A COMPARISON AND ANALYSIS BETWEEN FRANK LLOYD WRIGHT AND LE CORBUSIER IN CITY PLANNING

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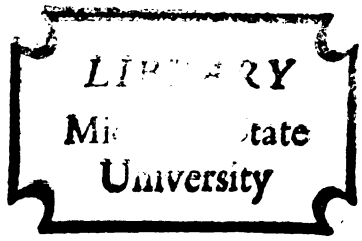

A COMPARISON AND ANALYSIS BETWEEN FRANK LLOYD WRIGHT AND LE CORBUSIER IN CITY PLANNING

by

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ABSTRACT

A COMPARISON AND ANALYSIS BETWEEN FRANK LLOYD WRIGHT AND LE CORBUSIER IN CITY PLANNING

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City planning requires a constant reevaluation of past plans and situations with insight into future problems and the possibilities of present and future living problems.

In this paper, I will compare Frank Lloyd Wright's and Le Corbusier's city planning in relationship to tomorrow's architectural and city problems. Each architect represents a different solution to the basic problems of the city. Wright is a nineteenth century Romanticist living in the twentiety century. Le Corbusier is a twentieth century classicist. Both forces and philosophies have strong movements in today's world. Both architects have written much on their solutions. The relationship of each to architecture and city planning has been well documented and analyzed through their own literary efforts and lectures, and by the critics of the time. Although comparisons have been made between Frank Lloyd Wright and Le Corbusier in architecture, no comparison or analyses of their city planning in relationship to today's city environment have been made. This matter is a pressing one for art history and for today's city planning.

In order to understand fully the area with which we are working, it is necessary that we have an understanding of today's city, its problems and needs, and where it is heading. The first chapter of this paper covers this area.

I also find it necessary to review the backgrounds of each architect, that we are better able to know and understand each architect's sources, philosophy and resulting aims and solutions in relationship to tomorrow's world.

Needless to say, their architectural type is the result of their work. For the purposes of this paper, I do not find it necessary to review all their architectural styles, but the one on which, in all probability, they would base a completed city plan of today. Both architects base their city plan on housing and its relationship to life. Each architect has completed both individual and multiple housing units. Due to their differing environments, each based his city plan on a different housing type. Wright's housing type was for the individual family; his city was based on the Usonian house. Le Corbusier's primary housing type was a skyscraper which housed great densities; his city was based on his Unite d'Habitation. Chapters II and III of this paper cover the individual backgrounds and housing units of each architect.

Because of the different housing types used by each architect, their city plans are completely different and

opposite. Wright's city plan is based on decentralization. Le Corbusier's plan is based on centralization. Through the process of analyzation of Frank Lloyd Wright's "Broadacre City" and Le Corbusier's "Radient City," in conjunction with the statistics on today's city and its tendencies, Wright's city planning is a utopian dream which can never become a reality; Le Corbusier's city, on the other hand, solves the majority of today's and tomorrow's city. Le Corbusier's city planning should be studied and applied in today's city planning; Le Corbusier is a forerunner in city planning.

CHAPTER I

CITY PROBLEMS

We must know the city of today to be able to judge the city planning of Frank Lloyd Wright and Le Corbusier realistically. The good city-planner works with more factors than the architect. He works with the tools of every profession. He must know the data on population growth, pollution, transportation, shelter, business and recreation intimately. He must know people. He must be able to understand the physical and mental needs of all types of people. His work must be geared to the total realism of living and all that affects it.

It is the city's nature to be cosmopolitan; it originated as the ceremonial, administrative, mercantile, and cultural center of vast areas. It should give man more than he could have behind a plow or in isolation. It is a foundation of cultural diversity, opportunity and intellectual stimulation. Most of all, the city is for people. It is many different types of people, each having wants, needs and abilities. The crowds, bright lights, the tension of the market place and the intensity of city life with its luxury and vice are only the big big show of the large centers; it is not their reality.

The everyday backbone of the city is living within it. Cities have to provide for daily family and individual life. Esthetics are a must for the mental needs of the city's inhabitants. Cities can be fantastic centers of opportunity for all ages and types or they can be horribly inhuman.

Today's city is unplanned. It is the summation of the haphazard, antagonistic whims of many self-centered, ill-advised individuals. Today's city is chaotic and is vulgar and cheap in appearance. Little pride, dignity or character is preserved. Its inhabitants desire to escape it at any cost.

The major facets of post-World-War.II city development were the continuing flight from the rural areas and the flight from the city's decaying center. In 1920, city people came to be the majority of America's population. Today, two-thirds of America lives in the metropolitan areas.[1] Practically all metropolitan growth is in the suburbs. The inner city is growing at the low rate of one percent.[2] This sets up the three developmental trends in today's city: vertical (as seen in Manhattan), horizontal (as seen in Los Angeles), and a combination of the two (as seen in the greater New York City area).

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1. THE NEW YORK TIMES ENCYLOPEDIC ALMANAC, 1970, p. 207.
2. Ibid., p. 207.

New York City is made up of five boroughs: Manhattan, Queens, Brooklyn, Staten Island, and the Bronx. It has a population of 11,575,000 in its 320 square-mile area. It has one of the greatest densities of any city in the world with 24,922 people per square mile. The center, Manhattan, is made up of a skyscraper next to skyscraper system. Its skyscrapers reach unbelievable heights; the Empire State Building is 102 stories high. The New York City region stretches beyond the city proper, encompassing not only the tallest skyscraper, but also the smallest white frame house with a picket fence. In fact, to look at the city from the air, it appears to reach as far north as Boston and as far south as Washington. The green spaces between these individual cities are quickly disappearing, leaving only a city-joining-city complex.

NEW YORK CITY

When flying to New York City, one's first view is exhilarating. It is the view of a giant megalopolis spreading miles in all directions. Skyscrapers jut from the landscape like proud twentieth century gods. Highways, filled with life, criss-cross the scene with exciting movement, a show of the twentieth century's progress. The port is filled with ships of all varieties, having purposes ranging from international trade and sightseeing to Sunday afternoon cruises.

In the very center lies Manhattan, the mother city, an island which is tied to its children by an ever-so-complex system of bridges, tunnels, and super highways. Manhattan is the center -- the center of trade, finance, business, literature and culture not only for New York, but for the nation and the world. In this huge center people live, work, dream, play and suffer; all nationalities, races, mixtures and classes are represented.

You land at La Gaurdia, departing for Manhattan. Everyone is so impersonal. Each is moving in his own direction, his own course; everyone grabs for himself and his own. You flag a taxi and begin to drive into "the city."

Now you meet the city as a person, as an individual within its complex, not as the "safe" observer. Cars move in and out. Horns blast in your ear. The pace is swift, moving and challenging. Your course quickly has you moving from one expressway to another. You must be alert, on top of the situation, not to end up in left field or demolished in the process. You relax, remembering it is the driver's responsibility. You again look at the city. This time from the ground, from human scale. It is beautiful, uplifting and exciting. Somehow these giants, these "gods" of our era, the skyscrapers, keep saying "We will overcome; we will succeed to a better way of living." Everywhere you look, you see the truth in man's ability to change, to make better and to stand strong and proud.

You are in the city. The traffic slows to an almost crawling pace. People are everywhere, constantly moving. You are still looking upward, at the style and height of the buildings which block the sun's rays from the city below. The narrow streets are in shadow. They are packed with traffic, both auto and pedestrian. They are filled with constant, rapid movement. You see people walking, to, who knows where. They are silent, contemplative, talking, laughing and depressed. You see people -- all shapes, all nationalities, all races, all incomes, living, moving and reacting in and to the city and to each other.

You now see the buildings close up. They are dirty, filthy. Only the windows are clean and shiny; a grey layer covers all. Yet, the people, constantly the people, move into and through these streets.

A light, you stop momentarily at beautiful and proud Park Avenue. You see sun, light, flowers and trees. The buildings are impressive, the people proud. Somehow this is the break you needed. The people and the traffic are still moving, but there is a sense of majesty, a sense of calm and inner strength to this street. The street and sidewalks are wider. It is a boulevard with a large planting area in the center. It is clean, as if the people respect it in a way they can't respect any other city street. The tall buildings are set back from the wide sidewalk. You once again look up at the sky.

You are off again, this time for Broadway and the hotel. Again, you see more narrow, dark, dirty, littered streets, more masses of pushing, moving people, more horns blasting away, echoing in these man-made canyons. The cab turns, you're on Broadway, Time Square, the tourist center of New York. Sunlight again shines on the city streets, but this time it shows filth and "crummy" theaters and shops. All is in disrepair. Broadway at this point is wide like Park Avenue, but its buildings are next to the six-foot sidewalk, which in turn abuts the crowded street. Here, the sidewalks are packed with people, shoulder to shoulder, pushing, shoving to stay on their feet, trying to reach their destination. The buildings are not the soaring, block-large skyscrapers of Park Avenue. Instead, they take up twenty feet next to the teeming sidewalk and rise to a mere five or six stories. They present no uniformity, no design and no beauty. The windows are full of junk, crammed full. Sale signs of poor taste and posters are pasted everywhere. Barkers yell out trying to drag the tourist into their shops or shows. A one-legged begger sits in the middle of this, extending his cup to all who pass by. The only possible comparison to this street is the county fair's midway. It is dirty, filty and ugly in daylight. Yet, at night it presents a fairytale glamour through neon lights and swiftly moving cabs.

You arrive at your hotel, on 50th and 7th, a step from Time Square. You tip the cabbie, grab a bell boy and go up to your room on the twentieth floor. You now have time to think, to absorb what you have seen. You relax, but you want to see the city from here. You go to your window. This is not the most beautiful view in the world, but perhaps one of the ugliest. Here, you see not only the greatness and possibilities of the city, but its horrid waste, bad planning, too small streets and sidewalks, buildings which are too small in square space area occupying too much ground space. You see ugly, useless rooftops having their own peculiar garbage. You gaze out over the skyline, to the harbor and you view man's greatest inhumanity to man -- pollution. Rising from the city hovers a huge grey cloud. The people are inhaling this stuff. It is eating up and dirtying the buildings, parks, and monuments.

You turn from the window thinking of this beautiful, exciting and horrid city. You shower, change and head for a bite to eat. Luckily, the hotel has a good restaurant. The atmosphere is reflective. A piano quietly sings its song of the city and its people. One forgets the business outside. After quiet talk, dinner is over. It is time to pick up the theater tickets.

You walk toward Broadway, pushing yourself through people. In this mass, you don't see the filth unless you trip over it. Everything is screaming at you: the barkers, the cabbies, the signs, the honky-tonks. You push forward. Even in this, there exists a strange kind of beauty, an excitement all its own. You reach the theater, pick up your tickets and enter. You watch the people enter, people of all varieties and types. The curtain goes up. The show begins. Only in the city can you get this type of entertainment every day. That is, if you want it and can afford it.

The next day begins with a tour to see a part of the city. You see people doing and reacting as before, shopping, talking, sitting, laughing, crying. You see old and young, priest and whore. You see distinct areas of the city: interesting Chinatown, the depressing Bowery with drunks sleeping on the pavement at two o'clock in the afternoon, artists displaying their work in stimulating Greenwich Village. You see the Supreme Court Building and the court house where Jackie Kennedy fought Salinger. You see where Lincoln and Washington spoke. You see the Statue of Liberty raising her torch to say, here you are free to have a chance if you care to try. You pass through the United Nations, where world policy is made by world nations. You see Johnny Carson's apartment building where he pays $40,000 a month rent. You see all this and more. You want to see more,

experience more. You're exhausted. You grab a cab and return to the hotel to freshen up, have dinner and see another show, the typical tourist bit.

You call a friend who works in the city. He invites you to dinner tomorrow at his apartment in the suburbs. You sleep. After breakfast, you walk to Grand Central Station. The walk has to be one of the most invigorating walks in the city. You pass Radio City Music Hall, NBC's studios in Rockefeller Center, Saks and down Park Avenue, beautiful Park Avenue. Once there, you again meet with city's confusion, again the pushing and shoving. You find out what track, where, etc., and head for your train. You find that people here are most willing to help and not as impersonal as you thought, just cautious. You go down the steps to the train. The air is heavy and foul to the senses. This lower level is dark and depressing. You hop the train. It takes some 45 minutes to reach Hartsdale. The train rattles on. People read newspapers and books, smoke and are quiet and reflective.

The train pulls onto the surface. Out the window are huge, blank housing projects, standing some twenty stories high. All have the same stark, bare, brick walls, broken only by small windows which are laid out in a grid-like pattern. On one or two of the window sills are pots of

geraniums and petunias. Even at ground level, the grid is imposed upon the inhabitants. A little bit of grass with a tree cut by pavement offers nothing to the imagination. The train moves on.

You now see Harlem, New York's own private hell. The streets here are more than just narrow; they have to be the ugliest in the world. The sidewalk's width runs straight up to the building from the street. People are sitting on porch steps, on curbs, talking, yelling, being propositioned and propositioning. Children in torn, dirty garments dart in and out of the adult crowd and the traffic. You see a rat -- no two. Garbage is everywhere. The buildings are dirty, ugly, crowded together, in disrepair and housing too many occupants. You see four children sleeping in one bed, torn sofas, too many people in one room. The train runs only 20 feet from the buildings. Harlem disappears.

You cross the river and come into increasingly better areas. The train moves on at a constant pace, to its own sort of music. It makes a few stops. You are beginning to see why people flee the "beautiful" city. The skyscrapers are now spreading out. Smaller, garden-type apartments and individual homes come into view. Here, there is a variety and a respect for people that did not exist in the other housing areas we passed through. Larger green areas are

passed. We arrive in Hartsdale with a little more knowledge of New York City.

Hartsdale is a welcomed relief. It is quiet by the city's standards, resembling Detroit's Birmingham area. The small, clean shops with trees close by are attractive. Even the large fifteen-story apartment buildings are inviting. They sit like giants, respecting the landscape. Around their bases, Japanese gardens (American style) have been created; they offer not only a pleasant appearance, but spaces to sit and meditate or just be able to enjoy the view. These garden areas have been terraced; a variety of shrubbery, stone, woods and sculpture creates a beautiful, personal space in a small area. Their facades are broken by the play of light and darks, with varied large openings which allow the light to penetrate into the building's interior. Individual terraces or balconies have been created for each unit with just enough room for chairs, table, a grill and a few plants.

You continue through park-like Hartsdale seeing more apartments and individual homes. You arrive at your friend's apartment which sits in a quiet wood. Dogs and children abound. A cat climbs a tree. Here, there is the quiet beauty of life needed by human beings. This is the retreat for the lucky city worker. You dine quietly,

leisurely, talk with close friends, play cards, relax. Then, back to the station and the 45 minute trip back to the city.

The majority of New York's (Manhattan's) day people commute by train or subway to and from Grand Central Station or the local subway stop, or a combination of the two. Many have even longer trips than this one from Hartsdale to Grand Central. By car, even more time is wasted. Cars have almost lost their purpose in Manhattan. Not only are the streets crowded with slow-moving traffic, but parking is almost impossible, unless you want to pay the $7.50 or higher for eight hours parking. It is better, cheaper and safer to ride the subway, train or even taxi.

The train continues on. This is a good time for a book or a newspaper during the interim between the suburb and Grand Central.

Ycu arrive back in the city. It is late, or should we say early in the morning. Suddenly, the vastness of the terminal overwhelms you. The lower level is lonely, dark, overpowering. The central area is gigantic. The ceiling above looks like a roof that slid off a nearby skyscraper. Big Ben (an eight-foot clock) dominates the scene; stratigically located in the center of the terminal, it regulates all. A man is sleeping, stretched out on the platform between the escalators. An old haggard woman crouches in

the corner moving bags of things about. A lover, sitting on a bench, holds the head of his girl friend, who is sleeping while waiting for their train. It is an eerie feeling that one could have only here. The vast emptiness is crossed by the hurried steps of a business man rushing for his train. You cross the almost empty hall to the steps which lead you to the street and the taxi. The city is quiet but not asleep. It never sleeps. People still move about; some are cleaning the steerings; others continue on to their destinations. You near Broadway which is still in full swing. You go to the hotel and sleep.

You awake, making plans to see the other side of Manhattan, at least a part of it. Today is the day for the Guggenheim, the Metropolitan Museam of Art and Central Park. Central Park is Manhattan's oasis. It has lakes, grass, trees, recreation and space for just relaxation and meditation. It is for everyone. Here the children play, the lovers sit and talk, the student studies, the dogs run and even drink their water from the "people" fountain. Once in it, you forget the teeming streets, with their filth and rush. The streets around the park offer some of the very best apartment buildings. The area is clean. New York's most famous museums are in this area. Walking from one to the other is most enjoyable, but this area is for the elite.

In Manhattan, you find not only the filth, dirt, and barbarism of the streets, but also the best museums, shops, libraries, operas, symphonies, plays, restaurants, etc., in the world. This is the city, New York City, in its vertical center and its total whole. It is what every American city could easily become; to improve it requires good city planning.

Los Angeles

Los Angeles best exemplifies the trend toward horizontal sprawl and decentralization typical of the majority of American cities. It is 100 suburbs in search of a city. It is eating up valuable extension space. A city can extend itself, horizontally, just so far until it looses its purpose. A city must concentrate and centralize its utilities in order to provide the needed services to its inhabitants at a reasonable cost. When the city goes beyond this point, it cannot function economically or politically; it cannot act according to its full need as a population and distribution center. Los Angeles has reached that point.

Due to decentralization, Los Angeles and its suburbs have the highest and greatest increase in crime rate throughout the nation. A police force can effectively cover a certain area of the city. When the force is spread too thin, all areas cannot be covered.

Los Angeles' most pressing problem, one that faces every American city, is what to do with its automobile population. In 1960, with a metropolitan population of 6,000,000, it had 3,000,000 autos, with 650 miles of freeway to serve them. By 1980, with an expected population of 15,000,000 (a 250% increase), every 1.7 persons will have an automobile. The city will need 1650 miles of freeway, plus 550 miles of expressway to handle the load.[3] This city has the heaviest per capita concentration of automobiles in the world, "about 95% of all travel is by automobile, a figure unequaled in any other large city."[4] Where will Los Angeles find the space to provide for future automobile needs? Where can it extend its population and at the same time give efficient utility and political service to its inhabitants?

Due to the sprawl, Los Angeles has become one of the highest pollution centers. Scattered, unrestricted industry and the carbon dioxide from the great number of automobiles push pollution and smog to an unprecedented height.

To further the problem, the metropolitan Los Angeles has no central head. Every suburb does its own thing. This city is faced with gigantic problems in every sphere. All cities following its example will have to face the same problems. Economical and functional space is not unlimited. Man, home, business, transportation, etc., are not safe from the effects of unrestricted decentralization.

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3. Edward Higbee, The Squeeze, Cities Withoug Space, Wm. Morrow & Co., New York, 1960, p. 207.

4. Fortune, The Exploding Metropolis, Doubleday, Garden City, 1958, p. 44.

Population and Density

The earth's population is growing at the greatest rate in history -- in 1930, there were two billion people; in 1970, only 40 years later, the population is 3.5 billion.[5] World population has reached an unprecedented current rate of 2% per annum.[6]

Compare the following densities:

	Country	Persons per Square Mile
1.	China	197.8
2.	India	415.3
3.	Japan	708.0
4.	West Germany	606.1
5.	United Kingdom	586.9
6.	France	238.3
7.	South Korea	801.6
8.	United States of America	55.7
9.	Canada	5.4 [7]

From these statistics, we can easily see that America's land is open space in comparison to that of many older nations, where densities are fantastic and food supply is limited. America's greatest concentration of people is in the metropolitan areas. It is also in these areas where the greatest expansion takes place. It can only be expected for population

5. Harold Helfrick, The Environmental Crisis, Yale University Press, New Haven, 1970, p. 48.
6. The New York Times Encyclopedic Almanac, 1970, p. 362.
7. Ibid., p. 363.

to increase. At the current rate of population growth within the United States, our 1960 population of 180,007,000 will double itself by 2000 to 361,424,000.[8] If we have problems now, what lies ahead in the next 30 years? Population growth in the cities must be provided for.

Psychology and the City

Two-thirds of America lives in the metropolitan areas: we are an urban-suburban society. Today's city dweller lives in high-rise housing, apartments, tenements or in deteriorating slums. The city's atmosphere, except for the very wealthy in their exclusive penthouses, is cold and depressing. Today's city has not concerned itself with the needs of man emotionally; a family needs variety, texture, color, relief, light and shade, gardens, and space for privacy, play and solitude, not just to look at, but to be used. Living in crowded conditions with too few utilities and even too few beds is wrong ethically, socially and morally. People need privacy and intimacy to exist and develop as good citizens who will take pride in their city and nation.

Today's city is anti-child and anti-elder, therefore anti-family. These two groups have no place to go and function according to their station as human beings.

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8. The New York Times Encyclopedic Almanac, 1970, p. 362.

Daily play and park areas are taken up for the needs of a better investment and the needs of the automobile. Our city forgets its citizens' needs in an economy drive to gain the "fast buck."

The city's ugliness and disrespect for the individual are totally unwarranted. The human mind and eye is capable of creating beauty instead of the chaos it sees. To quote Nietzche: "All that is ugly, weakens and afflicts man. It reminds him of deterioration, of danger, of impotence. He actually suffers loss of power by it. The effect of ugliness can be measured by the dynamoter. Whenever man is depressed, he has a sense of power, his will to power, his courage, his pride - they decrease with the ugly, they increase with the beautiful."[9] The most respected human attitudes do not develop in ugliness. Civilization and culture are not born in a person, but nurtured and instilled in him through his environment, family and community. A person must see beauty to take pride in and love his city, state and nation. The city's problems affect its citizens. Citizens are plagued with ugliness, loss of time, crime, and the lack of personal safety. If the human organism is constantly harassed by tensions and stresses, or if its little part of the world it lives in is tawdy, disorganized, cheap, it will be conditioned to react in a frantic,

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9. Henry S. Churchill, The City Is the People, W. W. Norton, New York, 1962, p. 111.

unbecoming manner. The inability to run away and the greater density of animals creates pressures that increase social quarrels, fighting, hypersexuality; with no outlet for frustration, man becomes caged. The more stress a person is put under, the more he is inclined toward mental disorder. Therefore, a city must provide a place to play, exercise and congregate, close at hand. The city must take care of the physical and mental needs of its citizens to have a healthy, supporting citizenry to back it.

Decentralization and the Suburb

The norm of American aspiration is now in suburbia. People are fleeing from the city's problems. They want to be close to the city and its facilities (museums, libraries, employment, shopping, entertainment, etc.), but they also want a safe place for their families to live and play in; they want beauty and nature around them daily. Business and industry, the two main sources of the city's income, are induced to move to the suburb for two major reasons: to be near their workers and consumers, and the availability of cheap land and low taxes. (At least at the time of purchase they are low.)

Ideally, the idea is great, but it does not work in reality. The constant coming and going on the suburb's street does not make it the safest place for children to play. The suburb has eliminated the large old park areas;

thus, there is no space allowed in the suburb for group recreation and activities which require much space. There is no room for football, baseball, hikes, picnics, etc.

Suburbia is an economically poor usage of ground space. As more people come to the suburb, more services are needed: water, utilities, schools, police, fire departments, libraries, etc. With this, property becomes more expensive and taxes rise to meet the adjusting cost of living. For example, garbage disposal is more expensive and more time consuming in a subdivision than in a large apartment building. The suburbanite ends up paying through the nose for his bit of green.

Many inner suburbs have already reached the point that they must react as a city without the city's advantages. Already, the inter-satellites are faced with the growing number of automobiles and traffic which pass through them to reach the city proper. The problem has grown to such an extent that one city's suburb is bumping the next city's suburb. "The dimensions of future urban areas are almost unbelievable; both Los Angeles and the New York City regions are projected to have urbanization approaching 5,000 square miles each; Chicago and the San Francisco Bay Area, each about 2,000 square miles; with Detroit, southeast Florida, and Washington ranging from 1,200 to 1,700 square miles each."10

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10. U.S. News and World Report, "New Cities: A Look at the Future", January 26, 1970, p. 64.

Vast decentralization leaves no one to support the city except the have-nots; it only furthers the city's problems. We are faced with a growing urban population. Existing metropolitan areas are doomed to grow. The suburb and decentralization destroy the peace of mind of the inhabitant in a constant rush to and from that distant point; they are failures, economically, functionally and even spiritually. The cause poor usage of space and time.

Transportation

The key to the problem is transportation. The automobile has caused decentralization and destruction of the city. Today's traffic planning creates the congestion and the emotionally demanding atmosphere which destroy our cities functionally, aesthetically and spiritually. Today, 1/4 to 1/3 of city residential areas are given to streets. New interstate roads are dumping traffic into congested sections faster than cities can handle it.

Each year cities tear down more buildings and eliminate more recreational space to make room for the automobile. In the next ten years when the population will increase 18%, the auto population will rise 40%.[11] With increasing population densities, it will be impossible for the city or even private concerns to provide the needed highways and parking for all the motorists who will want to come to them.

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11. Edward Higbee, Op. Cit., p. 203.

The commuter looses valuable time and money because of his automobile. In New York, the time to drive from 20 miles outside the city during prime hours to the city's center is at least one and a half hours; this means that the average commuter spends at least 15 hours a week or two full working days behind the wheel of his automobile. The cost of private transportation is expensive in comparison with that of public transit. "In commuting from Mamaroneck, New York to Grand Central Terminal, the cost of operating a Chevy over five years runs an annual fare of $1500 by auto, where the charge would be $262.80 by rail. That $1500 actually costs the commuter $1800-$2000 in salary."[12] Clearly, the private automobile is not the most economical, time-saving means of city transportation. It eats up valuable city space and costs the individual valuable family dollars.

Psychologically and economically, city streets serve far more important purposes than to just carry automobiles from one place to another. They are the life of the city. They carry the pedestrian, the shopper, the worker, the observer, the inhabitant of the city. Without these people, the city cannot function as a commercial, cultural or governmental center.

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12. Edward Higbee, Op. Cit., p. 113.

The city's street is a vicious circle. Its unattractiveness is increased by the lack of personal safety. Barbarism has taken over many of our streets. Muggings, theft and violence is feared by those who must use the street. Consequently, fewer people use the streets -- use the city.

Jane Jacobs, in Life and Death of Great American Cities, makes several points concerning the needs of the city street:

1. There must be a clear demarcation of public and private areas.
2. There must be eyes on the street, the eyes of the owners.
3. The sidewalk must be used constantly. People are drawn to people.
4. People won't use the street if it has no purpose.
5. People won't watch the streets if they don't want to.
6. Reasons must be given for using the street during the day and night. Shows, restaurants, bars, etc., must be scattered along it, in with business establishments.
7. The streets must be well lighted. People feel safer when they can see clearly.
8. People must feel publicly responsible for other people and this happens only when they have pride in their surroundings.
9. This surveillance is required for the safety of both child and adult.[13]

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13. Jane Jacobs, The Life and Death of Great American Cities, Vintage Books, Random House, N.Y., 1961, pp 30-33.

10. "Sidewalks thirty or thirty-five feet wide can accommodate virtually any demand of incidental play put upon them along with trees to shade activities, and sufficient space for pedestrian circulation and adult public sidewalk life and loitering."[14]

For the city to draw people back to it, the city must satisfy emotional needs. People long for the activity of the city street. People like to look at people, to be with people, work with people, in a way only the city can provide according to its nature. Space for walking, loitering and for the enjoyment of living must be provided. The human needs physical activity daily for mental and physical growth. Most city dwellers do not have it. Where such factors are provided, people are drawn to them and all prosper. The city and transportation, as the major factor, must be made to satisfy human needs.

Recreation

As a result of decentralization and the automobile, our group recreational space is vanishing. The Victorian status symbol, the park, is grabbed up for parking space instead of being saved for the use of the city's inhabitants. Soon the only green space left in the city will be its cemeteries. Between 1900 and 1940, park accessions in New York City averaged 16 acres for 1,000 people.

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14. Jane Jacobs, The Life and Death of Great American Cities, Vintage Books, Random House, N.Y., 1961, p. 87.

During the time between 1941 and 1955, the average dropped to 7 acres for 1,000 people. [15] Today, New York City has Central Park and ten municipal golf courses to serve eight million people.[16]

The physical and mental needs of the nation are related to its outdoor facilities. These areas are needed for exercise and as an outlet for the tension caused by the metropolitan environment where most of the day is spent inside the office, shop, factory, car, home and school. The daily recreation demands, particularly those of children, must be satisfied. Local parks must be created within walking distance of the home. These facilities are lacking in today's city planning.

Recreational problems are not limited to the city. "The resort areas that once seemed such a change of scene to the city dweller are being enveloped by metropolis. The banks of our rivers, assuming one would now want to swim from them, have been despoiled and along our shorelines practically no beach areas have been saved for the people... Along the Atlantic coast, little free beach remains and sewage outfalls gurgle ever more fetidly."[17] Private individuals and concerns have quickly grabbed up the

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15. Edward Higbee, Op. Cit., p. 228.
16. Ibid., p. 233.
17. Fortune, Op. Cit., pp. 125-126.

prime land along our lake and ocean fronts. With them comes the commercialization and the destruction of nature as a retreat. Decentralization is destroying nature and all human environment.

Farms and Food

Decentralization is destroying valuable farm land. Higbee points out that we will need 40% more food in 1975 than we did in 1955.[18] Food needs "will soon reach 40 million tons a year, by the turn of the century about 60 million tons. Traditional agriculture will not be able to produce these amounts rapidly enough."[19] Paul R. Ehrlich, in his series of lectures organized at Yale, stated: "Out of 3.5 billion humans on earth today, between one and two billion are malnourished or under-nourished.....We have too many people and an incredible growth rate, and we are just about out of food,"[20]

Industry and Business

Poor city planning and decentralization has done much to harm industry and business, the lifeline of the economy. Centralization's purpose is to promote better commercial and industrial efficiency. When too much activity is

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18. Edward Higbee, Op. Cit., p. 4.
19. New York Times, Op. Cit., p. 362
21. Harold Helfrick, Op. Cit., p. 49 and p. 54.

scattered at whim in a given area, every person and concern suffers. The result is the loss of time, energy, money and emotional comfort; the loss is passed on to the consumer; all are affected. Industry and commerce have been hurt terribly by the lack of planning. The sites open to them are not to their advantage, economically or psychologically (for their workers). One business is the drawing card for other business. People would rather take care of all their business in one area than run about town. Decentralization is destroying our economic basis.

Pollution

Forms of pollution grow with increasing decentralization and urbanization. Smoke, smog, noise and filth increase. "Over 3,000 foreign chemicals have been identified in our atmosphere; in our cities (soot, fly ash, and perhaps more importantly, particles of asbestos from brakes and of rubber from tires....combine with carbon monoxide, sulfur dioxide, and various nitrogen oxides to pose many problems."[21] We are using oxygen faster than the oceans can reassimilate it. Automobiles are said to contribute up to 70% of the pollution problem. Toxic airborn gases and vapors pit buildings and statuary, and peel paint from buildings. Lung cancer and emphysema are twice as prevalent among

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21. Harold Helfrick, Op. Cit., p. 11.

city dwellers as compared to country folk. Pollution's effects are fantastic. "In 1952, a pollution shroud, hanging low over London, killed 4,000 persons in a fortnight and caused 4,000 more to die lingering deaths."[22]

With the help of the waste which is killing our waterways, unsafe insecticies, radar and micro-waves, these pollutants could accomplish what no war has. If we continue at the present rate of growth and in the present manner of decentralization, most of the world's cities and countryside will be uninhabitable. Our cities contribute the greatest percentage to this problem. The disposal of waste and the use of the automobile must be regulated and controlled.

The City's Economy

Decentralization and the city have created a horrid circle. The city's lack of concern for the individual has driven its tax-paying citizen to the suburbs. Only the two most opposite classes remain in the city: the very rich who can afford to send their children to private schools and clubs, and the very poor who cannot afford the price of escape. The rich know how to escape the tax system; the poor live off the tax system. The city has even driven business and industry from its center. There is no one left to pay for the city's badly needed improvements and services. Good city planning, which will solve today's city problems, is a must for today's and tomorrow's city.

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22. New York Times, Op. Cit., p. 499.

CHAPTER II

FRANK LLOYD WRIGHT AND HIS ARCHITECTURAL TYPE

Wright was born in the late 1860's, in the rural area of Richland Center, Wisconsin. Only a few years earlier, Walt Whitman had published his first edition of Leaves of Grass, stating a belief in the individual and his strengths. Thoreau had died only six years earlier. The Civil War was barely over. America was in the midst of the Romantic movement.

Wright's father was a Baptist preacher, but on the eccentric side to say the least. To make a living, he gave music lessons and preached. His real passion was music which filled the house from morning till night; his son, Frank, would have a similar love for music.

Wright's mother had a strong Romantic personality. She brought him up in the Transcendentalist philosophy of the Concord Group, comprising Emerson and Longfellow, in the heart of a picturesque family of Welsh immigrants, pioneers in Wisconsin. She was positive that her unborn child (Frank) would be an architect. She did everything in her power to guide him into this profession: she wallpapered his room with reproductions of English cathedrals and instructed him in the Frobel manner.

Fredrich Frobel was the founder of the kindergarten. "His basic theory was that children should be taught through creative play, to experience objects, colors, textures, causes and effects."[23] To supplement his theories, Frobel developed several sets of toys including blocks and games using folded and pleated paper, string, beads, spheres and cones. "Frobel's notion was that children should be brought to relate his blocks and other devices in imaginative, but increasingly planned compositions, and he suggested that these compositions might form furniture, or complete buildings, or even small villages and towns."[24] Frobel's toys were Frank Lloyd Wright's toys.

At ten years of age, Wright came under the influence of his uncle, James Lloyd Jones. Frank spent a good deal of time on his farm during the summers, working hard and close to the soil. Wright felt that these summers brought him closer to nature and answered many questions that theoretical learning could never resolve. Wright's philosophy of life and architecture (Can the two be separated?) were based on this Romantic tradition -- that of hard work, in unison with nature and in being a firm, thinking individual. This is what he conveys in all his work.

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23. Peter Blake, Frank Lloyd Wright, Pelican Book, Baltimore, 1960, p. 15.

24. Ibid., p. 16.

Wright's apprenticeship in architecture began first at the hands of Allen Canover, a local contractor. Canover's buildings were not out of the ordinary, but they were structurally sound. While working with Canover, he studied engineering at the University of Wisconsin. There were no architects in Madison at this time.

At 18, Wright left Madison for Chicago. He worked first under the architect, Lyman Silsbee, who did not confine him to a set style. In 1881, Wright left Silsbee and took a job with Adler and Sullivan. Sullivan's architectural views differed widely from the norm of the day. Sullivan (in his early thirties) was already well known for his principles of a "democratic" architecture, wherein form develops from function, material and structure.

Sullivan was constantly searching for a new honesty in architecture. He firmly believed that the horizontal represented man's movement on the earth, and therefore that all buildings should stress the horizontal; that honesty was a purpose of function; that no building could be true to itself unless it clearly stated its purpose, and that form follows its function. He sternly opposed the eclectic neo-clasic architecture of his day. Sullivan turned to Art Nouveau. Although to most artists of the day Art Nouveau meant mere decoration, it meant more to

Sullivan. "To Sullivan and to his young disciple, the symbolic images of nature began, more and more, to represent images of America and democracy as well. America was space and landscape; Europe was crowding and formal urban life."[25] Sullivan was never able to grasp completely the relationship of natural form and architecture; natural form remained ornament in his hands. He could not create in depth what his philosophy demanded. Sullivan's beliefs and Wright's Romantic Agrarian upbringing formed Wright's basic philosophy.

Sullivan had provided Wright with his thinking material. Wright's early work (pre-1900) was marked by Sullivan's influence, but it was the Japanese temple at the Chicago Fair of 1893 which set Wright's basic architectural concepts:

> "The black wood posts and beams, the deep roof overhangs, the white plaster panels between the darkened framework and the intimate relation of house and nature - all these made a profound and lasting impression upon Wright. So did the open spaces within, lightly divided by sliding screens and separated from the gardens by still more transparent and translucent sliding panels. And so did the strong, modular organization of the buildings, the horizontal emphasis (the door-height horizontal that Wright used at Oak Park had long been a standard Japanese device)." [26]

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25. Ibid., p. 23.
26. Ibid., pp. 28-30.

The influence of the Japanese temple on Wright's work is seen in the interrelation of spaces and forms, in the use of differing ceiling heights to define different spacial cubes, and in the use of open planning with the interlocking of spaces instead of the unrelated box planning of traditional homes. Wright's concept of architecture as an integral part of nature was furthered by this temple. His roof overhangs, extended walls and his union of inner and outer spaces reflect the Japanese prototype. Even his use of the minimum in furnishing is based on Japanese design.

The United States, at the turn of the century, turned its back on modern architecture and was lost in the eclectism of historical styles. Europe,on the other hand, was moving ahead using modern technology to form a modern architecture. Bauhaus had formed many of the basic twentieth century, European architectural concepts. With the German publication of Wright's Executed Buildings and Drawings in 1909, European architects saw Wright as an innovater in twentieth century architectural design; Wright furnished the Europeans with a physical reality of the new architectural form. The Europeans were influenced greatly by his work, in fact, so much so that by 1912 most European architects were applying Wright's concepts to their own work. They strove for a new integrity in architecture. Materials were used according

to their individual nature. The use of superficial ornament was dropped. Planning was based on the new concept of "form follows function." Using Wright's cantilever to help them, they reduced their buildings to horizontal planes. The use of larger window areas furthered the horizontal emphasis. This window usage joined with open planning created the twentieth century sense of space - as "space in all directions." Wright influenced the Europeans in all these concepts and therefore influenced their resulting International Style.

Wright in turn, though never admitting it, was influenced by International Style. In the thirties his architectural planes became increasingly cleaner and simpler; they lost much of his early ornamentation and were not as broken. His buildings were not as heavy as earlier; they became more modern; more stress was given to curtain walls needed only for protection from the elements, not as load bearing walls.

Although Frank Lloyd Wright planned and built industrial buildings, hotels, chapels, museums, etc., his main architectural form and concern was individual housing. The vast majority of his completed work is in this area. By 1908, Wright's basic architectural philosophy and life's work was set. Wright's buildings differed in materials, site

location (He always built for the particular location.), and technological improvements. His method or ornamentation seen in his early work diminished in his later work. All his buildings from 1908 on have the same Romantic, spiritual feeling to them; they are all planned with the same basic purposes:

1. "Architecture should be in unison with the landscape... not a crime against it."[27]
2. "However simple this house, it will be well designed and planned with 'him' and for 'him' (the individual): good materials, in good design, well executed."[27]

The Jacob's House - Wright's Architectural Type

The Jacob House (plates I - III) follows Wright's theories of Organic Architecture; it is the Usonian house type which he will use as a basis for his Broadacre City. It is in unison with nature, as a part of the site. There is an interlocking and growth of interior and exterior forms into other forms, to the point you can't tell exactly where the building ends and nature begins. He accomplishes this through:

1. Creating a long, low, earth-hugging building
2. The use of local materials
3. The use of materials for what they are - as they are
4. Using the same materials both inside and outside, "Organically"
5. The plastic handling of space.

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27. Frank Lloyd Wright, Writings and Buildings, Meridian Books, World Publishing, N.Y., 1961, p. 267.

He merges inner and outer areas into one space by cantilevering the roof over outer areas, the use of varying ceiling heights to denote areas rather than walls (open planning) and by using walls of glass to bring the outside into the house and take the inside out.

Wright considered the machine a natural tool in construction. "The machine is here to stay (Wright announced in 1901). There is no more important work before the architect now than to use this normal tool of civilization to the best advantage, instead of prostituting it as he has hitherto done in reproducing with murderous ubiquity forms born of other times and conditions."[28] He urged that all items which lacked individuality be delivered to the building as a car, in prefabricated units.

Wright, as well as Le Corbusier, thought of the mass production of housing in planning the Jacob's House. "Here is a moderate-cost brick and wood house that by our new technology has been greatly extended both in scale and comfort: a single house suited to prefabrication because the factory can go to house.....Imagine how the costs would come down were the technique a familiar matter or if many houses were to be executed at one time - probably down to forty-five hundred dollars,[29] according to the number built and location."[30]

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28. P. Blake, Op. Cit., p. 58.
29. The Jacobs House cost $5500 in 1937, including the architect's fee.
30. Frank Lloyd Wright, The Natural House, Mentor Book, New American Library, Horizon Press, N.Y., 1954, p. 81.

Both his horizontal-unit and vertical-unit systems have been used in the construction of Jacob's House. The asphalt roof was built first on props to have the walls later placed under them. The vertical-unit was determined by the widths of the boards and batten bands which interlock with the brick courses. These board walls were designed to be the same inside and out; they consisted of three layers of boards with paper placed between them and fastened together by screws. They were designed to be vermin-proof, practically fireproof, and to have the ability to be prefabricated on the floor with any desired degree of insulation. They then could be made at the mill and shipped to the side in sections to be raised into place.

Wright uses local materials to constantly reinforce the Romantic relationship of site, building and space. He chooses specific materials to do this. His stones, woods, and brick are peculiar to the individual site, not imported. Wright carries the use of warm materials (coral hued bricks, stone, woods in their natural appearance and textures) throughout all his work, thereby creating a natural, informal quality to his design.

Wright was constantly aware of textural values in his buildings; he used texture to create an interesting, varied form. The aging quality of a material was a major concern to Wright. If a material would not hold up well throughout

many years, Wright refused to use it. Consequently his buildings were a mixture of brick, stone, cement and those woods which would hold up well without painting or staining (redwood and cedar).

The traditional house of the Victorian age and earlier was made up of boxes which fell into place because of the exterior appearance of the house. The Victorian architect kept exterior and interior spaces separate, handling each in a different manner. Walls were placed at random, based only on exterior design and the needed support location. The use and purpose of each box or room was planned only after both factors were established. The planning was so poor that in some cases you had to run through five rooms to reach the sixth. You often had a major door on each wall leading to a different room; many times more than one doorway was located on the same wall.

The developments of the late nineteenth and early twentieth centuries in the fields of transportation, publication, communication, technology and engineering changed space concepts. Twentieth century's space is infinite and extends unrestrained in all directions. It can be measured, defined and made apprehensible only by a sort of invisible geometry.

Wright conceived a twentieth century space as early as 1890. He was the originator of the open-planning. He felt, "The reality of the building does not consist in four walls and roof, but in the space within to be lived in."[31] Wright extends space through open-planning, having one area flow into another; inside and outside spaces merge into one. He bases this space concept on "form follows function." His housing unit strove to improve the old manner of planning. The house was designed in the scale of man, not in scale of grandeur. Areas doubled and tripled their purposes. His aim was not only to eliminate needless space and excess cost, but also to eliminate unnecessary work and upkeep for the house's inhabitant, "The margin of leisure should be spent in the fields, in the gardens, and in travel."[32]

Wright planned his housing for the individual family, its varying activities, and what each particular activity required in space and working pattern. He planned for what he felt was essential. Wright allows for as large a living area with as great a view as is economically feasible. Within the living area he places fireplace, open book-shelves, a dining table in an alcove, benches, and a quiet rug on the floor; this is his essential list. He removed the walls between the parlor, family room, dining room, library and kitchen and united the individual spaces.

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31. Frank Lloyd Wright, The Living City, Mentor Book, Horizon Press, N.Y., 1963, p. 180.

32. Frank Lloyd Wright, The Future of Architecture, Mentor Book, Horizon Press, N.Y., 1963, p. 191.

He allowed only one space per function; out went the breakfast room and the formal dining room; in came the dining area.

The central core is always a feature of Wright's houses. In the Jacob's house, it consists of a dominating fireplace and a kitchen workspace which is designed to save valuable steps. Wright puts the kitchen back into the living area; no longer is the housewife isolated from the family's activities. Separate areas are denoted by one or a combination of specific architectural devices: the placement of furniture, the raising or dropping of ceiling heights, the varying of floor levels, etc. Wright includes all the major noisy and group activities within his living area.

The open-plan has no relationship to the bedroom area of the house. The Jacob's bedrooms are in a wing of the house, as far removed from the noisy living area as possible. This is the quiet area of the home, where Wright allows for privacy.

Wright eliminated wasted space. To Wright the basement was noisy, gaseous, damp, ugly, and the catch-all of any house having one. He classified it as being a senseless expense. The attic he places in the same category; it too is useless and unneeded. In place of these traditional storage areas, Wright planned his storage areas into the

house. He replaced the garage with the carport, saying that a modern car does not require a garage. He made housing space more usable and livable for today's world. His areas were planned for versatility.

Wright rejected the interior designer and decorator. He felt that the architect should have complete control over the building, including its furnishings and landscaping. He incorporated the furnishings into his organic architecture. His chairs look more like a piece of architecture than a chair. He eliminated all ornament, moldings, columns, cornices, fixtures, old furniture, carpets and most hangings as being superficial decoration. His aim was the complete synthesis of planning, planting, furnishings, music, painting and sculpture.

Wright used all the elements of modern architecture in his individual buildings; he was often the first architect to envision the modern usage of many materials. However, Wright's background and his earliest Romantic dreams of the world never left him or his work. His work always tied to the rural agrarian community of late nineteenth century America.

CHAPTER III

LE CORBUSIER AND HIS ARCHITECTURAL TYPE

Charles Edouard Jeanneret, better known as Le Corbusier, came from a world and a philosophy which was very different from that of Frank Lloyd Wright. He was born twenty years after Wright, in 1887. The Europeans were moving from the Romanticism of the nineteenth century into a new twentieth century manner of seeing and thinking. The differences in their ages alone mark great strides in the use and theory of architectural materials, plus the discovery of new materials.

Steel, first developed by Bessemer in 1856, had come into its own; its properties for spanning voids (as in Roebling's Brooklyn Bridge of 1867-83), enclosing great areas (Paxton's Crystal Palace of 1851), reaching great heights (Eiffel Tower of 1889) and its basic skeletal nature were well known and understood by the time Le Corbusier reached the age of twenty.

The use of vast areas of glass was also becoming more common by the time he reached the age of twenty (1907). When Wright was twenty (1887), it was still an oddity. The use of glass was tied hand in hand with the use of steel in architecture. This union produced a new sense

of openness, a uniting of inner and outer areas, the dominance of the structural horizontal and vertical elements, the disappearance of the wall as a weight bearing element, and created a static quality to the architectural forms, while continuing to satisfy the need of shelter.

Concrete, a material which had been lost since the time of ancient Rome, reappeared as an architectural material. Its ability to shape a structure through reinforcement by steel (reinforced-concrete) was fully explored by Le Corbusier's teacher, the engineer, Auguste Perret. The Europeans were ready for a new architecture; they were ready for a new analytical architecture which would parallel the development of twentieth century painting, sculpture and music. America in 1907 (Wright was 40, Corbu was 20.) was still deeply involved in the"Romantic" architecture which had been furthered by the Columbian Exposition of 1892. America could not, would not accept the new architecture she had fostered with the development of the skyscraper in the 1880's.

This brings us to another major difference between the two architects -- Wright was an American; Le Corbusier was a European. America still had free, open space and a sparse population; Europeanspace was limited and its densities were great.

Le Corbusier's parents were professional engravers and painters of watch cases, a profession which required great patience and perfection. They passed these characteristics on to their son. His mother was a musician, who instructed her son in the beauty of the arts. Le Corbusier's life work was for the incorporation of all arts into a unified whole within architecture.

Le Corbusier's extraordinary ability for grasping visual experiences enabled him to qualify for the Ecole d'Art at La Chaux-de Fonds, where, at the age of thirteen, he served an apprenticeship as an engraver and chiseler of watches. While there, he studied under Professor L'Eplanlenier, who encouraged his student to study architecture and also to participate in sculpture and mural painting. This art school became a major factor in the development of his philosophy. As its most promising student, he was commissioned at eighteen to design and build a villa for one of the school's trustees. The importance of this work was not in the work itself, which was not significant in his life's work, but in that it enabled him to take trips beyond the Swiss borders. On these trips, from Prague to Serbia, to Rumania, then to Andrinople, Istanbul, Mount Athos, Athens and Rome, Le Corbusier became acquainted with the masterpieces of old architecture and the art of dimensioning. He was forever

impressed by "ancient" Greece: its integrating, refined construction, its relationship to man in scale, its mastery of light, its purity of materials and ideas and its stress of man over his environment.

Le Corbusier was the heir to all the traditions and strengths of the Mediterranean. Herein lies the fundamental and major difference in the backgrounds of Frank Lloyd Wright and Le Corbusier; Wright sees nature as God's gift to man, believing that man should not interrupt this natural beauty; Le Corbusier recognized the beauty of nature for itself, but also realized that God created man with a nature which is independent except for providing basic provisions. Le Corbusier felt that what is man's must reflect man.

From 1908 to 1909, Le Corbusier worked for Auguste Perret, the first master of reinforced-concrete. Perret insisted on the disciplined usage of this plastic material. His nine-story apartment house, 22 Rue Franklin, influenced Le Corbusier's structural concepts as no other building in the world.

> "Its frame is unfinished reinforced-concrete, clearly expressed on the facade and left completely undecorated. The grid of columns and beams is filled in almost entirely with glass, except for a few areas that are enclosed with panels of brickwork to meet special

> building code restrictions in the area. In plan, the building is quite open: the only fixed elements are the slender reinforced-concrete columns and certain stair wells. Everything else is nonstructural and, hence, entirely flexible. On the ground floor, for example.....(one) eyes the astonishing spectacle of a tall building apparently held up on nothing except a very few slim posts; all walls, all interior partitions were large sheets of glass, some transparent, others translucent."[33]

Le Corbusier was influenced by Perret in the use of unfinished reinforced concrete, the lack of decoration, the structural grid, the use of glass for a better illumination of the interior, and the openness and flexibility of the interior spaces. Le Corbusier also absorbed Perret's cantilevering of floors, the use of the roof as a garden and the honest method of using materials as their nature demanded. It is also highly likely that this building first enabled Le Corbusier to envision his concept of a building on stilts (pilotis), liberating the space beneath it.

In 1909, Le Corbusier was with Peter Behrens, the first modern industrial designer. Behrens, at this time, was occupied with utilitarian building. Behren's philosophy of functionalism further reinforced Perret's and Le Corbusier's pure, minimal, truthful, "classic" type of architectural form.

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33. Peter Blake, Le Corbusier, Penguin Books, Inc., Baltimore, Maryland, 1960, p. 21.

It was through Behrens that Le Corbusier learned the technical organization of machine art which he would develop into his "machine for living."

Le Corbusier's basic architectural philosophy was formed after his work with Behrens. He now felt that a building must be clear, sophisticated, functional statement, and it should stand in contrast to nature rather than appearing as an outgrowth of some natural formation. Thus, in Le Corbusier's work, nature and architecture enhance each other by a harmony of contrast and the most perfect solution to any problem is Le Corbusier's aim.

The Unite d'Habitation, as seen at Marseilles and Nantes, Le Corbusier's Architectural Type*

The Marseilles Block (1945-1952) and Nantes-Reze (1952-1955) are the logical development of the ideas which Le Corbusier had spent 40 years propagating. They represent the achievement and perfection of his vertical city and dwelling concepts as seen first in his "Citrohan" (1922), and "Ville Contemporaine" of 1922. Marseilles is located on a nine-acre site. The huge slab is 450 feet long, 66 feet thick and 200 feet high. It contains 340 apartments for some 1600 people. Nantes is located on an acre site with an east-west orientation (the same as Marseilles);

*(see plates IV - VII)

it hovers above 20,064 square feet of ground space. In conceptions, Nantes was inspired by the Marseilles prototype and was repeated again in Corbu's work at Berlin. Marseilles is the more completed city-type dwelling in Corbu's planning. It has a better apartment plan, larger shopping areas, a hotel and large meeting rooms as well as housing facilities than are included at Nantes. Nantes is important for three primary reasons:

1. The architectural type was an improved type of Marseilles.
2. Le Corbusier's more expressive use of materials at Nantes than at Marseilles.
3. The surrounding landscape at Nantes is more picturesque, enabling me to make a point which is often lost is most analyses of his work.

At Marseilles and Nantes, Le Corbusier makes use of the "Modular" system to create a highly complicated, aesthetically "classic" form. It is interesting to note that Le Corbusier has his modular man with arm extended on the walls, incorporating it into a relief design at both Marseilles and Nantes - "Architecture made by man, solved by man, for man."

Le Corbusier patented his final concept of the Modular in 1947, after becoming concerned that others were stealing his idea. His Modular is not the monotonous, repetitious

system of 1+1+1 which many modern architects have employed, and which most people as a whole call boring, ugly and inhumane, but rather a system of intricate related proportions based on man and the ancient "Golden Section." This Modular is a grid based on the frame of a six-foot man; 89 inches in length and 112 cubic inches of space are standard for the six-foot man. "In general, the Modular starts with the division of the height of a man into two proportions, at the waistline. These two proportions, according to Corbu, govern all other dimensions of the human body. For example, a man with his arm naturally upraised creates another Modular proportion, the distance between his head and his waist being in proper relation to the distance between his head and his fingertips. Starting with this interlocking system of proportions - fingertips to head to waistline to soles of feet - Corbu developed a gradually diminishing scale of proportionate dimensions."[34]

Le Corbusier used the Modular proportions throughout his later buildings to measure the largest, grandest elements (facades, pilotis's, roof gardens, etc.) and the most minute elements (the doorknobs, banisters and ventilators, etc.). In this way Le Corbusier has set up a relationship between man and his constructed environment,

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35. Ibid., p. 138.

providing the source for feelings of security, familiarity and happiness. The different parts have the overall feeling of a symphony with its accents and lulls, creating a harmonious whole. Le Corbusier uses this system, as patented, in all his work dating from the 1940's on. He would apply it, one of his "machines for living," to all future planning.

Marseilles and Nantes follow Le Corbusier's theory of construction. First, they are a forceful expression of man separated from nature; they contrast to their natural surroundings.[35] Secondly, both are Le Corbusier's developed skyscraper, "slab" form, meant to house great numbers of people while retaining the open, free-landscape space of their surroundings. Thirdly, in both Le Corbusier has gained valuable space over the traditional building by raising the building above the ground on stilts which he called "Pilotis," and by using the flat roof as a roof garden, which serves as a playground, complete with kindergarten and places for contemplation and relaxation. Finally, Corbu reflects and registers the interior space in the exterior of his buildings.

Le Corbusier's usage of materials is always "man-made," even when using natural materials (wood, stone, etc.).

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35. Refer to illustrations

His use of these materials are always that of man manipulating and creating the final form through his human capabilities. As stated previously, one of the main reasons for the selection of Nantes was because of Le Corbusier's use of materials in this building: the expressive, textural, variated, almost brute use of his primary building material, concrete. At Nantes, we are better able to see his usage of materials developing and are able to assume from this tendency what his future use of materials would be. Le Corbusier has moved beyond that "purism" of planes to a more sculptural, forceful, three-dimensional form. He has become increasingly aware of the progressions and recessions of light and shadow, becoming a sculptor of human spaces.

Corbu, in the nineteen forties and fifties, now knew the need for the use of materials which would age well; a fact which Frank Lloyd Wright had insisted upon even in his early work. The finishings of Le Corbusier's of the twenties and thirties turned out less than permanent, less than beautiful; with aging, their facades turned streaky and grey, depressing and loosing much of their initial character. He turned to the use of concrete, the twentieth century's most economical and plastic material.

The skeletons (foundations, structures, floors, exterior walls and roofs) at Marseilles and Nantes are of reinforced concrete. Concrete, as used by Le Corbusier, is poured into the simplest form and looks as virile as a rock. Le Corbusier uses all the so-called accidents of concrete. The imprints of the individual boards and wood sheets are purposely set in a manner to create an artistic design. The chips and cracks, as well as the pebbled surfaces here and the sea shell surfaces there, are used to create surface interest. He has created a textural beauty as aesthetically pleasing as any ancient ruins; he has created a sense of timelessness. "In answer to those who objected he replied: 'You who go looking at castles and cathedrals, haven't you noticed the faults; the badly cut stones being used to an advantage? Don't you see when you look at architecture?"[36]

Le Corbusier's tendency to a more textural surface is reflected at Nantes. (plates IV - VII) Here, he has also incorporated more sculptural relief: two modular men with upstretched hands, a geometric pine tree, an abstract flight symbol and a "Modular" relationship are imbedded and extending from the building's walls. This increasing tendency to incorporate all arts into architecture is especially noted in Le Corbusier's later work. One would be safe to say that Corbu's work, had he lived, would have

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36. Le Corbusier, 1946-1952, Les Editions Gersberger Zurick, 1953, p. 191.

continued to grow into a more sculptural, artistic form while retaining the necessity of function within the form.

Bright pastel colors (reds, ultramarines, ochres, and near blacks) have been used on the wall panels that separate adjoining balconies. These plastic earth colors are not applied flat to the facade of the building, but are seen only through a sort of veil (almost that of an imaginary facade) and give the structures an added sense of three-dimensionality.

In order to make life easier, more enjoyable and rewarding, Le Corbusier demands that his buildings function in a machine-manner; a building is a machine-of-sorts, the machine of life and living it to its fullest. Le Corbusier passes all the building's piping, wiring, etc., through his Pilotis. He houses all the machinery at Marseilles in the "dead" horizontal floor which rests immediately on the Pilotis. In actual use, this horizontal, running the length of the building proved an inefficient use of time and space. Thus at Nantes, he houses all the large machinery in an area directly above the entry, for easier and more compact accessibility.

Le Corbusier is fully aware of the "gadgets," "machines," and common services needed to make life easier. He includes these in his buildings: a garbage disposal system, telephones, fire appliances, etc., as well as his major systems.

Both Marseilles and Nantes have mechanical and central ventilation systems. He first introduced his idea for "controlled breathing," a sort of air conditioning, inside a double shell, where the interior would be pure air at a controlled temperature in his "Centrosoyus" of 1928. This system exists in its fully developed state at Marseilles and Nantes. The age-old mechanical ventilation system (windows) has also been included. A ceiling type of heating system is provided.

From his early beginnings, Le Corbusier was concerned with the illumination of the interior. In his early "International" work, he used "walls of glass" not only for making the construction of the building more evident, but also to create a full natural illumination of the interior. Le Corbusier's aim was to rid architecture of those dark cells with peep-holes for windows and to permit the occupant a view of nature. Since northern light does not completely illuminate an interior at any time, Le Corbusier, in his mature work, uses only East, South, and West facades for dwelling orientations; the North wall he leaves blank as an aesthetic source of forcefullness and to block the cold winds.

In planning his apartment building at the Porte Molitor, Paris, in 1933, Le Corbusier further realized the need for protection from the sun. To solve the problem

he created the "Brise-Solelle" or sunbreak. The sunbreaks were vertical or horizontal slats, movable or fixed in front of the windows to control the sun. His terraces or loggias are used for this purpose at Marseilles and Nantes. The use of "Brise-Solelle" is responsible for the creation of the "egg-crate" appearance of his later work. It is also responsible for the creation of a more animated, plastic spacial usage through the creation of great shadow depths.

The greatest need in apartment living is privacy. Le Corbusier developed a fantastic soundproofing system to create privacy in his multi-unit buildings. His first work in this area was at the Swiss Pavilion during 1930-1932. Marseilles apartments do not touch one another; they are insulated from the framework by the intermediary of lead boxes which assure perfect soundproofing. At Nantes the system is further improved; sound resistance is obtained by the use of floating floors, the layers consisting of glass-wood sheets. The walls are soundproofed with a special insulating layer of concrete. By placing his buildings on large acreage plots rather than a city block, and by prohibiting the close-by use of automobiles, the building's exterior noise level is held to a minimum. Le Corbusier states: "Everything depends on the closeness of surrounding walls which may be disposed accidentally in such a way as to form a magnificent sound projecting screen.

Conclusion: One can rigorously control the placement of skyscrapers in such a way that no reflective surfaces are offered to street noises, and thus the desired silence can be secured."[37]

Le Corbusier strongly urged the adoption of standardized functional elements into architecture. His first premise is that everyone needs a house. He then pointed out the economical assets of mass production using the example of the car; if a car was made in the manner of housing, its costs would soar up beyond 500% of what it is today. He continued: "I assure you that the efficiency of modern technical methods is the proof that big industry could interest itself successfully in building. The house can and ought to be made in the factory, by those industries which are actually idle because they manufacture only things that are superfluous - unproductive manufacture.....Let the cities be reorganized to give the new enterprises the opportunity for large scale mass production....Let industry realize that housing is its real market."[38] Custom housing entails enormous expenses of labor, time and costs the average man cannot afford. He urges, "Man of the machine age, master of his machines - employ them productively and realize that the fundamental need of the new machine age is the dwelling. The dwelling worthy of man - the 'dwelling-splendid.' The dwelling completely equipped with all the

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37. Le Corbusier, When the Cathedrals Were White, McGraw-Hill, N.Y., 1964, p. 66.

38. Le Corbusier, 1934-1938, Les Editions D'Architecture, Erlenback - Zurck, 1939, p. 68.

benefits of progress and organization. The dwelling that is planned in harmony with the most fundamental needs of human nature - sky, sun, space, and trees."[39] At Marseilles and Nantes, we see this standardization of form in the plan, windows, doors, lighting, furniture, stairs, etc.

Le Corbusier's planning affects all aspects of housing, from designing (He invented the CAIM grid for reading and classifying blueprints in 1947.) to the climate (In 1954, he created the "Climatic Grid," to determine planning according to the climatic location of the building.).

Le Corbusier has created common services for each apartment, basing their existence on cost to the individual and the builder. They are the key to financing, and the key to liberating the mother of the family from unnecessary toil. At ground level, in the real "green belt," Le Corbusier has located the area for sports which belong near the home (football, basketball, tennis, bathing, strolling, etc.). Elementary schools are accessible by means of the pedestrian sidewalks. Human safety is provided by limiting and withholding automobile traffic. Nurseries and meeting rooms are on the roofs of the Unites, close to the family home. The schools, gardens for botanical studies and juvenile workshops are located in the green. At Marseilles, Le Corbusier has included two floors for

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39. Ibis., p. 68.

commercial use (the seventh and eighth floors), containing commercial stores, food, clothing, pharmacy, hairdressers, etc., and an eighteen-room hotel. It has not proved out economically as the complete success it was hoped to be. At Nantes, Le Corbusier improved his design; the shopping area was confined to a smaller space at ground level to enable people from other buildings to use the stores without entering the privacy area of the occupants.

Le Corbusier first envisioned his roof garden at Perret's apartment, 22 Rue Franklin. Unlike Perret's apartment garden roof treatment, Le Corbusier's roof garden was conceived as a communal space, a kind of elevated plaza in the sky. In it he differentiated between the repetition of the street and the unique structures required by a public plaza. This plaza on the roof became an increasingly free composition of curvilinear forms, a huge sculptural garden with the French love of subtleties contrasting the simplicity of the slab and the naturalness of the plantings.

Marseilles' roof garden plaza is bordered by a high wall, providing a sense of security even at this height. It is filled with intensely sculptural elements: the great tapered funnels through which the air is exhausted from the buliding, vaulted structures that house a gymnasium, a concrete mountain range full of tunnels and caves designed for children to play in, a nursery school, a pool,

a restaurant, a row of curved concrete benches for seating, a bold free-standing vertical concrete slab on which to project films at night, and a cantilevered balcony for contemplation or to watch the sunset. He has even included a cinder track for jogging.

Marseilles' roof garden has more activities included in its plan than Nantes'. The roof garden at Nantes (plate VI) again marks Le Corbusier's developing interest in contrasting textures and the more expressive contrasting use of forms. Marseilles' cement garden seems bland in comparison. Nantes has pebbled and rough surface areas, board-imprinted areas all contrasted with smooth colored areas. No color was used in the Marseilles roof garden. Even Nantes' floor (plaza) marks a new contrast of textures. Whereas Marseilles' floor was all concrete except for the cinder track, Nantes' floor has a contrast of cement and natural stone (slate) to denote different areas.

Expressive window usage, first seen at Ronchamp, is introduced into the linear-city roof garden at Nantes. At first glance, the varying sized and shaped windows appear to have no relationship to each other; they seem to have been cut into the wall at whim. In reality, their placement has been highly calculated to provide a more interesting light source and to create a textural wall of their own.

Conclusion: Le Corbusier's development is toward the usage of a more varied textural surface and a greater use of natural materials. In all probability, he would have further developed this "humanizing" tendency in all future plans for the linear-city.

Le Corbusier's primary housing unit as seen at Marseilles and Nantes (plate VII) goes back to his "Citrohan House" of 1922. In it he developed his first major spacial ideas of interlocking spaces of different but related heights. He has two floor levels on one side, with the kitchen and dining areas on the lower level and the bedrooms on the upper level. On the other side, the living area is a two story space with its floor at the same level as the kitchen and its ceiling the same as the bedrooms. The "Citrohan House" also marked the beginnings of Le Corbusier's Pilotis and Roof Garden forms.

At Marseilles, housing is provided for 337 families, 1600 people, with the apartments occupying the entire width of the building. The apartments have been inserted into the structural frame of the building as drawers would be in a filing system. He had already begun to envision a completed flat raised into the building. Here, he described it as the bottle and rack system.

Each apartment has the same two-to-one spacial relationship, first established in "Citrohan" and which is typical for all his apartment dwellings. The general apartment relationship to interior street is that the bedrooms of one flat are above the internal street, while the bedrooms of the other below the internal street. This arrangement allows each apartment to open onto both eastern and western views. It further provides the best possible solution to the natural ventilation of an interior space. The living room is separated from the kitchen by a cupboard; it has Le Corbusier's standard height of two stories, or fifteen feet. Open planning is used where applicable (in the living areas); as opposed to the traditional four-walled cell with door and the constant repetition of the same cell throughout.

At Marseilles, we are able to see clearly Le Corbusier's primary desire to make full use of space and to cater to an uncomplicated mode of life for the average person. In speaking of his "Unite d'Habitation," Le Corbusier states: "But whom does it concern? 800,000, 200,000, or 3000 inhabitants? Not at all! It concerns a woman, a man, and a few children, elements of the harmoney of a hearth. But, today, the mother of the family is crushed by housework. This family group of 2, 3, or 6 persons, when it thus becomes 1600 or 2000 persons - these two reunited groups, blended in a "Unite d'Habitation de Grandeur Conforme,"

will have, in a like manner, achieved individual liberty and the benefit of collective resources. This has now been shown by actual experimentation and not only by the promises of theoretical studies and paper plans.....And the 'conditions of nature' will be reintroduced into the lives of men, women, and children of the machine civilization."[40] Le Corbusier pointed out that the family must once again become a unified reality of today's society; today's family is separated by loss of living time due to the decentralization, and the time it takes to get from one place to another. He has also provided the needed green space and the immediate recreational space which is so needed to keep our city's families sane and together.

Le Corbusier altered his space relationship at Nantes in order to gain more living space per unit at less cost. He eliminated the 15 foot, two-story living area, making a bedroom from the upper seven feet of the cubic space of the Marseilles unit. The street-apartment relationship, with each apartment having both an east and west view, remains the same. Le Corbusier had said in The Radient City, "with $14m^2$ of floorspace per person, we shall have properly equipped homes."[41] This allows the minimum of 588 square feet for the housing of a family of four. He applied this principle at Nantes.

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40. Le Corbusier, Oeuvre Complete 1952-1957, W. Boesiger aux Edition Girsberger, Zurick, 1957, p. 176.
41. Le Corbusier, The Radient City, Faber & Faber, London, 1967, p. 181.

One must agree with the critics, that the apartments of the linear-city leave much to be desired. "The architect.... seeks with violence to accommodate human beings to the inflexible dimensions of his monumental edifice."[42] Their plans are limited to fulfilling only the minimum necessities of food preparation, dining, bathing, dressing and sleeping. The casual seating area allows space for only a few chairs. All bedrooms, except the parent's, are only six foot wide. Ceilings are oppressively low (seven feet). The terrace or "loggia" offers only enough space to step out and see the view or to wash the windows. At Nantes, he has even less square footage of living-area space than he provided at Marseilles.

The furnishings of the interiors are mass-produced, standardized units. Le Corbusier again limits himself to a minimum: houshold machines, order-making elements, functional furnishings, such as tables, chairs and beds. Le Corbusier states that, "Human needs are very few; they are identical to all people since all people have been cast in the same mold since the earliest times we know of....These needs can be reduced to a number of types, which means that we all have the same needs."[43] These items are designed to fit the interior in the same manner that today's mobile home is fitted. Every inch is calculated; drawer space is provided under beds; bunks are

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42. Lewis Mumford, The Highway and The City, Mentor Book, New American Library, Harcourt, Bruce & World Inc., N.Y., 1963, p. 70.

43. Le Corbusier, L'Espirit Nouveau, No. 23, 1925.

used in the children's rooms; everything that can be built-in has been. It is interesting to note that Le Corbusier has provided the children a floor-to-ceiling, five to six foot wide chalkboard in their bedrooms.

Evidently, Le Corbusier's inhabitants do not spend time in their living unit; they must spend it in the nurseries, schools, libraries and recreational spaces. There is inadequate or no space provided for quiet family lounging, television, radio, stereo, books, toys, seasonal clothing (unless one has no clothes at all), general family storage, or for in-the-home activities. Perhaps such activities are to take place in the bedrooms; they are better equipped for lounging and play. Where then is the quiet, private area of the household? Why isn't the terrace large enough for sun-bathing, grilling or for just enjoying the view? His apartments do not allow for the variables of man; the variables are as important an aspect of household planning as are the simple necessities. It is through the variables, the differences, that man operates as a whole man. Wright understood this. Clearly then, Le Corbusier's linear-city apartment needs more square footage.

The interiors at Marseilles and Nantes are dull and repetitious. He has not used the variety of textures and shapes which he used on the exteriors and in the roof

gardens. All surfaces are plain and smooth, except for the terrace's rough concrete grillwork.

In the 1952 Jaoul Houses at Neuilly (plate VIII), Le Corbusier created one of the most aesthetically interesting textural-interior relationships of all times through the use of contrasting materials: brick, flat tiles, plaster, wood, metal, glass and concrete, through the almost cubistic sense of design. Art objects (paintings, pottery, etc.) have a place in the interior and are respected for their own right, their own characters. It is these items which make a housing unit a home. It must be admitted that Le Corbusier was upset with the occupants of Jaoul who made the mistake of installing old furniture, which they were fond of. Wright behaved in the same manner. Wright also wanted full say on the furnishing of his houses; it must be the "artist" in each architect which wants all under his control. At least Le Corbusier allows for more selection of objects d'art than Wright, who would not even allow paintings hung, unless they fit with his concepts. The point I wish to make is that when more money is provided per square foot, a more pleasing, interesting, spacious interior space has been created by Le Corbusier. Given the needed funds, Le Corbusier would definitely include this type of interior in his Unite d'Habitation;

he would combine the functional and space relationship of Marseilles and Nantes with the textural and spaciousness of Jaoul.

Le Corbusier's Unite d'Habitation has been declared to be cold, inhuman cells, offering none of the psychological necessities of man. This brings us to the point -- what is needed by the average man? This is the second and most important reason for the inclusion of Nantes in the analysis of Le Corbusier's Unite d'Habitation. Nantes is a more beautiful immediate, natural site than Marseilles, whose port view is stressed. The beauty of nature is appreciated by all. Le Corbusier makes it possible for every inhabitant to have a beautiful view from his window. He would not allow another skyscraper to be immediately next to his. It was against his principles of the humanized skyscraper form. Nantes has a most picturesque site: tall firs, mature deciduous trees, complete to a flowing stream through Nantes' property and under a part of the building itself. Le Corbusier is in no way destroying nature's own beauty. He does not shape and manipulate the natural forms of trees and ground, creating the artificiality of the site as seen in Baroque palaces or American Colonial dwellings. He simply makes what man made "man-made." He leaves nature to itself, appreciating it for its own beauty as a contrast to man. He enables more men to have the possibilities of

being with nature, having nature close to their own home, while maintaining the compactness, efficiency, and desirability of the city form.

Aesthetically, Le Corbusier has created a far more beautiful form than the local pillared, colonial rendition of building seen at the local apartment complex. Concerning the acceptance of the architectural form, people accept what they see and daily live with, whether it is a Duncan Phyfe or an Eames chair. Most people, if not placed in the environment where the item is daily lived with, dismiss the form; they are unable to relate to it. The acceptance of a form by the mass of people comes only through living with the piece and the memories of a "home-life" tied to the work. (Example: The "colonial" captains chair -- it is neither a work of extreme beauty nor extremely pleasant to sit in; it hurts your back. Yet, it is accepted due to the romanticized memories of the past.) As long as a person could obtain the best for his money, functionally, with the pleasing use of textures and design, he would eventually accept the form. Most people's sense of beauty is tied to a memory, a romantic picture of the social implications of the piece, not the design or even to the complete functionalism of the work. The average person is not a connoisseur of art or good design;

they want these things if they see them and they mean something to the person. It is the duty of the artist, art critic, architect, etc., to continue the education of the majority.

Le Corbusier's aim was to find the "machine" or concept which would solve architectural and city problems. To Le Corbusier "machine" was the word for the vehicle or the means of problem solution. His "machine for living" does not mean a building should look like a machine, but that it should operate as a machine, fulfilling its needs and purposes in all areas related to it: structurally, economically, efficiently, functionally and æsthetically. His buildings aimed for perfection in the meeting of practical requirements. His aim was to create "systematically, to work out a coherent system that will lend expression to the general spiritual and intellectual level, and not merely to an individual whim."[44]

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44. Boesiger & Girsberger, Le Corbusier 1910-1960, Editions Girsberger, Zurich, 1960, p. 10

CHAPTER IV

"BROADACRE CITY" AS CITY PLANNING

Wright comments on city planning throughout his literary work, but they are merely that, comments. He first set up his "Broadacre City" in his 1932 book, The Disappearing City; in 1945, he expanded it into the book, When Democracy Builds; then in 1963, he entirely reworded it into the book, The Living City. The results of all the books were the same: 1932 Broadacre City, with the adoption of one or more sky-scraper forms.

Broadacre City is the summation of all Wright's beliefs on how man could exist with dignity as an individual in today's world. The Taliesin Fellowship worked on huge models of Wright's ideal city from 1934 on. Incorporated within the plan were several buildings designed by Wright for specific clients and specific needs. All the plan's elements were related by Wright's basic architectural philosophy, his principles of architecture: any building should serve man and the purpose for which it was built. It must be true to the nature of its site and the nature of its materials. Above all, architecture must be true

to the princples of unity to the timeless beauty that lives in all great art.

In his plan, Wright constantly refers to the needed respect for nature (in true Emersonian logic): "Broadacres would be so actually built in sympathy with omnipresent nature that deep feeling for the beauty of the landscape not so much to build upon - as to build with."[45] It is also noteworthy that Wright includes within The Living City Ralph Waldo Emerson's "Essay on Farming;" in the essay, Emerson states Wright's own beliefs - that "all historic nobility rests on possession and use of land,"[46] the idea of the farmer standing at the right hand of God, and that city inhabitants are poisoned by town life and town vices. These beliefs are the direct result of Wright's agrarian American upbringing. Wright's Broadacre City, as we shall see, is not so much city planning as it is wishful 19th century dreaming. Unlike Le Corbusier's organized solution to today's and tomorrow's city problems, Wright had no solution. His answer to city problemswas to destroy the city as we know it.

Wright forms the basis of his city planning with an attack on today's city. He recognized the ugliness of today's city, but could not have grasped the total complexity of the statistics, which we noted in chapter one. He felt

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45. Frank Lloyd Wright, The Living City, Op. Cit., p. 123.
46. Ibid., p. 251.

that the centralized city originated due to the lack of mass transportation, modern communication, and as a center of trade and production. He further felt that our vast technological improvements had solved the problems which the city had been developed for. The car, train and plane could carry people and goods over vast areas quickly. Communication had enabled man on the east coast and west coast to know the same data within minutes, if need be. Wright believed we had land a plenty and proposed that the new city, the "Living City or Broadacre City" of tomorrow was nowhere, unless it was everywhere. In 1930, with the advent of his plan, Wright demanded an acre for every man, woman and child."[47] He later reduced his land measure to an acre per family. Thus, Wright's plan was based on decentralization, a factor which will not solve tomorrow's problems as we saw in chapter one.

As previously noted, Broadacre City was based on Wright's belief in architectural relationship to nature and the close to the ground, horizontal family structure as seen in the Jacob's house; Wright's first concern was to the individual family and its daily life. His result was pure nineteenth century Romanticism; it was to protect the very nineteenth century individualist of which he was a prime example. He was forever tied to the wide open spaces and the life in that type of environment. In other words, Wright wanted every man, woman and child to have for his own Wright's little "Walden."

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47. Ibid. p. 83.

Wright was a great believer in self-sufficiency. . Furthermore, Wright's self-sufficiency was based on the land, on occupations which were related to the land. He felt that people should go back to the land and live on farms, making everything for themselves. He speaks over and over of the evils of our capitalistic money: the landlord who gains money from doing nothing but collecting the rent, and the system of money earning money. He takes up a third of his book, The Living City, discussing what he calls "the undemocratic system" of today's economy. Wright's economy would give money only to those who had produced an object worth purchasing. Basically, Wright is trying to set up a commune; an ideal community, where everyone competes equally, doing his fair share. As a result, Wright's Broadacre City is more a philosophy of life, economy and politics than it is a workable city plan.

Like Le Corbusier, Wright also felt that in the future less time would be spent in the factories and shops and more time would be spent in the individual home. As a result of this and Wright's basic architectural principles, Broadacre City (plates IX - XIV) revolves around the individual dwelling as in the Jacob's House. It is true that Wright included a few skyscraper tower structures in his city plan. However, these structures were the same type of afterthought that Le Corbusier's individual house was

to his city plan. The tower forms solved Wright's problems of housing the old, traditional city folk, of providing accommodations for visitors to the city, and for locating the duties which would not take up the majority of the inhabitant's day. Basically then, Wright's skyscraper was to take care of the community's odds and ends, without taking up city space.

Wright's Broadacre City skyscraper was based upon his 1929 St. Mark's-in-the-Bouwerie project. This building was finally realized in the 1953 Price Tower (plate XI); It is a combination of offices and apartments with one-fourth of each floor being given to apartment space. Wright's Johnson Laboratory is another type of skyscraper which would fit the Broadacre City plan, just as would the Guggenheim. Wright humanizes the skyscraper we know today; he demands that the skyscraper stand free in the country on a large land space. On this point, Wright and Le Corbusier demand the same thing: the skyscraper must be set in a park of green. The difference is that Wright's tower stands in a larger park than Le Corbusier's.

Just as Wright was against the boring repetition of the same architectural form, his city's buildings are of all types and serve all purposes. Wright planned for average and above average individual homes, quadruple housing (a one floor building divided into four separate and equal

housing units) and for the skyscraper housing of those people who would not try the "true democratic" way of life on the ground. Wright looked at this last group as some sort of idiots. Wright set aside a specific location for the univeral worship of God. Included within this area was a columbarium, cemetery, and nine sectarian temples which encircled a central building for universal worship. Community group activities were grouped together in a civic center area; in it was contained the skyscraper county building (a taller Price Tower type), the stadium for the circus and county fair, and a skyscraper model for city visitors. Wright scatters roadside markets about his plan; they are similar, though smaller than Detroit's Northland and provide room for a bakery, delicatessen, restaurants, shows, shops, lounges, and a service station. Various sizes of farms and factory areas are also featured in the plan. A specific area is set aside for the housing of the crafts and country architects. Wright provides for all, including stables, baths, gyms, arboretums, cottages and even vineyards. Wright even went so far as to play with such novelties as a houseboat, a modern car, and helicopters in the planning of Broadacre City. The total is conceived of as one huge park-like garden, extending in all directions and never ending.

Wright's individual buildings and their concepts are beautiful, but their relationship within the city plan fails miserably. In referring to Wright's plan view of Broadacre City (plate IX), we see the results of Wright's two basic principles of city planning. The basic earth-hugging form joined to an acre per family has destroyed the centralized city. It has caused fantastically low densities, similar to those of a village, and a jig-saw type of traffic system, which is the same as the horrid system of today's city. Broadacre City engulfs all the land; there is no free, open space; there is no room for the projected population growth of today's city. Broadacre City is the "Garden City" all encompassing; it is the result of a nineteenth century attitude of city planning.

The street system defines a city; it sets the city's limits in all areas. Wright's system was a maze for the most highly skilled mouse. It is basically the same as today's street system; it has the tiny sidestreet and super expressway. Each building has the needed access, resulting in the same type of grid we have today. It differs from today's city in the distance one has to drive between specific city points. In this way, Wright hoped to thin out present automobile congestion. Wright's traffic system will not work with the growing population and the increasing number of cars projected for tomorrow's city.

Wright, like Le Corbusier, felt the need to separate pedestrian and motor traffic. His plan was to throw the sidewalks and the curb into the street and to raise the sidewalks above the present street level. His plan was that "these elevated sidewalks should be connected across, each way, at the street intersections and down, by incline to the streets below at the same four points of street intersections."[49]

Wright provided protected parking space under the sidewalks which were cantilevered from the building. Building show windows and entrances were provided at both ground and second floor level. "Entrances could be had to stores from the road bed by recessions built in the lower store front or by loggias that might be cut back into them."[50]

Wright has reversed Le Corbusier's separation of traffic. Le Corbusier's pedestrian was on the ground; Wright's is on the second level. It is also interesting to note that Wright's building recessions are close to Le Corbusier's pilotis idea; Wright would never admit it. One still wonders where Wright is going to provide adequate parking for great numbers of cars. He still has the old city block and parking relationship in mind. Of course, with Wright's low densities, you wouldn't have a great number of cars. This is the unreality, the unfunctionability of Wright's city plan.

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49. Frank Lloyd Wright, The Future of Architecture, Mentor Book, Horizon Press, N.Y., 1953, p. 173.

50. Frank Lloyd Wright, The Living City, Op. Cit., p. 174.

In Wright's traffic plan (plates XII and XIV), like Le Corbusier, Wright has proposed a one-way street and overpass system to eliminate today's traffic problem. Street accesses and exits are provided for by turnoffs and ramps. His overpasses and underpasses, in the complete traffic plan, do not solve the problem. A bottle-neck remains at the top of his overpass. He could have cleared up the problem in his overpass section, but he allowed for those of us who do not take the right turn in the first place.

Wright's Broadacre City does not solve the problems of today's city. It does not face the statistics of tomorrow's society. It remains a dream of the Romantic nineteenth century.

CHAPTER V

THE "RADIENT CITY" AS CITY PLANNING

Unlike Wright, whose city plan was a result of his architecture, Le Corbusier's city plan regulates his architecture. Le Corbusier never dissociated town planning from architecture; for him building was a social action aimed at man and the solution of his problems. "I have laid it down that the cornerstore for any form of organization in a machine civilization must be a respect for the liberty of the individual."[51] Le Corbusier's concern is for humanity and its physical, social and spiritual needs. He deals with the realities and tools of today, not the dreams of yesterday.

Le Corbusier laid down his first city plan in his 1922 "Ville Contemporaine," a plan which has never become a realitiy. He further developed this city plan in his 1933 book, La Ville Radieuse, (The Radient City). Within it, he analyzes the needs of man, of today's city and farm, projecting his solution from his findings. All Le Corbusier's future city planning incorporated the basic theories as established in The Radient City, the requirements of the

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51. Le Corbusier, The Radient City, Op. Cit., p. 113.

individual city to be planned and the use of the latest technological improvements.

Le Corbusier designed his city to serve mankind in the following order and hierarchy: to live, to work, to cultivate body and spirit, and to be able to travel about. He stated, "The Radient City, inspired by the laws of the universe and by human law is an attempt to guarantee the men of the machine civilization all this world's basic pleasures: sun in the house, sky through their window panes, trees to look at as they step outside.....I say the basic materials of city planning are: sun, sky, trees, steel, and cement, in that order of importance."[52] He also included the second group of pleasures into his city plan: action and participation in collective work. He based this on the fact that communal effort and activity benefits the happiness and sanity of society as a whole, even among its most humble members.

Le Corbusier states that today's city does not function to serve the needs of man, economically, physically, socially, efficiently or spiritually. He points out that technology has taken great leaps forward since the turn of the century, but twentiety century man still lives and operates in cities designed for the age of the horse and carriage. Today's circulation pattern is of another age;

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52. Ibid., pp. 85-86.

its bottlenecks, mingling of different speeds and mixing of pedestrian and automobile create chaos and even death. The relationship of commerce, industry, administration and housing is haphazard and wasteful. The placing of buildings along corridor streets is unhealthy due to the lack of sun, sky, trees and the excessive noise created by the closeness of building walls. "The air of the cities is not God-given air. It is the devil's air. Doctors reveal the result of their analyses[53].....trees absorb carbon dioxide. They give off oxygen. The tree is man's companion. Soon there will be no trees in the cities."[54] The dimensions of today's city are insufficient; the skyscrapers are too small; they are spectacular catastrophes. The city's dispersion into suburbia is doomed from both an economic and a mental standpoint. The individual dwelling is too large; it takes up too much valuable ground space and is full of useless, finicky objects from a past age. Le Corbusier's aim was to solve these problems; his Radient City does.

Le Corbusier analyzes today. He divides the city's day into 24 hours: 8 hours for sleep, 1½ hours for transit, 8 hours for work, 1½ hours again for transit, leaving 5 hours for home life and leisure activities. "When and where today can (man) offer his pale body to the restoring and strengthening influence of its light? Like a plant in a cellar, he

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53. Doctors pointed out that 10 cubic meters of air within Paris in 1933 had 55,000 bacteria compared to 0 bacteria out at sea.

lives in the dark. What does he breathe? You know only too well. And you know also only too well the tiring and exhausting noise of the modern city. A small wonder that our nerves are in a permanent state of derangement..... Ultimately there comes the disillusionment - the awakening from the dream. When the workers reach their homes in the garden - cities at eight o'clock in the evening.....they are utterly exhausted in mind and body."[55]

Le Corbusier, in The Radient City, proposes that existing cities be made fit for twentieth century man and the fantastic rate of population growth, and that the centers of those cities which are unfit for all forms of traffic be demolished, saving only the monuments of architectural and historical interest. "Knowing how to live is the fundamental question before modern society everywhere in the whole world. Do you know how to live soundly, strongly, gaily, free of the hundred stupidities established by habit custom and urban organization."[56] "A new age has begun, let's construct everything, harness the machine, build a new consciousness."[57] Le Corbusier believed in the great city, the metropolis; he believed it could be supremely beautiful, functional and efficient. He believed that city planning was architecture at its highest level and that its basic organization, its spacial relationships, its forms,

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55. Le Corbusier, 1934-1938, Op. Cit., pp. 21-22.
56. Le Corbusier, When the Cathedrals were White, Op. Cit., xvii.
57. Ibid., p. 217.

its level of activity, its heart, its relationship to human spiritual and physical needs must be planned for in today's and tomorrow's city.

Le Corbusier begins his basic city plan as first seen in Ville Contemporaine with four principles: the decongestion of the city's center, the increase of density in the skyscraper form, the enlargement of circulation and the emphasis of landscape into park areas throughout the city. His main tool in accomplishing these principles is his skyscraper form as seen at Marseilles and Nantes; "build it bigger and more useful and it will reclaim a vast amount of land, will compensate for depreciating properties, will provide a perfect system of circulation and will bring trees and open spaces into the city."[58] This structure could hold great densities, 400 persons to an acre. It would sit upon only 12% of the ground, leaving 88% of the ground free for transportation, parks, sports and greenery. In fact, due to the pilotis and roof garden, it would not even take up 12% of the ground space, but give an additional 24% of space - 112% of space is given to men and group activity.

The skyscraper, as used in Le Corbusier's plans would bring back sky, air, light and trees to the most humble city dweller. Furthermore, the skyscraper would diminish

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58. Le Corbusier, 1934-1938, Op. Cit., p. 21.

internal distances, make the city more compact, save time, provide closeby recreation and would function more economically and efficiently than today's city forms.

In this way he would create a vertical garden city which would fulfill the city's four functions of living, working, cultivating the body and spirit, and circulation. His main emphasis constantly remains, "Natural conditions must be reinstated in the life and work of man, restoring the reign of the cosmic and psycho-physiological equilibrium."[59]

As a result of the acceptance of his four principles and projected technology, Le Corbusier creates a new 24 hour city day with: 8 hours for sleep, ½ hour transit, 4 hours work (due to technology and increased efficiency of his city plan), ½ hour transit, and 11 hours of leisure for family, recreation, social activities and further education. In this way he aims to once again make the family the center of society and thus make the society more sane, stable, and contributive to itself.

Le Corbusier's city plans for Algiers, Rio de Janerio, Saint Die, Marseilles and Chandigarh are all based on his Radient City plan of 1931. The only differences lie in the techological improvements and aesthetic style of his skyscraper type; his 1931 skyscraper is a definite part of

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59. Le Corbusier, 1946-1952, Op. Cit., p. 181.

International Style, whereas his later buildings (as at Nantes, Ronchamp, etc.) are of his mature, individual style. They are more sculptural, plastic, and organic, having a timeless quality to them that his earlier work lacked. His city of today would combine "The Radient City" and the architectural type as seen at Nantes.

Le Corbusier's Radient City (plates XV and XVI) is designed in parallel sections, according to their functions. "Any concentrically designed city (all cities created in the past on ground plans determined by "donkey tracks;" also my own 1922 project for a modern city of 3 million inhabitants) makes regular, organic development impossible: a biological defect.....Here, it can be extended without difficulty on either side and into the country. A considerable margin should be reserved from the very beginning for civic organization."[60] Le Corbusier adjusted this basic layout to the geography of each proposed city site.

Le Corbusier places housing in the center of his Radient City, not business as in today's city. He conceived of three main types of city housing: the vertical Unite d'Habitation for families containing up to 2000 people in various sized apartments, a similar unit for newly married couples, and the two to three story horizontal Unites,

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60. Le Corbusier, The Radient City, Op. Cit., p. 168.

which luxuriously housed up to 305 persons to the acre. Individual housing for the super-rich was placed near the outer limits of the city. By placing housing in the city's center, the inhabitant is able to reach all city points, saving valuable time and diminishing internal traffic by half.

Immediately north of the housing district lie:

1. The hotels and embassies
2. The international transportation center (rail, air, and interstates)
3. The business and civic centers
4. The government and university center
5. The satellite cities (in this order) making up the "Radio-Concentric City of Exchange."

One can clearly see the functionability involved in the placement of each center. The main interstate transportation system is centralized; the airport is on the roof of the rail terminal. It is connected to the international and inter-city road system. From its location, all city sectors employing its services most often have quick access. The city is even planned taking into consideration the normal wind movement from the northwest. All industries which could cause pollution problems are placed in the southeast area of the city. Le Corbusier's aim through use of the skyscraper is to concentrate and to bring together as -

much as possible, while providing a spiritually needed view of landscape to the city's workers.

Heading south from the housing sector, one passes through a green protective forest to the factory belt. Le Corbusier's factories are also skyscrapers, though not as high as his Unites. Proceeding south, one comes upon the warehouse belt and finally the belt of heavy industry is reached. This sector is Le Corbusier's "Linear-Industrial City." It implies the redistribution of industries of certain size. The means for the distribution of goods by rail, road, and waterway is planned into the linear city's traffic system. The placement of the linear city enables the worker to live near his work, with both work and home being in natural surroundings in park areas.

The different sectors of the Radient City are completely reorganized in terms of two standards - function and traffic. In turn, they are further differentiated according to the rational type of activity carried on in the factory, business, dwelling and green zone.

Unlike Frank Lloyd Wright's updated nineteenth century street plan, Le Corbusier's solution to traffic and our streets deals with the realities of today and the foreseen problems of tomorrow. He classifies speeds, "normal biological speeds must never be forced into contact with high speeds of modern vehicles."[61] He uses a one-way traffic

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61. Le Corbusier, The Radient City, Op. Cit., p. 121.

system. He eliminates crossroads with every imaginable overpass and underpass seen today, including the "cloverleaf;" his overpasses are successful. He allows high-speed vehicles for only certain designated purposes and limits which streets they may use. He states the function of the heavy vehicle and limits its operation ground. Finally, he gives the pedestrian sole possession of the entire ground surface; he is free to walk anywhere, everywhere without the slightest danger.

The pedestrian is urged to use his feet; walking is man's best form of exercise. Covered walkways are provided to protect him from the elements while walking. These foot paths crisscross the city diagonally and orthogonally, providing the shortest route to any point. The pedestrian paths pass beneath the traffic lanes every 1300 feet or more.

In his Radient City traffic system (plate XVI) Le Corbusier separates cars, trucks and trains from one another and the pedestrian. He places his auto-way 20 feet above the ground level; Wright placed the pedestrian at this level. Le Corbusier's is the most logical solution; cars have to stay on their paths at whatever level, humans can vary their path if at ground level. Directly beneath it is the truck and heavy vehicle roadway at ground level. To either side of the truck-way are the city's train-commuter tracks with their depots. No parking or pedestrian is allowed on these highways.

Le Corbusier proposes a network of city units a quarter of a mile in length on each side. In this way he is able to place the access ramps of the different levels far enough apart in order to eliminate intersections. Thus, cars are able to move one way without stops, and the city's center is quickly accessible. This system was joined at its ends by a peripheral highway system that passed the city altogether.

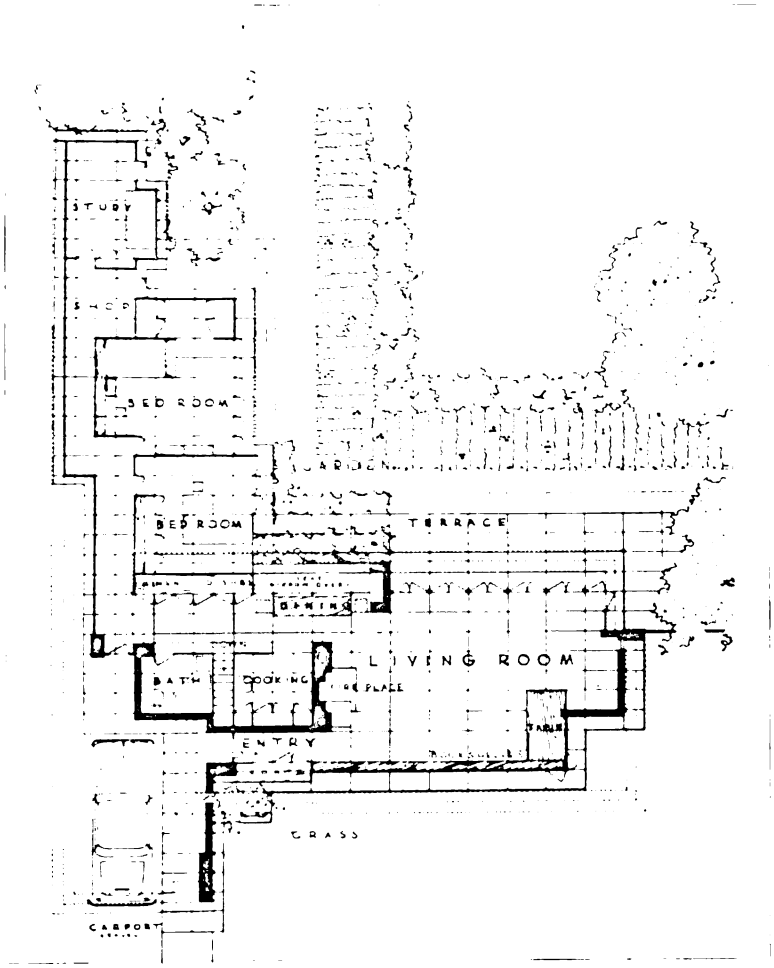
The pedestrian's building entrance is at ground level; the main door, which opens directly onto the carport area is at the second level, 20 feet above the ground. A slow-speed branch road connects the autoport with the nearest highway.

In the late nineteen forties, Le Corbusier added "The Theory of the 7V" (V = road) to his city planning. It reclassifies motor vehicle traffic according to speed. He applied the 7V system to the planning of Marseilles Sud Michelet in 1951 and later to his realized work at Chandigarh. V1 crosses the countryside and towns; it is the international roadway. V2 is for fast traffic, both cars and busses. Every ¼ to ½ mile a specially designed turning-off and access point is provided. V3 is a distribution and road dividing sector. The V3's have no pavements and are used exclusively by wheeled traffic; consequently, there are no doors opening on them anywhere. They run

through the parkland, interrupted only at intervals by service stations. The V3's feed the V4's, the streets serving the business center. Along the V4's are two or three-story buildings, shops, artisan workshops, cafes, cinemas, etc. Here one can walk about, buy things, talk or sit on cafe terraces watching the people go by. Cars and bicycles move slowly past and pedestrians walk on ample pavements under green trees. The V5's and V6's are fed by V4's; they lead toward the housing, but only the houses' branches. The V7's link V6's and V4's. They serve zones reserved for the culture of the body and spirit (the schools, clubs, and recreational areas).

At Marseilles, Le Corbusier added the famous V8 for bicycles, scooters and motorcycles to his traffic system, extending them from the V1, on one side, to the doors of each house on the other. He also reduced his V3 network to a minimum, furnishing it with carports and parking stands where needed.

Le Corbusier creates a city plan which meets and solves the problems of today's and tomorrow's city. The "Radient City" will take care of the great densities of tomorrow, while saving land and nature for posterity. At the same time it satisfies the city's mental and physical needs; it enables the city dweller "to live heroically." Le Corbusier is the forerunner of modern city planning.


STUDY
SHOP
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BED ROOM
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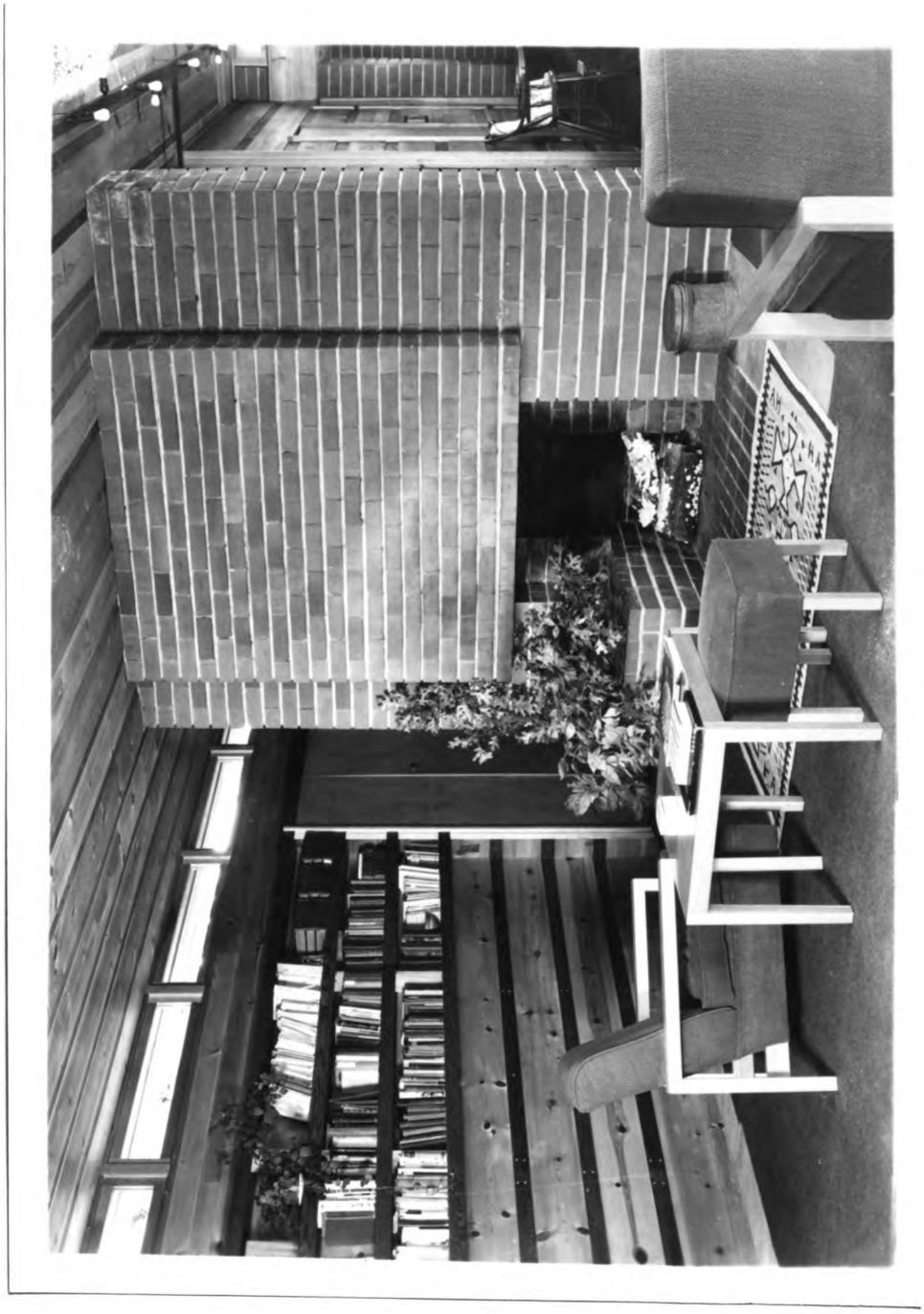
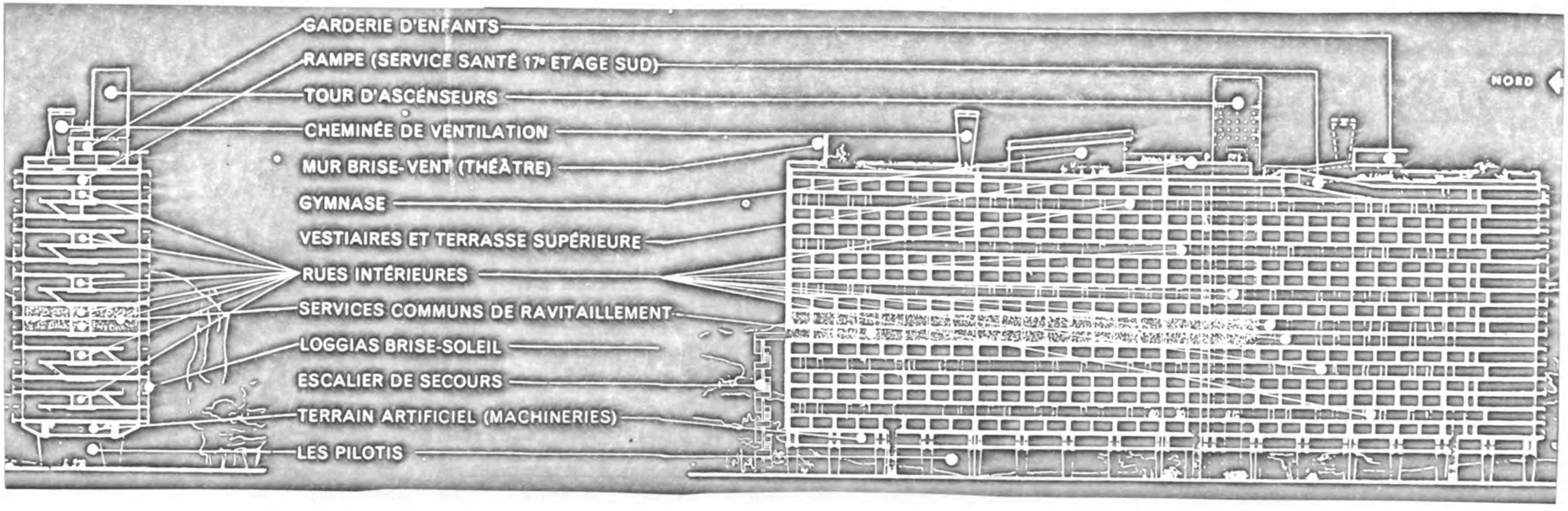
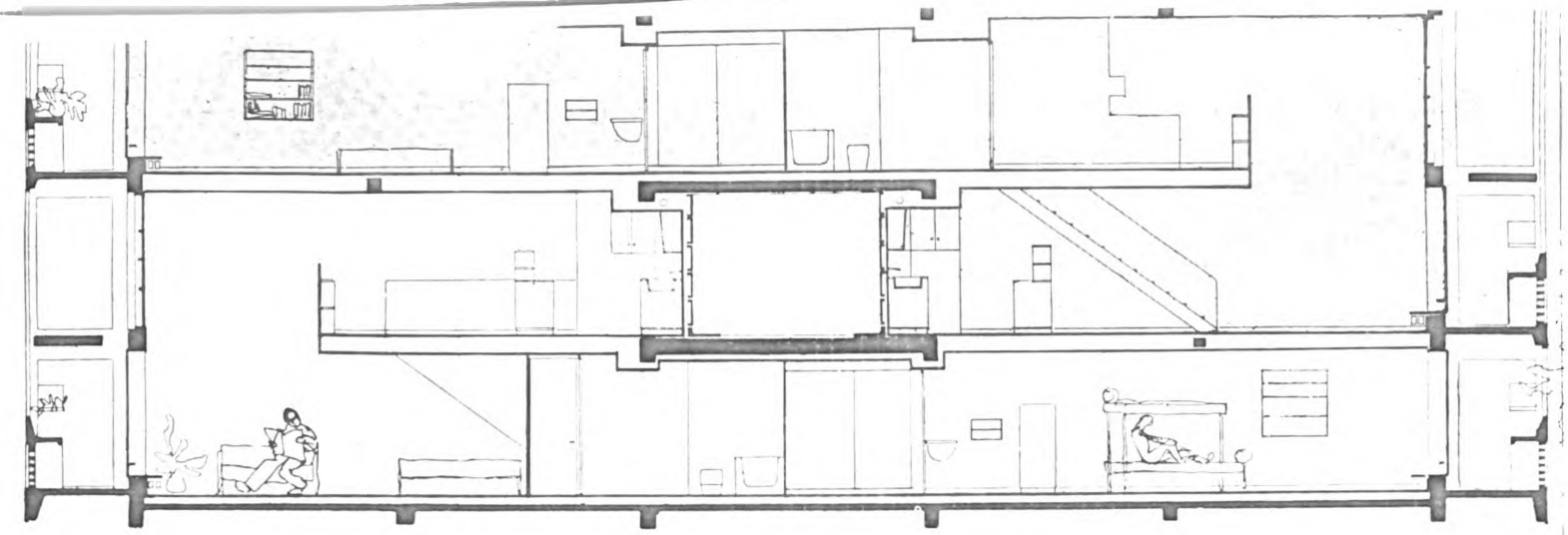
BATH
COOKING
LIVING ROOM
ENTRY
TABLE
GRASS
CARPORT



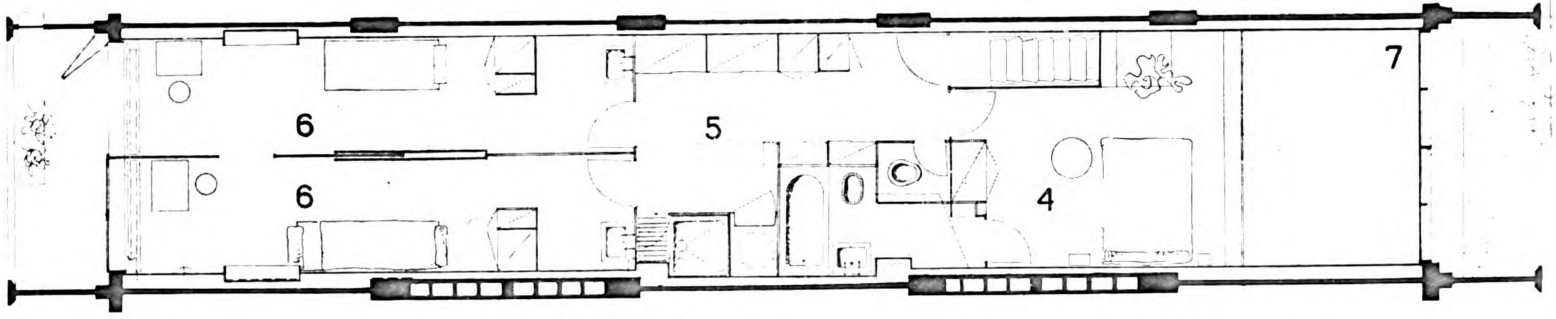

GARDERIE D'ENFANTS
RAMPE (SERVICE SANTÉ 17e ETAGE SUD)
TOUR D'ASCENSEURS
CHEMINÉE DE VENTILATION
MUR BRISE-VENT (THÉÂTRE)
GYMNASE
VESTIAIRES ET TERRASSE SUPÉRIEURE
RUES INTÉRIEURES
SERVICES COMMUNS DE RAVITAILLEMENT
LOGGIAS BRISE-SOLEIL
ESCALIER DE SECOURS
TERRAIN ARTIFICIEL (MACHINERIES)
LES PILOTIS
NORD

Coupe longitudinale sur une «couple de cases» Une rue intérieure dessert les appartements
Longitudinal section through a "compartment couple". An interior street serves the apartments
Längsschnitt durch ein «Wohnungspaar». Eine innere Strasse führt zu den Wohnungen

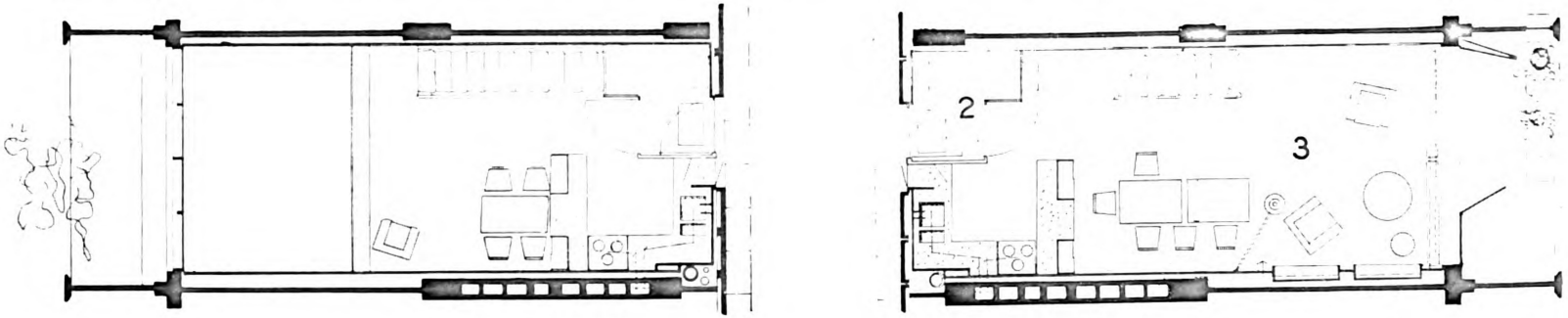


Appartement pour famille de 2 à 4 enfants (type inférieur)

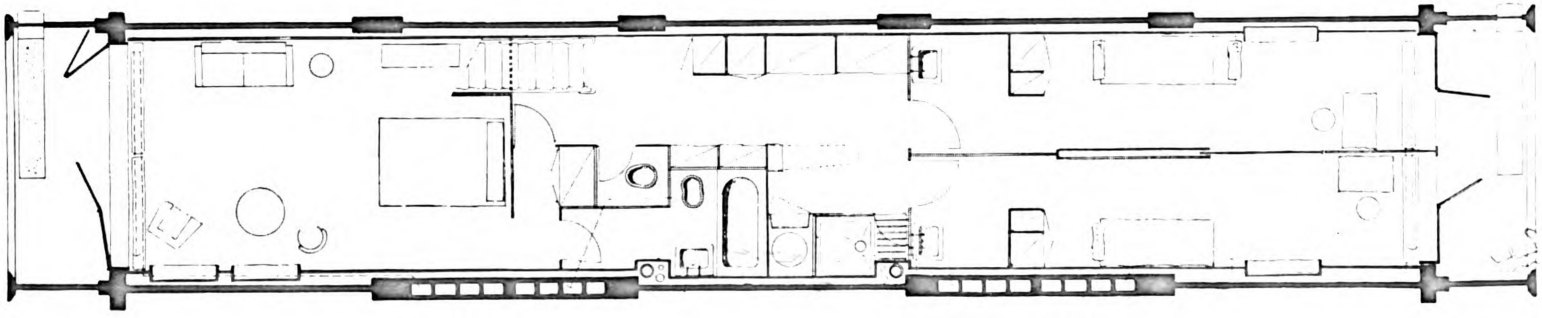
Plan d'appartement type supérieur

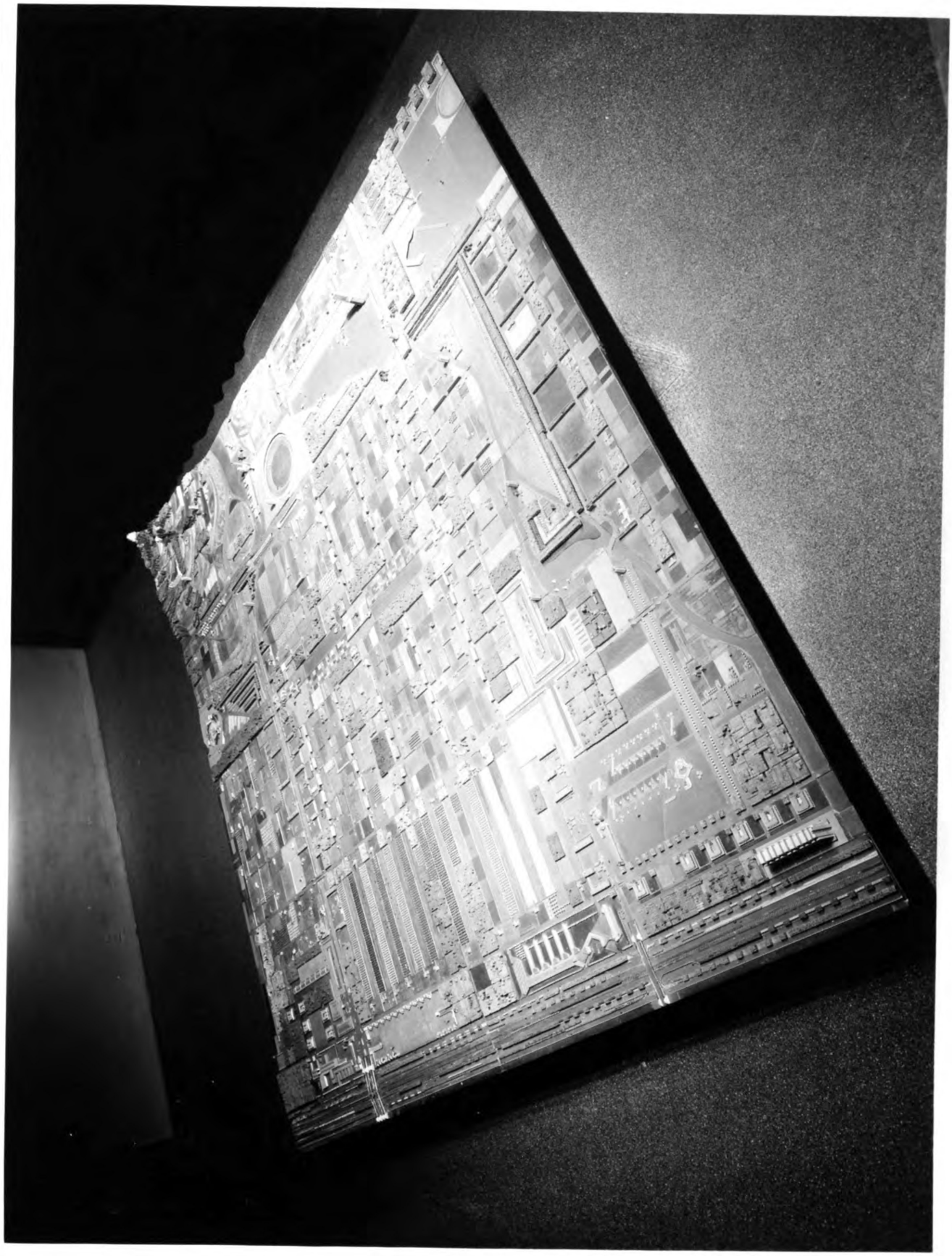


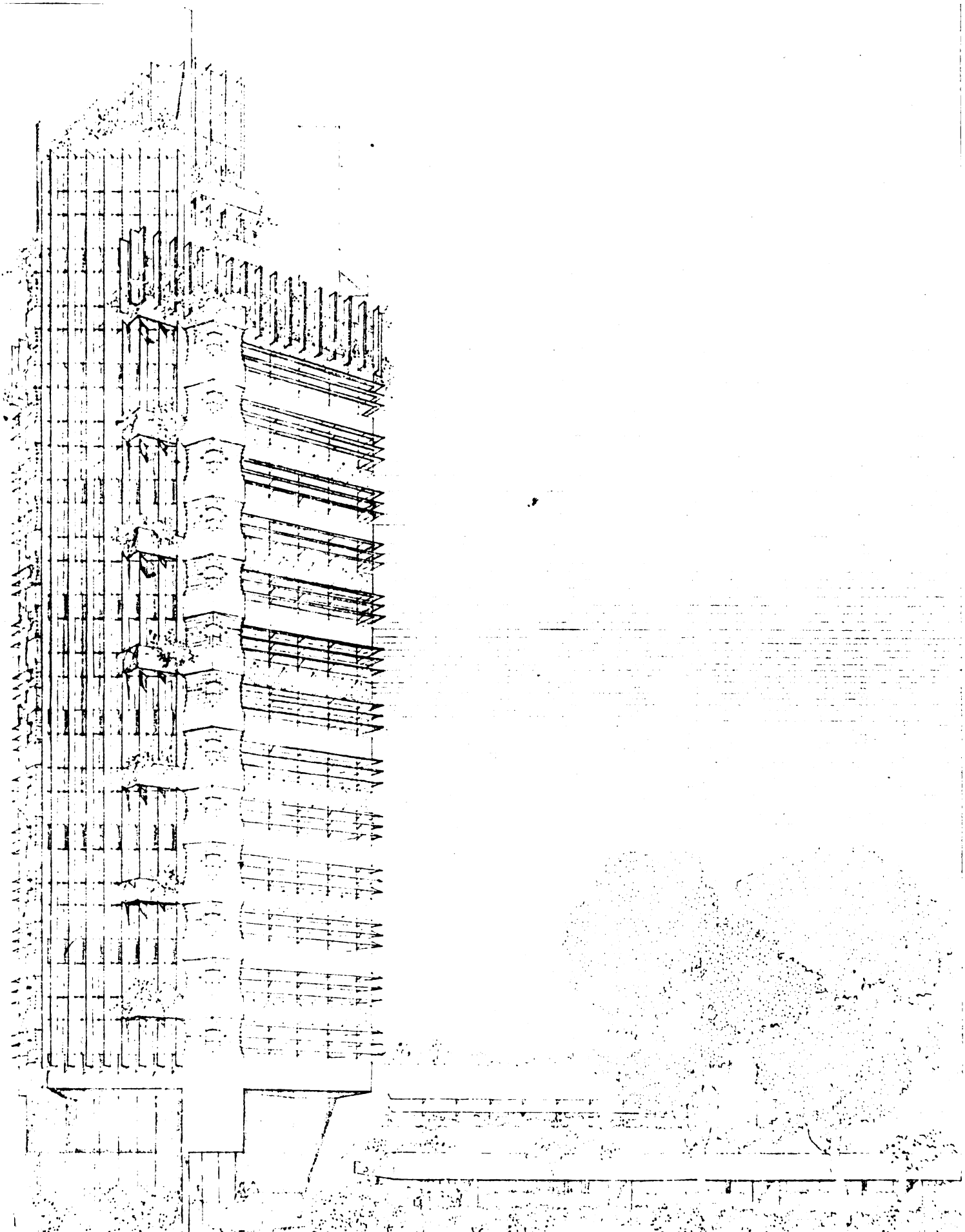
1 Rue intérieure
Interior street
Innere Strasse
2 Entrée
3 Salle commune avec cuisine
Living-room with kitchen
Wohnraum mit Küche
4 Chambre des parents avec salle de bains
parents' room with bath
Elternzimmer mit Bad
5 Casiers, penderie, placards, planche à repasser, douche pour enfants
6 Chambres d'enfants
7 Vide de la salle commune



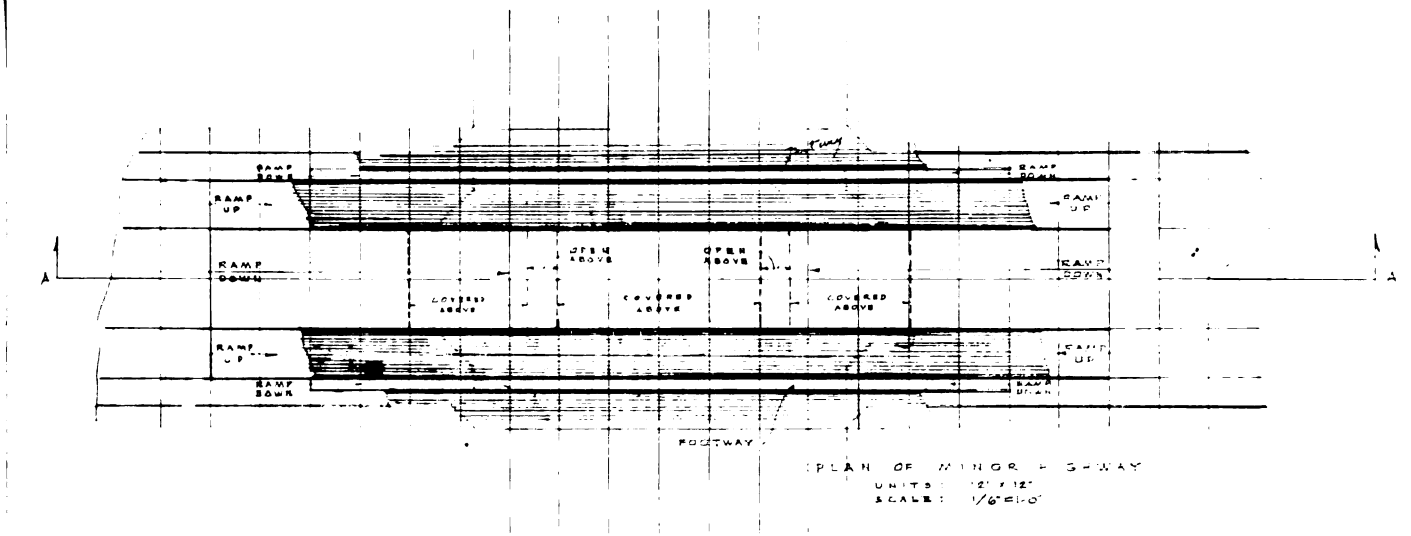
Plan d'appartement type inférieur





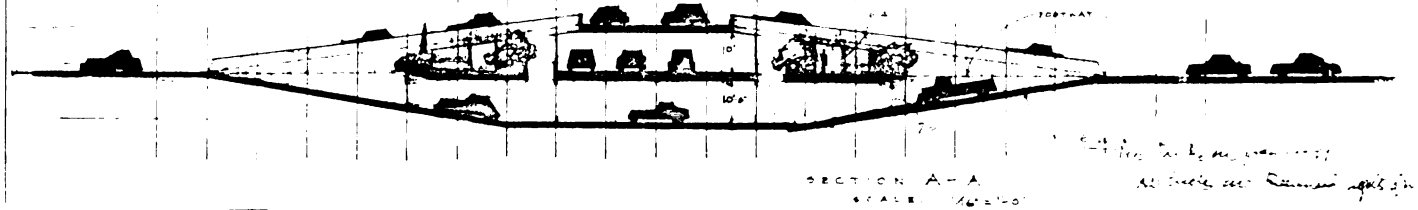


PLAN OF MINOR HIGHWAY

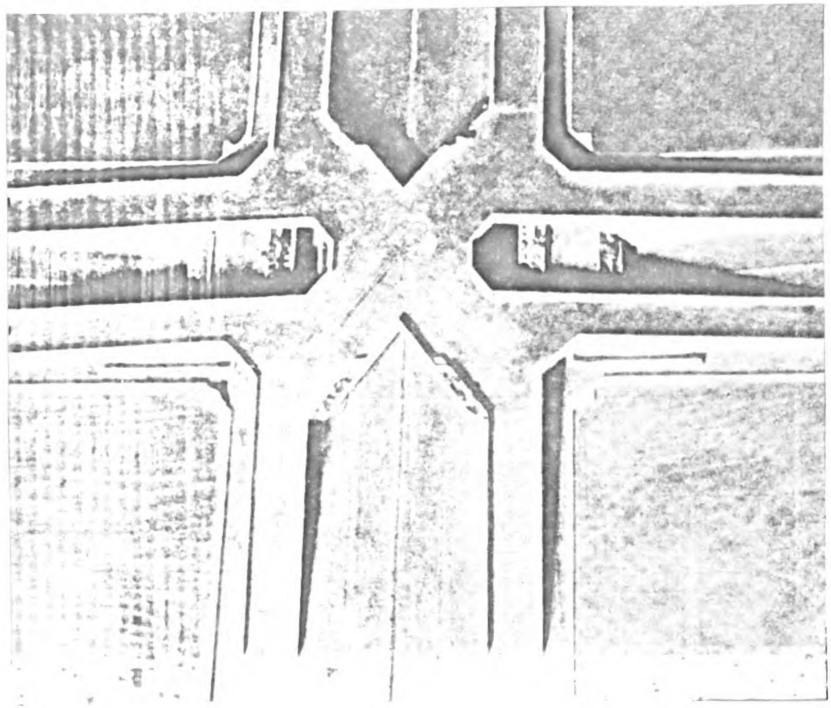


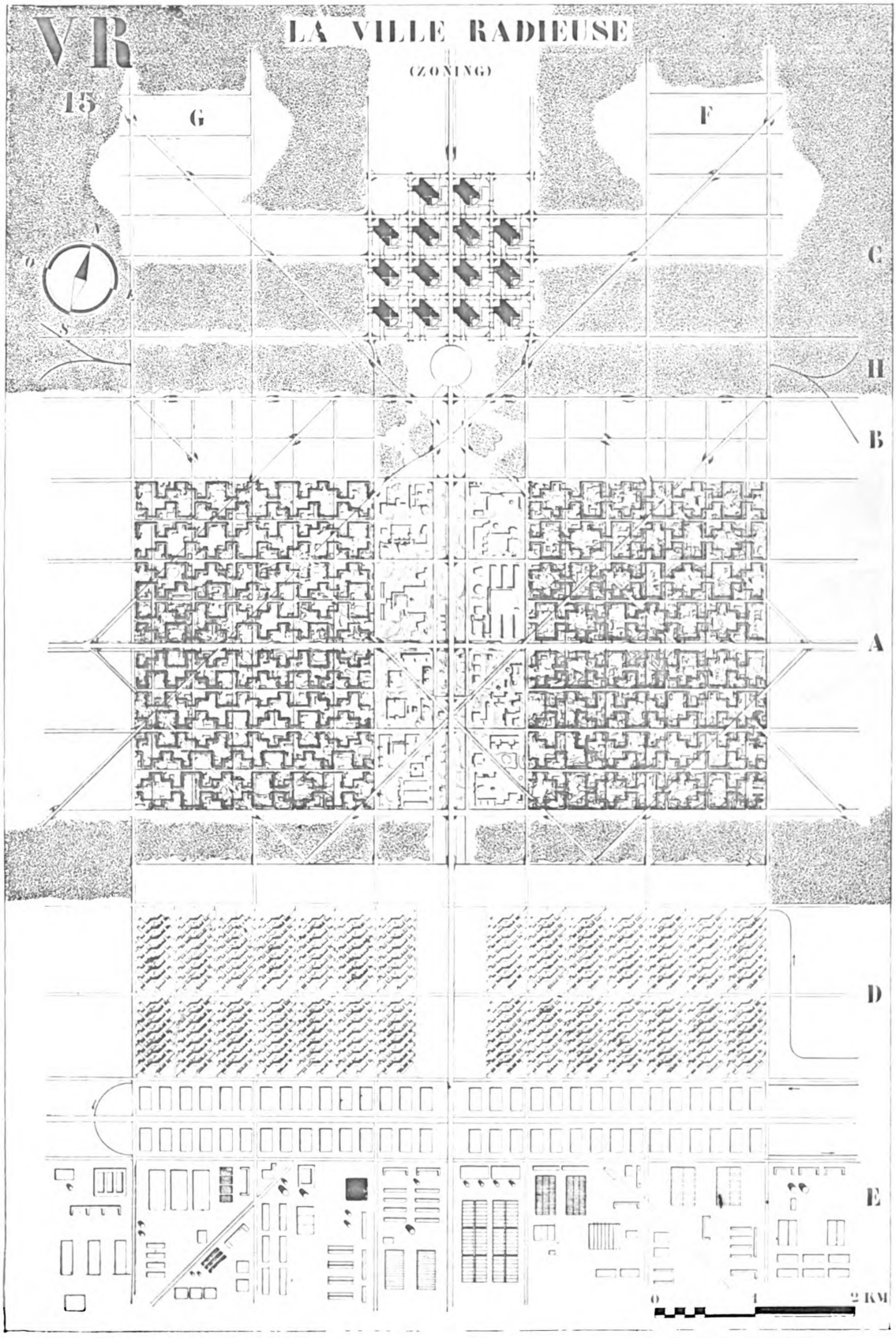
PLAN OF MINOR HIGHWAY
UNITS : 12' x 12'
SCALE : 1/8"=1'-0"

SECTION OF OVERPASS



SECTION A-A
SCALE : 1/8"=1'-0"





Satellite cities. e.g.: government buildings or center for social studies, etc.

The business center

Railroad station and air terminal

Hotels
Embassies

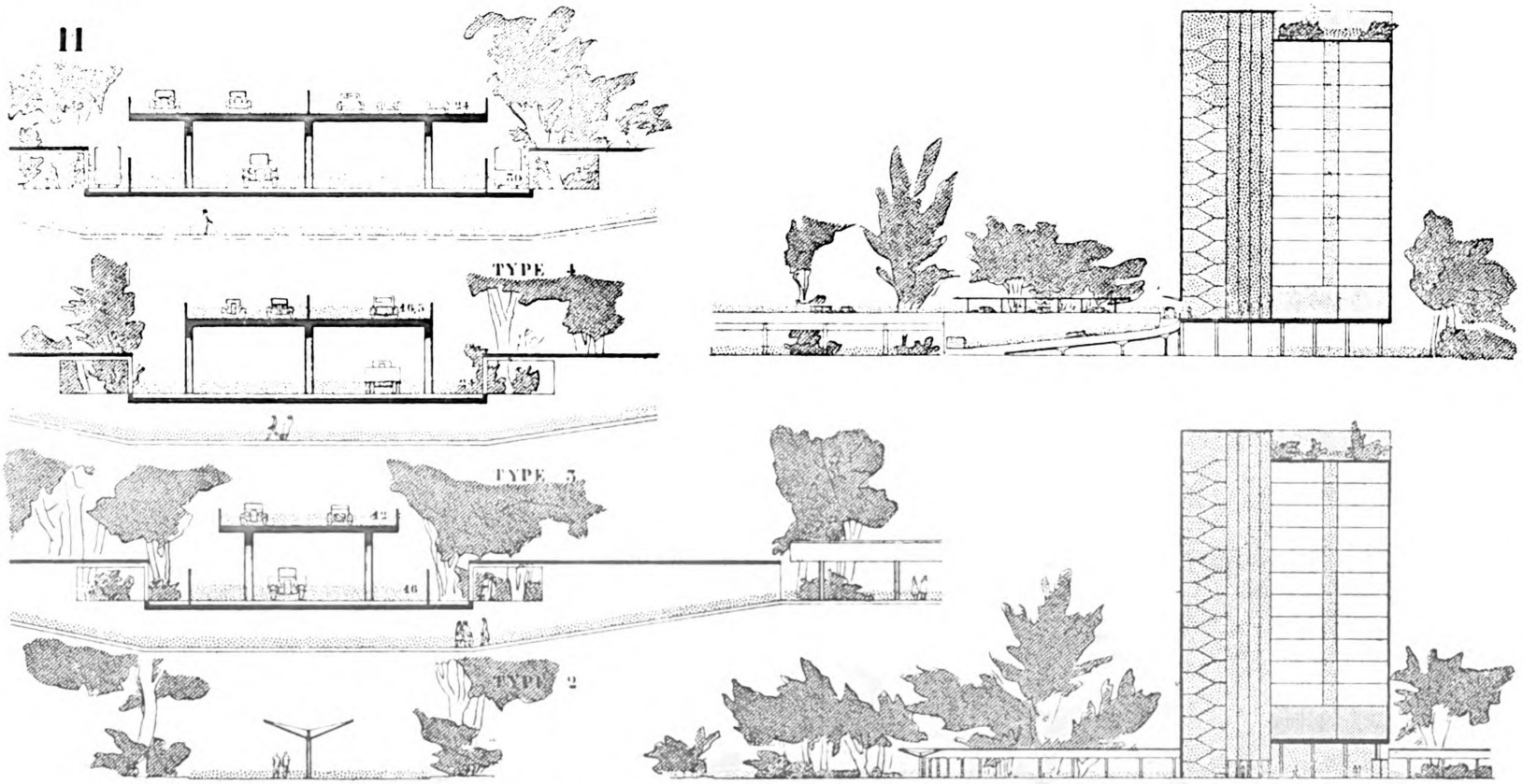
Housing

Factories

Warehouses

Heavy industry

VR



TYPE 1

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