950. Economic activity diversified. Future growth indicated principally in manufacturing, retail and wholesale trade, oil production, agriculture, and development as a resort center—also as transportation center.

Sketch land-use plan provides for development of bayfront with housing, hotels and shops, civic center, and recreational areas. Great new airport on point to north will be quickly accessible to and from central district. Industrial area to expand westward up Nueces River. Expanded residential area will have adequate schools, parks, and playgrounds. Blighted districts to be rehabilitated. All proposals built on sound economic study, aimed at positive and practicable goals. The city now has an *intention*. It is up to the citizens to see that planning is continued and that the goals are reached.



SALT LAKE CITY, Utah. State Capital and regional center. Estimated population in 1943, 168,000 (1940 census: 150,000). Agriculture and mining originally chief economic activities, now being crowded for supremacy by industry, which is growing. City has relatively low population density, corresponding low land prices, and is in position to make physical changes economically. Future possibilities lie in increased manufactures, successful conversion of war industries, development of recreational facilities of region and continuation of agriculture and mining.

Proposals after six months' study for changes in land-use include reduction of central area zoned for commerce and industry with provision for future industry west of Jordan River, reduction of "strip development" of business and encouragement of compact new secondary commercial areas to serve growing residential districts, development of main traffic arteries and parkways on the present outskirts, a new civic center at east side of central business district, modification of residential zoning accompanied by rehabilitation and suppression of blighting influences.



Organization of the City

From Corpus Christi Newspapers

Nov. 1, 1942 . . . . . PUBLIC SCHOOL SYSTEM COMPLETES FIRST STAGE OF PROPOSED RECONSTRUCTION OF CORPUS CHRISTI.

Nov. 15, 1942 . . CITIZENS' FORECASTS VARY. FUTURE SIZE OF CORPUS CHRISTI TO DEPEND ON GROWTH OF INDUSTRY.

. . . . . Information from those who live and earn their living in this city—some of them as employers of many whose welfare is bound up with the future of the city—is therefore of interest . . . . .

The population guesses, however, have this value: They lead to inquiry into the reasons for the estimates, and the reasons reveal what the native sons plan and hope for their city . . . . .

Dec. 7, 1942 . . . . . A. C. Walker, director of the local Planning Board, recently met with the executive committee of the Council of Community Agencies and arranged for the Council to assist in those fields of service which it has been serving as a planning and coordinating agency. Corpus Christi is one of six cities selected by the National Resources Planning Board with which to work out plans for postwar developments. The national agency provides consultants and authorities in various fields to gather data but will assume no direct responsibility for carrying plans into action.

Dec. 15, 1942 . . . The Real Estate Board also voted its close cooperation with the National Resources Planning Board in its postwar plan for Corpus Christi.

Feb. 2, 1943 . . . . Members of the Corpus Christi Real Estate Board at a luncheon meeting yesterday voted unanimously to cooperate with the City Planning Commission and property owners on plans for development along Shoreline Boulevard . . . . .

Mar. 20, 1943 . . . . . Tentative postwar plans for Corpus Christi were adopted last night at a meeting sponsored by the City Zoning and Planning Commission in the Marine Room of the Nueces Hotel.

Attending the meeting were representatives of the City Council, the County Commissioners' Court, representatives of the School Board, directors of the Chamber of Commerce, and other civic leaders.

Mar. 24, 1943 . . . . . POSTWAR PLANNING WORK HERE PRAISED BY HOUSING OFFICIAL . . . . . Hugh R. Pomeroy, director of the National Association of Housing Officials, praised the post-war planning work being done in Corpus Christi. . . . . He cited Corpus Christi as an example of "common sense planning" that has been brought about by the City Zoning and Planning Commission and other planning and housing officials here. "The planning being done here is one of the most significant happenings in the field today," he said . . . . .

The problem of organization of the demonstration cities was three-fold. First, it was necessary for the planning technician to win the support of the community and to make it clear that many people had a part to play in the undertaking. Since the demonstrations were undertaken at the official invitation of the city, it was possible to get many representative groups together to hear the program explained and the necessary steps outlined. Discussions with these groups helped to make clear what part of the work each group could undertake and how its work would be tied in with that of other groups.

The second step in organization required the establishment of leadership for each of the main sections of the study and the clear coordination of the whole under the Planning Commission, special Mayor's Committee, or whatever group might be designated the responsible head of the program. It was necessary in this early stage to set up various committees to enlist the active participation of a number of key individuals whose special knowledge and informed judgment would contribute a great deal to the project and save valuable time.

The third requirement for organization was to arrange with a number of state and federal agencies for the special information and technical aid bearing upon community problems which they could provide.

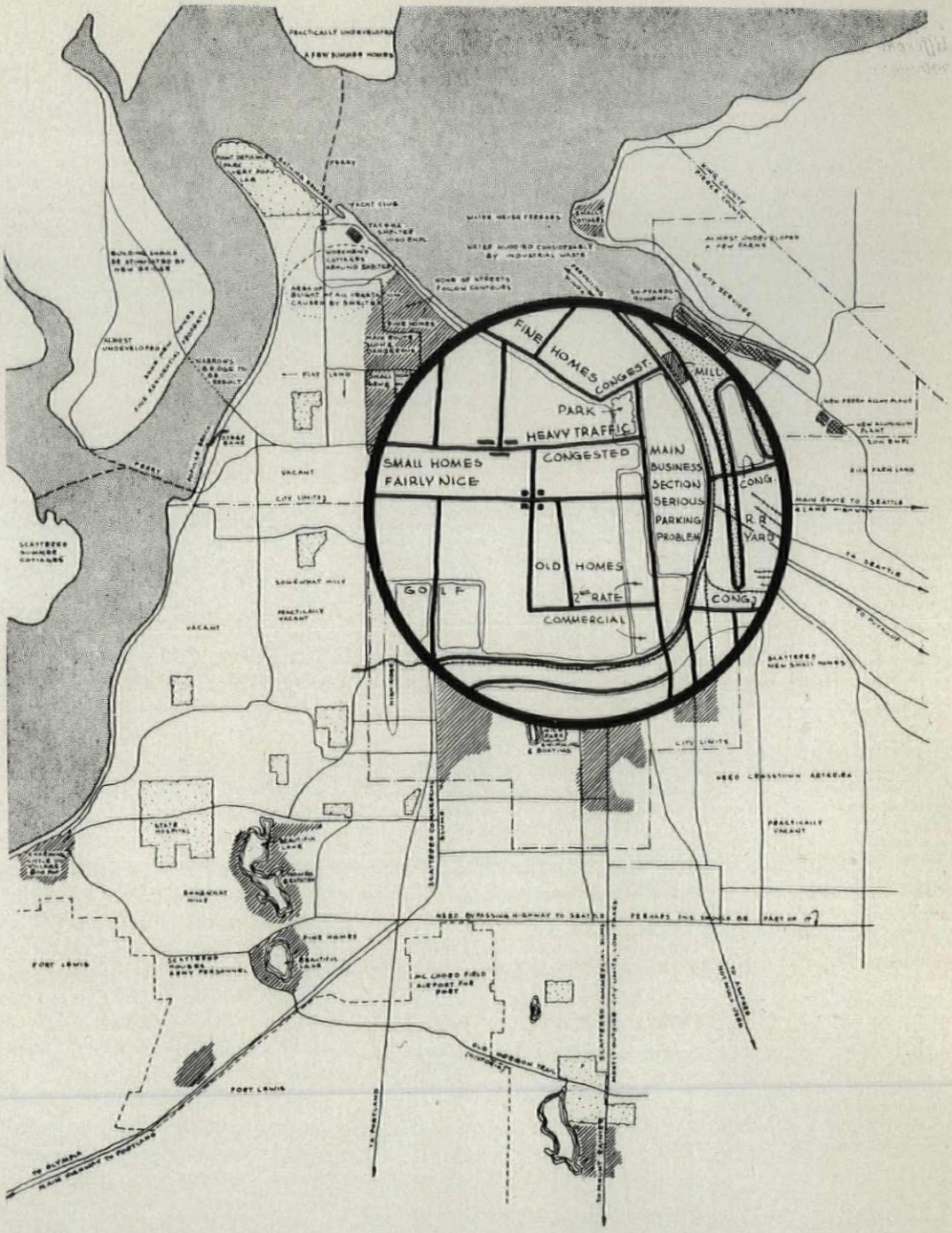
In the case of Corpus Christi, for example, the Planning Commission was designated as the responsible group to head the program. Its planning engineer acted as Director and Coordinator. The Mayor and Council, the Planning Committee of the Chamber of Commerce, and the local newspaper had been in favor of the project from the beginning, so they were naturally involved in its development. The Mayor sent a letter to all municipal departments, requesting that all available help be given to the program through the local director. Shortly after that, a number of local agencies and independent boards—such as the School Board, Housing Authority, Library Board, Recreation Council, Real Estate Board, Council of Community Agencies—voted to cooperate by contributing studies of their own programs and providing staff assistants to work with other groups.

Leadership for the economic study of Corpus Christi was provided by the Industrial Committee of the Chamber of Commerce. The Council of Community Agencies undertook to develop the plans for community services. The Planning Commission and the City Engineering Department became responsible for the physical plan. Each of these leading groups set up sub-committees to cover subjects such as Employment Planning and Training, Health, Transportation, etc. Parent committees and sub-committees included both officials and lay citizens.

The whole pattern of organization spread from the central Planning Commission through the committees to individuals who were called upon to assist; their studies flowed back from the individuals and working groups through various committees to the Planning Commission. One local architect who volunteered his services at the beginning was later engaged to work for the planning staff and to carry out studies for the Housing Authority. So successful was the organization work in Corpus Christi that by the end of the six months' demonstration, over 30 agencies and more than 600 individuals were earnestly planning the future of their own city.

Some of the participating agencies were state and federal. The state educational institutions helped effectively; the University on studies of population, the A & M College on Bayfront development, and the nearby College of Arts and Industry on economic studies for the development of natural gas and agricultural resources. The State Park Board and State Highway Department joined with local and federal representatives to plan for recreation and highways. Regional representatives of the Civil Aeronautics Authority guided the airport planning and the National Housing Agency participated in the first studies for housing.

The whole demonstration formed a remarkable illustration of how successfully collaboration may be obtained—where the will exists—between private and public agencies; among local, state, and federal agencies; between experts and laymen. It is probably safe to say that never before had all these various elements of a city been organized to concentrate intensively on working out a general scheme for their community's future development. These people have found that by getting together in this way they can work toward a common solution for their municipal problems.



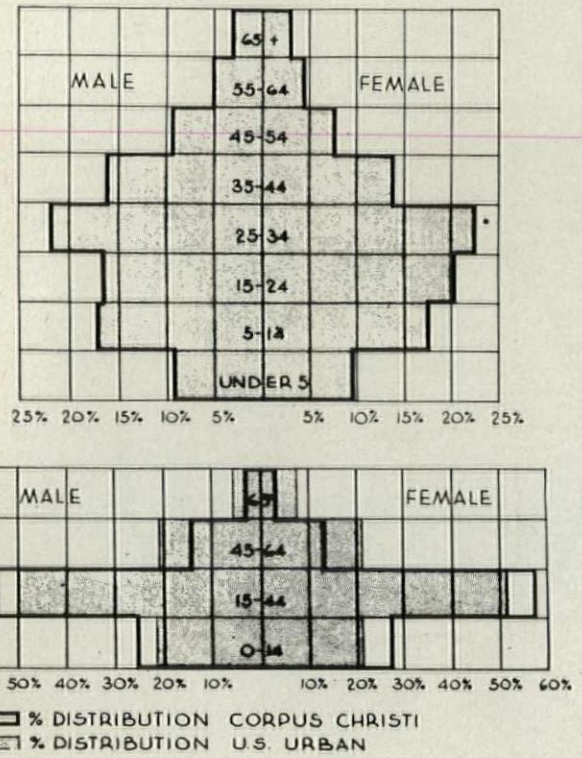
In each demonstration city, the program started with a quick reconnaissance survey by the planning technician to get a fresh view of the community, to identify key problems, to uncover available data, to take note of the agencies and individuals who might be drawn into the work and to mark out tentatively the area to be planned. The reconnaissance took approximately a week and was made by touring the area with officials of the city; by examining documents, maps, and aerial photographs; and by conferring with officials, business, and civic leaders. The information was brought together in a report and graphically interpreted in a rapidly prepared sketch map. The Tacoma map illustrated here was drafted in three hours!

This preliminary survey provided a quick appraisal, free from confusing detail. It served as a means of setting directions for the planning program, and provided a first rough guide to what was to be done, when, and by whom. In essense, it sums up the technique of a comprehensive attack basic to the whole demonstration procedure: in the language of an architect, "writing up the program, making a preliminary sketch, and progressively developing a design for the city in successive stages." At any stage, the skeletal sketch provides a clear, comprehensive scheme to which details and refinements are added as the work progresses.

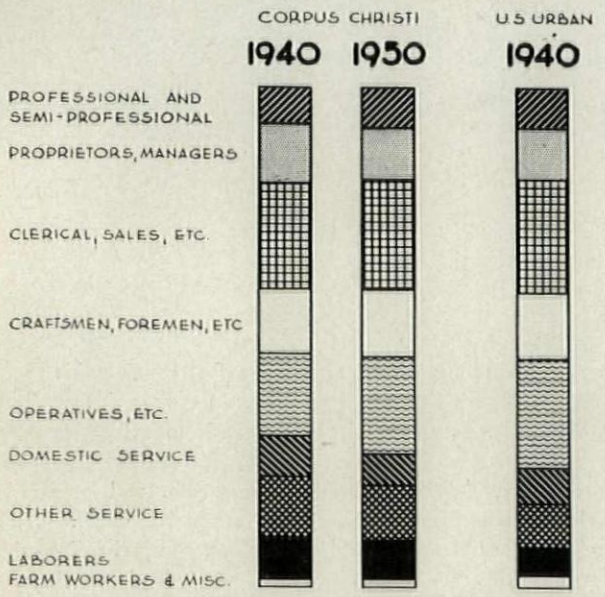
It is interesting to note that the reconnaissance sketch scheme set down after a week's survey was found to approximate, in its general outlines, the basic plan arrived at after six months study. Properly done, the reconnaissance will contain the broad essentials that will characterize the city's ultimate planned form.

The Study of the People

A typical age-sex pyramid. Such pyramids were prepared for different years to compare changes in age-sex composition of population.



Age-sex pyramid for 1940, comparing Corpus Christi with U. S. Urban. This shows graphically the greater proportion of young people as compared with the average condition for the United States. In Tacoma the picture was just the opposite. Similar studies were made comparing Corpus Christi with other cities in the Southwest and in the nation.



Another study of population characteristics showing the distribution of occupations in the labor force of Corpus Christi for 1940 as compared with the projected distribution for 1950 and the U. S. average for 1940. Throughout the procedure, such comparisons were frequently made with other cities. Much of this type of comparative data was prepared by the NRPB Washington office as one of its contributions to the local study.

"Cities are for people. The prime objective of planning is to create a safe, healthy, convenient, and enjoyable place for people to live, to have jobs, to raise families, to have privacy, to have community contacts. Planning starts with the people." (From the Community Planning Manual)

It is important that each community estimate its total future population, analyze the compositional characteristics of that population, and study its distribution. The age groups of males and females have important bearing on such problems as determining the size and composition of the labor force and planning for schools. The size of families, and the levels of individual income affect plans for housing. The land-use plan, one of the most important aspects of the planning process, must be based on a program for population distribution.

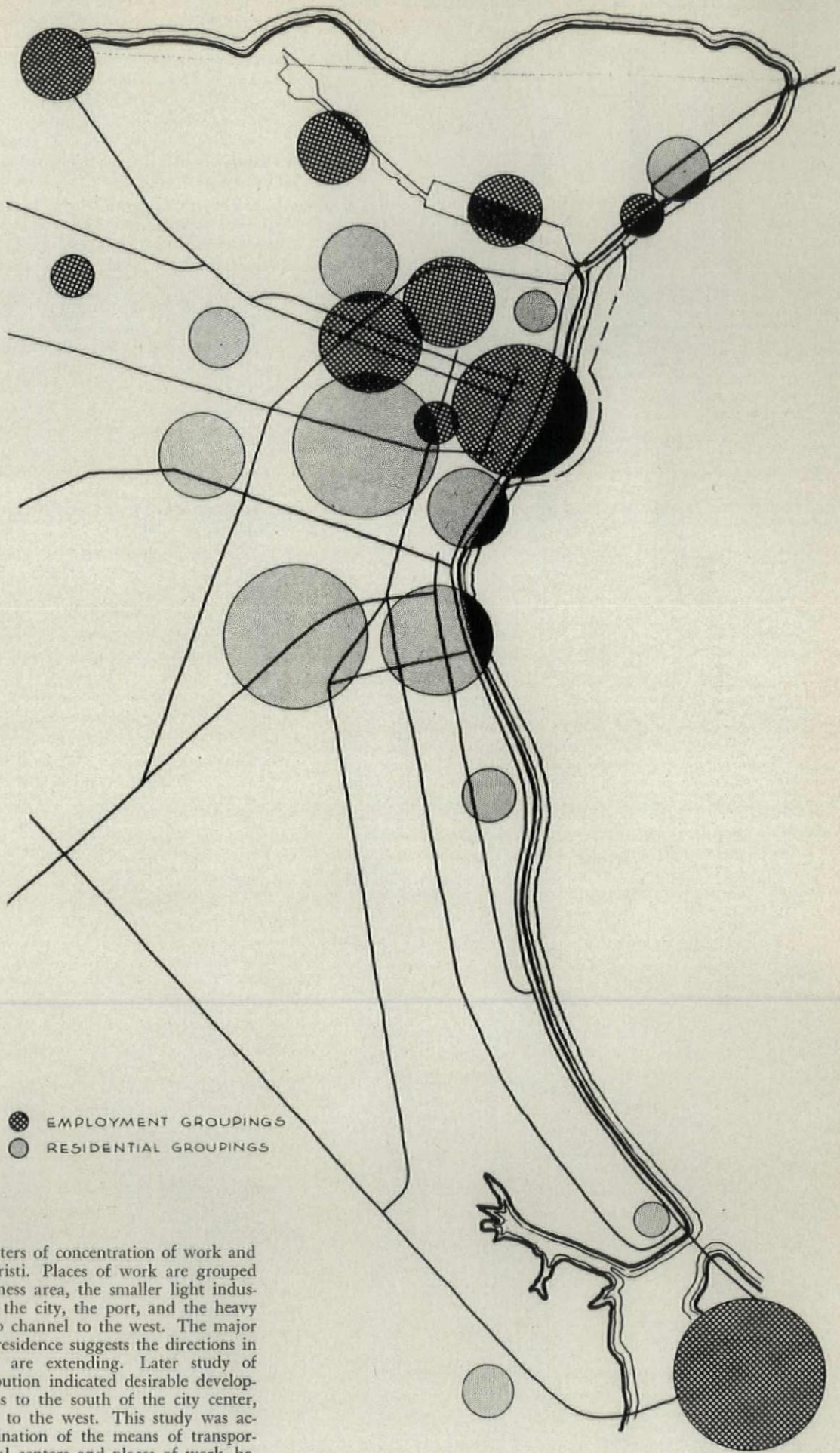
It is far more difficult to make estimates of future population for a city than it is for a large region or for a nation. The movement of war workers and future migration of these workers in and out of a city after the war will probably be the most significant factors in arriving at population estimates. Much will depend, in any one community, on region-wide and national developments and it is necessary that each community study its problems in relation to its region and the nation.

Here is where help from outside may be needed. In the demonstrations, such help was provided in the form of information from such national agencies as the War Man-power Commission, the Bureau of Labor Statistics, and the Rationing Boards. In some cities, individuals will be found who have made special studies of population growth and movements. A utility company may have such information. All that is available should be brought together, for there is danger in simply extending a population curve on the basis of past growth or of estimating natural increase simply by calculating gross birth and death rates. Estimates need to be made on the basis of prospects for future employment. Such questions as the conversion of war industries into peacetime production, utilization of local resources, and other industrial developments must be considered in formulating these estimates.

Population characteristics have to be taken into account in studying the future population and here, too, the demonstrations called for the aid of outside agencies.

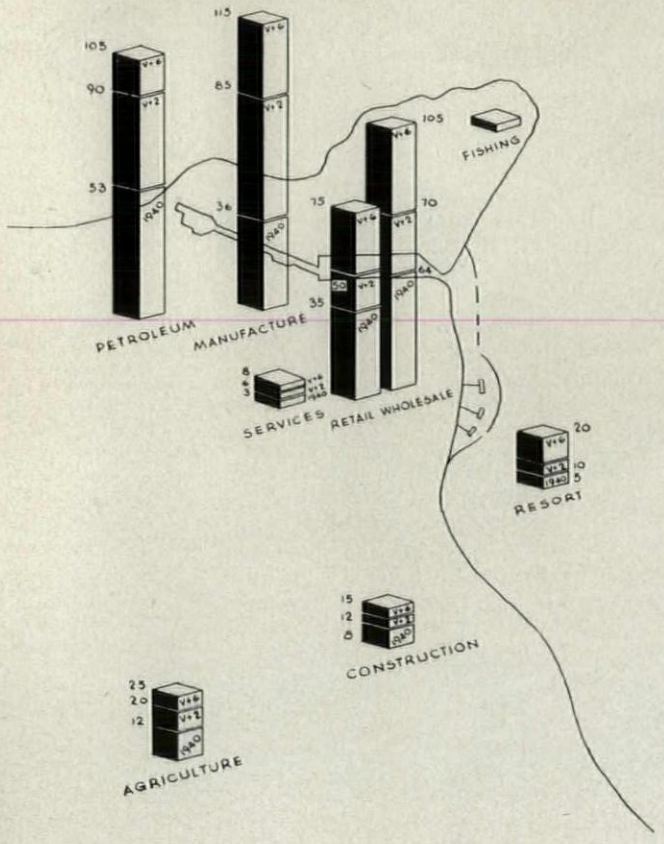
The study of distribution involves consideration of where people are during their daytime activities and where they are at night. The relation between home and work, between home and school, home and recreation areas, home and shopping, all have to be analyzed together with the means of movement between centers of concentration. From the outset, therefore, the study of people bears upon a number of other problems such as traffic, transportation, location of industry, of schools, of central shopping areas, and of recreation centers. From the beginning the threads of these problems must be found and carried throughout the entire procedure, all referring repeatedly back to the study of the people.

The study of population in the demonstration cities helped make clear that one of the important problems of local planning is to determine how much and what kind of study can be made locally and how much and what kind of study calls for the help of those who have special understanding of problems that not only affect the city but must be considered from the point of view of regional and national development. No city is self-sufficient. It can do much on its own and with its own, but it must recognize that it is inexorably linked to its region and nation.

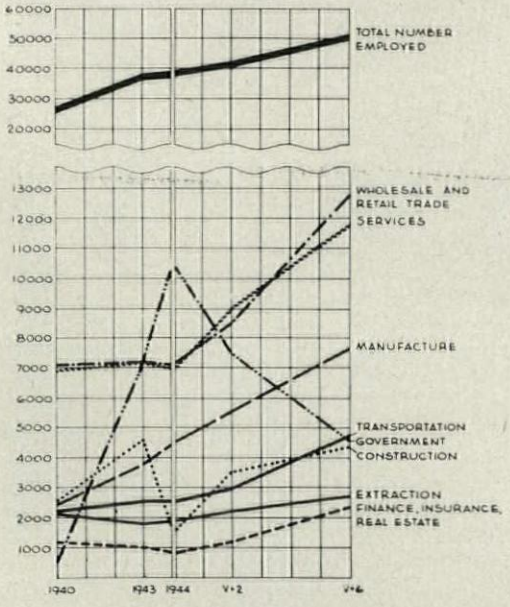


This map shows the centers of concentration of work and residence in Corpus Christi. Places of work are grouped around the central business area, the smaller light industries near the center of the city, the port, and the heavy industries along the ship channel to the west. The major concentration points of residence suggests the directions in which residential areas are extending. Later study of future population distribution indicated desirable development of residential areas to the south of the city center, along the Bayfront and to the west. This study was accompanied by an examination of the means of transportation between residential centers and places of work, between neighborhoods, and between residential centers and the recreational areas along the Bayfront and across the ship channel.

The Economic Base: Jobs for the People



On the basis of a study of its resources, existing industry, and new war industries, the Industrial Committee in Corpus Christi was able to set goals for industrial production and trade for period two and six years after the war. It was able to make an analysis of the labor force in terms of estimated population and the set employment goals for the activities that form the city's economy. For example, the curve showing the workers employed in construction indicates the estimated extent of recovery of this activity during postwar years. These figures were reached after analysis of the city's prospects viewed in relation to resources and its competitive position regionally and nationally. They will need to be revised from time to time.



The most critical challenge to our cities today is the question of providing employment in the immediate postwar period. Cities prepared for this situation will face less disruption and loss of population than those that are unready. There is much that they can do by planning now to aid postwar economic and industrial development they can, first of all, decide on a strategy for such development.

The community will also have to think through its strategy in terms of new weapons of technology, new products, new methods of fabrication, new means of transportation. It will have to keep itself informed of industrial, trade, and other economic changes so that it can revise its strategy to meet national as well as regional trends and fit its program to changing conditions.

A city can decide now what kind of industries it wants to retain and what kinds should be kept out. It can set goals for employment, taking account of the under-employment of minority groups, the continued employment of women, and the employment of youth leaving school and wanting jobs. It can set goals for future industrial production and for trade. It can develop its public works program and its program for services so they can be scheduled to balance private enterprise. It can plan facilities such as water supply to aid industry and other private undertakings.

Whatever strategy can be worked out at this point should be checked as the program develops. Problems that may arise may call for some modification of parts of the strategy. Alternatives will have to be considered. The strategy for meeting the immediate postwar period may have to be substantially different than that for the long range development of the community, which, however, should remain a constant factor.

Programs should result from collaboration between the city and its industrial and business leaders. For example, the housing program should be a total program, taking into account public and private projects. In Corpus Christi, such a program was developed by drawing up gross estimates for the total housing need several years after the war and indicating the parts to be built privately and publicly. By far the greater quantity was scheduled for private building.

Also in Corpus Christi, the program for recreational facilities indicated a vast opportunity and responsibility for both public and private enterprise. Studies of future resort trade showed that a reasonable goal would be twenty million dollars of annual business as compared with five million dollars estimated for 1940. It would be necessary to build up the plant for resort and recreational activities. The desirability of improving the hitherto undeveloped Bayfront was clear, and studies showed that there would need to be many public undertakings, including extension of the Bayfront protecting wall, construction of beach and boating facilities, a civic auditorium, and many provisions for outdoor recreation. For its part, private enterprise is expected to provide the hotels, restaurants, places of entertainment, and tourist accommodations for the full development of the Bayfront.

In addition to local collaboration in planning for economic development, cities need to measure their prospects in terms of competing cities—must relate their development to that of the region and of the nation. Study of the community's future must therefore include an examination of national and regional trends and an analysis of the prospects of the community in relation to the economic future of the country as a whole. At several points, planning in the community must tie in with regional, state, and national planning, both public and private, if it is to be fully realistic.

Economic Strategy for Corpus Christi, Texas

The Corpus Christi area has been one of unusually rapid growth. Its resources consist of a rich agricultural base, enormous gas and oil deposits, a favorable geographical position, trade and shipping advantages for a large region, a new and progressive population.

Beginning with its agricultural base, it has prospered through a series of successive booms; the building of its port, the introduction of large-scale chemical industry, the discovery of oil, and the establishment of a major naval air training station. Its war manufacturing activities are of the kind to continue practically uninterrupted into peacetime production.

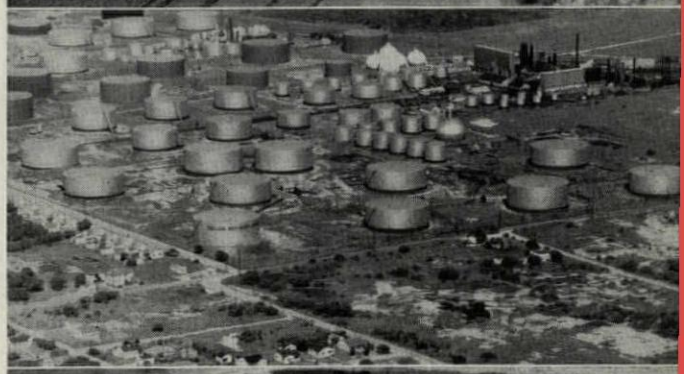
The pattern of its resources indicates that its economy should be highly diversified. Its present diverse activities include transportation (the port), manufacturing (chemicals, oil refining), distribution (both wholesale and retail trade), extraction (cotton, vegetables, cattle, oil and gas, fishing), resort (climate, hunting, fishing, boating, bathing), defense (naval air base) construction (growing urban area).

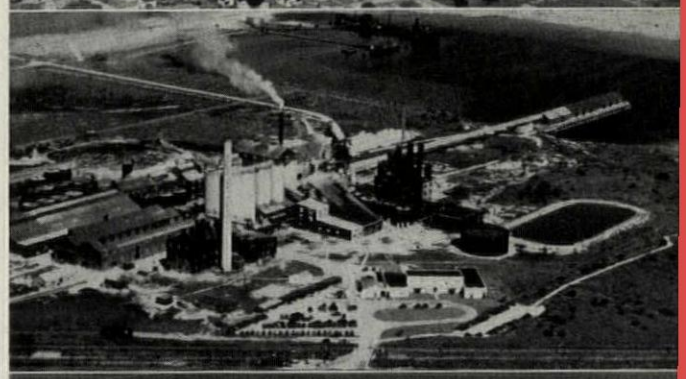
The character of the resources suggest not only diversification of activities but diversification within them. For example, manufacturing can be broadened from existing large-scale industry to smaller scale fabrication involving the finishing of consumer products, and including crafts. For this latter, use can be made of the skills of the local Latin-American population.

The prospects also indicate expansion of activities. Agricultural production needs to be projected into industrial processes; cotton and other fibers into textiles, cattle into meat packing, vegetables into dehydration and other food processing, increase of castor bean and similar plant production for plastics. Transportation can expand with the completion of the Intra-Coastal Canal, the development of air-transport, and the coordination of terminal facilities. Manufacturing can expand with the use of natural gas both as a cheap fuel and as raw material; it can be linked to the possibilities of light metals fabrication in the Texas Coastal area. Construction must increase materially to meet the shortages of housing, tourist accommodations, utilities, and public works.

The strategy of this city was therefore worked out in the direction of broad diversification and expansion. The points of attack were established. For example, the opening front in the development of the resort trade is at the new and as yet undeveloped Bayfront and extends to the regional opportunities of Padre and Mustang Islands nearby on the Gulf of Mexico, the hunting and fishing grounds adjacent to the north, and the state parks inland. The strategy is rounded out in the prospects of possible growth of trade with Central and South America.

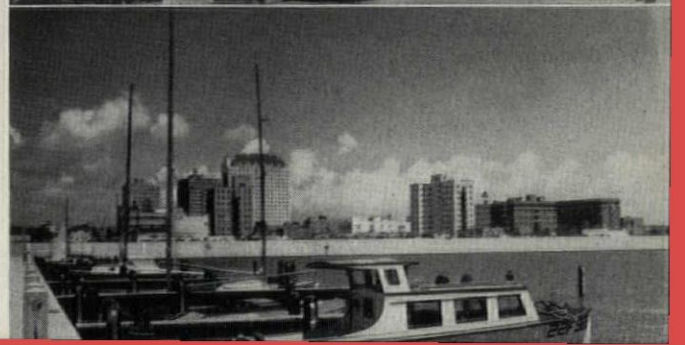
This is the strategy of a fast growing city which is expected to retain its wartime growth and to continue its prewar development in line with the regional trend. Other communities will have to work out different strategies according to their own local and regional objectives, resources, and activities.





Ayres

Brown

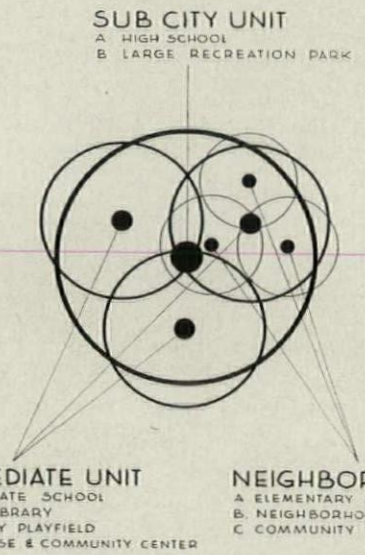


More and more, every American community will be called upon to provide expanding services in Health, Education, Welfare and Recreation. Greater responsibility will be thrown upon the community not only to build up physical facilities, but to maintain adequate staffs and wider-ranging programs. Education, for example, will be extended to include adult programs as well as pre-school and nursery training. More will be called for in the way of clinics, health centers, hospitals, and medical care. Welfare problems related to social security will become the subject of many more local as well as national discussions. Public safety systems must be improved and greater coordination brought about between city, state, and federal police work. Public provision for the good use of leisure time will extend beyond park and playground facilities, and will call for public training in arts and crafts and other cultural subjects.

All of these expanded programs call for more, not less, planning. They call for the planning of city-wide development, with balance among the various services so that public funds will produce the greatest good for the greatest number. In most cities many separate programs for services are divided and sub-divided among separate boards and commissions, which often makes for duplication and waste. Part of the planning job must be to give attention to administrative changes so as to "streamline" public activity and coordinate public and private services.

A very great problem for planners is the creation of neighborhood units and the reconstitution of neighborhood life. A major part of the job lies in the redevelopment of depressed areas, which are characteristic of our American cities, large and small. Planning for redevelopment calls for bold thinking on the part of the community, with drastic changes in legislation and finance to enable effective action. No community can afford to wait for these problems to be solved in New York or Chicago or Washington. Each community must make its own study and carry its own conclusions to state capitols and congressional committees. State and federal government will have sounder ground for action if the communities themselves set before them their needs, expressed in well-thought-out plans.

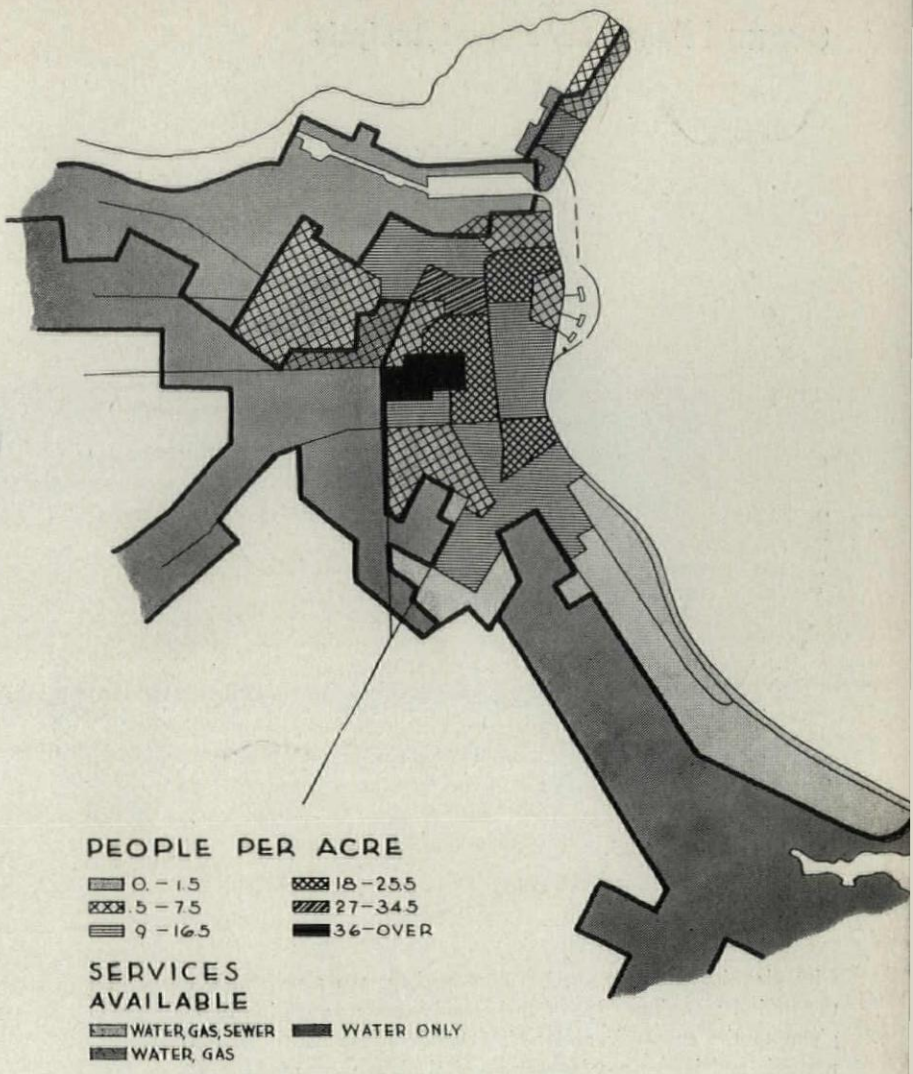
The utilities and other physical arrangements needed as parts of the service program must be based on the objectives that the community sets for itself in creating designs for a good place to live. In this part of the demonstration planning procedure there is again encountered the recurrent problem of relating the needs of the people, and the programs for their fulfillment, with the physical arrangements of the ground plans. It was observed that well-rounded programs for community services, carefully worked out before physical planning begins, will provide a basis for their most efficient and economical satisfaction in buildings and equipment. Several activities may be housed in one building or group of buildings if related programs are properly brought together in the first place. This saves public money.



This chart, with its accompanying diagram above, was developed during the Tacoma studies to show the relationship of community services and general community organization. This proved useful in making clear to local people the ways in which their city could be improved and furnished with well-balanced services. In arriving at standards for sizes of service areas, the technician consulted the Housing Authority, Library Board, School Board, Metropolitan Park Board, Council of Churches, Safeway Chain Store, the local theater chain, some real estate people, and local architects.

UNIT	SCHOOLS	RECREATION
PLANNING UNIT **For Urban type neighborhood units, the population will range from 3,000 to 5,000.** **– 143 acres to 430 acres –** **The density will range from six housing units per gross acre for the completion of partially built up neighborhoods, to 3.0 units per gross acre for new suburban units.**	**ELEMENTARY SCHOOL** Minimum — 250 pupils Maximum — 700 pupils Desirable — 500 pupils Should have at least 5 acres without playground; 10 acres with playground. One elementary school in a sub-city area may be combined with a High School. Maximum walking distance — ½ mile on level ground.	**PRE-SCHOOL PLAY LOTS** 1 acre per 1,000 persons. 2 to 4 acres — total. **Neighborhood Playground** 1 acre per 1,000 persons. Minimum — 4 acres Maximum — 7 acres May be adjacent to school. Playground should have community character and be equipped for general community recreation.
INTERMEDIATE UNIT **2 to 4 neighborhood units.** **Population range from 10,000 to 16,000 persons.** **Area range from 800 to 1,600 acres.**	**INTERMEDIATE SCHOOL** 1 per intermediate unit. Minimum — 500 pupils Maximum — 1200 pupils Desirable — 800 pupils 15 acres including playfield. Maximum walking distance 1¼ miles. One of these intermediate schools might be combined with a High School.	**PLAYFIELD** 10 to 20 acres. 1 acre per 800 persons preferable. The playfield may be combined with intermediate school if adequately planned for use by school and community alike. If intermediate school gymnasium and auditorium are overburdened, provide supplementary recreation and community buildinn.
SUB-CITY UNIT **2 to 4 intermediate units.** **Total population ranging from 18,000 to 36,000.** **Where possible, super-highways for through-traffic should by-pass or separate sub-city units.**	**HIGH SCHOOL** Minimum — 500 pupils Maximum — 2700 pupils Desirable — 1100 pupils Maximum distance without bus service — 2 miles. 15 acres, including sports-park	**LARGE RECREATION PARK** 1 Park for 40,000 persons, maximum. Maximum size — 100 acres. Would be desirable adjacent to High School, giving High School a campus character. If High School recreation facilities are fully used by students, supplementary field house and community center with standard sized combination gymnasium should be provided.
ALL-CITY & METROPOLITAN AREA	**1 TECHNICAL HIGH SCHOOL** Centrally located in relation to the other High Schools in order to combine and coordinate curricula. One Vocational or Technical School per 400,000 people.	**THE RESERVATION** 500 acres or more. Defiance Park services this function adequately for Tacoma. However, another one should be provided North of the Dash Point area. Other facilities: 1 large downtown recreation center. 1 large recreation center in good relation to the Tide-Flats

A study of the areas served by utilities in conjunction with a study of population density and distribution will constitute a guide to the needed extension of new utilities. It will also help to determine proper development of undeveloped areas in relation to existing utilities. This is one of many ways in which planning may lead to intelligent economies in allocating the public funds.



CHURCHES	LIBRARIES	MUSEUMS	CIVIC CENTER ACTIVITIES	SHOPPING
SMALL CHURCHES 1 to 3 for a neighborhood unit. 200 to 500 seating capacity. Ample provision for off-street parking. 1 to 2 acres per church.	Small unit for local circulation preferably located adjacent to neighborhood shopping center. May be located in the Community Building or store building. Such circulating department would be serviced by the nearest branch library. Should have ample space for parking.	Local Community Center may have room for exchange exhibitions, etc.	**NEIGHBORHOOD CIVIC CENTER** One for each neighborhood community desirable, but may be one for two communities combined. May be part of community church and may contain library circulating room. Could be combined with school if properly arranged to insure community character.	1.9 Acres per 1,000 persons. Shopping center area would range from 3.8 to 7.6 acres. This is assuming one shopping center per neighborhood community. Shopping centers may be at four corners of the neighborhood if serving four neighborhoods.
COMMUNITY CHURCH GROUP One to an intermediate unit. Gymnasium and other recreational facilities might well be provided to supplement intermediate school facilities if a community building is not provided. Seating capacity of auditorium — 800 to 1,400. Ample parking space should be provided. Area — 2 to 4 acres.	**BRANCH LIBRARY** Most desirable location — adjacent to or within a large neighborhood shopping center. A library corresponding to the intermediate unit would mark the maximum for a branch library. Service area should be within a mile radius. Should provide at least one acre of land.		Where a neighborhood unit cannot afford a Community Center with club room, meeting rooms, etc., such facilities may be developed for three or four neighborhood units.	1.0 acres per 1,000 persons. Area of the shopping center would range from 10 acres to 16 acres, assuming ample space for off-street parking and an ample protective belt separating the shopping center from residential areas.
LARGE COMMUNITY CHURCH Provision might be made in this type of church for a variety of community functions to take the place of a large community building for the sub-city area, providing the church were a true Community Church. Seating capacity — 1,200 to 2,000. 3 to 6 acres.	**BRANCH LIBRARY** Corresponding to the High School or sub-city service area would mark the minimum requirement. Here again the library would be most effective adjacent to or within a large sub-city shopping center.	May combine Museum with Branch Library. Should be equipped for traveling exhibits.	**AUDITORIUM FOR LITTLE THEATRE ACTIVITIES, ETC.** May use High School auditorium or Intermediate School auditorium, but not very satisfactory if they are much used. May have small museum combined. Club rooms should be furnished. May combine community center and large field house.	.8 acres per 1,000 persons. Total area ranging from 15 acres to 30 acres.
DOWNTOWN CITY CHURCH A downtown church should be provided for the convenience of people working or shopping in the downtown commercial section. Its program should be oriented to their needs.	**DOWNTOWN CITY LIBRARY** This library should be located as near as possible to the heaviest pedestrian movement in the city. It should contain the administrative system. It should not be a monument but a functional building.	**CENTRAL MUSEUM** – With permanent collection – Ample room for large traveling exhibits. Close to downtown pedestrian movement preferred. Could be in easily accessible and much used large recreation park.	**AUDITORIUM** Large Downtown Auditorium. 10,000 capacity — for conventions and other large gatherings. Music hall and theater. One of these should be provided.	**CENTRAL SHOPPING CENTER** Ratio of total area in shopping center to population changes as the population changes.

Ground Plan: Functional Analysis

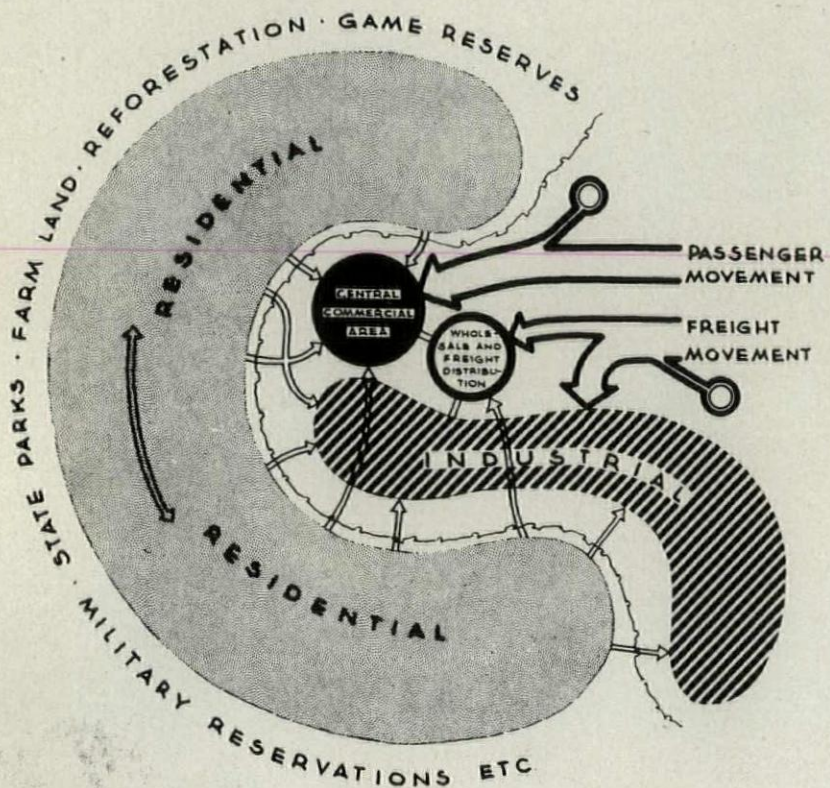


Diagram of the functional relationships among the several parts of the city of Tacoma. This indicates broadly the relative positions, sizes, and circulation connections of the areas devoted to industry, residence, central business, wholesale trade, and freight distribution—all in relation to passenger and freight movement. The area indicated for industry is larger in proportion than for most cities, which is accounted for by the relatively greater needs for railroad activities and shipping. This diagram, of course, is not a plan but an abstraction of the arrangements. It was found a convenient way to give preliminary direction to the actual plan, which was later worked out in relation to conditions of topography and existing features.

City planning, up to now, has been perhaps too much limited to physical planning. Too often has only cursory attention been given to the economic and social considerations which should underlie and influence whatever physical plans were made.

The procedure followed in the demonstration cities was designed to emphasize these economic and social foundations. Only after arriving at concepts of the size, character, and desirable distribution of the population, and setting goals for future employment and economic activities for the kind of community the people wanted, was the next step undertaken: i. e., to work out a physical arrangement to fit those economic and social needs.

The first thing to be established was a broad functional pattern, such as would be most desirable for the community, taking into account the kinds of activities and their interrelationship. To show this pattern graphically, several alternative diagrammatic sketches were made inter-relating the various functional parts of the city. An analysis of existing conditions was followed by an examination of the forces tending to bring about changes.

These studies were supplemented by an appraisal of what could be tentatively considered to be areas free or needing changes and areas considered to be fixed because they were already properly used in relation to the desirable pattern. By adjusting the existing pattern to the desirable pattern it was possible to work out a first draft of a physical plan, including a scheme of population density.

Once this first draft was complete, studies were made of certain areas in detail, to test the arrangements within these areas as they related to the comprehensive scheme. Designs for neighborhoods, for the central commercial areas, for industrial locations, for school and recreation areas, for transportation systems and terminals were typical.

On this and the next few pages are illustrated some of the types of studies made in all three of the demonstration cities.

A diagrammatic study of industrial locations for Corpus Christi. This shows the relationships of heavy industry to transportation and to terminal facilities as well as to homes and light (non-nuisance) industry. This diagram was based on the possibilities of development and was intended to serve as a guide in attacking the more precise physical study of future locations for new industry and feasible adjustments in neighborhood arrangements.

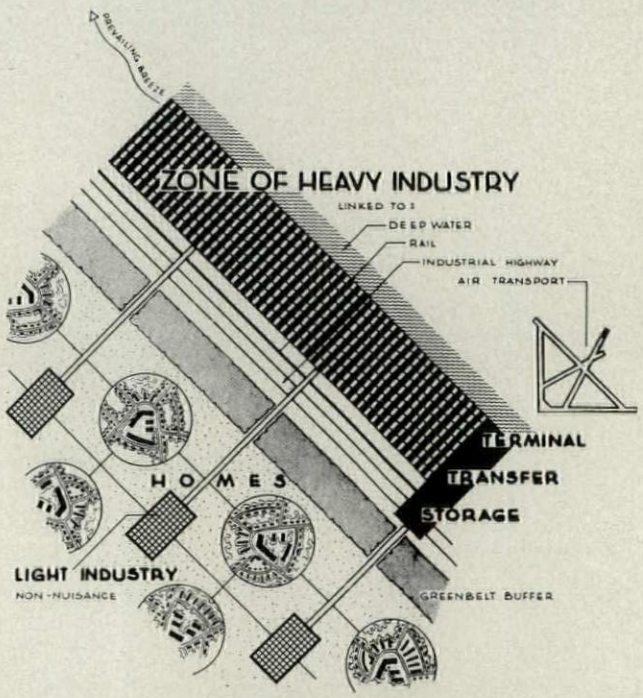
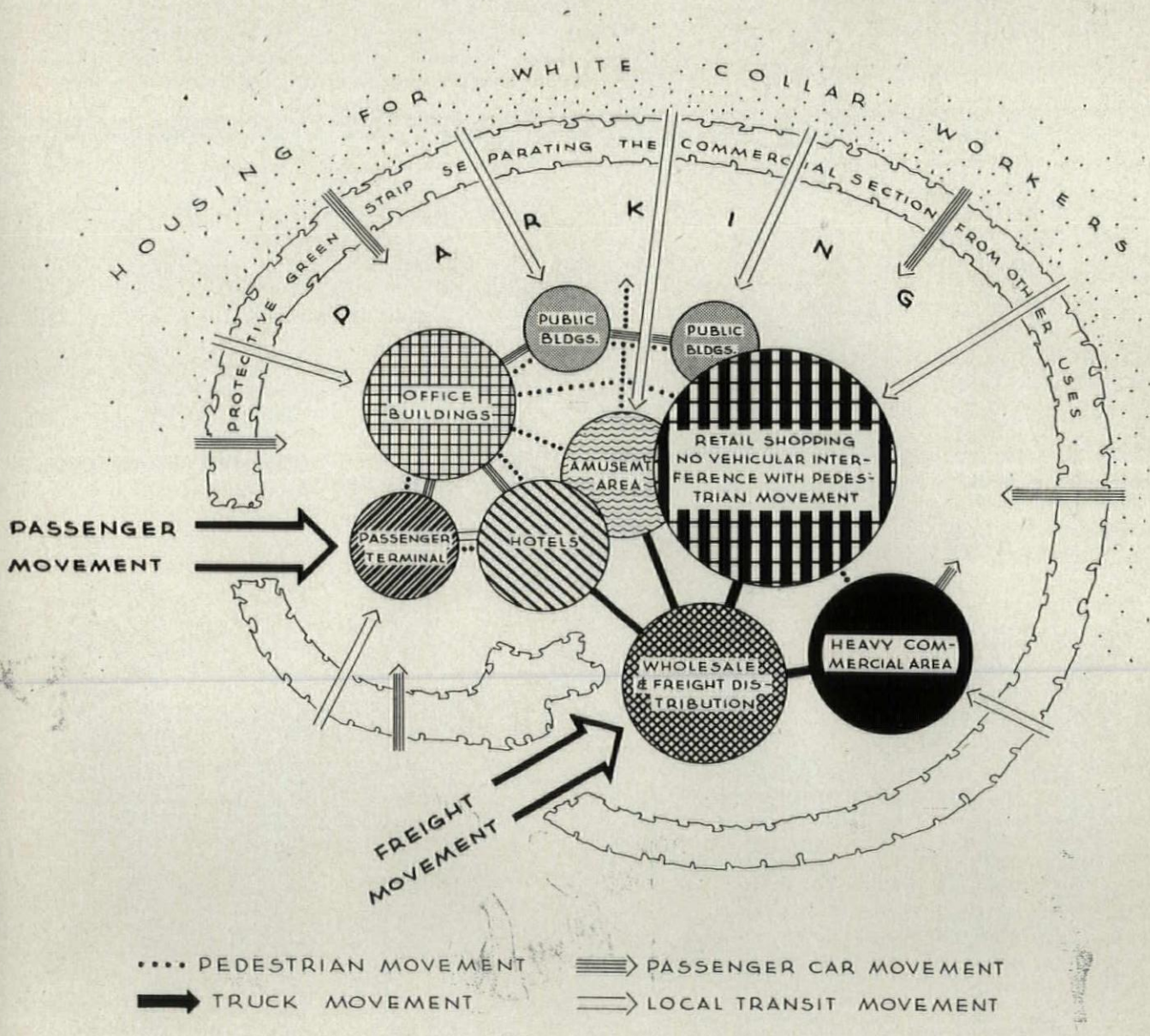
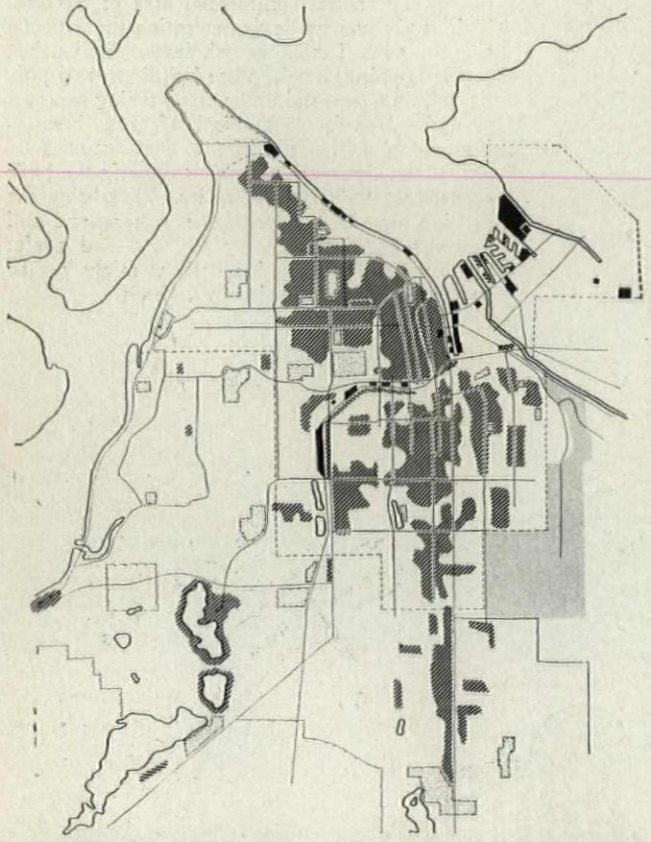


Diagram of the functional relationships of activities in the central commercial area of Tacoma. This study was made to determine the articulation of such factors as wholesale distribution, retail shopping, hotels, office buildings, and public buildings and the traffic and parking arrangements needed for economical safe and time-saving access and circulations. Such studies of downtown areas are valuable to clarify the basic operations of this part of a city. They bring out relationships in a way easy to comprehend and sometimes point the way to bold and useful measures of rehabilitation such as might not be suggested by the physical map itself.



Existing land uses

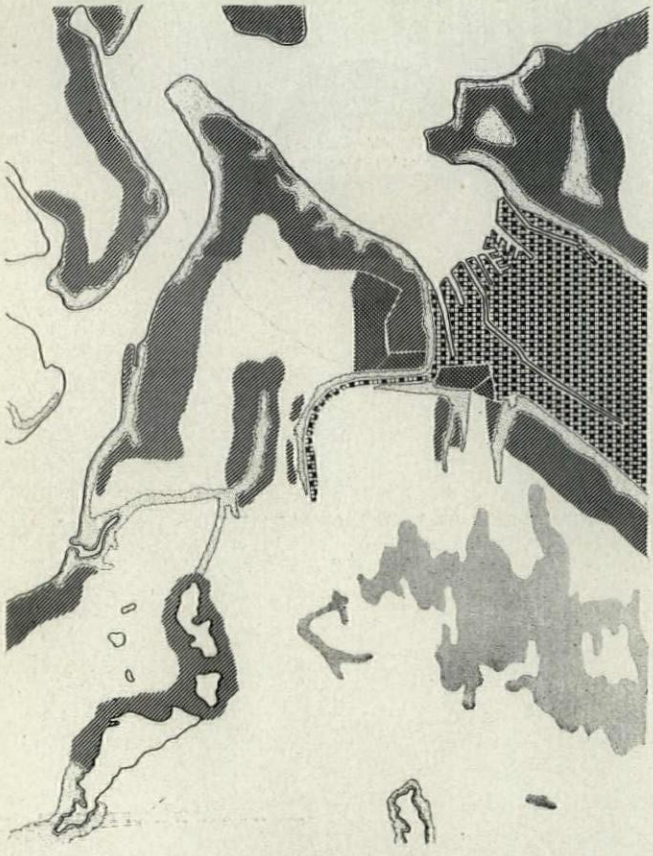


In Tacoma, the technician worked closely with the Mayor and the Mayor's Research Committee and, as the work progressed, secured the interest and cooperation of many local groups and individuals as in the other cities. At the end of the demonstration, when the general sketch scheme was completed, with many reports, charts, maps, and plans, and a contour model of the metropolitan area, a large meeting of the outstanding, significant citizens was called by the Mayor. About a hundred people attended, representing the Chamber of Commerce, banks, real estate groups, labor unions, downtown merchants, industrialists, the Housing Authority, the Architects' Association, the School Board, Metropolitan Park Board, Port Authority, and other interests, many of which had participated in forwarding the studies. Much interest and enthusiasm was shown, which was taken to indicate that the responsible people are fully awake to the job that confronts them and the possibilities of planning as against drifting.

During the studies, a number of maps were prepared to study and record all significant conditions affecting the plan. Among

LAND WHOSE PRESENT USE IS FIXED BY LOGICAL OR PERMANENT DEVELOPMENT
LAND WHOSE PRESENT USE IS LOGICAL BUT NOT INTENSE, I.E. GOOD FARM LAND
LAND WHICH IS FREE TO BE CHANGED TO A MORE DESIRABLE USE

Desirable uses of land



Desirable land use pattern

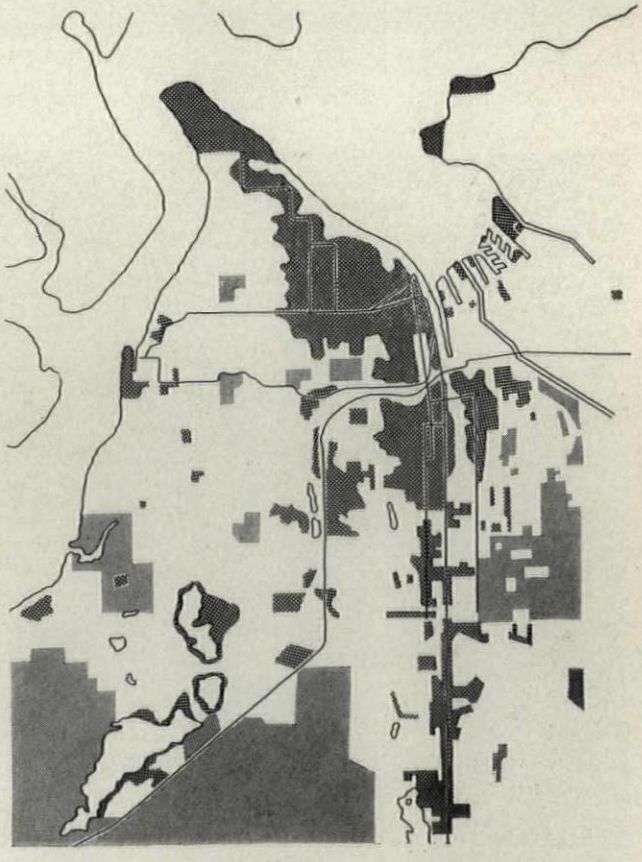
the subjects thus charted were: New Construction 1931-1940; Existing Housing Density; Distribution of Industry; Area of Public Services; Recreation Areas; Existing Schools; Topography and Climate; and Soil and Earth Structure. A map of existing land uses was prepared as a point of departure. It is shown opposite. Immediately below it appears a map of desirable uses of lands based on climatic, topographical and geological considerations. An investigation of fixed and free areas for planning was made and recorded as shown at the right, below. Several maps showing a desirable land use pattern were then developed, taking into consideration both natural and man-made factors. Eventually the proposed long-range plan was set down as shown here below and further defined on the model at the right.

This is the present status of planning in Tacoma. It is up to the city to continue its studies of details, making such modifications of the ultimate pattern as may be dictated by changing circumstances. A number of specific assignments have been made to civic groups and city departments for further study. They are going ahead at the present time.

Contour model of area

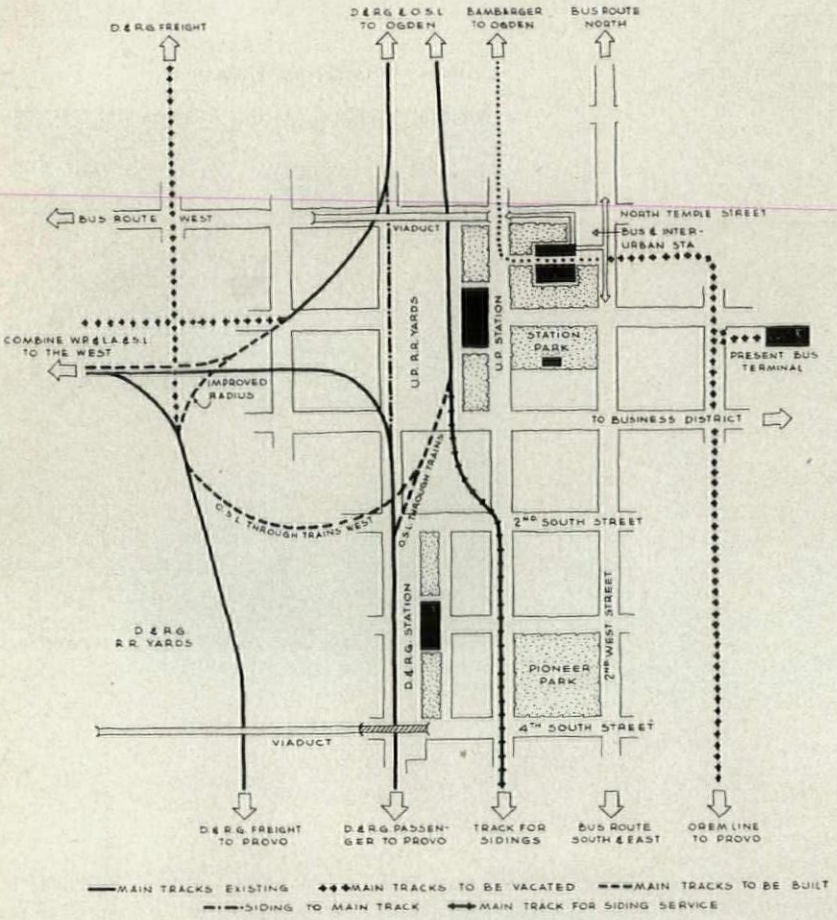
RESIDENTIAL COMMERCIAL INDUSTRIAL & WHOLESALE
PARK AGRICULTURAL

Free and fixed land uses



Proposed long range plan

Ground Plan: Study of Details



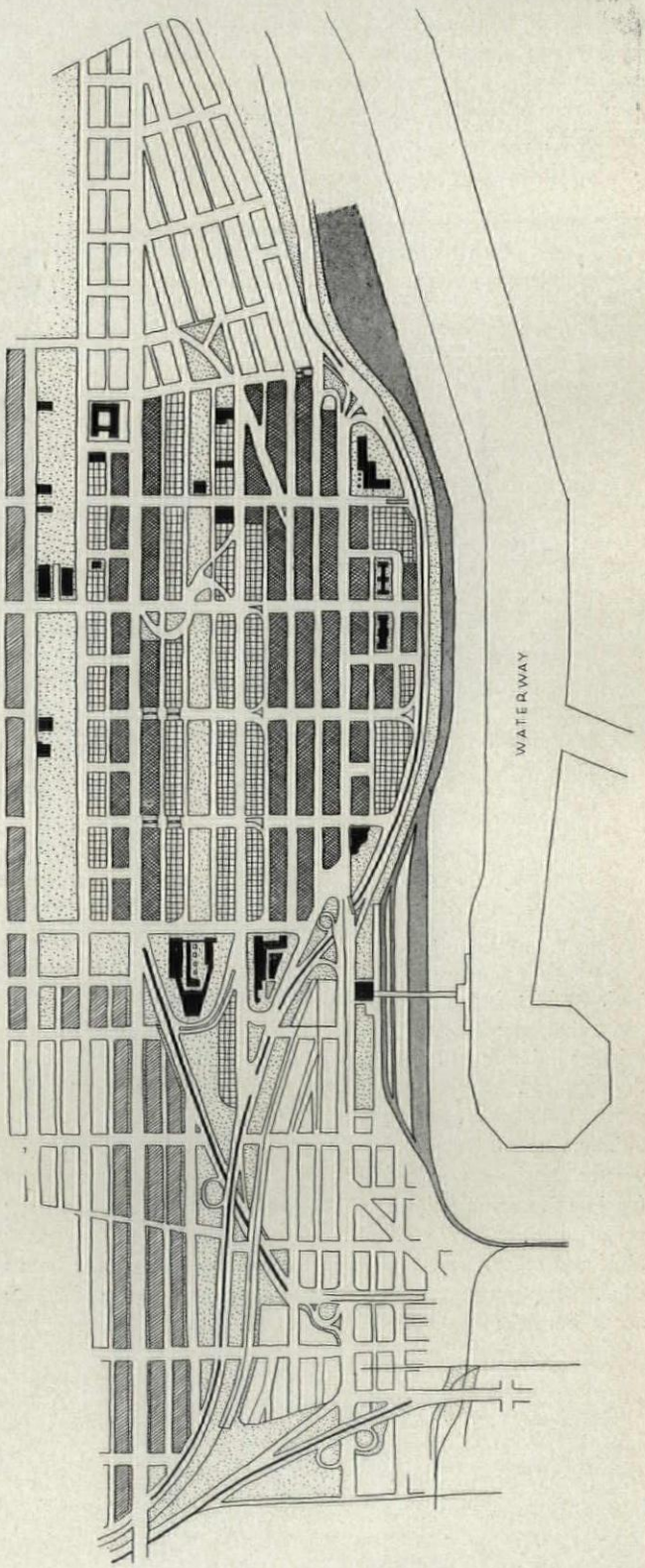
Typical of the study that was given to details of the ground plan in all three of the demonstration cities is the proposal, developed with the City Zoning Commission, to reorganize the rail and bus traffic in the passenger terminal area of Salt Lake City. The two existing railroad stations are to be retained in their present location but the track arrangements would be improved and simplified under the proposed scheme. A new Union Bus and Interurban Terminal is recommended northeast of the U. P. Station, involving a complete block and including a station park. Other details studied in Salt Lake City with the City Engineer's office include blighted neighborhood block rehabilitation and a new Civic Center with library, court house, auditorium, police-fire-health headquarters, municipal offices, a federal office building, and a museum.

Dept. Publ. & Pub. Wks., Salt Lake City

In Tacoma, the central commercial section was the subject of a careful detail analysis and study by the planning technician, aided by consultation with the various local individuals and groups that were concerned. This was based on the possible increase in population, the needs in regard to commercial activities, governmental activities, freight distribution, solution of traffic and parking problems, the need for a protective belt separating commercial uses from adjacent residential areas and for eliminating the existing belt of deterioration next to the business section. It was recommended that these blighted areas be turned into parking areas, parks, and apartment house developments for workers in the central district. The area lies on a fairly steep hillside and lends itself to an arrangement for two-level parking in the spaces thus assigned. The incoming automobile traffic from the south is to be distributed from the through road to different levels of the hillside as indicated.

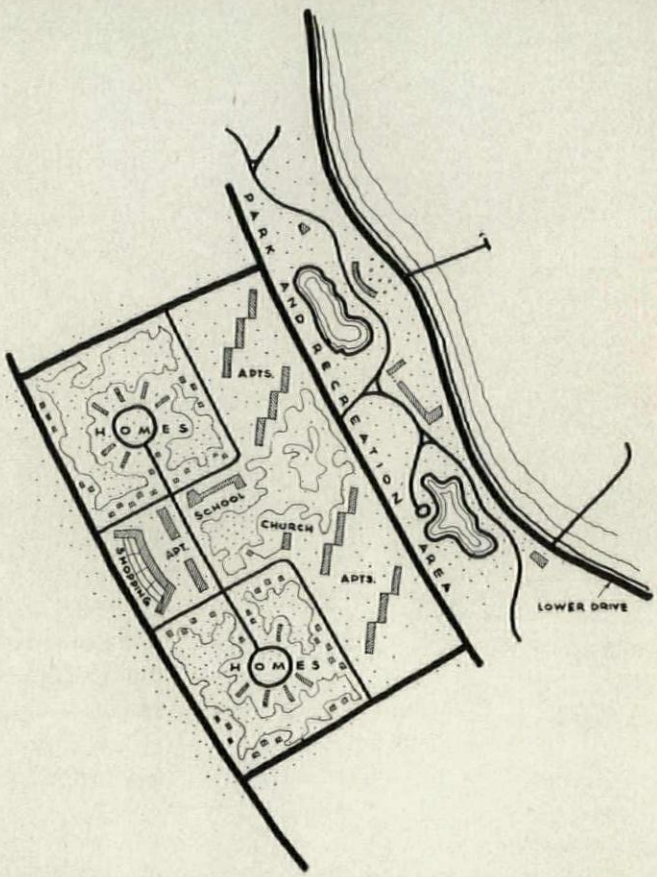
Studies of the area adjoining the present commercial section showed very low land values for much of this property, which made it practical to develop it into the proposed parkway strips, parks, freeway roads, and other public uses. Certain of the department stores had already created their own parking lots within this particular area and it seemed logical for other merchants to share this advantage by developing adequate parking for the entire length of the commercial section.

Several public buildings, including a new City-County building at the north and a municipal auditorium and community center at the south of the area were proposed. Apartments, to be developed along the high land along the west side of the section, would give convenient access for their residents to the business and shopping area below and would afford a transition to the residential areas further west.



Ground Plan: Neighborhood Layout

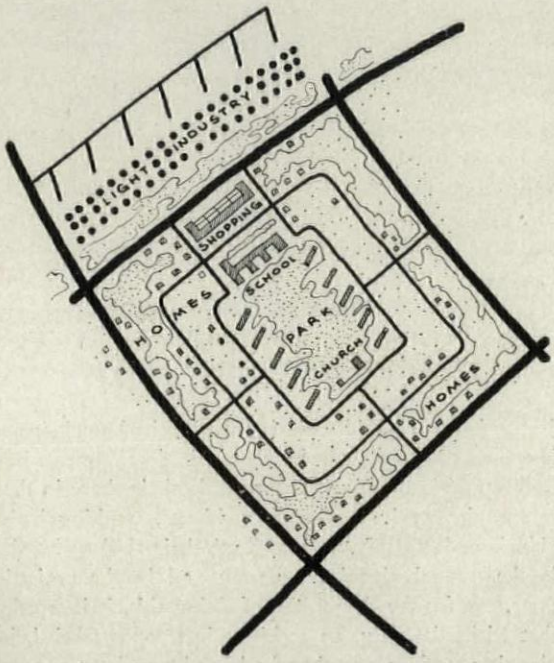
Studies of possible neighborhood unit design were made during a reexamination of early drafts of the ground plan of Corpus Christi. These three types of neighborhood units were considered for application to specific areas and problems. These are obviously only quick sketches and the architect on the planning staff is continuing to study the possibilities in greater detail, and to work out definite projects with developers and with the Housing Authority.

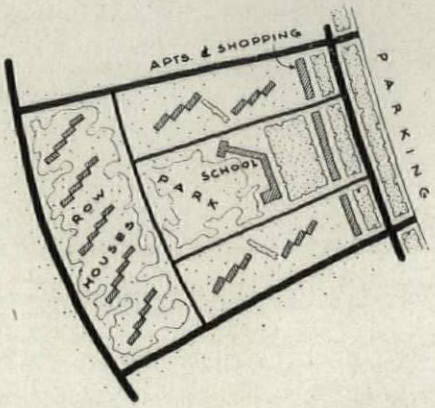


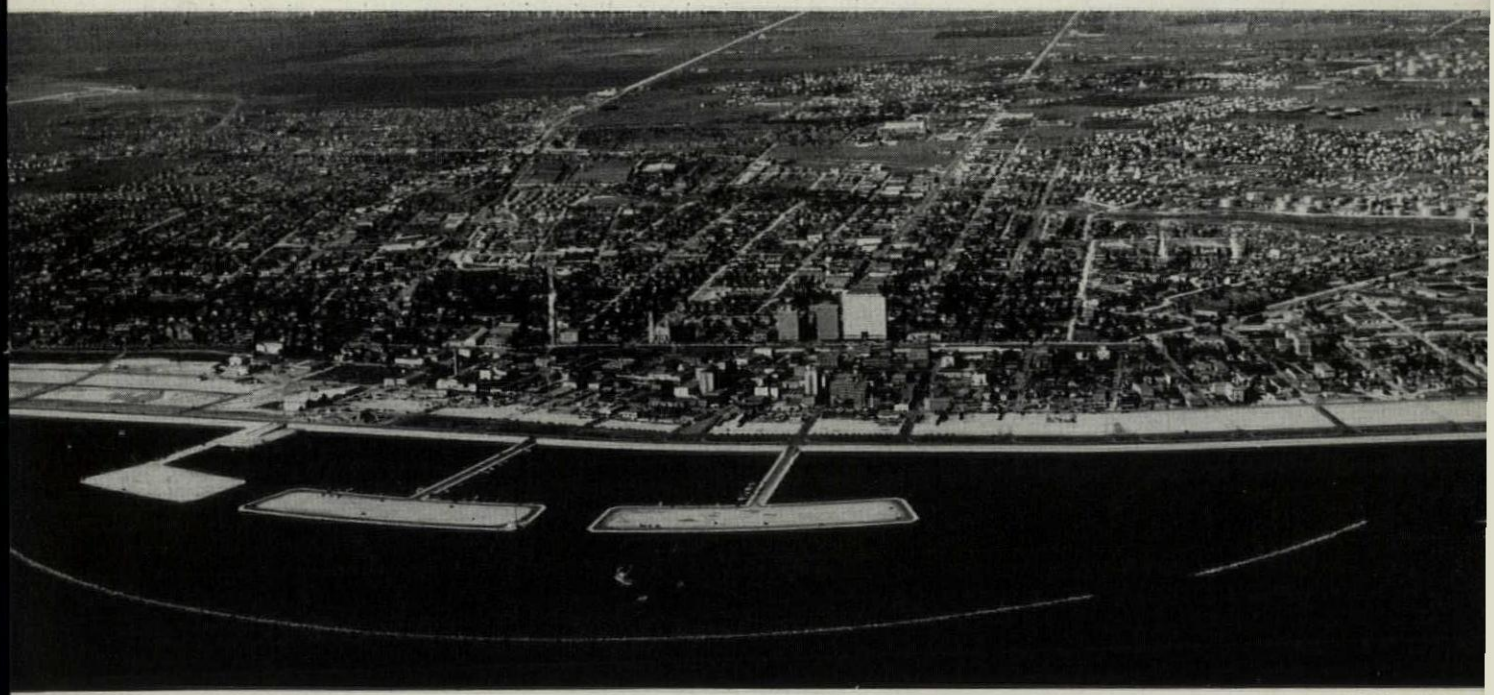
"A", at right, is a suggested design for a neighborhood development along the bluff to the south of the city. This area has little existing building and can be guided into desirable neighborhood development. Apartments are provided along the east to give greater numbers of people the advantage of breeze and view. The buildings are oriented to the southeast for this purpose. The greater density resulting from this arrangement is compensated for in open space gained by relating the neighborhood to the proposed lower drive and park, a feature planned to preserve the bluff and relieve heavy traffic on the existing road at the bluff's edge. An arrangement of grade separations provides for safe access from the neighborhood area to the park.

"B," below, is a design for a new area on hitherto undeveloped land which it is anticipated will be opened up for residential purposes. The estimates of future population, taken together with the results of other studies, indicated the probable eventual extension of residential uses to these raw areas. The designs were sketched to show desirable arrangements of homes in relation to shopping center, school and community center, park and playground—and in some locations to nearby non-nuisance light, small-scale industry.

"C," below, is a study of a possible neighborhood unit to be created as part of a slum clearance and redevelopment program in the central part of the city. Both apartments and row-housing are provided. Access to the downtown business area and to the Bayfront explain in part the greater density allowed for in this design as compared with "B." All buildings are oriented for breeze; and, as in the case of the other designs, separation of through parkways or limited access roads is provided.







Leslie Aylor

Plan and Resulting Program

Many cities have been engaged in drawing up lists of public works. Practically no city has based its program of public works on a comprehensive plan for development.

One of the major aims of these NRPB demonstrations was to show how there could be sketched out rapidly for each city a sufficiently comprehensive plan so that the need for the public works, their suitability, and the order in which they should be constructed could be tested in terms of the plan. Having such a plan, one could ask the questions that should be asked on any proposed project and expect to get the kinds of answers that should be had. With such a plan, the community can draw programs for not only the physical structures but also for the services they are expected to provide.

The plan can provide a guide to the long-time desirability and proper location of proposed projects for public or private construction. With such a guide the community can eliminate the futility and damage which results from widening a street, or erecting a public building, or authorizing private construction, at the wrong time or in the wrong place. In order to avoid waste of public funds, even in projects designed principally to provide employment, public works should meet a present need and remain useful and desirable for many years.

The considerations most likely to be neglected without this general development plan are the future usefulness of projects and their effect upon the future development of the rest of the city. In checking against this plan the long-term desirability of any proposed project, it should be possible to answer these questions; (1) Is it needed now? Can the need be satisfied by better use of existing facilities? (2) Is the need only temporary or will it continue to exist for sufficient time to make the expenditure worth while? (3) Will the project help achieve a desirable future development of the locality or will it distort that development? (4) Will the project complement, not detract from, the effectiveness of other present or proposed public works?

Once the desirability of such a project—or rather the validity of its purpose—has been established, the remaining pertinent question which the ground plans will help answer will include: (1) Where should it be located? (2) How large should it be or of what capacity? (3) What should be its quality or design? (4) When should it be constructed, considering the order of desirability of projects? (5) On what other public works does it depend? (6) Can it be maintained?

It is particularly on the last series of questions that the architects of a community have a great deal to contribute. Not only can they participate in the general development of the total planning program but they can also contribute a skill in projecting plans into the third dimension—sketching and projecting building and other construction to give a more certain base for estimating projects.

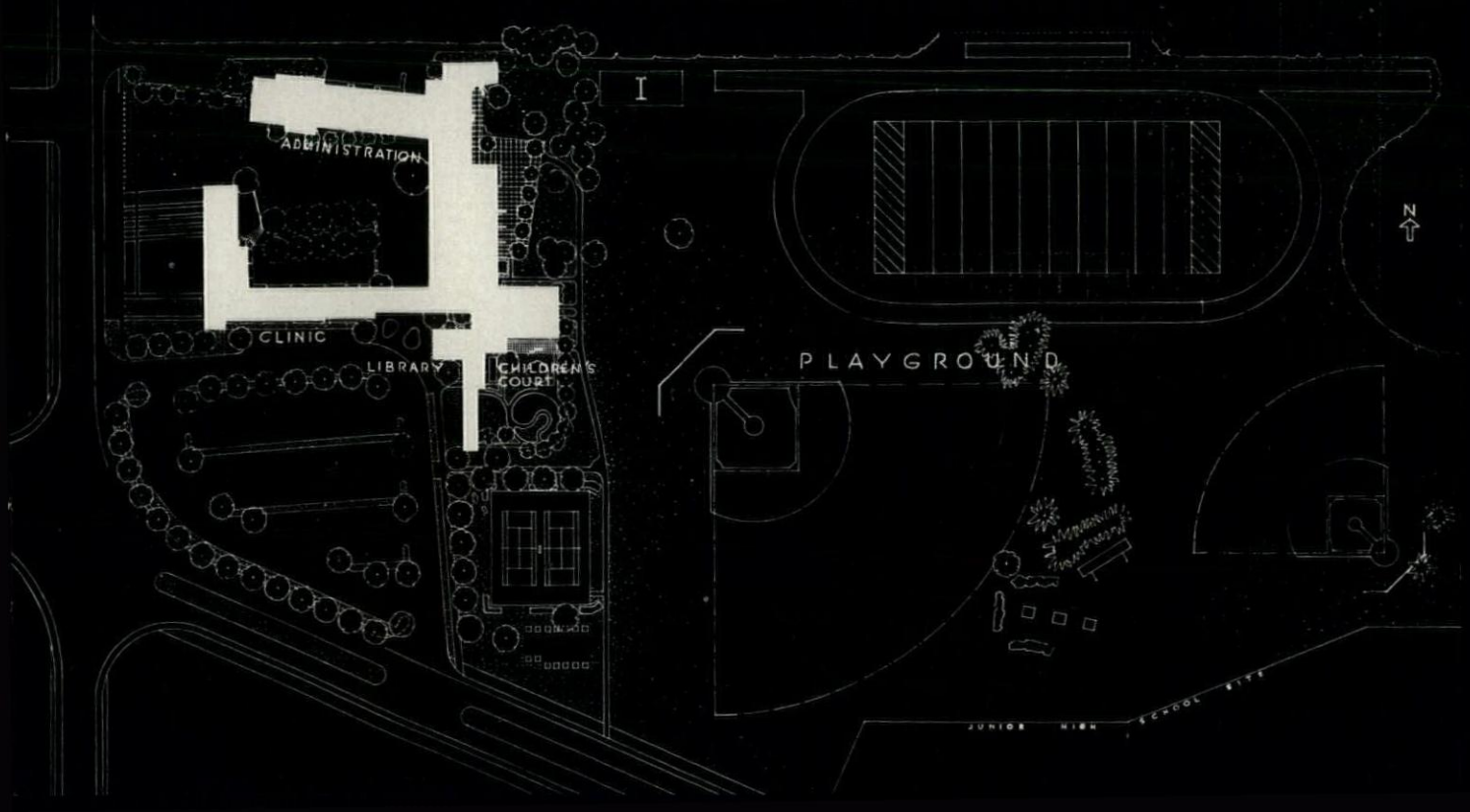
Out of the plan will come a determination of the buildings and groups of buildings needed to carry out the city's development. There will be an indication of the number, kinds, and locations of schools, hospitals, and other public buildings. There will also be a general summary of the quantity and types of housing, individual residences, apartment buildings, hotels, and public housing projects. All of these will call for some preliminary design in order to arrive at reasonable estimates of the extent of both public and private construction.

Just as industrial leadership is applying its knowledge and training to provide the plans for economic development, just as civic leaders and institutional personnel do their share in the study of community services, so must architects, working both as individuals and committees, contribute their skill and training both in the general planning program and in the projection of its parts. As for the desirability of doing this, it is worthy of note that Richard Colley, an architect in Corpus Christi, joined the planning staff on part-time basis and was later engaged by the Housing Authority of the city to make studies for future housing, after he had volunteered his services early in the program.

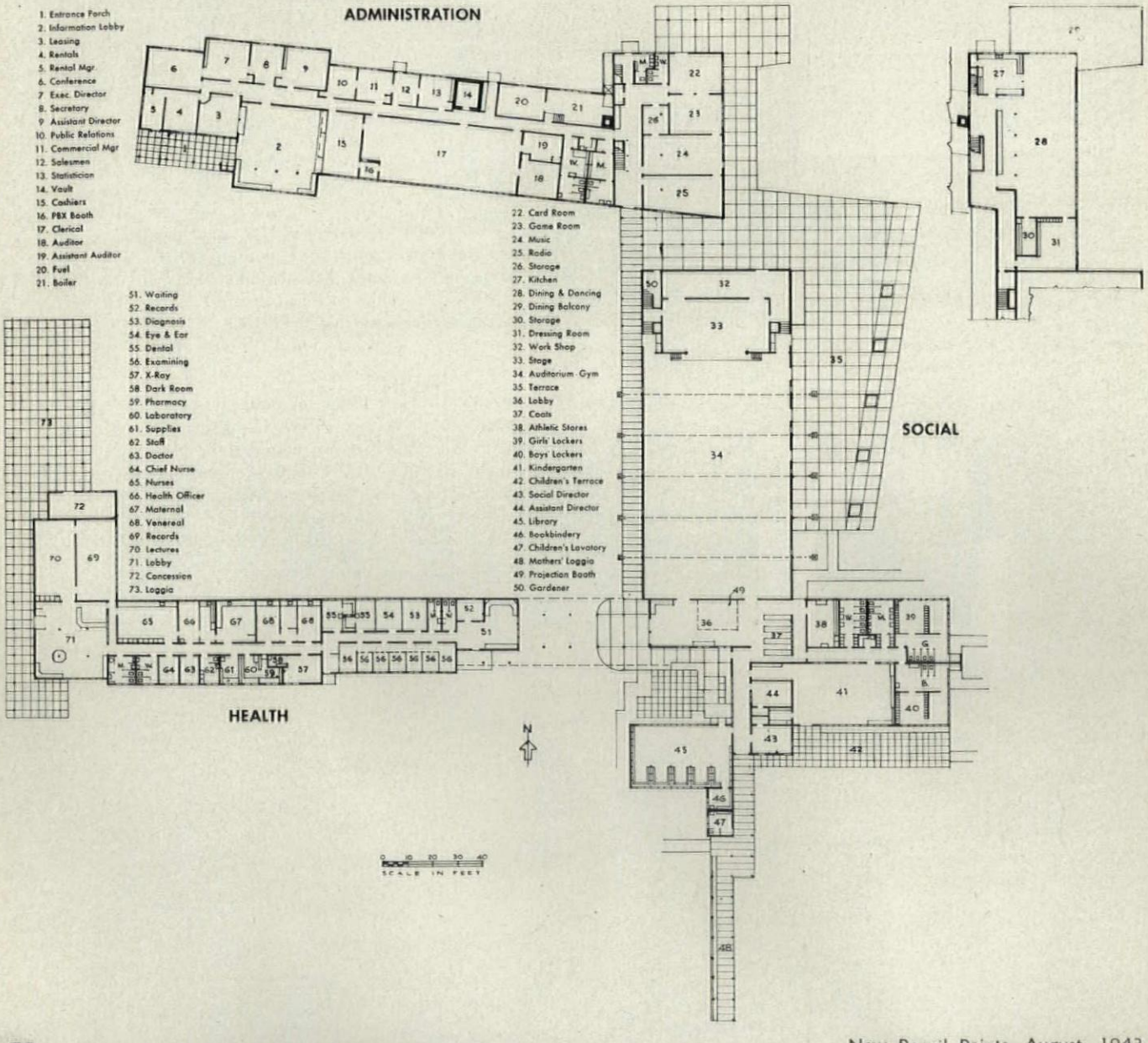
Another useful result of the planning done in Corpus Christi was that the program formulated for school building has served to guide local architects in preparation for future school work. In Tacoma the local architectural society met weekly during the demonstration period to study and analyze the building needs and possibilities being developed out of the Tacoma plan. In Salt Lake City a local architect consulted with the planning technician about a civic auditorium in relation to other proposed civic buildings to form a civic center. It is probable that one of these days the project will go ahead, in which case the architect in question will be the logical man to do the job he helped to develop.

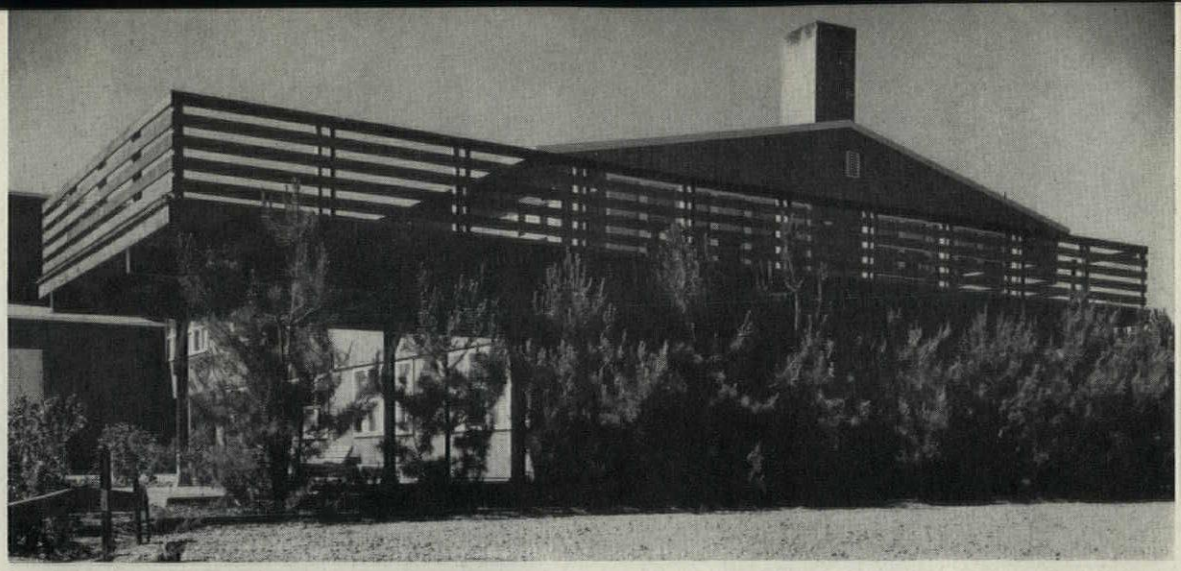
Administration Center, McLaughlin Heights, Vancouver, Wash.

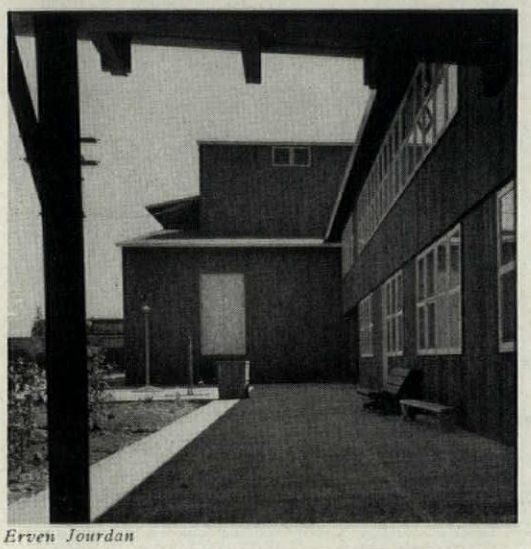
Roi L. Morin, Architect



D. W. Edmundson







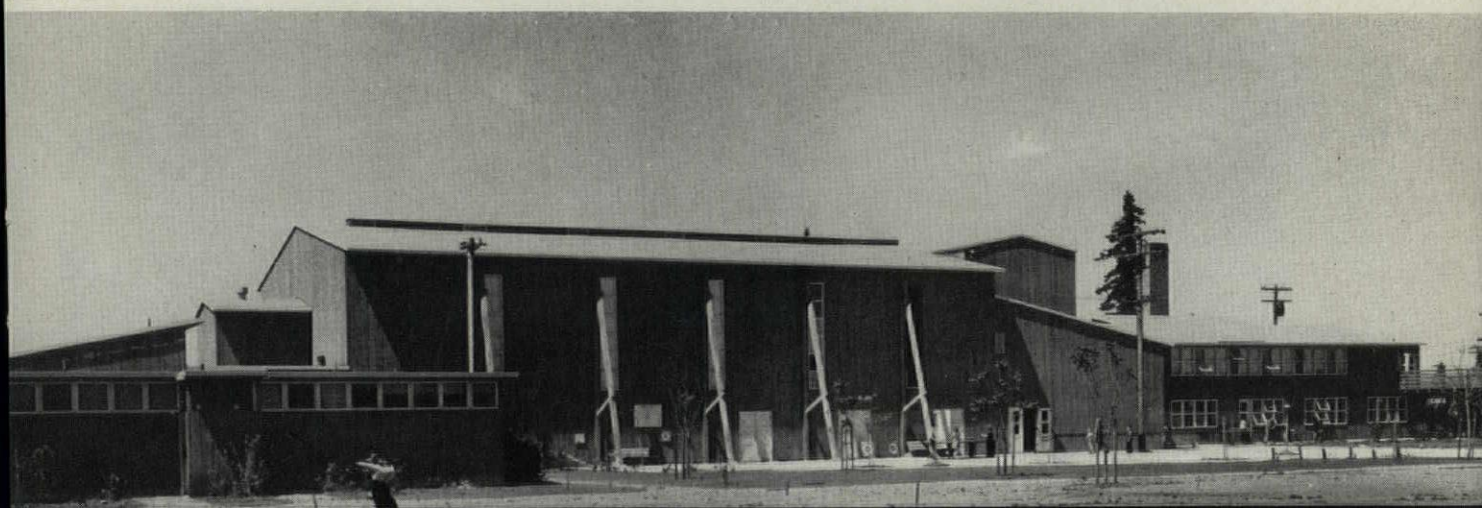
Erven Jourdan

At first glance this Community Center may seem large and extravagant; it is nothing of the sort, as it is now cramped and overcrowded. Originally planned to service, in part, some 4000 dwelling units, it is now the center of control for some 10,000 units and 8000 dormitories. Auxiliary facilities such as recreation halls, nursery schools, fire stations, etc., have been provided in a dozen other places throughout this area, but centralized control is still shunted through this McLaughlin Heights center, because it is the home of the Housing Authority of the City of Vancouver.

Planned in the early stages of the war housing boom (June to August 1942), the center was unhampered by the stock planning which later resulted from blanket priorities limitations. In fact, FPHA had little data of sufficient magnitude on which to base design. Existing charts designating room size requirements were based on 1000-dwelling-unit maximums. Many problems which arose were therefore unforeseen. No space was allotted for a Collector of Delinquent Rents, or a Statistician, or several other functionaries who became mandatory for such a great number of houses. Maintenance and other service buildings, some of which were enlarged during construction, are still too small. (These will be shown in a future issue of NEW PENCIL POINTS.)

Auditorium size was determined by basketball league requirements; it has a clear 22-foot height under bottom chord of trusses. Exterior buttresses were provided instead of interior knee braces.

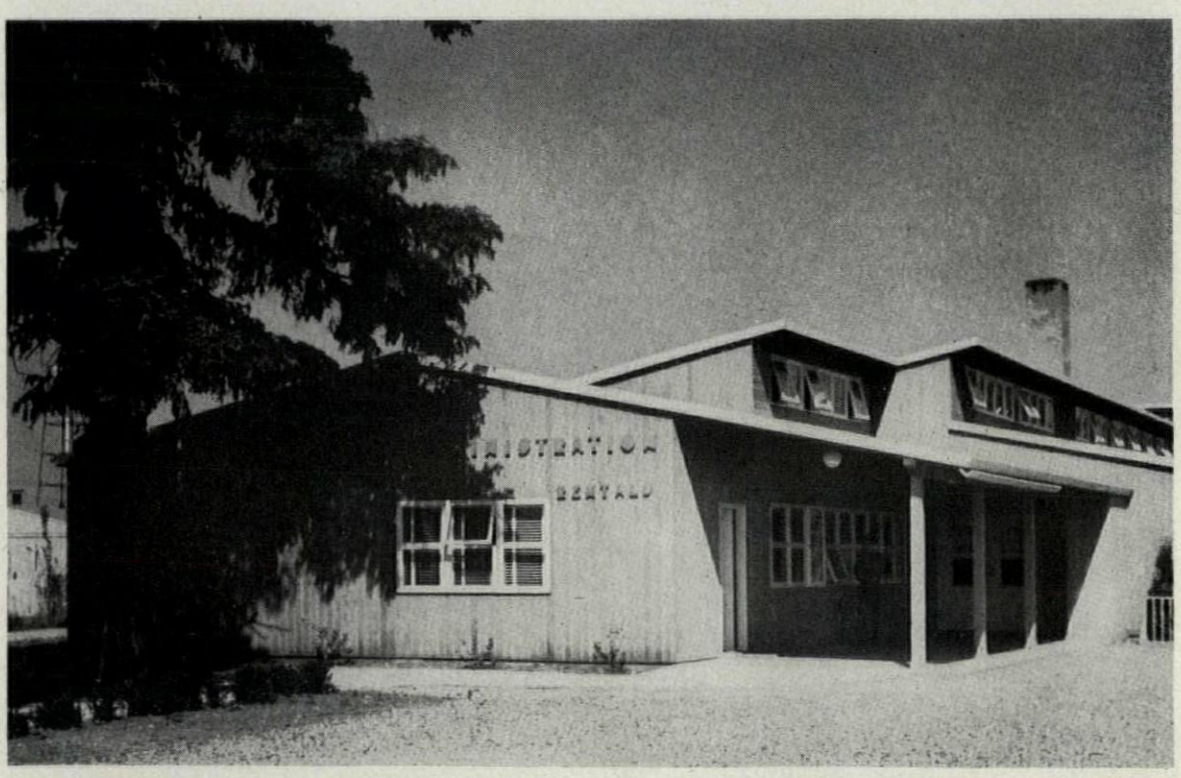
ven Jourdan



Erven Jourdan

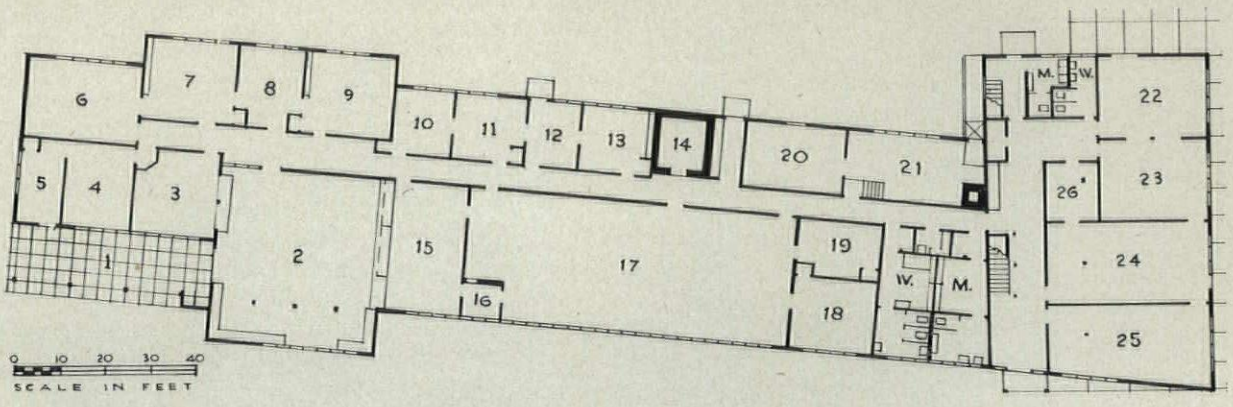
Above is the Administration Unit, seen from the terrace before the Social Hall; below, the rental office entrance. Designed under difficulties, while the nation was preparing for war and available building materials were becoming daily more scarce, the McLaughlin Heights Center is more than an exercise in ingenuity. Materials which could be used—chiefly wood, plaster, and unreinforced concrete—are put to work courageously and honestly. The result is good, inexpensive architecture, designed in haste and with regard for exigencies, not splendor.

D. W. Edmundson



Administration

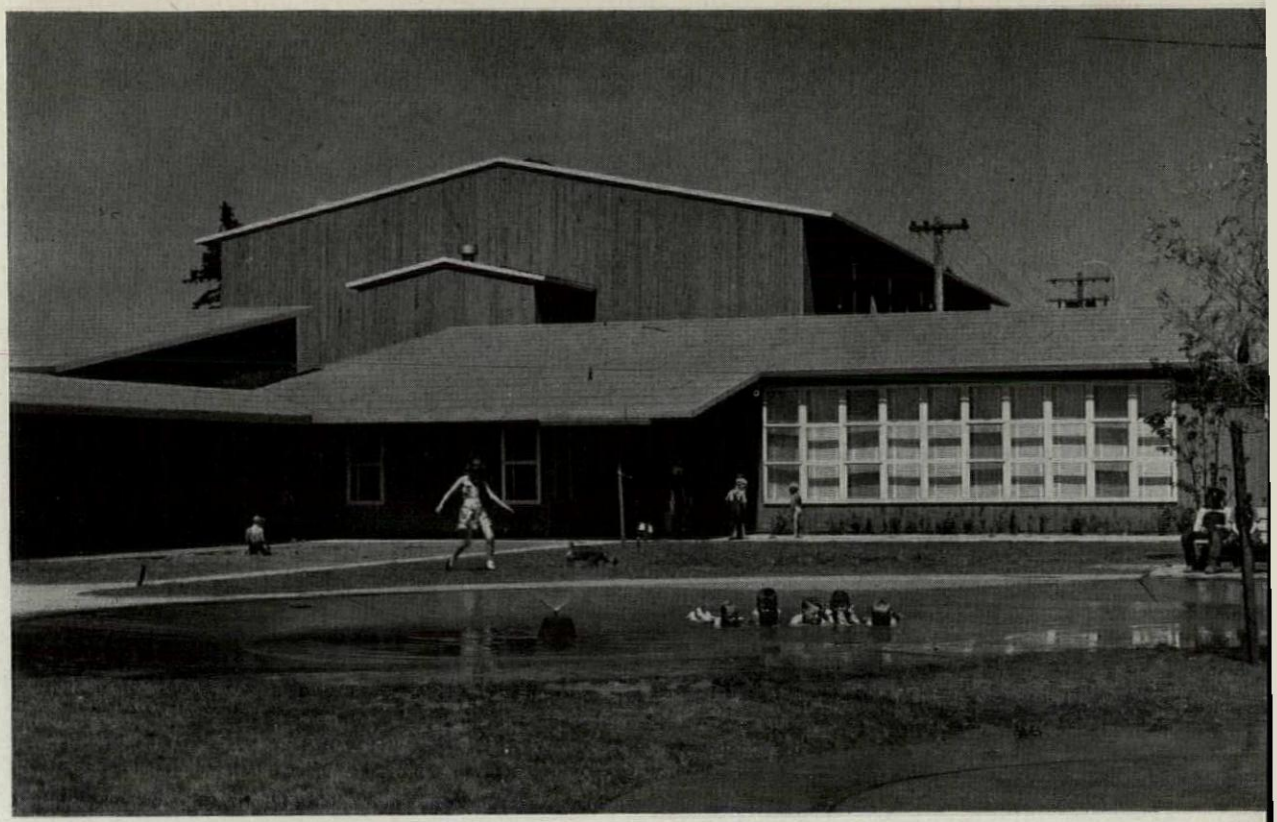
1. Entrance Porch
2. Information Lobby
3. Leasing
4. Rentals
5. Rental Mgr
6. Conference
7. Exec Director
8. Secretary
9. Assistant Director
10. Public Relations
11. Commercial Mgr
12. Salesmen
13. Statistician
14. Vault
15. Cashiers
16. PBX Booth
17. Clerical
18. Auditor
19. Assistant Auditor
20. Fuel
21. Boiler

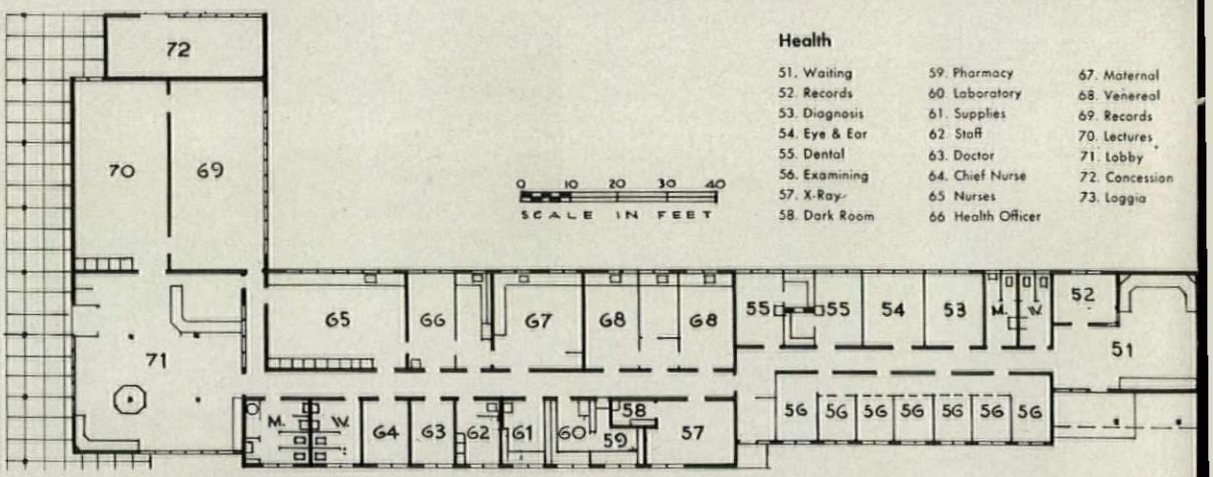


On these two pages is the Administration Unit of the Vancouver Center at McLaughlin Heights. Views below show the accounting department, and at bottom of page, tenants' lobby.

In spite of deficiencies noted on previous pages, this project compares most favorably with community facilities provided for war housing since Pearl Harbor. The architect was unhampered for space, as some 26 acres, in two tracts, were set aside for building. The buildings are arranged in a long flowing sequence, with clear through circulation. They are so developed as to be readily expansible. It was deemed expedient—in contrast with other such centers—to divorce maintenance and repair shops completely from the administration center, on another site about 1000 feet away.

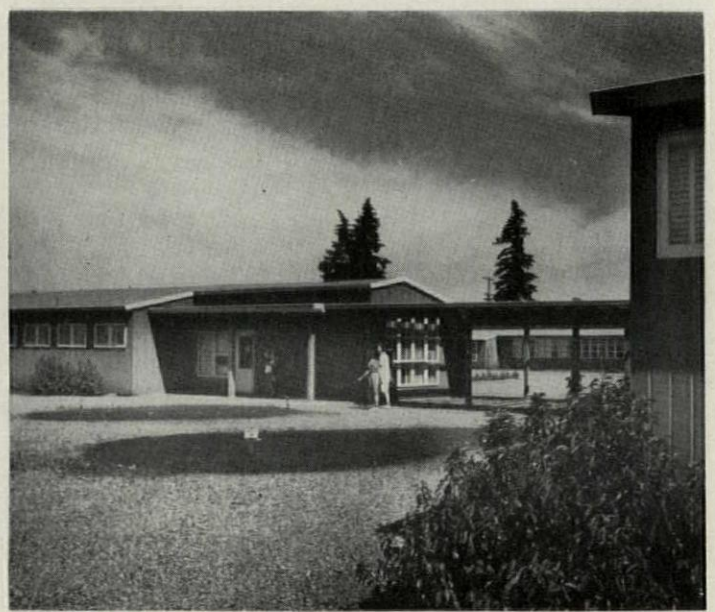
D. W. Edmundson



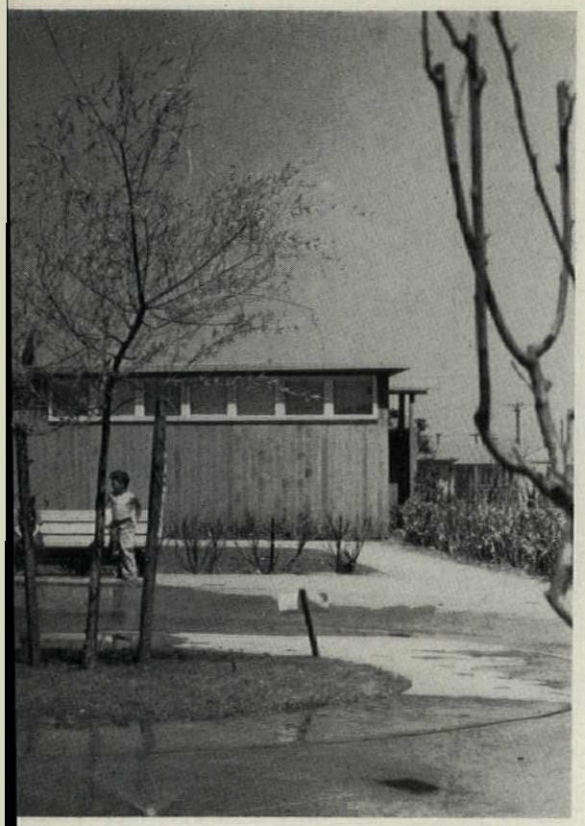


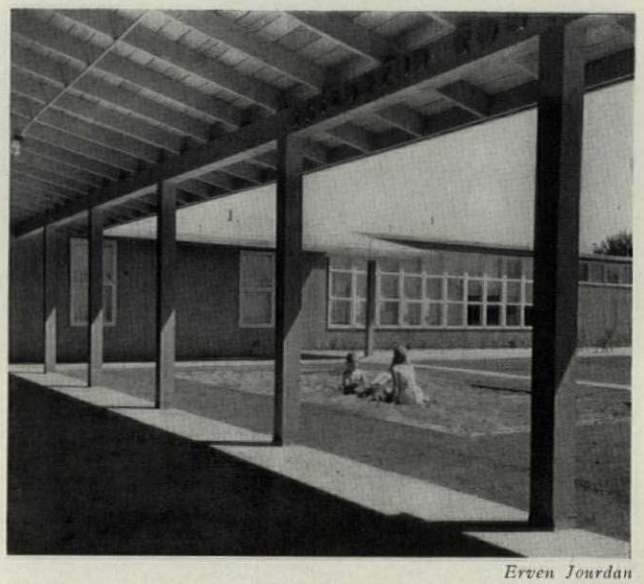
Health

51. Waiting
52. Records
53. Diagnosis
54. Eye & Ear
55. Dental
56. Examining
57. X-Ray
58. Dark Room
59. Pharmacy
60. Laboratory
61. Supplies
62. Staff
63. Doctor
64. Chief Nurse
65. Nurses
66. Health Officer
67. Maternal
68. Venereal
69. Records
70. Lectures
71. Lobby
72. Concession
73. Loggia



D. W. Edmundson





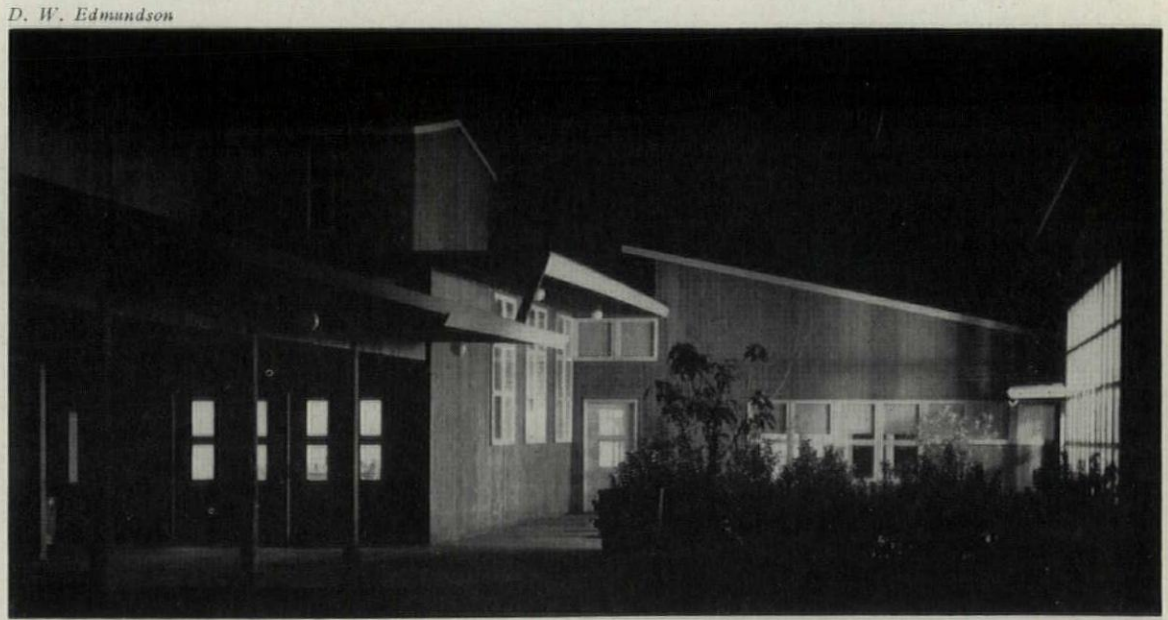
Erven Jourdan

Above are some of the children's recreational facilities, with the Children's Court and spray pool at the left, sandbox at right. Below, on the facing page, are interior and exterior views of the Clinic. At the bottom of this page is a night view of the Library Court.

Construction was simple: continuous 6-inch concrete foundations; unreinforced concrete slabs over 6-inch gravel fill; 2-by-6-inch stud walls sheathed with ¼-inch reject plywood and finished with 1-by-6 T&G, V-joint, rough-sawn cedar boards set vertically. Interiors, except in shops and auditorium, are sand-finished plaster on wood lath. The low-pitched roofs are covered with a single layer of sage-green, mineral-surfaced roofing. Exterior walls are stained a warm reddish brown, the sash and trim painted 3 coats in a cream color. All interior walls are sprayed two coats in light ivory with pale blue ceilings. The portion of the project shown in this issue, including landscaping, playfield and all fixed equipment ready for occupancy, cost approximately $240,000.

The architect wishes to express his appreciation of the help given him by Messrs. Eyler Brown, Harlow Hudson and Wallace Hayden of the teaching staff of the University of Oregon, during the summer vacation of 1942—particularly Mr. Hayden, who personally handled much of the design-drafting. Thomas E. Taylor did the mechanical engineering, George Pettingell the electrical engineering; and Josephine Lumm Matsler was the landscape architect.

D. W. Edmundson



Architecture and Reinforced Concrete

by Paul Weidlinger

Paul Weidlinger studied architecture in Czechoslovakia and at the Swiss Polytechnical Institute, where he specialized in reinforced concrete design. He has worked with Le Corbusier and Moholy-Nagy in Europe; in South America; and in New York, where he is now Chief Engineer for Fellheimer and Wagner, architects. While he was in South America, he was made Professor of Reinforced Concrete Design in the University of San Andres, at La Paz, Bolivia; and he was also Chief Engineer of the Section for Irrigation of the Bolivian Ministry of Agriculture. In this capacity he designed, among other projects, the largest water control project in Bolivia, a dam over which the rate of flow is 120,000 cu.ft. per second — not as large a project as Boulder Dam, but a tremendous undertaking for Bolivia.

Characteristic of contemporary technical development is the necessity for clarity, particularly in solving the increasingly involved problems of modern life. Simplicity and directness can be observed in the best of contemporary architecture. The architect deals with a multitude of human activities, some intimate, some impersonal. He must create appropriate surroundings for them, and in so doing he has to satisfy not only functional and esthetic requirements, but also economic and social demands. To an extent, a measure of his ability lies in the skill with which he reconciles many diverse factors which are often beyond his jurisdiction.

The structural system and selection of materials are both engineering and architectural considerations. Of materials we now have a tremendous array: rubber, glass, plastics, steel, concrete, chromium, aluminum alloys, asbestos, and others, natural and compound, some of which were unknown or not of interest only a few decades ago. As to methods of construction, important studies have been made and are continuing, in the field of the mechanics of statically indeterminate structures, which eventually will enable designers to find practical structural solutions for any design problem, provided the properties of the chosen material are compatible.

Effect of Reinforced Concrete on Architecture

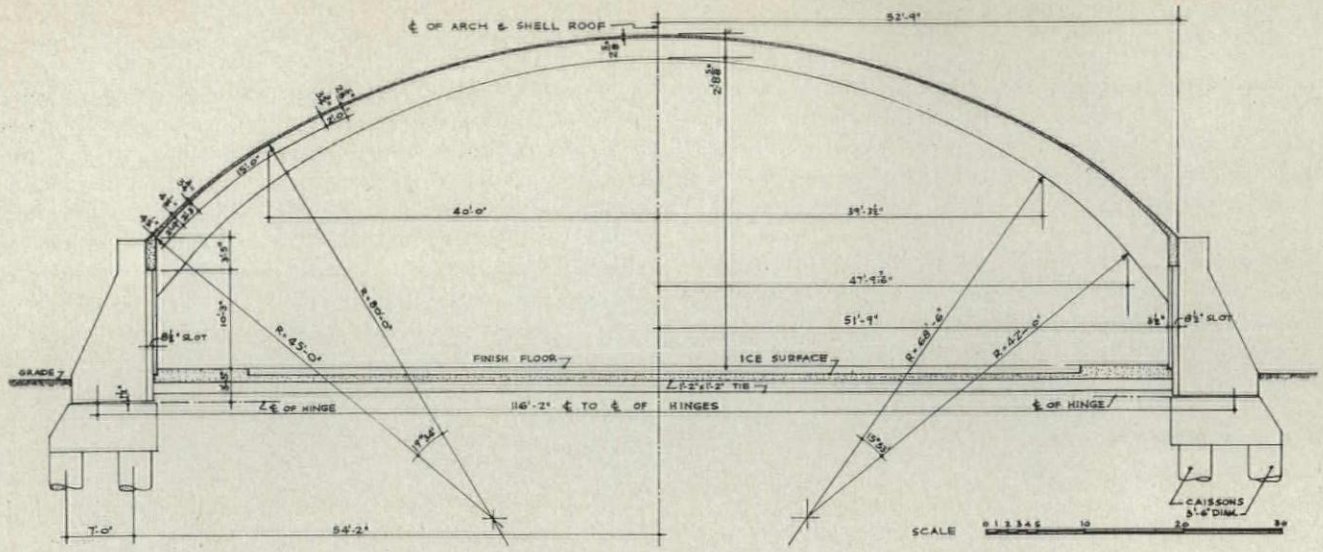
Reinforced concrete, since its introduction as a recognized building material, has had a tremendous effect upon architectural design. It is not worth while discussing whether reinforced concrete engineering has influenced architectural design or *vice-versa;* the influence has been reciprocal. Not all of the material's potentialities have been generally recognized in this country, but it has made possible "free" planning, no matter in what type of building, to an extent which is hardly attainable in other materials. Almost any structural desire of the designer can be executed in reinforced concrete, provided its physical characteristics are understood and it is intelligently used.

The introduction of reinforcing into concrete, in 1850, coincided with the beginning of a period of great industrial development. In part, its importance as a building material lies in the fact that its production and placement are an industrial process rather than a skilled craft; building design in concrete is predesign. The highly skilled artisan, bricklayer or carpenter, is replaced by a laborer capable of operating a machine.

It is at this point that economic considerations begin to enter the designer's problem and the engineer's calculations. Engineering in concrete does not consist alone of designing a structure according to the laws of statics and strengths of materials. Computations must take into account economies which can be attained in erecting the structure. In general, savings can usually be made in two ways: in material, or in labor. A noticeable difference between the usual reinforced concrete design in the United States and common practice abroad has its basis in this question of economy. In Europe, the cost of material is relatively higher, in comparison with conditions here, than cost of labor.

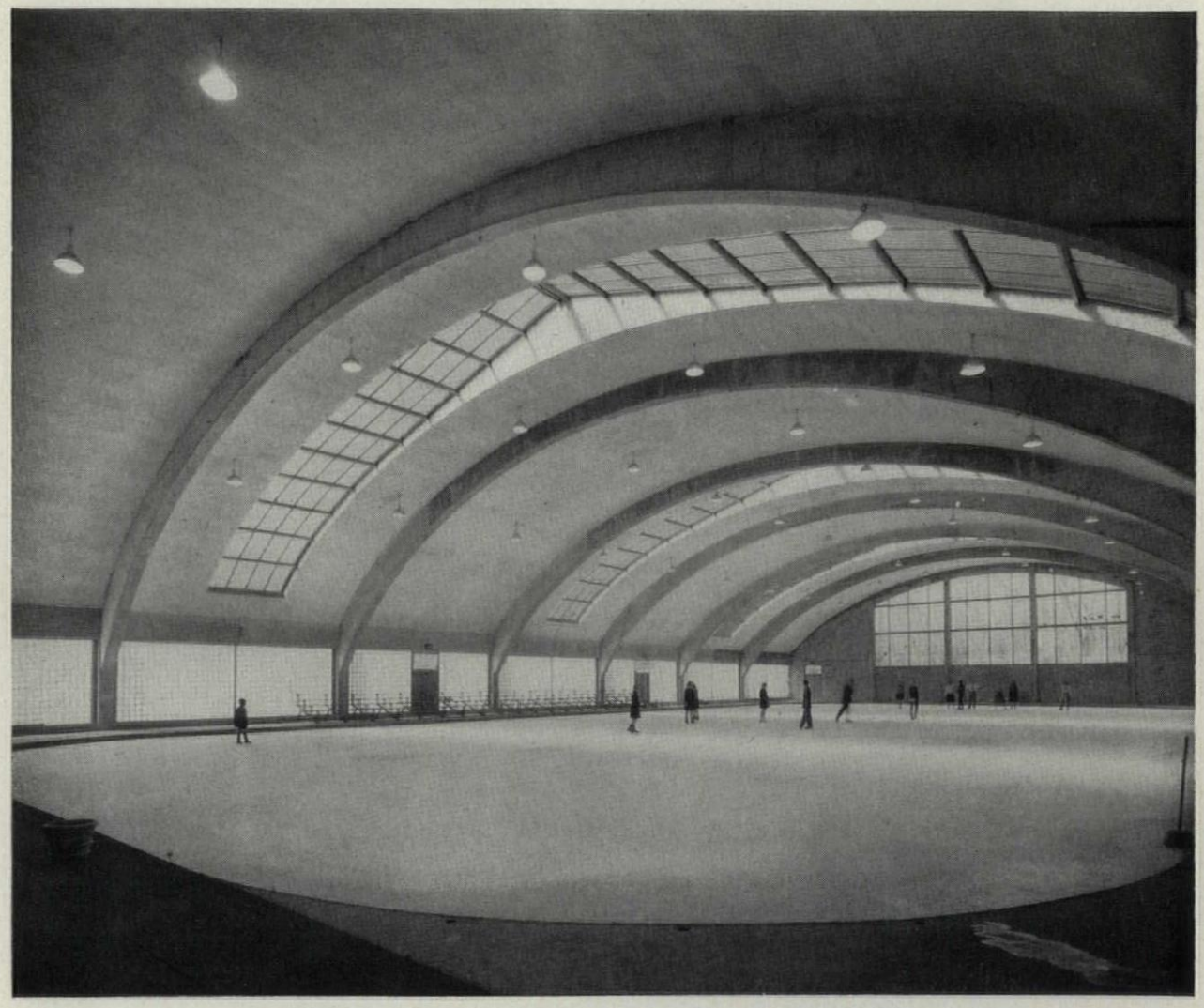
European structures are usually designed to achieve savings in the amount of reinforcing steel, which, in the end, requires increased labor costs. This practice is reflected in the use of more complicated shapes, slender forms, special steel-saving devices, etc. It is reflected in building codes as well: proportionally higher steel stresses than are allowed here, prevail there.

In the United States, important savings can be obtained through economizing on labor. This, of course, leads to a more generous disposition of materials, to simple (and often clumsy) shapes, and to reinforcing steel used in larger quantities, though



In the article it is stated that the simplest reinforced concrete member is in reality a complicated part of the entire monolithic structure. This skating rink, at Haverford, Pennsylvania, is a series of monoliths separated by expansion joints and skylights. Each unit consists of two reinforced concrete, two-hinged arches, 29 ft. on centers, with the membrane shell roof spanning between and cantilevering 9 ft. beyond each arch. The shell, which rises 34 ft. above ice level, is less than 3 in. thick at the center, but increases to 4½ in. thick at the haunches to take the thrust developed. Exterior buttresses carry the arch loads to caisson footings. The arches, which have a theoretical span of 116 ft., are tied beneath the ice by tension members consisting of concrete-encased bars. High early-strength cement was used in the rather stiff mix, which was vibrated as placed. Cork ceiling slabs, for thermal and acoustical insulation, lined the inner forms; no outer forms were needed due to the stiffness of the mix. The architect was E. Nelson Edwards; the designing and supervising engineers were Roberts & Schaefer Co. Sauter and Schwertner built the rink.

Roberts & Schaefer



as far as possible placed in a simple manner, with a minimum of end hooks and bending. Savings include a reduction in the work of computing and designing performed by the structural engineer, which may contribute to the above results.

The present shortage of steel, taken together with development and introduction of labor-saving devices in concrete fabrication, may well lead sooner or later to well-balanced design methods. These, if and when they are accepted, will doubtless produce results superior to present-day practice, either here or abroad.

Still a New Material

Like any other invention, reinforced concrete design has had to undergo a period of transition. All discoveries pass through this phase of adjustment, in which they are tested and during which obsolete methods and forms are discarded. In architecture we have several examples; a striking one is the Greek temple, which clearly imitates wood construction (slender columns, straight beams, triangular roof trusses) although stone construction would appear to require heavier piers, and arches. A more modern case is the first gasoline-driven vehicle: it looked like a buggy without a horse (this is not to say that the form of the modern automobile is yet perfect, considering its function and construction.)

The principal forerunner of reinforced concrete construction in Europe was the traditional masonry-and-wood method. The advantages of concrete soon became apparent and early attempts were undertaken to exploit them fully, although no special techniques of construction yet existed. The earliest examples followed the techniques of masonry, or timber framing on bearing walls. In the process of development, attention became focussed on the possibility of reducing the depth of floor construction, and of increasing spans. When reinforced columns began to replace bearing walls, all these potentialities were united to produce the reinforced concrete *skeleton*.

Scientific research could not keep pace with the growing popularity of this new material. A few disastrous building failures forced engineers to become thoroughly familiar with all the quirks of this new material. Development was returned from the field to the laboratory and the research engineer's desk.

When research had advanced sufficiently, the influence of traditional methods became unjustified, until now justification is usually only barely possible. For a while, most architects concentrated on dressing up the naked structures which engineers designed. At the same time, however, the economics of construction and collaboration between the most advanced architects and engineers occasionally produced sincere, well designed works in reinforced concrete.

At about the time such developments were proceeding, another relatively new material, structural steel, was also becoming familiar. Each material soon captured a share of the construction field, a division which was defined by economic and structural factors. Discussions of the superiority of one material over the other have long since ceased; increasing technical knowledge has clearly demonstrated to what types of structures each is most suited.

In the United States, as contrasted with developments abroad, the history of reinforced concrete has been much the same, with one extremely important exception: its immediate forerunner and competitor was structural steel. Some time passed before reinforced concrete was accepted as an independent structural material, rather than a supplement to or substitute for structural steel. Even today unfortunately, Portland cement, the manufacture of which is one of ten leading industries, is used to produce reinforced concrete skeletons designed in the tradition of structural steel. There is less difference between the steel and the concrete skeleton frame than between reinforced concrete and masonry. Distinct, detached elements appear in both steel and concrete skeletons: columns, girders, beams. In both, walls (both exterior and partition) are separately applied curtains, nonstructural.

This has been partly due to a certain resistance against employing reinforced concrete to its fullest advantage, a reaction which, in turn, is partly due to the relative simplicity of methods of computation for riveted steel construction. Armed with a few rules and formulae, which are available in excellent reference books, the average contractor can—and often does—safely design simple steel structures. But this simplicity cannot be applied to reinforced concrete, as even the comparatively uncomplicated structures offer, due to the continuity of the material, difficulties which may seem unsurmountable to those who lack a certain basic knowledge.

Another factor is attributable to those manufacturers of Portland cements, who, in their efforts to popularize their products, have emphasized the "surface" qualities of concrete. That a concrete surface can be treated easily in various ways, or that the effect of stone can be secured readily, or that the finished surface can be covered with other materials, has little to do with the essential properties of reinforced concrete. Imitation Greek temples in concrete are advertised, rather than examples which point out to designers the constructive possibilities which lie in proper use of the material.

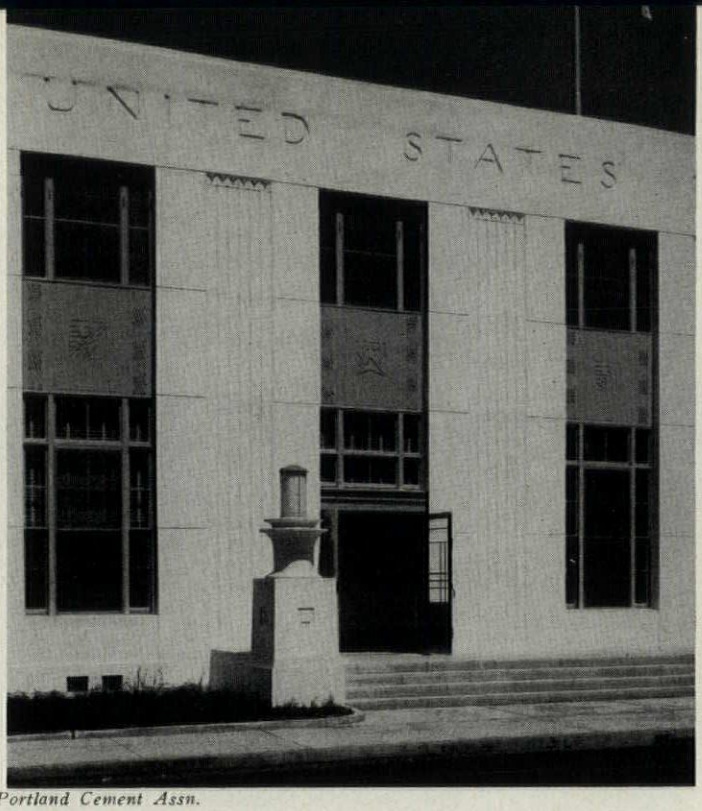
Although this is not a treatise on advertising, it is only fair to state that there have been, of course, noteworthy examples of advertising promotion based on sound concrete design. Likewise, outstanding American architects and engineers have made contributions important enough to assure further developments. Nevertheless, the factors outlined have helped to build a resistance to honest, healthy reinforced concrete design.

A New, Complex Material

In some textbook it has been stated that some early reinforced concrete structures (Monier bridges) were built so that, according to design coefficients still used today, they should have collapsed long since. It is true that few of them stand today, but the majority of those which have vanished were deliberately destroyed to make way for the new structures which an advancing civilization required.

This shows how relatively small is the body of our knowledge of the properties of the material. Yet we have advanced far enough to know precisely those properties on which we can securely rely, and those on which we cannot. Furthermore, we have developed methods of analysis and design which enable us, for the most part, to avoid the uncertain characteristics and make use of the tested.

Reinforced concrete *is* an extremely complex material, but the difficulty of designing in and for it is far from insurmountable. It does not follow exactly, but approximates—and then only under certain circumstances—the basic laws of physics (hypoth-

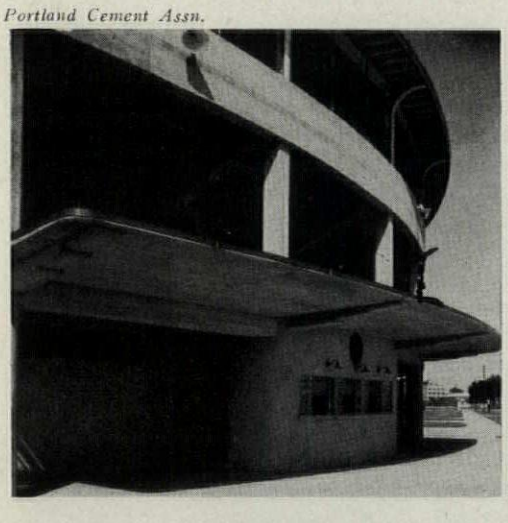


These three examples are demonstrations of the different ways in which design in concrete has been approached. At left is the Post Office, West Palm Beach, Fla., Treanor and Fatio, Architects; Louis A. Simon, Supervising Architect, Treasury Department. Every attempt was made to secure a smooth textured surface, from selection of the forming materials and careful placing of the concrete to the use of white cement paint as a finish treatment. The result looks like cut stone.

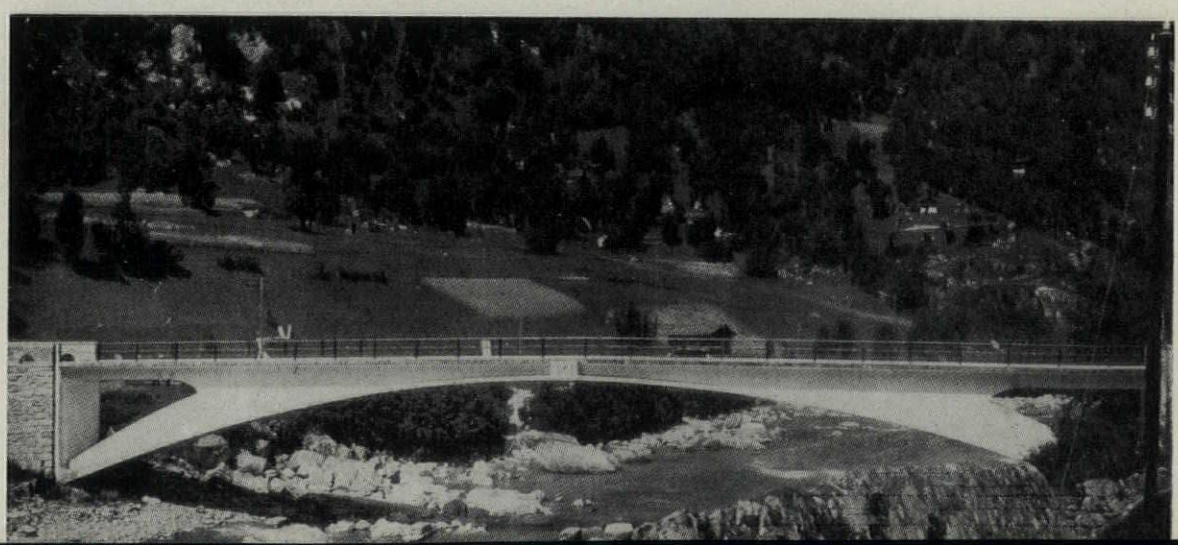
Portland Cement Assn.

Below is the baseball grandstand at Louisiana State University; Weiss, Dreyfous & Seiferth, Architects; George P. Rice, Structural Engineer. Here reinforced concrete is combined with a steel structure, and the principle of continuity is expressed in the steel columns and roof as well as, to a certain extent, in the concrete substructure. The curved fascia girder and cantilevered entrance canopy are good examples of what the author calls "two-dimensional" design.

Portland Cement Assn.



Below, bridge over the Tavanasa, Switzerland, designed by Robert Maillart; built in 1905 and since destroyed; an approach to full utilization of the design possibilities inherent in reinforced concrete.



esis of Bernoulli-Naviére, law of Hook). Even such seemingly simple physical coefficients as the moment of inertia of a section cannot be precisely determined. In the light of these statements, it might seem hopeless to attempt analysis of even the simplest structures. It *is* a matter of fact that certain parts of the elaborate, impressive mathematical computations of the past are useless, even deceitful, if we expect reinforced concrete structures to behave as the calculations predict. We must use, then, a different type of analysis, one which proceeds not from absolute values of design coefficients, but *on the basis of their relations in different members.* This is a most important distinction, and introduces us to modern methods of computation and execution; which allows us to predict, if not the exact quantity and quality of strains and stresses, an approximation on which we can rely. Insecurity due to uncertainty regarding physical characteristics is in great part eliminated by this relative approach to analysis.

We have been accustomed to thinking of some parts of reinforced concrete structures as essentially quite simple. In reality, the very simplest elements are tremendously complicated. Even a simple slab offers almost insurmountable obstacles to *complete* understanding. The division of a structure into slabs, beams, girders, and columns is in itself rather artless, though a necessary procedure without which we could not conveniently approach most of our problems. The designer, of course, should always remember that a reinforced concrete structure, if not interrupted by through joints, acts absolutely as a single, homogeneous piece. This is true no matter how strongly we would wish otherwise.

Continuity

The principle of continuity is an extremely important, though essentially simple, geometrical and physical characteristic. It means that if a certain part of a structure is affected by loads, shrinkage, change of temperature, wind pressure, etc., other members will likewise be deflected or show change in geometrical shape. Analysis of continuous structures relies on the necessity for providing that any such change in the structure has to be compatible with its original geometrical form. Thus we must visualize the deformations, which is a most important aid in understanding the whole procedure. Naturally, the clearer and simpler the organization of the members, the simpler and safer the analysis.

The real behavior of reinforced concrete under stress was, not so long ago, nearly a closed book to the engineer. Theoretical formulae did not often satisfy actual conditions. At present, the correctness of some of our formulae is the subject of much discussion. A great deal of the necessary research has yet to be done.

The most obvious characteristic of reinforced concrete is, of course, that the plain concrete is reinforced with steel. Still when we call it a well-known fact, that concrete takes the compressive stresses while tensile and diagonal-tensile stresses are resisted by the steel, we presuppose complete knowledge of an extremely involved process. We actually have only a limited knowledge of what takes place within reinforced concrete structures. The effectiveness of the bond between steel and concrete, its distribution along the steel, the occurrence of bond slip in cracked sections, which part of the tension is taken by the concrete, etc., are questions to which at present no exact answers are available. Improved methods of laboratory testing give us a growing insight into the behavior of reinforced concrete; modern laboratory research and ingenious experiments (as the photoelastic examination of reinforced plastic members) will provide us with a better understanding of empirical formulae and rules.

But the mere fact that we are able to locate the places where we expect maximal stresses, and are able to impose a limitation upon them, allows us to distribute the material in each member of a structure quantitatively and qualitatively. Reinforced concrete is specially suited for such distribution: one can place the necessary quantity of the steel reinforcement at the proper locations, and give the concrete the desired shape and dimension, which may vary within each individual member.

Characteristic Forms Derived from Physical Properties

All the described physical properties lead naturally to a characteristic appearance of sincerely designed reinforced concrete structures, which distinguish it from any other kind of construction.

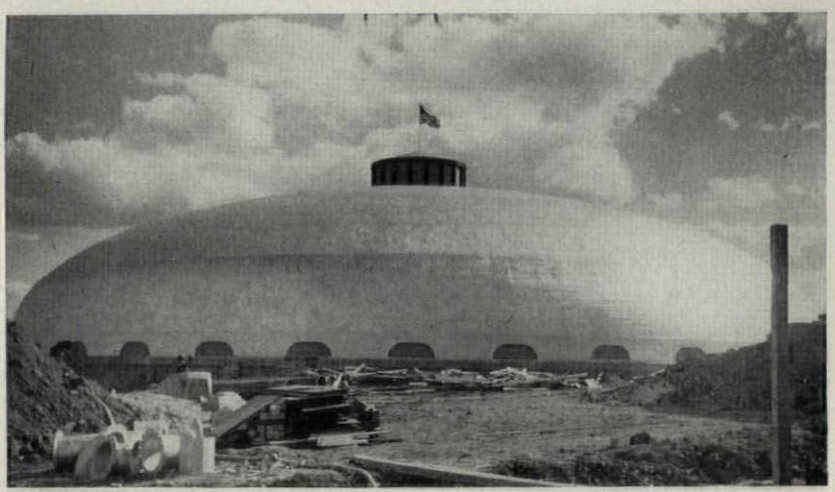
The form which developed earliest is the *T beam;* that is, the beam combined with the slab, where the flange of the beam provides an increased compression area, and acts at the same time as part of the slab, transmitting loads to the beam. This principle appears clearly in joist construction, a typical, economical kind of reinforced concrete floor.

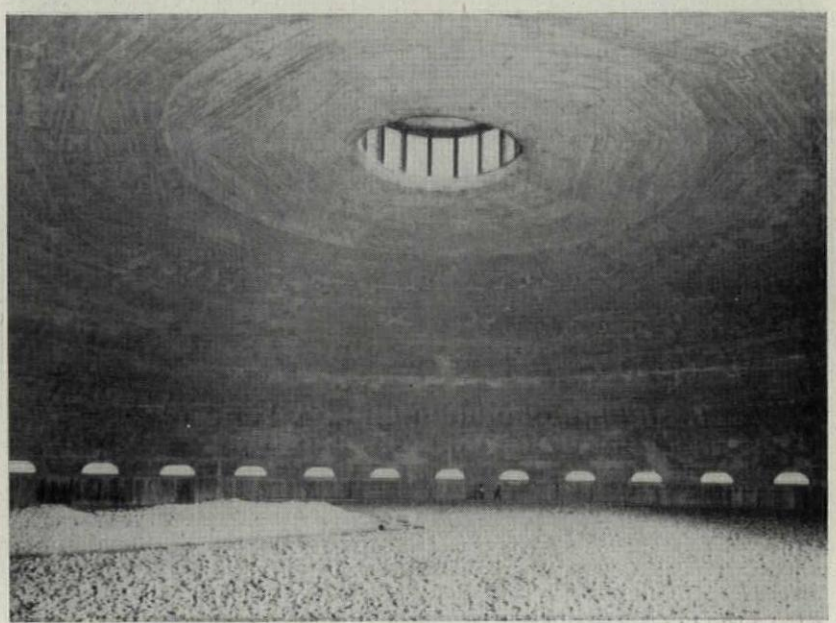
Haunched beams have been developed through distribution of material according the distribution of bending moments. They demonstrate how, in continuous girders, bending moments increase from the centers toward the supports. The curved form of the haunch assures a smooth transition of shapes, which prevents stress accumulation at points of sudden change. The form of junction between column and flat slab offers another illustration of the way the whole system works: the slab is supported on and restrained by the columns. *Arched reinforced concrete bridges* show clearly the function attributed to each member. These developments follow a clear progression, which may be described as proceeding from one dimension to two, and from there to three dimensional structures. The column, the beam, the simple slab in a typical skeleton are one-dimensional elements. Their function of supporting and transmitting loads takes place along one line. Although the whole structure is three-dimensional, each element is treated individually and one-dimensionally.

The first step in two-dimensional development is the two-way slab; that is, a slab supported on more than two sides. It is a very natural, logical way of handling slabs poured homogeneously, but a good amount of judgment and understanding, as well as theoretical consideration, were necessary until satisfactory ways of designing were achieved. It was a radical change from all former methods of designing, and was a very important step.

The slab which is continuous in all directions can be supported on columns, instead of along walls or beams, which leads to the idea of the flat slab. The slab, which has had hitherto a more or less passive, secondary role, then becomes the main element. The continuity of the structure is utilized to the utmost.

Just as slabs once played a passive role, so did the walls of the reinforced concrete skeleton. They remained fillers for the spaces between columns, or sometimes were stiffening members, transmitting wind loads. In monolithic structures, where





These domes, which cover two trickling filters for the municipal sewage treatment plant at Hibbing, Minnesota, are another example of shell construction. Whereas the skating rink shell (page 59) was interrupted and hence required arches for its support, the Hibbing domes are continuous membranes, and so self-supporting. J. C. Taylor was the architect; Roberts & Schaefer Co. were designing and supervising engineers.

Roberts & Schaefer

the walls are reinforced concrete poured integrally with other elements, walls take over the functions of girders. Thus members which up to now have been traditionally considered supporting elements, have in monolithic construction the task of transmitting loads to columns. The accentuated differences vanish, the roles of carrying, transmitting, and supporting loads cannot be isolated because the structure becomes continuous and is rigid; bending moments caused by loads on girders and slabs are not exclusively resisted by them, but to a measurable degree by columns and walls.

A logical development in this direction is *shell construction*. In this system there is none of the traditional division into columns, beams etc. The shell membrane plays a universal role, extending in three dimensions, and gives the necessary stiffness to the whole structure. This opens up tremendous possibilities. Simple forms are employed, dimensions are reduced (the thickness of the slab is usually no more than 3 inches) and the system is suitable for spanning almost any distance.

It is now up to architects to exploit and adapt these new forms of construction.

Concrete and Esthetics

The esthetics of contemporary architecture may be accepted or not—it is not the task of this article to discuss that question. Yet it cannot be doubted that the introduction of reinforced concrete has left a definite mark on the architecture of the last few decades. If we accept the fact that the characteristics of this material influenced the appearance of the buildings, bridges, highways, and dams of our times, then it follows that only the clear, honest, and uncamouflaged concrete constructions have added anything positive and basically new to the evolution of contemporary esthetics. Reinforced concrete buildings imitating Greek temples, reinforced concrete bridges with stone facings, do not show any signs of esthetic evolution.

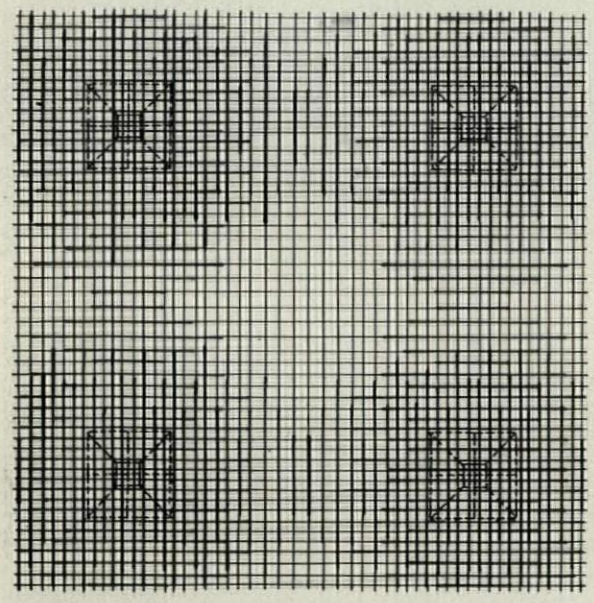
It seems that severe economic conditions work in favor of the appearance of structures. Engineer and architect are forced to remove superfluous elements. The engineer must make his structure light and simple; the architect must forego his attempt to "sophisticate" and "camouflage," seeking instead to accentuate the beauty of a well balanced structure and carefully chosen materials. Some excellent reinforced concrete industrial buildings have been produced, but factories usually remain unknown to architects. Yet those sober, prosaic buildings are important signs of evolution toward an esthetic which is representative of our times. In the interest of beauty, economy, quality, honesty (and may we add: safety) of our structures, it behooves us to reach a better understanding of this material, and this understanding will doubtless be reflected in our esthetic appreciation.

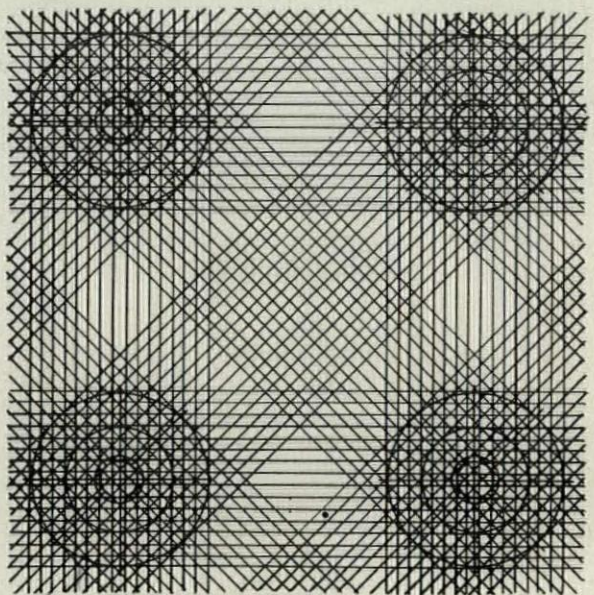
The Future

The possibilities which still lie before us, which are yet far from exhausted, include development of new forms, of plastic effects, and new organization of space and masses.

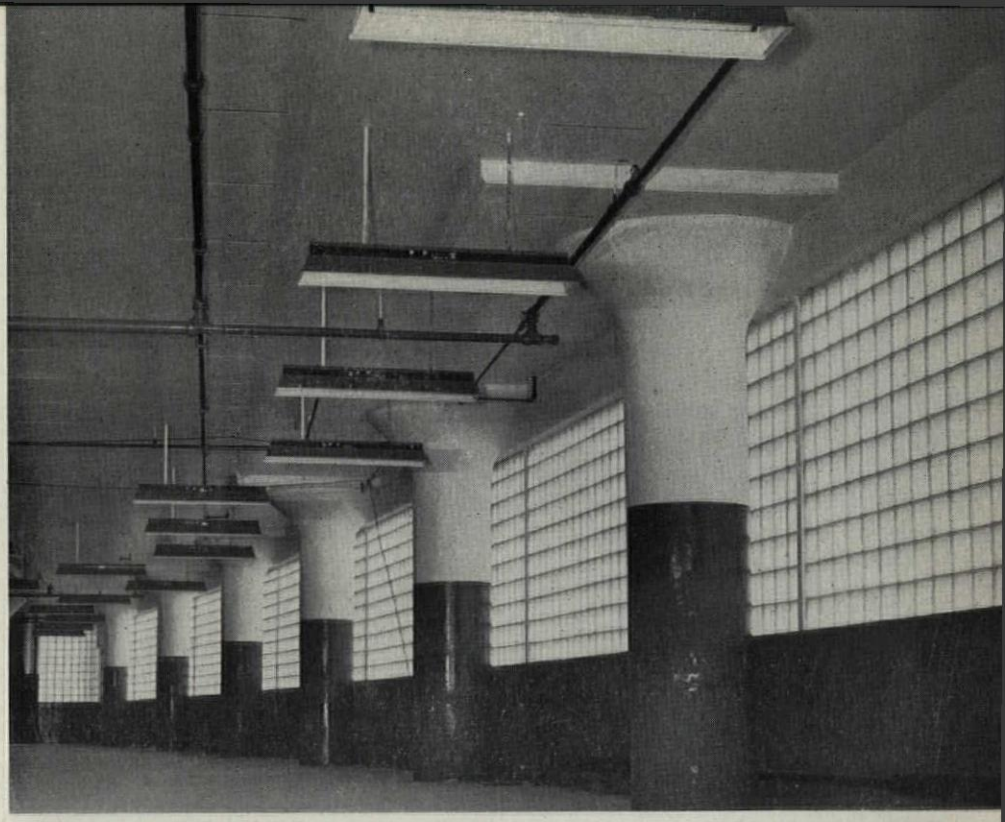
Ensuing developments in reinforced concrete (or some other material of similar properties) will exploit *all* the advantages of a material which can be cast in any desired form, from thin shell to heavy mass, and will lead to some kind of an organic form, and approach those developed by Nature.

A similar development in another branch of science is to be observed in the streamlined form, which was developed to re-

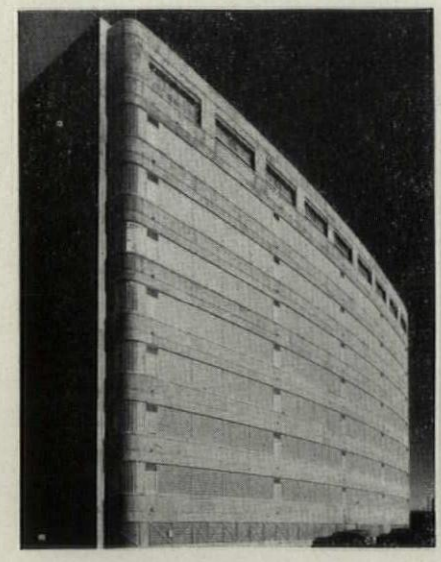




Reinforcement diagrams for two types of flat slab construction: at left, reinforced on the Maillart principle; right, a four-way slab with mushroom column heads. In the one case, the slab is considered a homogeneous, continuous member; in the other as a series of beams reacting on the column heads as if independent of one another (drawings adapted from illustrations in an article by Siegfried Giedion in "Circle," published by Faber and Faber, London, 1937.) Since Giedion wrote that ". . . American designers have not been able to rid themselves of the idea that a slab is subject to stress in separate directions, and embed their rods diagonally across the floor like intersecting beams," much progress has been made in this country; although many building codes still impose unnecessarily stringent limits on reinforced concrete design.



Damora



In a recent war plant, where use of reinforced concrete was dictated partly by the necessity of saving critical metal in construction, flat slabs were cantilevered beyond the outer row of columns so that continuous walls of glass block could be provided. Insulating and diffusing glass block was required in order to maintain even, glare-free daylighting, and closely controlled temperature and humidity—necessities of the manufacturing process. In the lower right photograph, the slab would appear to be truly continuous; but in the upper photo it becomes clearly evident that the level ceiling has been furred down; that the slab "rests" on a dropped panel atop the column. Engineers state that this is unnecessary except that the average building code requires it unless column spacings are so reduced that reinforced concrete construction becomes uneconomical. L. G. Mertz cooperated in designing the building with Lockwood Green Engineers, Inc.

duce the dynamic air resistance and skin friction of high speed vehicles (certainly *not* for use in advertising). Streamlined ships and planes approach a form employed by nature for the same purpose. Some similar form will inevitably develop in our structural science, but will have the task of reducing static (rather than dynamic) resistance. *As the streamlined form represents speedy motion, so will our buildings be symbols of equilibrium.*

Architecture, Industry, and Schools of Architecture

Part of the function of architecture is the creation of new materials and the adaptation and further development of existing products. The specific needs of contemporary architecture will provide industry and science with the incentive to seek solutions for structural problems which at the present time cannot be answered.

In spite of great developments in mechanical processing, conveying of concrete, formwork and the placing of reinforcing bars remain toilsome, unmechanized work. Prefabricated elements are not the answer to these problems, for the inherent limitations of prefabrication prevent its individual adaptation to specific requirements and eliminate one of the chief merits of reinforced concrete.

Uncertainty as to the uniform composition of the concrete mixture is one factor which can only be eliminated by controlling absolutely all the components which define the strength of the mixture. American codes are the first (and to my knowledge, the only ones) which introduce the water-cement ratio as a means of defining the strength of concrete for design purposes. This is a very important step. If once we arrive at a stage of development which makes it possible to depend on the strength and uniformity of a concrete mix as we do on steel, the safety factor (which might be called the "ignorance factor") can be greatly reduced. This will lead to reduction of dimensions, savings in materials, and reduced work. Because the material is in this sense unreliable, we waste much of it for safety's sake. Yet, recalling the steady increase in allowable stresses permitted by building codes, the tendency toward more and more economical use of concrete and steel is readily visible. The use of ready-mixed concrete, metal and plywood forms, prestressed steel, vibration, etc., are all steps in this direction.

Much responsibility for further evolution lies on the shoulders of architects: a demand for solving such problems, the posing of new questions to the designer and research engineer, are strong impulses to promote new developments. The task of the engineer is not only answering the questions, but also uncovering all the vast possibilities which may yet be buried in textbooks, scientific papers, or laboratories.

Coordination between architect and engineer is today more important than ever before. The work of today's architect and engineer is so involved that at best only an encyclopedic knowledge of the work of either can be expected of the other. Still, understanding of the material itself, of its basic properties and characteristics, is absolutely necessary to the architect. It is desirable for the structural engineer to gain a fair idea of the task of the architect, so that he may not just design a structure around or in the architect's project, but may collaborate with suggestions of a structural nature. Such a collaboration should not be restricted to actual collaboration on given projects, but should be a continuous process. Lectures for architects, given by engineers (and *vice-versa*), or organizations for studying such problems, would be means for reaching a fruitful coordination.

Very important roles are played, naturally, by the schools and colleges. In the usual case, students of architecture attend lectures on statics, reinforced concrete, steel structures, etc. The average student immediately after graduation forgets most of his knowledge of structural matters as something which is not essential to the prosecution of his profession. As a matter of fact, he may in all his career never need actually to employ his knowledge of structural design. His knowledge ordinarily is far too little to enable him to tackle anything but the very simplest problems of reinforced concrete design. Any complicated problem has to be solved by the structural engineer, and concrete design becomes a mystery for him, a trade secret known only to people who are able to manipulate the slide rule and complicated mathematical formulae. Yet understanding and handling problems of continuous framing does not require any great amount of higher mathematics. It requires the ability to visualize deflected structures completely and well, sound judgment, and a goodly amount of logical thought. The average person, armed only with a basic knowledge of statics, should be able to get a fairly good "feeling" of all the "mysterious" problems of continuous reinforced concrete structures. This should be emphasized in schools of architecture, in courses on structural design.

The student should receive basic knowledge, and the background of advanced methods of structural design and analysis. At the end of his course, he should not be expected to be able to take over the work of the structural engineer, but he should be able to judge his own plans, as to their compatibility with the chosen form of structure and framing. He should be able to design architecturally so that his plans make it possible for the engineer to design a simple structure. He should be able, also, at a very early stage of design, to determine the required form of structure, and be able to follow it through simultaneously with the development of his project. For this purpose, he needs to know a lot *about* the trickiest parts of structural design, but does not need to be able to design, structurally, himself.

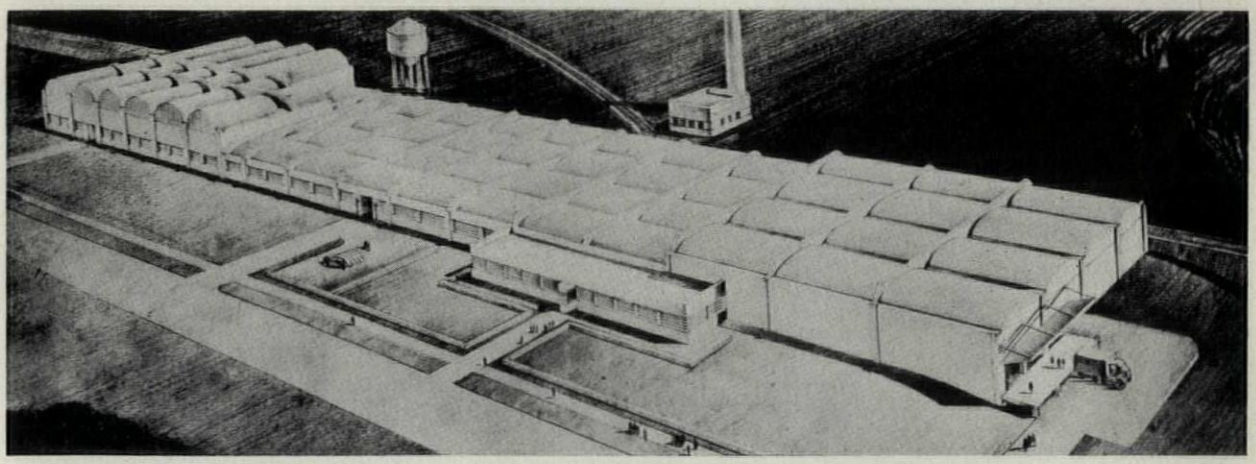
Colleges of engineering might incorporate in their courses something on the esthetics of construction, knowledge which could be most beneficial for the graduate engineer. Esthetics are as mysterious to the engineer as statics to the architect. I think a generation of architects and structural engineers educated along these lines could give an enormous impulse to the development of both architecture and engineering.

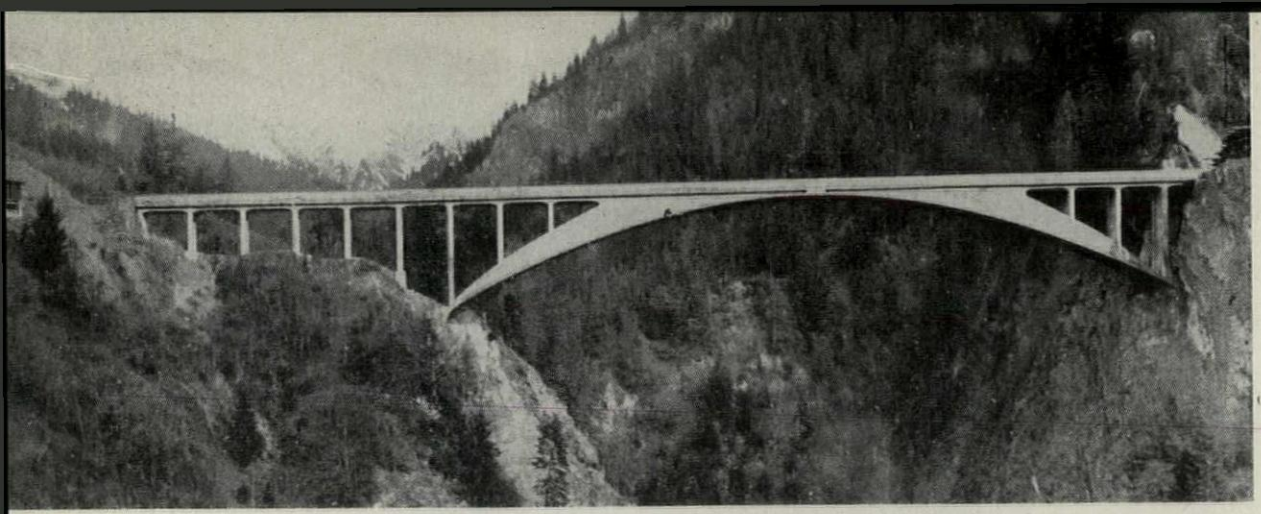
American scientists and research engineers have in the last decade made important discoveries in the field of reinforced concrete engineering. Reinforced concrete, originally a French discovery, which in its early stages was mastered by French and German constructors, has developed in its own way in the United States for several years. New, precise methods of designing have been introduced by Americans, particularly in the field of analysis of continuous frames, in which American methods have outstripped the European. The work of Professor Hardy Cross, an American, is one of the most important contributions to the science of mastering indeterminate continuous structures. But his methods, though known in Spain and parts of South America, are often ignored here.

I think reinforced concrete engineers are far ahead of architects. It is time for architects to catch up. . . .

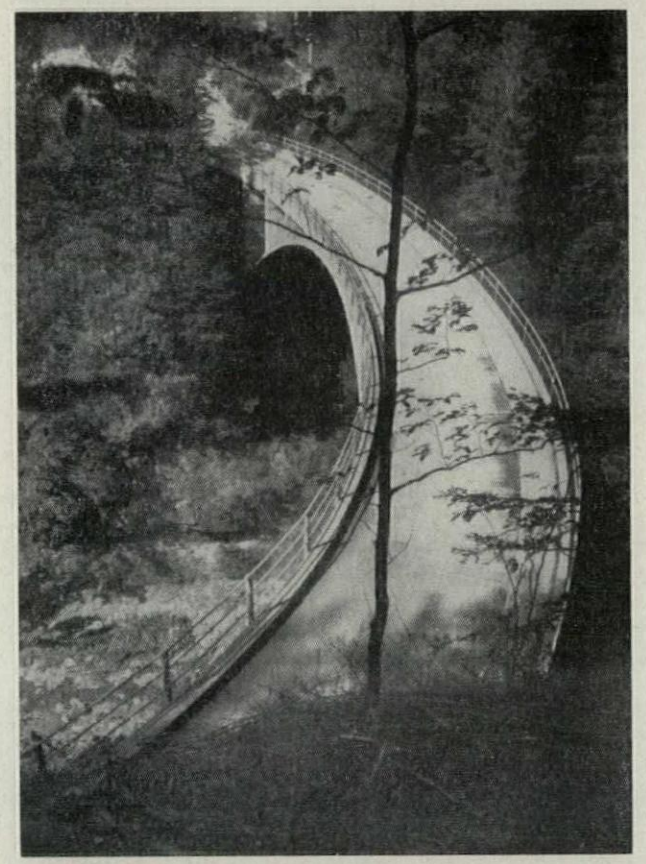
Roberts & Schaefer

Examples of recent barrel-vaulted, reinforced concrete shell construction (the "Z-D" system) in various war plants. Above, an airplane engine plant built in 1942; below, a rubber factory and warehouse. J. T. Canizaro was the architect of the rubber factory. Roberts & Schaefer Co. were designing and supervising engineers for all the buildings shown here.

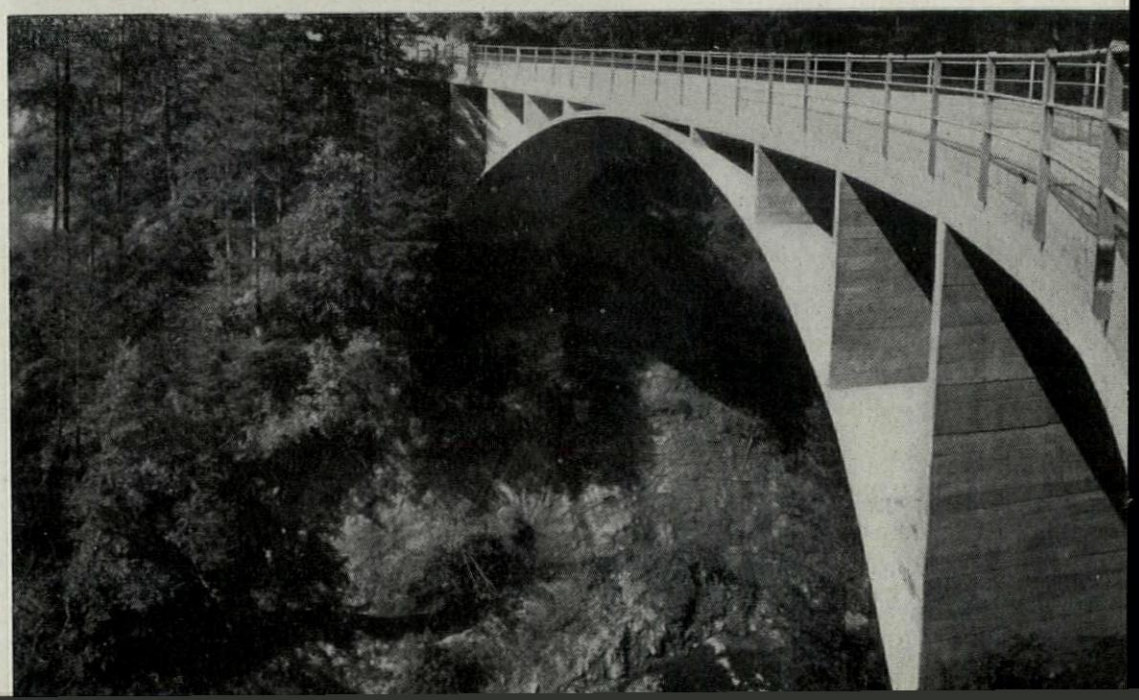




Photos from Circle



Two reinforced concrete bridges by Maillart, both in Switzerland: above, bridge over the Salgina-Tobel, built in 1929-30; here the evolution of his bridge design, into a system of flat and curved slabs wherein stresses are exactly counterbalanced, is becoming evident. In the bridge over the Schwandbach (at left and below) built in 1933, development has reached the stage which permits design of a curved bridge, necessary because of the highway location. Traffic travels directly on the horizontal membrane.



Discussions on Urbanism

This is the sixth installment of the reports on the discussions held by the Planning and Housing Division, School of Architecture, Columbia University. The final installment will be published later.

16 Wartime Tools for Postwar Urban Planning, by Charles S. Ascher, NHA Regional Representative, lecturer, author, member of planning, housing, administration, and citizens' organizations including NAHO, ASPO, Citizens Housing Council, N. Y. State Federation of Official Planning Boards, Etc.

(Continued from the July issue)

One of the experts whom *Fortune* had brought to Syracuse in expounding the full-employment economy preached by my good friend Alvin Hansen, had pointed out the importance of the expansion of social services in such an economy. I was asked to dine with several industrialists who were the leading spirits in the Council of Social Agencies, to spell out with them more specifically what a program of preventive-medicine could mean, of mental hygiene that would avoid maladjustments and do away with the tremendously expensive system of state institutions for the maladjusted, of recreation, libraries, adult education. These business men were enthusiastic about the possibilities of such a program, but it was clear that in this community of nearly 250,000 there was nobody who could translate it into either the needed physical facilities or staff. It was a drink of cool, fresh water to their thirsting lips to learn that the Urban Section of the NRPB was pulling together *national standards* for some of these social service. Given those as starting points, Syracuse could figure out for itself how to apply them locally. This episode illustrated to me vividly a reason why the development of urban programs will continue to call for collaboration between local and national agencies.

And the encouraging development of our war housing program is that in 150 or more communities there are war housing advisory committees backing up these local first-aid stations set up by NHA's Homes Use Service, that we call war housing centers. In one community in my region it took six weeks to organize this committee: I have been told that it is the first time in that community that *any* committee has been organized on which all groups are represented. A live-wire young liberal leader in that small, conservative community is making that committee learn to work together. The members have their self-interests: this builder urges more housing because he wants priorities; that manufacturer does not want too many workers brought into town to upset his pattern of cheap, contented labor. But when we put before them our proposals for war housing and ask their advice, they are prepared to arrive at a consensus—these interests wash out or else the people learn somehow to work together.

Maybe when the war is over that spirit will disappear. I like to believe that it won't. It won't because the pressures that have fused the community together, that have molded these crude wartime tools won't be relieved for a long time even when the heat of war is over. We shall have the pressures of re-absorbing the soldiers and war workers into a peacetime economy of full employment and a postwar world of decent homes in well planned communities. Perhaps these continued pressures will help us refine these tools.

11 Planning: Economic and Social Aspects, by Svend Riemer; Professor, Department of Sociology and Anthropology, Cornell University; formerly staff member of Department of Sociology, University of Washington; noted for study and housing surveys in Scandinavia.

In 1937 the Cooperative Building Society of Sweden (H.S.B.) had granted research funds to a small group of scholars connected with the Social Science Institute to investigate home life in Stockholm in order to suggest architectural improvements in functional design of the individual dwelling unit in the customary large tenement house. We found that no similar investigation had ever been undertaken.

Even today this entire field of observation, dealing with the functions of family life in order to improve its physical shelter, is being treated on a more or less pre-scientific level. The architect uses intuition. Education in this field is carried out on the basis of apprentice-master relationships. The young architect works in the office of an experienced designer and thus gradually absorbs some wisdom and skill. Only systematic investigations in this field will make it possible to bring this borderline subject into the regular curriculum of our schools of architecture.

In Sweden we asked for the cooperation of the family in filling our activity records for a period of eight days. Every member of the family gave a chronological account of his activities and indicated the rooms in which these activities had taken place. In addition, social workers discussed with tenants the whole range of relevant problems of home adjustment and provided us with a rough sketch of the furniture arrangement in these homes. These data proved useful in indicating family attitudes and specific frustrations due to misunderstandings of the intentions of the designing architect. We asked also for identification data referring to the type of family and the type of home involved. The study was based upon a random sample of the household lists of Stockholm city. We restricted ourselves, however, to families with children, and to dwelling units containing apartments up to four rooms only (this latter category covering 85 percent of all families in that city). Fifty percent of all families approached filled out activity records and were interviewed.

When I came to this country and discussed our investigation with interested architects and other experts I was often confronted with the embarrassingly level-headed question: "Exactly how does this teach us to build better houses?"

As a result of the Swedish investigation, we are able to point to a number of results of practical importance. There were striking differences in the housing facilities required by the white-collar group and the manual labor group. The desire for privacy was much less developed in the latter, but it was quite strong among the white-collar workers, where the nervous tension of occupational routine during the day made it desirable for the individual to be able to isolate himself to some extent during the evening. These white-collar families wanted privacy above all, and were willing to accept individual rooms of a minimum size in order to carry on separate leisure-time activities. Manual laborers were willing to sacrifice privacy for space. They were very sensitive to the small cubicles of the modern city apartment. Their social habits were different. The family usually gathered in the living room or the kitchen during the evening for leisure time and recreation.

This social differentiation was also reflected in their furniture arrangement. Labor families preferred a concentric arrangement of furniture around a large table, while a number of the white-collar employees separated their furniture in the living room in such a manner that each corner, so to speak, contained a special set of furniture to which the individual members of the family were able to withdraw.

In the labor group the whole family tends to cling together at all times of the day. The child of pre-school age stays with the mother and follows her during her housekeeping activities. When the gainfully employed members of the family come home they drift to the kitchen to chat with each other and to keep company with the housewife. Even after dinner they sit and chat in the kitchen rather than in the living room. This would indicate an extension of the kitchen rather than the living room wherever housing facilities are definitely aimed at a group of manual laborers. On the basis of these data it is possible to compute statistics about the percentage of time spent in either the kitchen or the living room, thus suggesting changes in the relative size of these individual rooms. The importance of the kitchen as a general living room decreases as the size of the apartment increases. But there are variations even within the same income level and the same type of apartment as we go from white-collar to manual laboring groups.

Such occupancy statistics may be used also to give tentative anwers to the question, "Does housing affect social maladjustment, crime, and juvenile delinquency?" We were able to show how the size of the apartment affected the leisure-time activities of the children. We computed the time which adolescent boys and girls spent inside and outside the home after five o'clock in the afternoon. We found that 50 percent more time was spent at home among children living in four-room apartments than among those living in two-room apartments. This indicates very clearly—and further investigation should amplify this statement—that crowding actually pushes the younger generation out of the home.

More important is the fact that we are able to form an opinion as to how it is possible for family life to adjust itself to the crowded conditions which are prevalent in Sweden without impairing morale, cleanliness, and mental hygiene.

If we were to transfer the crowded living conditions of the apartment houses of Stockholm to this country the consequence would undoubtedly be social as well as personal disorganization. In Sweden we visualize a minimum of social maladjustment. A contributing cause is probably to be seen in the rural traditions of that country where families became adjusted to staying, at least in winter time, in the one heated room of the house, the kitchen. They adjust themselves to a minimum of space at home and take advantage of the excellent equipment with which they are furnished in the modern apartment.

I have been trying lately to develop a questionnaire which will make it possible for the American architect to test the functional adequacy of the home he designs. One of the greatest difficulties in developing such a research instrument was the necessity of getting the opinions of the people involved without, however, relying entirely upon their judgment. Most people do not know what type of home they need. Gadgets, as well as the correction of the greatest handicap in the last home, are the dominating factors that determine the choice of a residence. The average housewife is not able to visualize the whole complexity of the problem of adjusting routine to a particular home.

In any sort of questionnaire you can scarcely avoid subjective and unreliable judgment. You have to be afraid of suggesting solutions. You may travel along the whole range of home facilities that may be provided and then you can finally ask, as some sociologists have done successfully: "Are you happy, average happy, or very happy?" You can correlate that with the whole set of identification data. That may seem clumsy but there have been excellent sociological investigations using as crude an instrument as that. But we wanted to avoid such general subjective judgments as long as possible. What else could we do?

I went through the whole range of home adjustment problems and formulated a series of questions asking for inconveniences that might have arisen in present homes. I did not trust the housewife to tell me whether she wanted more space here or there. I did not want an esthetic judgment but I did want to know whether, in connection with specific activities carried out in the home, there was sufficient space, sufficient privacy, and whether the equipment, as well as the design, was adequate. On such a basis it should be possible to evaluate what functions are handicapped by design and what particular items need reconsideration by the architect.

Some recent attempts to evaluate the functional adequacy of home designs have failed because the problem was approached on a relatively superficial level. Good theory here, we hope, is going to turn into good work in the long run. The greatest difficulty involved in such tests is the circumstance that there are two variables, both affecting the home adjustment of the family: the physical shelter based on the design, and the traditions and habits of the family, their ability to adjust to the physical shelter as it stands. It will never be possible to construct the "ideal" home for the family. It will be necessary for the architect to experiment indefinitely with a great variety of designs to meet different housing needs. It will be necessary to provide not only for needs as they are today, but even as they are going to be in thirty or fifty years, when social change will have affected family life in a more or less unpredictable manner.

Housing is an enterprise that involves compromise from the beginning to the end. The home planner starts out with a definite margin in the family budget and then proceeds to speculate on possible facilities which can be provided for with this margin as a rental basis. The question is not: "What does the family want?" The question is rather: "What does the family want to sacrifice in order to gain other advantages?"

An interesting article in the *Architectural Record* ("Housing From the Tenant's Viewpoint," Elizabeth Coit, April, 1942) is, in the final outcome, not too useful because the author missed this very point. She discussed, item by item, the living room, bathroom, dining room, bedroom, and complaints concerning them. Her recommendations are sound and profitable to the architect, but her conclusions are that you need a larger living room, a larger kitchen, a larger bathroom, etc.; in fact, an apartment or a home double the size that can be provided for the given rent. Several similar investigations fall short on exactly this point. They do not specify which type of family is able to accept certain disadvantages in order to have a larger living room, or a smaller living room in order to have a larger kitchen. In these investigations the problem is not formulated in those terms in which it offers itself to the architect.

On the basis of cost and technological calculations the architect can usually determine the total space which he can provide for the family. Then he will have to compromise with regard to interior design, placement of walls, partitions, etc. The family will have to compromise either privacy for the sake of space, or space for the sake of privacy. They cannot have both to the full extent of their needs. Only that investigation will be useful to him which gives a clear indication as to which disadvantages are acceptable for the sake of which advantages.

It is necessary also to decide upon the right compromise with regard to another alternative; namely, distance versus proximity in the arrangement of various units in the home design. The bathroom should not be too close to the bedroom because of noise interference, but it should not be too far either to avoid cumbersome traffic and transportation. The home design has to strike upon some sort of an optimum. Finally, there will have to be a compromise between providing either a relative maximum of total space or to invest more money in an efficient kitchen and home equipment (closets) in order to make even a home of limited size livable. In the modern metropolis with high land values and expensive steel constructions, the tendency is definitely in favor of equipment rather than space. This reflects existing cost relations and also the organization of our industries. Mechanical refrigerators, kitchen equipment, and similar items take advantage of industrial concentration and relatively cheap mass production. The same certainly cannot be said about residential construction as such.

Which needs should be accommodated and which can be relatively neglected? We can either accommodate the everyday life routine or a limited number of special occasions when the family invites a number of their friends for a nice dinner to be served in the living room. Should the latter be enlarged or should the size of the kitchen be increased? It is not always possible to do both. We cannot set up norms but we can find out by sociological investigation what different types of families actually prefer.

We should not have in mind the construction of the "ideal home" which can be published in some sort of manual for the architect. We should consider the problem much more realistically, being as complex as it really is. Home planning will have to be related to the process of home adjustment, which is dependent upon family attitudes as well as upon the qualities of the physical structure. The home for the middle classes and the lower income groups will never even approximate ideal conditions. The "houser" is really a social planner who will have to visualize the coordination of construction activities as well as an educational program that might be necessary in order to teach people how to take best possible advantage of a given building. This is particularly true where the architect considers the neighborhood as the adequate unit for the planning of residential housing rather than the individual home. If tenants do not take advantage of neighborhood facilities offered, the home planner may have missed the point due to lack of insight into their psychological and sociological make-up.

I think we should gradually get away from somewhat stereotyped attempts in recent literature to measure the effects of good and bad housing. I do not want to criticize the excellent pioneer work of F. Stuart Chapin in this field but it seems to me that we should strain ourselves in the future to make—as sociologists—contributions that are of more immediate practical usefulness to the architect. Chapin contributed to the development of methods for objective measurement in the housing field and is making further advances with this highly specialized problem. It is somewhat disconcerting, however, to glance through a research bulletin, *Social Aspects of Housing*, which USHA distributed two years ago. The main emphasis was again on the effects of housing and only that, visualizing widespread research activities in universities and other research institutes dealing with the effects of good and bad housing on social maladjustment, crime, juvenile delinquency, etc. This type of research may be of interest to the sociologist but it will never be specifically useful to the architect and the "houser"; the architect is interested in it only because it furnishes him with justification of slum-clearance and other housing activities. It provides good advertising material, but does not assist in the process of home planning.

I feel challenged to connect my research more closely to problems of home design as they appear in the architect's office. My home adjustment test has been distributed so far to a random sample of 300 middle-class families in Seattle and to 100 prospective tenants of a government housing project in that city. I am rechecking these latter cases with regard to their new homes in the project. Results are not available yet. But I cannot expect more from these investigations than very general indications as to the most prominent inconveniences and frustrations. I hope there will be an advance beyond previous research, inasmuch as it should be possible to indicate more specifically what items in design and equipment need correction most urgently.

The next step will be a concentration on more limited design problems. If it is necessary to provide a dining space that overlaps either with the kitchen or the living room, which is more desirable? The answer will not indicate one or the other as the ideal arrangement, but should indicate for which families one or the other arrangement is more suitable. In Seattle dwelling units in a housing project were designed in such a manner as to make it necessary to cross the living room in order to get into the kitchen. There have been complaints but we do not know as yet whether the architect did not make the right decision, as he tried to avoid great density of cross traffic at the entrance door. Different solutions of this specific problem will have to be tested after having been in use for some time.

Fortunately most architects interested in the housing field are rather good sociologists on an intuitive, pre-scientific level. But certain inadequacies in functional design occur again and again and can be weeded out only by further empirical studies which coordinate the viewpoint of the sociologist with that of the architect. I hope that the home planner of the future will recognize the possibilities of sociological assistance. A relatively unimportant investment in a sociological investigation which brings out the relative value of various home designs, conducted in the initial stages of home or neighborhood planning, may greatly increase the happiness and the morale of the future tenant.

13 New York City and Its Relation to the Postwar World, by John Bell Condliffe, Associate Director of Division of Economics and History, Carnegie Endowment for International Peace; Research Secretary for the Institute of Pacific Relations; associated with Economic Intelligence Service of the League of Nations; author of books on international trade and international relations.

The evolution of cities from east to west across Europe is clearly connected with the growth of commerce. One can trace the development of applied science—as it is related to transportation, communication, and equally to production—in the great cities which became the centers of new trade. The development of western Europe prior to the Industrial Revolution followed the growth of cities first in northern Italy and then over the passes, up the river valleys of southern Germany, and along the great routes of medieval trade, through France, to the Low Countries, and finally to the place where these routes branched, some going to England and some further north.

All of the cities of the Middle Ages followed the same pattern. They were compact, built primarily for defense, and were usually surrounded by a wall. What beauty there was in them was largely interior, its best expression being in the decorations and furnishings of the Guild Halls and other centers where craftsmen and traders met. Not until quite late in the history of western Europe, not until the early part of the 17th Century, did London outgrow the area of the old Roman London. All the developments, however, are of very similar pattern until the application of steam power to production and, at the same time, to means of communication, presented an entirely new problem to the

of communication, presented an entirely new problem to the people engaged in manufacture and trade. This period of great urban expansion is characteristic almost entirely of the last 150 years. In Europe, in 1930, there were more than ten times as many cities with a population of more than 100,000 than there were in 1830; and every city which had a population of 100,000 in 1830 had over a million in 1930. This rate of increase, a product of the Industrial Revolution, was progressing until the last two decades.

The basic reason for the great rise of these new manufacturing cities, particularly in England, was a change in the technique of industry and, therefore, in the location of factories. This was the period during which the balance of population in England shifted from the south to the north. Nearly everything had to be improvised in the industrial north where cities grew like Topsy; there was no planning. One sees the same kind of growth where urbanism is now even more developed. Not only in this country but in all new countries there has been more development of big cities in relation to population than in the older areas of settlement. One of the most industrialized and urbanized countries is Australia which, having only seven and a half million people, has two great cities of over a million population and four smaller cities with hundreds of thousands of people.

Industrial development in the East has come about in the same way. Centers of western trade, such as Bombay, Rangoon, Singapore, and Shanghai are all along the sea coast. Railroad lines lead to these ports so that traffic goes out to western European centers, and particularly to England. The map of Africa has a lace fringe around the edge where the railways are marked leading to the different ports. This 19th Century system is dead. We shall not again have trade of the type which developed these great coastal cities and which led to the type of city of which New York is a good example.

In 1880 there were no cities of 100,000 population in the United States. Gradually cities developed, and they all developed at breaks in transportation, first of all on the sea coast, then on lakes and rivers. After the great transcontinental railroad lines were built in the Seventies, every city that came within the range of a 100,000 population was a railway junction. Cities grew as a result of this new form of transportation. As long as the bulk of the trade consisted of shifting heavy goods by rail to concentrated centers of manufacture, the inevitable result was that the cities grew at the expense of the country population, and super-cities grew faster than great cities. The automobile has brought the development of satellite cities, and suburban areas around the great cities, with the consequent real estate values that have come to places like London and New York. One can see this development more easily in London than in New York because of the latter's position on the island of Manhattan. "Ribbon" building has developed along the roads leading out to a ring of suburban factories eight, ten, or fifteen miles from London. There is a certain decentralization, but it is not planned, and it has brought a development of a drab suburban life rather than country life.

Now we face the beginning of another development. The airplane is going to add its influence, though perhaps not as fast as some persons think, to that of the railroad and automobile. The automobile was added to the railway and a ring of satellite cities grew around a great city built by the railroad. The airplane will be added to the automobile and the railroad. It is difficult to foresee what this change in communication will mean but the railroad and the automobile will still be effective and probably dominant for some time.

Before taking up the effects of this change, however, I should like to go more specifically into some trends that seem to be apparent in the nature of international trade as it is influenced by developing means of communication. It seems probable that just as trucks and automobiles took away much passenger freight from the older means of transportation, and much of the valuable light freight, particularly for short hauls, so the airplane will have a selective influence on trade. We are now in the unhealthy position of having to use air transport for things not suitable to it. We use mica in order to build apparatus for warships and airplanes; so airplanes coming from India bring mica. It is wasteful for it is necessary to bring twelve pounds of mica for every pound that can be used. In the same way tin and tung oil were brought out from China by plane after the Burma Road was closed. In wartime, air transport is being used uneconomically for heavy and bulky commodities. This is not likely to continue in peace time because it is too expensive. But there is likely to be a residual of air transport which will be used to take commodities that have high value in small bulk, and to take passengers. I believe the British, in planning the rebuilding of Southhampton, are reckoning on the possibility that ocean liner traffic across the Atlantic will be greatly impeded by the competition of transatlantic air transport and are preparing facilities for the new form of transportation. Their cities when rebuilt will be oriented, at least to some extent, toward airports inland and ports for seaplanes. This is not a prophecy, but it does illustrate the possibilities in the situation. It is likely that in other cities, conveniently placed for transatlantic crossings, similar forces will be at work. Any new developments in the city of New York should try to anticipate the necessity of combining terminal facilities for air, rail, and sea in close proximity. It would not be surprising to find that Grand Central would lose custom as compared with a terminal facility near an airport with more spacious surroundings than La Guardia Field. On the west coast, San Francisco would appear to be more favorably situated than Los Angeles.

There has been in process for two or three decades a trend which will be greatly accelerated by war shifts of industrial development to those areas. The point may be illustrated by the attitude of Indian and Chinese leaders toward future economic development. A recent Indian statement was prefaced by saying that, to the Indians, everyone from the West is a European—whether British, Dutch, German, or American—representing those forces of the industrial west which came with trade and investment and built in India those great ports through which the trade and produce of the country flows, not to the domestic development of India, but to the markets of the world. "When you come and build cities, railroads, and factories," the report went on, "you use your own people, your own insurance companies, your own technicians, your own sailors, and the only use you make of our people is as laborers, and this we are determined to stop. We will not again accept investments on your terms. We will develop our own country for the development and training of the technical capacities of our own people and for the raising of our standard of living. We may do it badly, but we are going to see that we have our own architects and scientists, so that industry shall be a means not only of livelihood but also of intellectual and social training for our people." Chinese, Filipinos, and representatives from other Asiatic countries sat by listening to this statement in smiling agreement. Such a statement is a natural development of the democratic influence which entered these countries. We are apt to forget that when the British prescribed a system of education for the Indians, Macaulay prescribed, among other textbooks in English literature, Milton's *Areopagitica,* the defense of liberty against tyrants. The Indians have learned the text very well. The more they learn it and put it into practice the better it will be for their own country and for the future of the English people. There will be in the future self-directed and interior development such as has been taking place in Soviet Russia where the great centers of industry have grown up, not at ports, but in the interior where the resources are. We shall not again in our time see Shanghai as im-

portant as it used to be. We shall see, on the other hand, the development of Hankow and other interior ports.

This shift of attitude and actual industrial development, which goes on in Latin America as well as in the Far East, means that there is a pull of population from the North Atlantic to other oceans. Just after the last war the Economic Intelligence Service of the League of Nations stated that the world's trade was passing from the Atlantic to the Pacific. That must mean a shift of population and industrial development such as is now taking place in California and the southern states, and a dispersal of industry away from the industrial East. After all there are some of the materials of modern industry here, but those materials can be found in other parts of the country. Materials are not the only basis for the location of industry.

The development of new products is also important. One recent development is the production of light metals, which means relatively less demand for steel and other bulky construction materials for machines and houses. These are paralleled by plastics of various kinds and by new textile products.

The location of industry is determined largely by the optimum point at which transport costs can be minimized. If the materials are lighter the transport costs become less important factors in the equation that determines the location of industry. It is much easier to bring aluminum or magnesium for assembly and working to California and it is easier to erect light metal industries there than it is to bring coal from Utah or iron ore from the Lake Superior region. They are building steel mills in California but that industry is probably less economic than the development of the light metal and light textile industry. As the development of scientific research brings us these light materials there is likely to be a considerable shift in the locating of industry toward the potential markets or nearer the sources of power, be they coal, petroleum, or electricity.

Industry has taken a different form. The cities of the 19th Century grew up to house plants (they could still be seen in England just before the war) which were very small in size and completely self-contained. In New Zealand, for example, which is not an industrialized country, the scale of butter production is very big. This is why New Zealand soldiers were surprised to see the scale of agriculture in England. They were used to flocks of 150,000 sheep. It was a shock to them to see the small flocks in England, where the sheep were sheared by hand, when they had seen them sheared by machinery, several hundred a day. In many of the towns of the industrial north factories bearing trade names for cloth that are well known were very small. One factory, in operation till quite recently, had its power supplied by an engine installed over a hundred years ago. That is the kind of factory around which the industrial cities of the 19th Century grew. But our modern factories have come to depend more and more upon scientific research done in great laboratories and they have come to constitute a unit which makes it worth while to put the factories and the residences for the working people out in the country areas.

It is doubtful whether we can restore the kind of trade that depended only on private enterprise. The increasing degree of government intervention contributes to the already marked growth of capital cities. If we are forced into a system of trade in which government officials conduct marketing negotiations, there won't be such need for great mercantile houses in a city like New York. If the financing goes to the government it will import, export, and do the banking instead of private investment houses, and Wall Street will be bluer still. Any trend toward an increasing measure of government control will strike a blow at great commercial cities.

From the economic point of view, cities grow at breaks in transportation, at the water's edge, or at a change in the management of a railroad system. Sometimes the mere manipulation of railroad rates has been important. One factor in the development of America has been that natural line of division between the states, the Mississippi River. The railroad goes to the edge and then another road takes over and where there is a break one will find a large town. What I am suggesting about New York in this connection is that the change in the nature of transportation, which may be gradual but continuous, together with the trend toward air traffic, may locate the break of transportation at new points. The quickest way of getting to the Far East may be over the North Pole to Siberia. The quickest way to London may mean the development of terminal facilities for Europe north of New York. The quickest route to Russia and the Far East may involve the development of a great Alaskan port, which will take away some of the trade. If the silk trade should recover, a large part of it may come across by air express instead of by express ships, and if it does, may not come to Seattle but to Fairbanks and from there to the centers of manufacturing. That center may not be Paterson, New Jersey. The result of this change in transportation may be not so much a direct decline of New York as a decline of the ring of industrial towns around New York.

The second group of city services is commercial and financial. A great part of the money-earning activity of the city consists in these services. The heart of any great commercial city consists of the banking and insurance houses, the stock exchange, the markets. These go with commercial services. London could not have operated as a financial clearing city if cheek by jowl with the banks there were not the metal exchange, the cotton exchange, the wool exchange, and other commodity markets. The services rendered in connection with the turnover of trade and the financing of trade and investment are important to a city.

Heavy manufacturing grows near a port or near a break in transportation. But if the importance of heavy manufacturing diminishes this may diminish the importance of manufacturing locations near traffic centers. It may be easier to produce airplanes in Wichita, Kansas.

Finally, there are the supplementary manufactures which grow out of city services. When any great change occurs in the economic circumstances, this fringe of dependent, secondary occupation is apt to go through a long period of travail. The best illustration of this is what Hammond called "the long tragedy of the hand-loom weavers" who were finally forced out by the efficiency of the new manufacturing methods. In his most challenging book, *The Clash of Progress and Security,* Professor A. G. B. Fisher puts forward the thesis that scientific production leads away from dependence upon primitive agriculture and simple manufactures to secondary and tertiary industries. As the national income increases a greater proportion of the population is engaged in the provision of services for the rest of the population. This has a great deal to do with the kind of housing one wants to provide for people in great cities. The development may be illustrated by contrast. Not only in China and India, but in Bulgaria and other parts of Eastern Europe, 80 percent of the population is on the land. It takes the continuous work of four people in every five to produce the goods necessary for five people. In New Zealand or Australia where there is a great export surplus of agricultural products, about one in every five or six persons is engaged directly in agricultural production. That gives a margin of four people out of every five, either for manufacturing or for secondary and tertiary services. Incidentally, it is one reason why New Zealand exports so many of its people.

Perhaps in the course of the next half century we shall see a development of the process that Charles Kingsley foreshadowed a century ago when he said, commenting upon the evils of urban development, that what we need is neither city life nor country life, but an interpenetration of the two so that we shall have an urban countryside in the sense that there will be a great area in which we have the facilities for transportation and the modern conveniences of living combined with rural amenities.

Discussions on Urbanism

14 Urban Redevelopment, by Carl S. Stern, Lawyer; Counsel for Long Island State Park Commission, State Board of Housing; Board of Directors, Citizen's Housing Council; Member Committee on Slum Clearance; Chairman of legislative subcommittee drafting New York Housing Authority Act.

Up to the present, American cities have not been bombed, nor have we had to apply the torch to any of our buildings. War's destruction, however, is no substitute for slum clearance; the enemy is usually not obliging enough to bomb blighted areas, nor would much military advantage be gained by burning down South Harlem. The report to the British Parliament of the committee headed by Mr. Justice Uthwatt concludes that reconstructing blighted areas "is as important as the rebuilding of war-devastated areas and in our view the tasks cannot be treated as separate and distinct, but should be regarded as different parts of a single problem."

In this country we, fortunately, have no civilian casualties and no precious structures to rebuild as a result of war damage. The problem with us is whether we have the intelligence, imagination and, above all, the will to devote resources that will not have to be devoted to repairing war's devastation to the cure of a disease which, though not acute and not dramatized by bombing, is becoming progressively more deadly.

I shall not attempt to discuss symptoms of the disease that has blighted American cities. They are well summarized in the *Handbook on Urban Rehabilitation* published by the Federal Housing Administration. But we may observe that as a result of the lack of planning administered in the public interest, we have, after expending vast sums of money, succeeded only in producing cities that are financially embarrassed, and large parts of which are unattractive to live in; that urban real estate —the investment in which forms a substantial part of the portfolios of savings banks, insurance companies, and trust companies—is valued for tax purposes, in many cities, at figures which cannot be economically supported, and which interfere with a reasonable development of land. Rapid transit, paid for by taxpayers, has drawn people from the centers of cities to more comfortable living conditions in suburbs.

Herbert Nelson, Vice President of the National Association of Real Estate Boards, said recently: "High buildings struck this country like a new fashion and sprang up as an expression of the engineering achievement of our civilization. The tragic truth, however, is that they do not pay. You may be surprised to know that there are only about 500 buildings in the United States of 20 stories or more in height, and these 500 buildings make a story of complete financial disaster."

Most informed persons admit the existence of the disease. Most of them think something must be done about it. Most, I think, are in accord that whatever is done must be done on a large scale, that patchwork will no longer serve. Many realize that limits must be imposed on the optimism and irresponsibility of the builder and the realtor. There are, however, differences of opinion as to how to go about it, and basic is the question of what controls must be exercised in the public interest for carrying out the plan, and for operating the structures once they are built. Redevelopment of American cities calls for their modification, so that they will become better and more comfortable places in which to live and work. It should involve a reasonable and practicable fiscal program—one that will harmonize, as far as possible, the interests of citizens, taxpayers, owners, businessmen, and investors.

American cities are not the only American institutions that have not worked perfectly. In recent years the public has found it necessary to step in and reorganize railroads, public utilities, and public financing generally. Techniques that have been applied in reorganizing public service enterprises may be useful here, for though in many ways the problems are simpler, they are not unlike those that face cities.

In railroads, public utilities, and financing, optimism and inefficiency, and sometimes selfishness and irresponsibility, resulted in over-capitalization. Price tags on securities were frequently meaningless. The concerns that were financed could not make a return to investors upon the capitalization basis that had resulted, in part at least, from lack of supervision in the public interest. The reorganizations that followed were largely concerned with readjustment of the financial set-up but not wholly. Thus, in the case of the reorganization of two bankrupt railroads, where the plan called for the lease of the property of one to the other, the railroads resisted the provision of the plan requiring them to take care of employees likely to be displaced, and to make provisions for covering the moving expenses of those who had to take new positions and move to new locations. They argued that employees were not part of the public whose interest was to be promoted by the plan. But the United States Supreme Court in construing the power of the Interstate Commerce Commission to see that the plan promoted the public interest, held that it was proper for the Commission to require provisions for the protection of displaced employees.

Nowadays in reorganizations the techniques of controls run to a pattern. A plan is required to be fair, to be feasible, and to contain provisions for carrying out its terms.

Translating such experience to the question of urban redevelopment: a plan to be fair should harmonize interests of inhabitants, businessmen, owners, taxpayers and investors; the plan to be feasible must provide means for obtaining funds to carry out its provisions.

About this question of controls there is a widespread difference of opinion. This was illustrated recently by public discussion concerning the propriety of the Hampton-Mitchell Amendment to a bill passed in 1942 providing for the creation of so-called Redevelopment Companies. The amendment was designed to induce insurance company money to come into the redevelopment field. To do this it eliminated some of the safeguards in the original bill. The president of the Regional Plan Association of New York strongly supported the amendment and warned that an opportunity might be missed by disputing minor details. The distinguished former Commissioner of Housing thought that substantial controls in the public interest, which he believed would be eliminated by the amendment, were not "minor details." The Citizens' Housing Council of New York took the same view. Mayor LaGuardia dismissed all objections with a wave of his hand. Governor Dewey approved the amendment, saying, "The immediate practical problem is housing or no housing. The answer is in favor of housing."

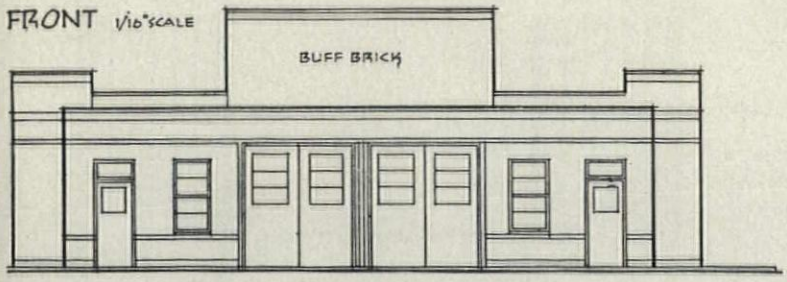
Underlying the differences in point of view is the deep-rooted American disinclination to interfere with private initiative. And, since most of us feel that everything must be left to private initiative that will not demonstrably hurt the community and business generally, it is well to face squarely the nature of the problem as it affects urban redevelopment.

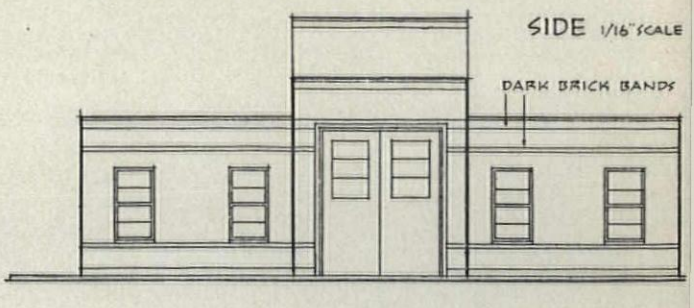
We must realize that, in the past, development of land has been treated largely as a private matter. Recent happenings have, however, somewhat distorted our notions of what is entitled to be called "private." Parkchester has over 40,000 inhabitants. There are 3,668 cities in the United States with a population in

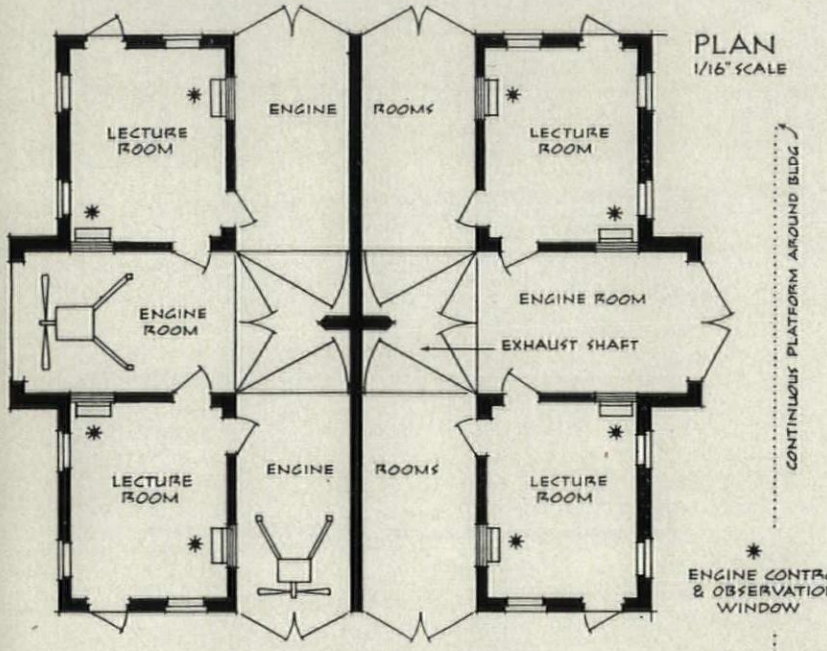
Continued on page 100

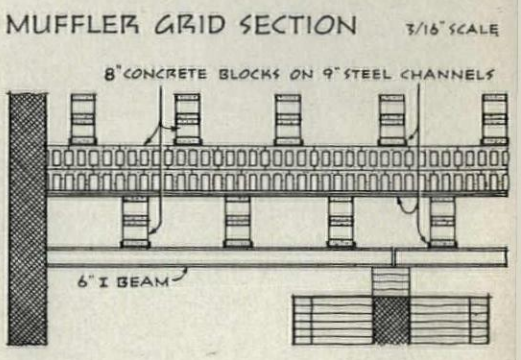
Airplane Engine Test House—1

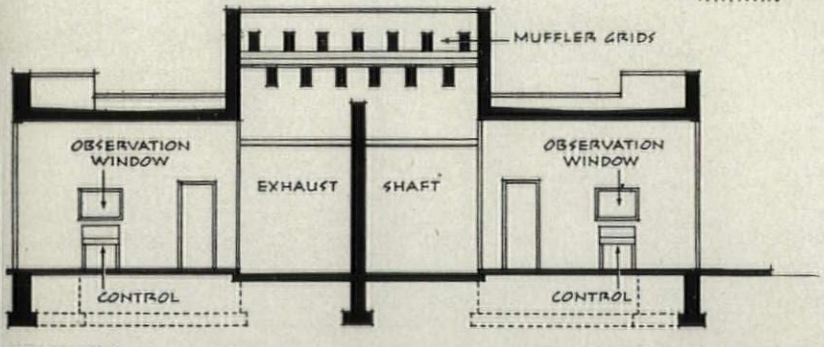
Design for an economical and efficient test house for airplane engines, developed by aeronautical engineer Lee Warrender, with architect John di Martino collaborating, for use at a well-known school of aeronautics. Arrangements of baffles have been found effective in reducing noise so as not to interfere with nearby instruction activities. Simplicity and adequate strength of lightweight shaft doors is noteworthy. Built at a fraction of the cost of the more elaborate test houses commonly in use, this example has stood up perfectly under constant use for several years.



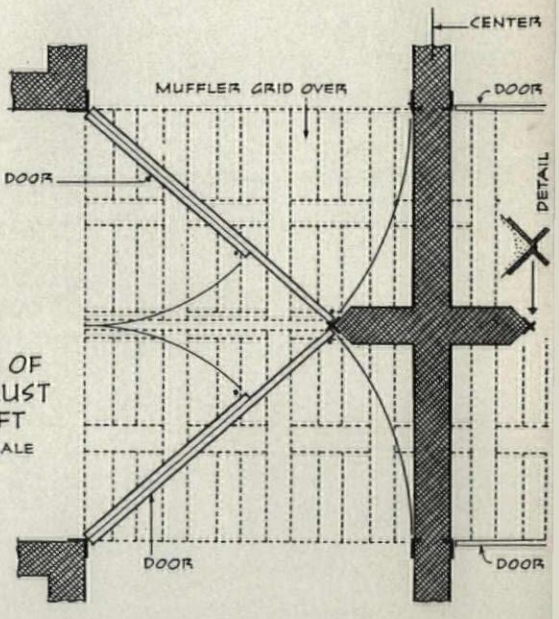






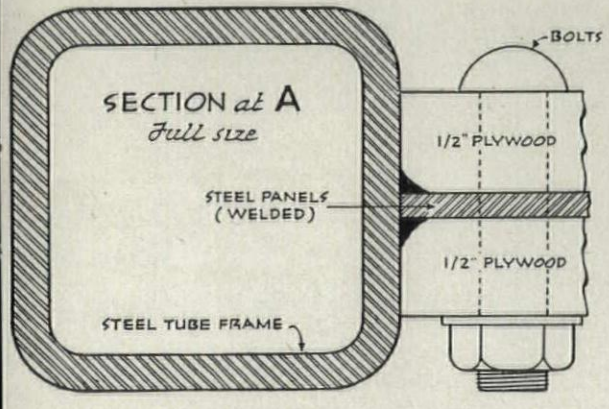


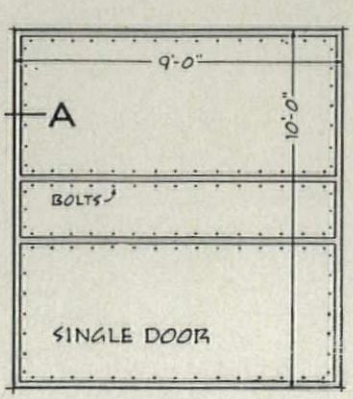
SECTION 1/16"SCALE

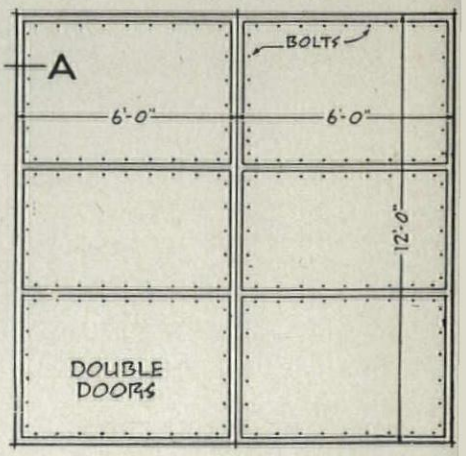


PLAN OF EXHAUST SHAFT 3/16" SCALE

DETAILS of SHAFT DOORS

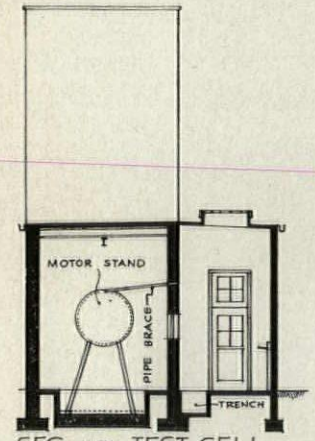




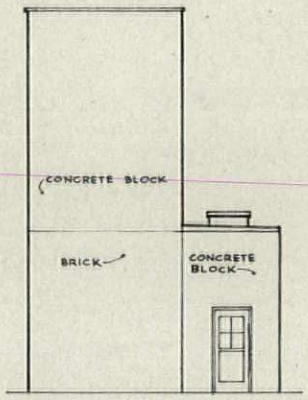


Airplane Engine Test House-2

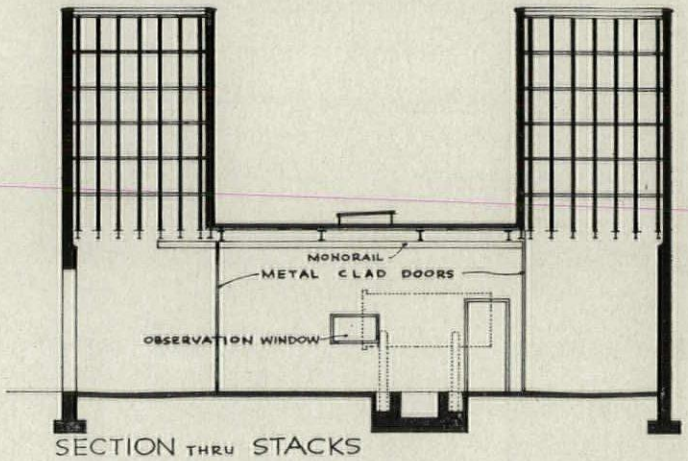
Similar to the test house shown on the preceding page, but designed for a single motor, this unit was developed by Wright Aeronautical Corp. for use at one of their plants. Note height of intake and exhaust stacks, and differences (from preceding example) in acoustic treatment. This unit has served as a model for recent test houses.



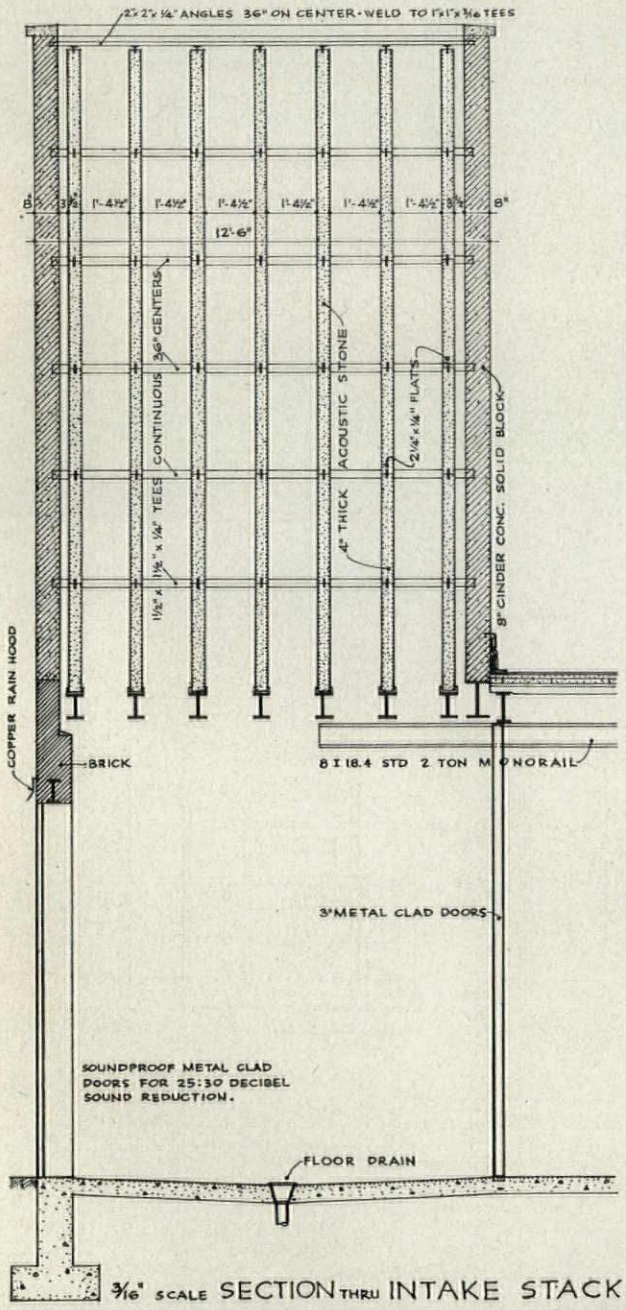
SEC. THRU TEST CELL



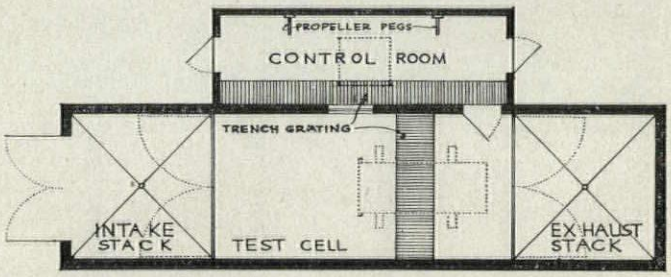
ELEVATION OF SIDE



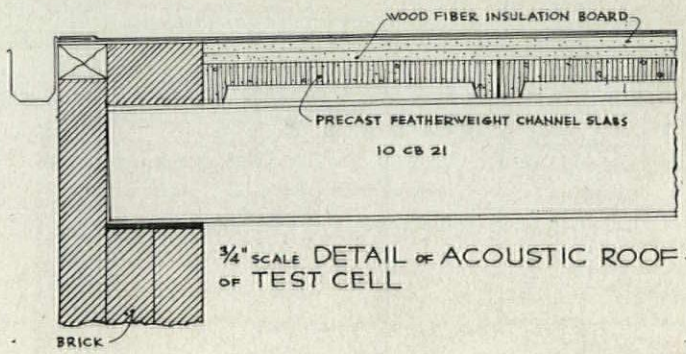
SECTION THRU STACKS



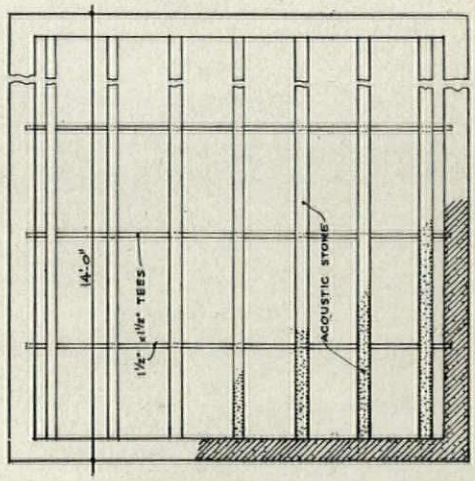
3/16" SCALE SECTION THRU INTAKE STACK



1/16" SCALE PLAN



¾" SCALE DETAIL OF ACOUSTIC ROOF OF TEST CELL

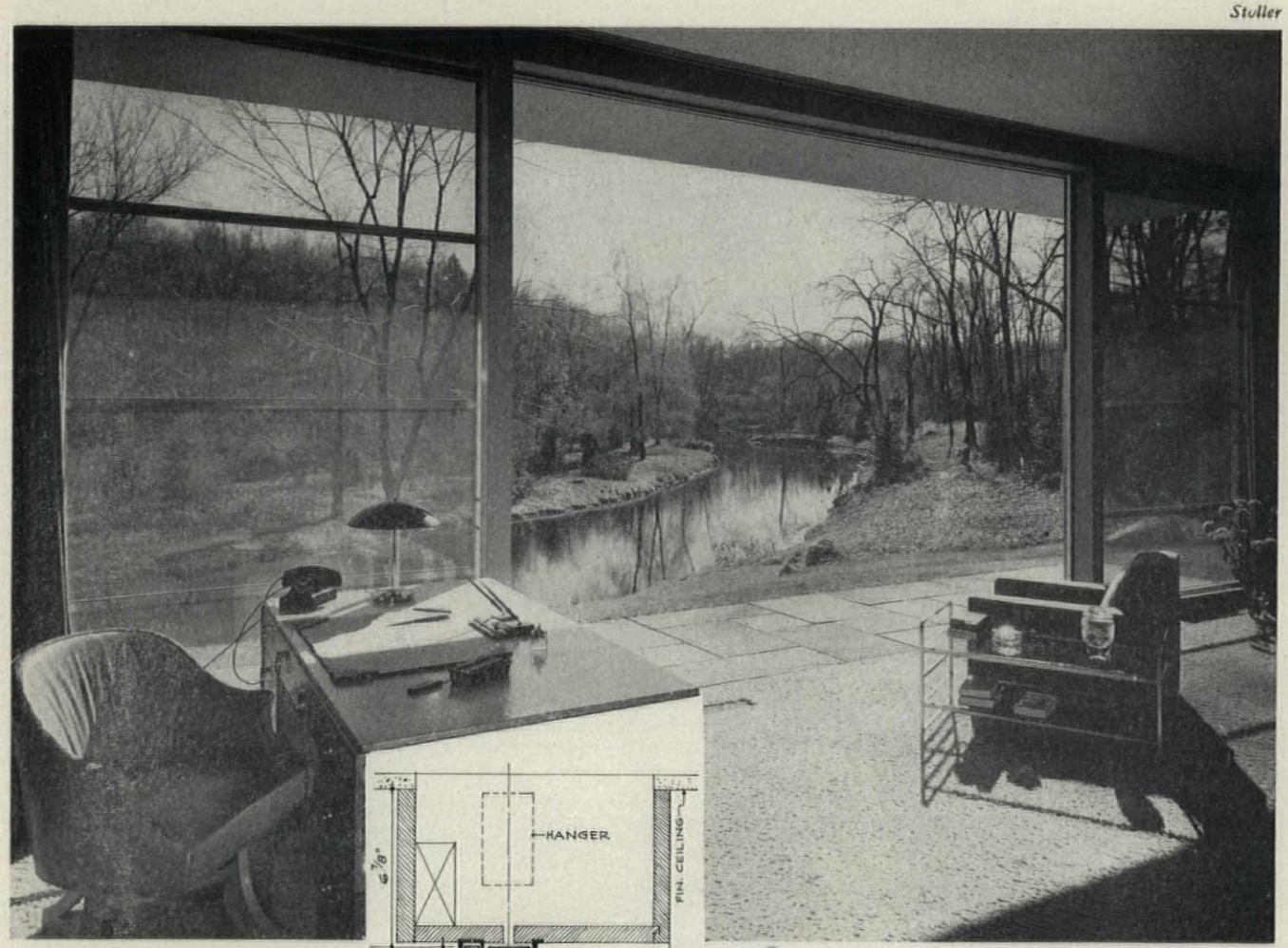


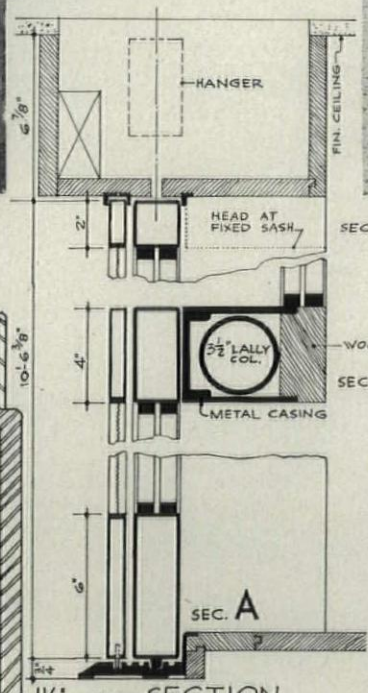
3/16" SCALE PLAN THRU STACK WALLS

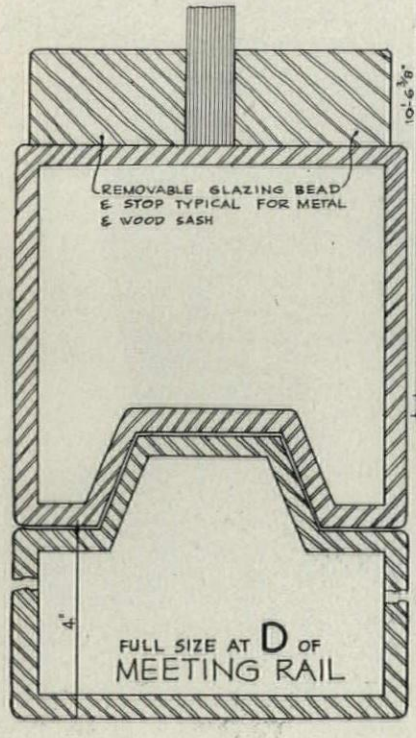
Glass Wall—Edward D. Stone, Architect

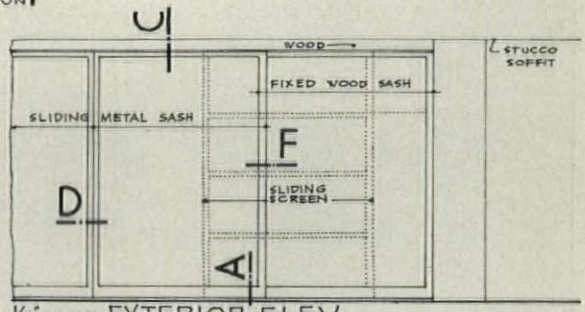
Developed for the library in the residence of Frank Altschul in Stamford, Conn., this window-wall permits an excellent view to become part of the room. The library has an oak plank floor and oak shelving. Note that the strong horizontals visible in the photograph are screen muntins. The glass is continuous, floor to ceiling.

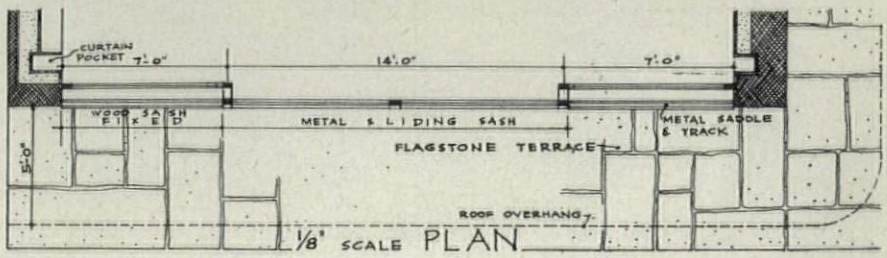
Stoller





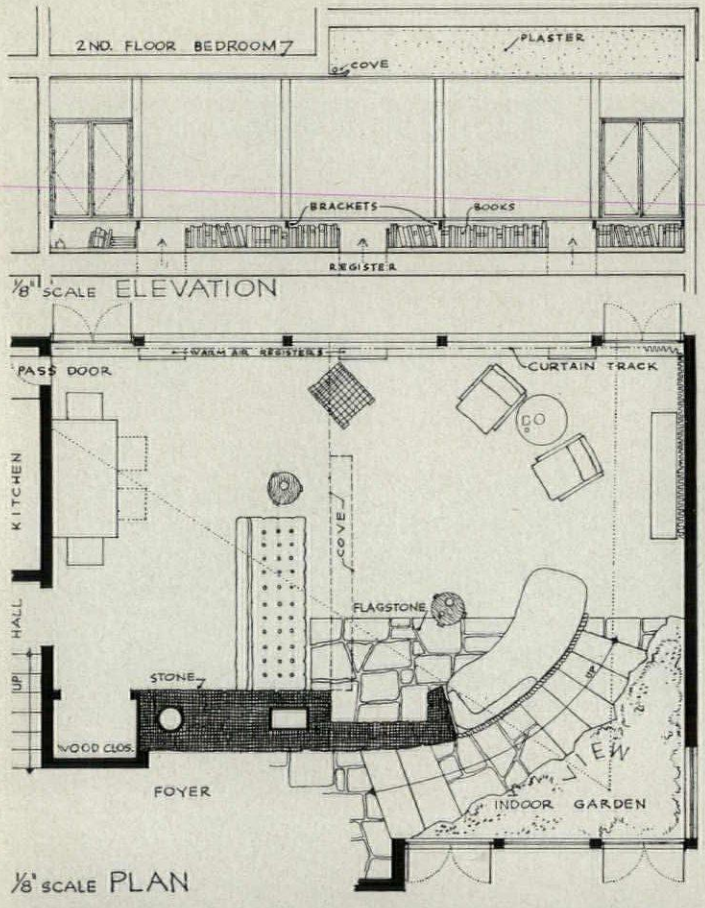


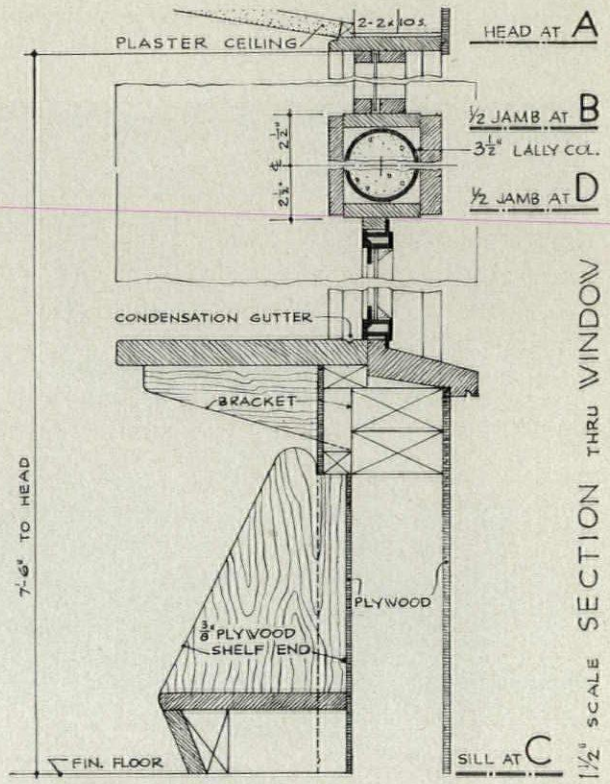


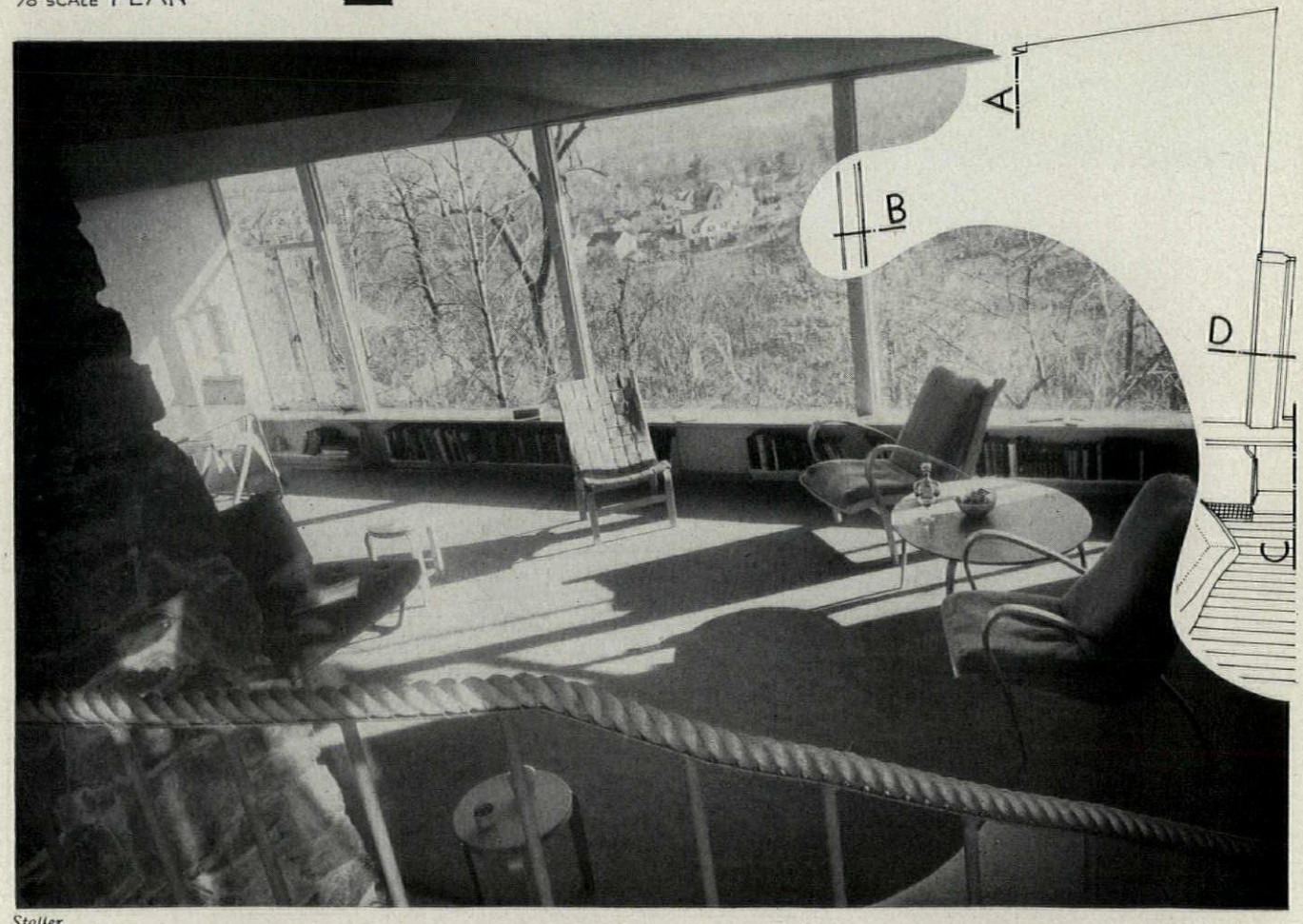


Glass Wall—Carl Koch, Architect

This house, designed by the architect for his own use, sits on a steep rocky slope. The outcropping ledge is incorporated into the room, as the plan shows; and the window-wall, though at first floor level, is well above grade, with a full story below it.







Stoller