THE RICE INSTITUTE

CITY PLANNING THEORIES OF
LE CORBUSIER

by

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Le Corbusier, pseudonym for Charles Edouard Jeanneret-Gris, has been a prolific writer and practitioner in architecture and city planning. Born in Switzerland in 1887, he travelled widely during his youth and finally settled in Paris. After the First World War he became quite active among the avant-garde and devoted a large portion of his energy to painting. His radical outlook extended to city planning, and his first book on the subject, Urbanisme, was published in 1924. The book was a proposal to design the city for the automobile and to arrive at a new esthetic from the solution of contemporary needs. He envisioned the city center as a group of tall skyscrapers surrounded by apartment houses. These, in turn, were surrounded by open country—a controlled zone for expansion—and garden cities were beyond. The proposals in Urbanisme were not systematic and sometimes ambiguous in spite of the fact that Corbusier's intent was to write something of a technical treatise.

La Ville Radieuse, his second major writing in city planning, was published in 1935. In this book Le Corbusier clarified and put into somewhat more complete order the proposals of Urbanisme. During the years after the publication of Urbanisme, but before World War II, Corbusier planned numerous projects embodying principles set forth in the two books. Although there were exceptions, the projects manifested an intensely romantic approach in which his highly imaginative creative ability sometimes overshadowed logical process. After the war, however, his projects manifested a more logical order and appreciation of the human being (not the automobile) as the basis of design. This is illustrated in the master plan of Chandigarh, India (1952) where there is also a well organized system of
circulation and an interesting juxtaposition of land use areas.

Le Corbusier has made definite contributions to the field of planning; perhaps the most important was the boldness of his thinking. His comprehensive designs for complete metropolitan areas established a contemporary precedent, the potentialities of which have not yet been fully developed. He was the first planner to express, in his writings and projects, the importance of high density concentrations, the city centers, to the functioning of a mechanized highly populated society. His separation of traffic according to speed and function was an early recognition of the growing importance of the automobile in urban design, but in his earliest designs this is overemphasized to the detriment of the pedestrian and the visual effect of the city-scape.
PREFACE

The city planning theories of Le Corbusier have been well attended and his realizations widely published, but his style of presentation coupled with a general lack of systematic study on the part of his audience has resulted in some misunderstanding of his work. This thesis is an attempt to clarify the basic principles of planning as expressed by Le Corbusier and to evaluate them in reference to the conceptual development of planning. He has been an eminent theorist and creative artist for over four decades, and the fact that he is still active makes a definitive study impossible. This thesis in no way purports to be that.

The thesis is organized into three parts: an introduction including a biographical sketch of his early years; a clarification of principles as shown in his writings and manifested in his projects; and a commentary on the significance of his ideas in the field of planning. Chronological order is generally followed to help emphasize the evolution of his thought. It is outside the scope of this thesis to analyze historical precedents of Le Corbusier's thinking, and it has already been done in a general way in the histories by Gideon, Whittick and others, although there is still a great need for the scientific historian to apply his methods to the field of planning.

I wish to acknowledge a great debt to Dr. Edward De Zurko of the Architecture Department whose guidance made the thesis possible. The staff of Fondren Library of the Rice Institute has been most patient in procuring necessary books, Mr. James W. Phillips especially having given generously of his time.
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CHAPTER I

INTRODUCTION

In studying and evaluating the ideas of a man it is illuminating to know something of his life in order to establish any causal relation which might exist between events and influences, and both the general tone and specific proposals of his ideas. What follows is a rather brief account of the early part of Le Corbusier's life and an attempt to establish such a relation while leaving out what appears to be irrelevant detail.¹ Le Corbusier is the pseudonym of Charles Edouard Jeanneret-Gris and is the name with which he has signed most projects and writings.² Le Corbusier, the name of a grandfather, is as solidly established as Samuel Clemens' Mark Twain, so it, or the shortened Corbusier, is used throughout the text, and where Jeanneret does occur it signifies Le Corbusier's cousin, Pierre.

Le Corbusier was born the sixth of October 1887 in La Chaux-de-Fonds, a town near Neuchatel in the heart of the Jura of the Swiss Alps. It is interesting to speculate as to what effect the majesty and beauty of such an area might have on a person for it seems that the romantic and grandly scaled conceptions of Corbusier might be in some way related to the landscape of his native region. His father was a watch engraver and Le Corbusier's education was pointed toward his taking up the same work. He


² The pseudonym Paul Boulard was sometimes used to sign articles for the magazine Esprit Nouveau.
had the usual primary and superior school training up to his fourteenth year and later went to the Ecole d'Art de La Chaux-de-Fonds, a school founded in the nineteenth century for the instruction of engravers or, more strictly, decorators of watches. While there Corbusier was strongly stimulated by one of the teachers, L'Eplatenier, who had studied at the Ecole des Beaux Arts and who, by Corbusier's own acknowledgement, first introduced him to the problems of art. L'Eplatenier evidently gave the students free rein of his library, and this vicarious contact with art and architecture was soon felt as a constructive background for Corbusier's appreciation of both old and new in his extensive travels. To the influence of L'Eplatenier and that of William Ritter can be traced his discontent with the then present position of art and his desire to seek new solutions. Ritter was an older friend with whom he discussed doubts and problems in the early period when he was formulating and clarifying his ideas.

His formal education ended at nineteen when he left his home town to travel, and this fact may explain Le Corbusier's dogmatic self-confidence; a quality so often seen in the self-taught. The observation that he is to a great extent self-taught is unavoidable, for he absorbed so much of the vitality and radical ideas of the new approach to art through personal contact. Especially he became a member of the avant-garde in painting. He travelled through Italy with busy sketch book, seeing Florence, Sienna, Ravena, Padua, and Verona, where the grandeur of Roman constructions, brilliant Italian polychromy and fervor of pre-Renais-

Renaissance Christianity deeply impressed him. The vigor of early Renaissance was sympathetic to his intuitive ideas. Its headlong attack of new problems and sensitive use of geometrical proportion find parallels in his own work. Strangely enough he was not enthused by the spontaneity of the Baroque and to this day looks coolly upon the architecture of that period. In its distortion of classical motifs and rejection of structural logic it reminded him of contemporary eclecticism. Already he was reacting against eclectic dullness of invention and rigid adherence to superfluities. This certain lack of historical objectivity is the more unfortunate, for Corbusier's thinking proceeds as directly from Baroque movement as Renaissance humanism. Motion, which the Baroque had discovered as a design element, was applied fundamentally by Corbusier in solving new spatial problems arising from machine age functions.

At Lyons about 1907 he met Tony Garnier who, as a pensionnaire of the Académie de France à Rome, had done the amazingly forward looking studies of an industrial city. The planning and architectural composition (done in the period 1901-1904 but not published until 1917) was far reaching in its significance. Garnier pointed the way for new philosophies in...
planning and helped determine the form of the new architecture. The importance of his work can hardly be over-emphasized; it foretold the broad scope of modern planning concepts in considering everything from water supply to the individual dwelling unit.

From Italy he went on to Budapest and to Vienna where he spent a winter in contact with the artistic and musical life of the city. While there he met Josef Hoffman, but declined when Hoffman asked him to work in his atelier. Hoffman had been a student of Otto Wagner, one of the key figures at the beginning of the modern movement. Wagner himself had done some city planning and had projected very interesting multi-levelled schemes for Vienna subway stations. Although the temperament of Vienna was stimulating, Hoffman did not have the potential of his teacher. Corbusier might well have been dissatisfied with the approach to architecture through handicrafts and the minor arts which Hoffman practiced at the Wienerwerkstätte.

In any case Le Corbusier returned to Paris in 1908 and went to work in the atelier of the Perret brothers. There he learned an appreciation of reinforced concrete from one of its principal proponents and his gropings for philosophy of a new architecture were forwarded by the strict morality of the engineer. He quotes Auguste Perret as saying, "Ornament always hides a fault in construction." Corbusier worked with Perret for a few months over a year, and this intimate contact was a great force in his development. We must not overlook the influence of engineering on the

6 For some reason confusion exists on this point as some commentators have stated that Corbusier worked for Hoffman.
architecture of the period. It showed that a constructural morality could produce its own aesthetic, more truly expressive of an industrial society than the prevailing eclecticism. The establishment of an engineering aesthetic, forwarded by the work of Gustave Eiffel, culminated in the great steel Galerie des Machines of the Paris International Exhibition of 1889. However, bare steel construction seemed to depend on overwhelming scale for its effect, a scale not always suited to architectural compositions. Then, too, building in steel was becoming increasingly difficult from an economic point of view in Europe when architects turned to reinforced concrete in seeking an architectural use of engineering. Reinforced concrete came into general use only in the very late nineteenth century. The designs of Robert Maillart, the great Swiss engineer, manifested an aesthetic based on the new material in an amazingly short time. His fine bridges constructed in Switzerland from 1900 to his death in 1940 and his flat slab buildings show a benevolence toward the material that is only equaled today by Nervi in Italy. The impact of these constructions on early twentieth century architecture may be overly stressed for they may not have been widely known by his contemporaries, but by the thirties they seem to have been generally known and discovered even in this country. The constructions of Freyssinet, however, were widely known, and his airship hangars at Orly (1916) were much admired.

7 The architect was Dudert and the engineer Cottancin.

While working with Perret, Corbusier was able to take several courses at the Ecole des Beaux Arts and the Sorbonne, and he also took mathematics lessons from an engineer. One wonders how much mathematics he absorbed for he sometimes errs in its use. He remains impressed with pure forms of geometry and the analytic of mathematics, though he uses it only when it can prove his intuitive judgments and sometimes perverts the logical argument. His methods are Cartesian. He has started with very definite premises arrived at intuitively, attempting to build a logical system of planning on them. It is these axioms which have gotten him into difficulty; but more of this later. (Cf. post, pp. 15 ff.)

In 1910-1911 Corbusier was in Germany under the auspices of his old school in La Chaux-de-Fonds. A critique of the new German movement, written as a report to the school, was his first published work. This was a time of intense activity in Germany - The Deutsche Werkbund had been established just three years previously, and Peter Behrens had been producing designs of almost everything for the Allgemeine Elektricitat Gesellschaft for several years. If any one man could be given credit for the development of modern architecture in Europe, it would have to be Behrens. His atelier was like a magnet to the younger generation of

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9 In The Modulor, trans. Peter de Francia and Anna Bostock (Cambridge: Harvard, 1954) he insists throughout the book that a right angle can be inscribed in a rectangle - a double square - at some point other than the bisector, even after one of his cohorts, Hanning, told him it was impossible. The proof of this impossibility is a rather obvious one in plane geometry.

10 Etude sur le mouvement d'art decoratif en Allemagne, (La Chaux-de-Fonds: 1912).
architects. Mies van der Rohe and Walter Gropius worked under him, and
Corbusier was there for a short five months. Although the spatial con-
cept in Behrens' buildings was not unconventional, he cleared the air for
later developments. Especially the turbine factory for A. E. G. of 1909
shows a fine clarity of form and attention to the aesthetic possibilities
of mass-produced materials. While Corbusier was in Germany, Walter Gro-
pius was designing his Fagus Works (1911-1913) and parts of it were al-
ready being built. This complex shows an even keener differentiation of
materials according to their function than Behrens' work. The window
has become a glass skin; brick has the character of a curtain wall; and
the structure is a well articulated steel frame.

However, Corbusier was not satisfied with the results of the German move-
ment. He felt that there was a lack of facility in the absence of a
tradition.\footnote{Cf. Maximilian Gauthier, \textit{Le Corbusier}, p. 33.} In a sense this was true, and it was very penetrating for
a contemporary comment. The Germans were quite consciously breaking with
past methods whereas the modern movement in other countries followed a
more gentle growth. In Holland, for instance, work such as that by H. P.
Berlage developed from nineteenth century eclecticism to twentieth cen-
tury spatial ideas while continuing in the idiom of traditional materials.
In France, of course, it was the engineer who joined the two centuries
and gave the building tradition its continuity.

Two books of Frank Lloyd Wright's work were published in Germany, one
in 1910 and one in 1911.\textsuperscript{12} Wright's work with its free and literally organic planning was accepted with enthusiasm even though evidences of his influence come only later. It is curious that Corbusier says it was 1913 before he saw a publication of Wright's work,\textsuperscript{13} for certainly it must have been often discussed among the young men in Behrens' atelier. The obvious speculation is that Corbusier, who was writing in 1929, may have become mixed up in his chronology. At any rate he does acknowledge a debt to Wright but calls Wright's master, Louis Sullivan, a greater pioneer. Certainly the Chicago office buildings of the turn of the century were precedents for Corbusier's large scale projects and held even more significance for him than Wright's domestic work. The rigid logic of the steel frame and differentiation of the wall surface with the resulting geometrical facades appealed to his analytical mind.

From Berlin Corbusier started off again, this time travelling through Bohemia, Serbia, Romania and Bulgaria; and seeing the color and monumentality of Byzantine Constantinople, the sensitive spatial composition of the Acropolis, and again the grand constructions of Rome and Pompeii. His wide travels - more than an awareness of regional differences - gave him a sophisticated appreciation of the homogeneity of man. He has always been more concerned with the universality of his ideas than their


\textsuperscript{13} Le Corbusier, \textit{Oeuvre complète}, 1910-1929, p. 10.
immediate appropriateness.

Corbusier returned to Paris and permanently established himself there in 1918. He had done little in architecture during the war and, even now, turned his attention mainly to painting. Paris was the center of the avant-garde. Not only painting but literature and, to a lesser extent perhaps, music was represented in the discussions on the course of art. In this wonderfully stimulating atmosphere Corbusier was introduced to Amédée Ozenfant by Perret. The two men were almost the same age and had complementary ideas. The latter part of 1918 they held their first joint exhibition, and in 1920 they published the first issue of *Esprit Nouveau*. Writing for the magazine on urbanism, architecture, the decorative arts, and painting gave Corbusier a chance to formulate his ideas. Le Corbusier, himself a first rank painter, was influenced by the adventures in motion and spatial relationships of cubism and later experiments more than any other architect. His competition entry for the Palais des Nations at Geneva of 1927-1928 shows an ability to organize complex functional elements in one composition. The rejection of a neo-classic mold allowed him freedom in architectural planning. The plan relationships show the same freedom of spatial organization as contemporary painting. The functions are differentiated and joined with the other parts of the complex only where circulation is required. This resulted in a loose-jointed complex which cannot be seen and understood without moving around it. The parts are not unified by the simplicity of the over all building shape but rather by the relationships of the
Vue du Palais, côté de la route de Lausanne
parts to each other. Some writers (Gideon is probably the most widely read) think that this planning in space-time, as he calls it, had its most complete precedent in Versailles (1668-1684). This relation seems too obscure to bear so much emphasis, although Versailles is unquestionably an important building in the evolution of modern planning.

From this point on it is more fruitful to discuss the growth of Le Corbusier's concepts through his writings and projects. It only remains to be acknowledged here that he entered partnership with his cousin Pierre Jeanneret in 1922 and jointly signed most projects until 1940.\[14\]

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\[14\] This is the date that Corbusier gives, Ibid. p. 10, but Stamo Papadaki gives the date of partnership as 1925 in the foreword to *Le Corbusier, Architect, Painter, Writer*, (New York: Macmillan, 1948), p. 6. This is evidently a typographical error.
CHAPTER II

THE NEW CITY

Le Corbusier has set down his planning ideas at two points in his development—first, in the book *Urbanisme* published in 1924 and secondly in *La Ville Radieuse* of 1935. The first book is of prime importance because of its statement of the problem of modern city organization, and it is of further interest because of the two projects presented— a contemporary city for 3 million and the *Voisin* plan for Paris. *La Ville Radieuse* is of interest and importance because of its more mature proposals for ordering the urban environment.

*Urbanisme*, or (as it is titled in the English translation) *The City of To-morrow*, was a direct outgrowth of a project done in 1922. In June of that year Corbusier was asked to do something for the urban section of the *Salon d'Automne* the next November. He chose to present a project for an hypothetical town of 3 million inhabitants. The project was received with enthusiasm by some but caused violently negative reactions from others, architects and general public alike. It is worthwhile to discuss this project and the one of the *Voisin* plan in conjunction with the general statements of the book, for the first part of the book serves as an introduction to them.

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I feel that his general statements were a much more constructive contribution to planning than the designs themselves. Corbusier was consciously trying to get at a clear statement of the problems of urban organization. The realization that the problem of the modern city needed restating was in itself provocative. He was at least cognizant of earlier planning proposals but was not satisfied that they were sufficient for a mechanical age. He saw the industrialization of society as a revolution which gave man a tremendous potential to conquer his environment, and he felt that drastic cultural readjustments would have to be made to realize this potential.

The condition of cities in 1924 expressed various degrees of disorder, but more tragically there seemed to be little possibility of progressing to either visual or functional order under the existing systems of city growth. Industrialization and rapid population growth had led to changes which came too fast to be dealt with by anything but conscious planning. Lewis Mumford expressed the deficiency of method well when he said... "Cities lacked the useful urban folkways of the Middle Ages or the confident esthetic command of the Baroque period:..."2

Of course Le Corbusier was not the first man to be disturbed by the condition of cities. Camillo Sitte, the Viennese planner, thought that the self-conscious formality then current in urban design was at fault. The inviolable rectangular grid system was inherently unsatisfactory in defining the visual environment. He advocated a return to the organic

methods and more informal organizations of the Middle Ages.\footnote{3} Ebenezer Howard visualized complete reform along the lines of the "garden city".\footnote{4} Otto Wagner returned to a more rigid formalism than that of Haussman who had replanned Paris and rebuilt large portions of the city between 1853-1869.\footnote{5} H. P. Berlage had designed parts of Amsterdam in a sort of compromise between formalism and the proposals of Sitte. Tony Garnier's contribution has been mentioned previously (Cf. ante p. 7); in his Cité Industrielle was an attempt to define and separate the various functions of the city and give them aesthetic interpretations. In retrospect Garnier seems to have been far ahead of his time and we must confess that even today planning practices have advanced little over his amazingly sound project.

Corbusier greatly admired Garnier's "fusion of utilitarian and plastic solutions,"\footnote{6} but still he was not satisfied that an adequate solution for metropolitan centers had developed. His discontent was certainly justified for even if Haussman had concerned himself with the problems of a great metropolitan center, he was planning for nineteenth century needs and methods of transportation. Wagner and Sant'Elia had investigated

\footnote{5}{Sigfried Gideon, \textit{Space, Time and Architecture}, pp. 647, 684.}
\footnote{6}{Le Corbusier, \textit{Towards a New Architecture}, p. 51.}
the possibilities of rapid transit, but no one could have foreseen the rapid development of personal transportation in the form of the automobile. Corbusier then tried to do two things: he attempted to state the problem in terms of an industrialized society and to discover the basic criteria for judging an approach to the problem. What follows is a discussion of his conclusions.

"The GREAT CITY is a recent event, with devastating consequences!"  
"The great city is a recent event and dates back barely fifty years."  

These two quotations point out the enthusiasm and emphasis of Corbusier's approach to urban problems. He has been immensely impressed by the effects of industrialization on world culture. The metropolis of the twentieth century must become the product of man's best use of his new-found potential. He implies rather than states the problem: to make the city an efficient vehicle for mechanical age man's urban functions.

He looked to geometry for the standard on which to base this functional city design; more than that, he thought of it as the basic criteria of all humanly created form. More specifically he made a god of the right angle. It is worthwhile to quote his argument for this and examine it.

The laws of gravity seem to resolve for us the conflict of forces and to maintain the universe in equilibrium; as a result of this we have the vertical. The horizon gives us the horizontal, the line of the transcental plane of immobility.

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7 See Sigfried Gideon, Space, Time and Architecture, pp. 319, 320, 443 for a short discussion of Sant'Elia's futuristic schemes. I have been unable to find any mention of these designs in Corbusier's writings.

8 Le Corbusier, The City of To-morrow, p. 83.

9 Ibid., p. 84.
The vertical in conjunction with the horizontal gives us two right angles. There is only one vertical, one horizontal; they are two constants. The right angle is as it were the sum of the forces which keep the world in equilibrium. There is only one right angle; but there is an infinitude of other angles. The right angle, therefore, has superior rights over other angles; it is unique and it is constant...... The right angle is, it may be said, the essential and sufficient instrument of action because it enables us to determine space with absolute exactness. The right angle is lawful, it is a part of our determinism, it is obligatory. 10

This argument is put forth as a rational one, as a product of reason. As such it seems to me to be unacceptable. If the primacy of the right angle was admitted as an intuitive thought, perhaps it would be valid. Corbusier is arguing like Pythagoras in the age of quantum mechanics. The horizontal he speaks of is really the tangent to the vertical and is not the horizon which of course is a curve. Sometimes it is even visually a curve as at the seashore or in an airplane. The right angle is unique, true, but in the "infinitude" of other angles any one of them is also unique. The argument here loses its point because the conclusion that the right angle has superior rights will not follow if we acknowledge the uniqueness of every other angle.

The discussion here has been destructive. I have no intention of claiming that the conclusion really is wrong because this argument is illogical nor of saying that Corbusier's thinking is invalid because so much of it is built on this theorem. As I said above the primacy of the right angle might have validity as an intuitive assumption. Certainly the history of architecture acknowledges its constant use, but this may be

10 Le Corbusier, The City of To-morrow, pp. 20-21.
due to other things, perhaps the post and lintel system of construction. This was beyond reasonable doubt the first system man developed but it is basic in no other way, for it does not have an inherent structural superiority over other forms. Because of the large bending stresses it is weaker than the round arch and less stable than the parabolic arch which distributes loads almost entirely by compression.

Although Corbusier believes in the supremacy of reason, we see that he has not always applied reason consistently. His ingenious mind has set up standards for planning and architecture which he cannot always justify with logical argument. His methods are a curious mixture of Cartesian rationalism and poetic intuition. He has been unable to completely synthesize these two approaches into one. The following two quotations bear this out.

"Man governs his feelings by reason."

"Intuition is the sum of acquired knowledge."

Le Corbusier's acknowledgment that reason subordinates romantic flights of the mind stems from the reaction to romanticism and the illogical element in eclecticism. In Germany this reaction developed along the lines set forth by Gropius and the Werkbund. They attempted to rationally apply standards of the machine with its functional logic to architecture. Corbusier combined both of these approaches, a fact which may recall his Swiss background. However, it seems to me that he felt much more in

11 Le Corbusier, The City of To-morrow, p. 5.
12 Ibid., p. 33.
harmony with the French approach, in spite of his statement that the house is a machine for living. Indeed, this statement has achieved a popularity out of all proportion to its emphasis in Corbusier's own writings. He spends a much greater part of his writings on the esthetics of the house than in discussing its similarity to a machine. Of course even in "the machine for living" expression he was differing from the German approach. The Germans were not so much concerned with making architecture functional like a machine as with applying the products of mechanization to architecture.

Corbusier's attempt to apply the logic of structure to design can be seen very early in his development in the project for "Domino" houses in 1914 when he was just twenty-seven. This is a clear statement of structural logic although the structure is not expressed on the outside of the buildings as well as in the projected "Monol" houses of six years later. The "Domino" houses are units composed of three horizontal planes of reinforced concrete, the first floor, second floor, and roof, supported by six thin reinforced concrete columns. That is the total structure; the walls become completely independent. The "Monol" houses were roofed with a series of concrete vaults laid over curved steel plates. These barrel vaults continued past the walls to form the silhouette of the houses. Corbusier's own words emphasize the role of structure: "There is a new spirit: it is a spirit of construction and of synthesis guided by a clear conception. Whatever may be thought of

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14 See Ibid., p. 30.
it, it animates today the great part of human activity."\(^{15}\)

The creative or poetic side of Corbusier deserves a more careful appraisal.... "We shall come to an important decision; we shall come to consider as more important than the mechanism of the city, what we may call the soul of the city."\(^{16}\) This sentence and its implications seem somewhat ambiguous with his attitude toward rational procedure. Corbusier expresses himself here as a creative artist, a poet. He concerns himself only superficially with this relationship of creativity and reason - he is not writing in the philosophy of esthetics. Throughout his long productive career Corbusier's work manifests these two contending approaches in a striving for rational process and at the same time an intensely romantic vision. His proposals become clearer if we keep this dualism in mind while discussing and criticizing them.

In Urbanisme, or The City of To-morrow, Corbusier was chiefly concerned with the metropolis and in particular the center of the whole urban conglomeration. This he thought to be the true core of urban life, but it has yet to assume its proper place in the minds of our planners. "They ignore the heart of the problem, which is that of the centres of our great cities. It is as though we were to concentrate on an athlete's muscles and blind ourselves to the fact that his heart was weak and his life in danger."\(^{17}\) More than that the city center is the concentration of modern functions, the very heart of the reason the city exists and its rehabilitation is the first

\(^{15}\) Le Corbusier, Toward a New Architecture, p. 83.

\(^{16}\) Le Corbusier, The City of To-morrow, p. 58.

\(^{17}\) Ibid., p. 96n.
problem of city planning. In *The City of To-morrow* Le Corbusier gave two reasons for this emphasis: the exigencies of modern business demand a compact relationship, and the city center has become the entrance into the city. The first reason has come under questioning of late, but for the most part we can agree with him. Certainly the meeting of people in their daily routine is conducive to smoothly functioning business, and meetings of top level personnel from different organizations as well as within the same company are imperative in the large scale transactions of today. The fact that there are organizations which do not need this close relationship does not destroy the general truth of the argument.

"Today the city's gates are in its center: for its real gates are the railway stations." By railways Corbusier here is referring to both interstate and suburban rapid transit. In our time the automobile and the airplane have complicated this simple definition, but even so I believe that Corbusier is justified in his statement. It seems to me to be a true condition brought about by the size of urban conglomerations. If we envision any shape of complex for the city, we can obviously never find a more central point than the center of this complex. As a distribution point for people entering the city, the center is most efficient. The transportation difficulties that exist in most cities in regards to their airports are good examples of the inefficiency of non-centralized distribution points. By their very nature airports for large planes cannot be in the city center, so the solution will probably come with new and better transportation - perhaps the commercially practical heli-

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copter and the vertical-take-off airplane or more efficient rapid transit on the ground.

The need of a distribution point implies public transportation systems. There is little doubt that systems of mass transportation are essential to a modern city. With individually controlled systems - the automobile for example - there is too awkward a ratio between the size of the carrier and the number of persons it carries to be used exclusively. Also the complexities of modern transport - especially notable in flying - have rendered individual control impossible. This is not to say that the automobile is an unimportant form of transportation. On the contrary, it has given the individual a new freedom of movement and has changed the pace of the city. Corbusier recognized that cities must be planned for efficient vehicular circulation if the full potential of this freedom is to be realized.

One of the most baffling problems of planning is urban growth with its consequences of outmoded and inadequate accommodation. Corbusier is aware of this problem and devotes a good number of pages to it. He quotes statistics showing the awesome growth of Paris, London, Berlin, and New York. "How to create a zone free for development is the second problem of town planning."20 His suggestion is to have the city buy an open and protected zone around the existing built up areas and resell it to builders as the need arises but with necessary restrictions. Since the land would become more valuable as it was put into urban usage the

20 Ibid., p. 96.
city would profit on its investment and still control its own growth. This allowance for growth is not a fundamental answer to the problem for it does not establish limits for growth. In the continuous absorption of surrounding areas what would happen to villages or garden cities which are in the path? Would they be converted into urban uses by a fungus like city growth? Corbusier evidently does not realize the seriousness of these questions for he does not discuss any limitation of population. Neither does he say that the city should be allowed to grow indefinitely. The three million population chosen for his first planning project seems arbitrary; it was only somewhat less than the population of Paris at the time. Le Corbusier believed that some provision should be made for growth of the business center into the English park, but he was not specific as to how much.

In a report made to the Town Planning Congress of Strassbourg in 1923 Corbusier listed four points as the foundations of modern remedial town planning.

1. We must de-congest the centres of cities in order to provide for the demands of traffic.
2. We must increase the density of the centres of cities in order to bring about the close contact demanded by business.
3. We must increase the means whereby traffic can circulate, i.e., we must completely modify the present-day conception

21 "Garden cities" are indicated on the plans for the city for three million inhabitants.

22 A more detailed discussion of the growth problem is part of the account of the project for a city of three million people which follows.
of the street, which has shown itself useless in regard to the new phenomenon of modern means of transport; tubes, motors, trams and airplanes.

4. We must increase the area of green and open spaces; this is the only way to ensure the necessary degree of health and peace to enable men to meet the anxieties of work occasioned by the new speed at which business is carried on.  

The first point is certainly basic once the assumption is made that the city center must continue to exist in order to fulfill necessary functions of the modern metropolis. The necessity for increasing the density of the city center has been questioned by many people, and it has not always been understood that this applied only to the business district, density of residential areas being less than in some existing cities. However, granting that closer contact would increase the efficiency of business operations, we come to the difficulty of establishing an optimum density. In the design for a city of three million he uses a density of 1,200 people per acre in the business center, but he does not explain how this figure was arrived at. The third point of improving traffic circulation is necessary if a more efficiently functioning city is desired and is probably more obvious today than in 1924.

The last point calls for an increase in green area and open space. Corbusier appealed to man's love of light and growing things which is as natural as his dependence on them. It would seem that any increase in

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23 Quoted in Ibid., p. 100.

24 Corbusier quotes the average density "of the over-crowded quarters of Paris 213, and of London 169." Ibid., p. 172. His ideas of population distribution are confusing. A further discussion on this may be found later in the chapter 4 in the more detailed description of his "contemporary city."
these would strengthen the esthetic value of the city as long as urban functions were not hindered.

A whole chapter of The City of To-morrow is devoted to statistics and their place in planning.

Statistics are the Pegasus of the town planner. They are tedious things, meticulous, passionless and impassive. All the same they are the jumping-off ground for poetry, the base from which the poet may leap into the future and the unknown, although his feet remain planted on the solid groundwork of figures, graphs, the eternal verities.²⁵

Although he gives statistics so much time in his writing, he is not very definite about the statistical method. To him their value lies in the expression of past and present conditions so that "by following the development of the curve we are enabled to penetrate into the future and make those truths our own which otherwise we could only have guessed at."²⁶ In both the contemporary city for three million and the Voisin plan for Paris he quoted population and area statistics, but it is not clear how he applied them in the design of his projects. This does, however, point out some awareness of the value of statistics.

A CONTEMPORARY CITY OF THREE MILLION INHABITANTS.

This is the project done for the Salon d'Automne in 1922. The problem was an hypothetical one, and there was no attempt to deal with conditions of the existing city. Corbusier was presenting his idea of what a city should be and he concerned himself but little with the method of realization.

²⁵ Ibid., p. 107.
²⁶ Ibid., p. 108.
The plan is a rigidly rectangular pattern and is organized in ten parts:

1. Central transportation terminal.
2. Sixty story skyscrapers - the business center.
3. Luxury housing - the horizontal set back system.
4. Housing - the cellular system.
5. Garden cities.
6. Civic center.
7. English park.
8. Sports area.
9. Protected zone-land owned by the city.
10. Freight yard, warehouses, industries.  

Central Transportation Terminal.

The need for a central distribution point for travelers has been previously discussed. They were to enter the city by air or rail at the terminal where they would change to inter-city transportation for distribution to various urban areas. This was the focal point of transportation for the surrounding garden cities as well. The terminal itself was organized on six levels, three above ground and three below. The uppermost level or roof formed a landing space for taxi-planes. The next level down was the crossing of two major city streets - fast vehicular traffic - and included offices and various spaces needed for the functioning of the terminal. At ground level service streets for heavy traffic crossed, and there were booking halls, and other passenger areas. The subway station took up the first underground level below which came the

27 Cf. Ibid., pp. 170 ff.
RAILWAY SYSTEM: SUBURBAN AND MAIN LINES

The inter-urban system; the tubes, following the main arteries; the outer loop system of one-way traffic; the main lines.

PROJECT FOR CONTEMPORARY CITY FOR THREE MILLION, 1922

The City of To-morrow, p. 173 and p. 181.
suburban train level. The lowest level was for main lines which ended in the terminal. The problem of entering the city center by air has been noted. Corbusier realized the problem, but felt sure that the technology of air travel - so new in his time - would work out solutions. We can see now a definite effort to close this gap in air travel, an effort which seems to be close enough to success to justify his optimism.

The suburban railways were designed as a one way loop system connecting the garden cities with the terminal. The inter-city and inter-state lines are brought in under the city streets along with the suburban lines. The diagram on the facing page will illustrate the difficulty of the one-way loop system. Anyone entraining at A or B would be forced to complete the loop before getting to the city. This would take him thirty miles out of the way; an intolerable waste of time. It seems strange that Corbusier did not realize this, but he seems to have been captivated with the idea of continuous train service. It should be noted that the diagram does not show the rail connections to the freight yards and industrial area. However, the plan of the city indicated the main lines meeting here for transference of goods and through freight. There was no allowance made though for through passenger traffic as no connection existed between the main lines in the terminal. In his later Voisin plan for Paris the main lines were one way loops but there still seems to have been no way to serve through trains.
Business Center

The business center was to be housed in twenty-four sixty story skyscrapers. It must be assumed that the intention was to make them all of similar plan. Corbusier never explained to what extent these plans are diagramatic and we cannot be completely sure that he intended all buildings to be built according to his one design. Certainly he has planned the buildings to a fair degree of detail. They were set on stilts, only the elevator lobbies and stairways being enclosed. In the angles of the Greek cross plan there was some covered car parking. Corbusier evidently assumed that most people would still use the public transportation system because the parking is hardly large enough for so many people. Corbusier stated that only 5 percent of the business district was built over. By "built over" he must have been referring to the buildings proper because buildings, streets, and parking aggregate well over this percentage.

"Here we have twenty-four skyscrapers capable each of housing 10,000 to 50,000 employees; this is the business and hotel section, etc., and accounts for 400,000 to 600,000 inhabitants. The garden cities give us a further 2,000,000 inhabitants or more." In this way Corbusier accounted for all the three million inhabitants, but the idea of "housing" in the skyscrapers is confusing. The intent seems to be that the

28 Ibid., p. 176. Some variety in size of the skyscrapers is indicated but there is only one plan type - the Greek cross.

29 Ibid., p. 172.
employees live there, and that would have to be true to get his popu-
lation totals. However, Corbusier never discusses these skyscrapers as
dwellings; indeed he has said that "the sky-scraper cannot adequately
provide for family life" and that it "would necessarily be devoted
exclusively to business."  

Luxury Housing

The luxury housing was to be all of the horizontal set-back type apart-
ment block. Perhaps block is not an accurate word for the apartments
continued over many of the streets to form one continuous unit. These
apartments permitted a ground coverage of only 15 per cent, the remain-
der being given over to gardens and sports areas. Corbusier made much
of the point of having these recreation areas near each dwelling unit
for he believed active participation in games a more healthy activity
than spectator sports. He was by no means ignoring spectator sports
for he allowed quite an extensive area for them. Population density
was established at 120 inhabitants to the acre which was less than half
that of the most crowded sections of contemporary great cities.

Housing

The other housing within the city proper was another apartment type,
the "Immeuble-villas". The apartments extend along the periphery of

30 Le Corbusier, Report to the Town Planning Congress of Strass-
bourg, 1923, quoted in Ibid., p. 101.

31 Le Corbusier, Towards a New Architecture, p. 54.

32 Le Corbusier, Oeuvre Complète, 1910-1929, pp. 40-43 and
Le Corbusier, The City of To-morrow, pp. 215 ff.
a block surrounding a large court. The design was developed much further than that of the luxury housing. Corbusier called these dwelling units on the "cellular" system, and indeed the appearance justified this name. Each dwelling unit was horizontally insulated by a terrace opening through the building and forming a void equal to the solid of the apartment itself. The ground coverage of this area is 52 percent but the density is the same as that for the luxury apartments.

Corbusier did not explain his use of these two apartment types from a sociological point of view, and it would seem that this bipartite scheme was somewhat arbitrary. It is difficult to tell to what extent Corbusier was trying to force social reform and how much of this design comes directly from his imagination. He was certainly aware of the possibilities of increasing living standards and was greatly concerned with the potential of industrialization. Through mechanization he believed the working classes could be freed from the drudgery of their working day.

Garden Cities

It is somewhat surprising to find that of the three million inhabitants two million were to live in the garden cities for Corbusier's emphasis is definitely on designing the city proper, its circulation, high density housing, and business center. However, there is recognition of three types of families: 1, those who live in the city proper and work there or the industrial area; 2, those who live in the garden cities and work in the city or industrial area; and 3, those who both live and work in the garden cities. 33 Evidently these suburban towns were to have a

33 Cf. Le Corbusier, The City of To-morrow, p. 166.
socio-political organization similar to existing suburbs, but this point is not explained. Corbusier did present a suggested solution for the housing though in a modified version of the cellular system projected for the city proper.\(^3\) The dwelling units - the two story apartment with adjoining open terrace of the same height - were juxtaposed in three superimposed double stories. The ground area thus made free was to be used as communal gardens and sports areas.

Civic Center
The civic center is not a new idea and Corbusier did not develop any detailed plan for it. In the area would be the universities, museums of art and industry, public services, and government buildings. He was certainly optimistic in the area allowance. It would seem impossible to include all these functions and have any open space at all. A city of this size could support at least two universities which would take up considerable space in themselves.

English Park
The park is an outgrowth of Corbusier's desire to put greenery back into the heart of the city. In plan it reminds one of eighteenth-century landscape developments in England, and the fact that he called it an English park suggests his indebtedness. The park extended into the city only as far as the civic center and, it seems, its usefulness would suffer by its distance from most of the inhabitants. Its purpose was similar to Central Park in New York, but there the length of the park

\[^3\text{Ibid.}, \text{pp. 202 ff.}\]
corresponds to the shape of the **surrounding** city and draws people from the sides - a relatively short distance. Very few people would be within walking distance to Corbusier's park, and it is difficult to take a baby carriage on a subway. The park was to absorb expansion of the business center, but this raises more problems than it solves. In expanding, the business district would be divided by the civic center, and the city would lose its park and some of its openness, one of the finest things about the plan.

**Sports Area**

A sports area in the protected zone to the northwest of the city was to be the focal point of spectator sports. The plans indicate what must be a race-track and stadia, but Corbusier did not develop the site in any detail. Concentrating the large crowds of spectators in one area has advantages in maintenance and servicing, but even so it is of questionable value since the difficulties of transportation for such crowds, especially if there were several concurrent events, would be enormous. The problem is heightened by the fact that the greater population of the city is on the east side across town from the sports area, the west side being largely civic center and park.

**Protected Zone**

This area surrounding the city was to be owned by the city and sold to private developers as needed. In this way Corbusier thought the urban growth could be controlled, but I believe he was oversimplifying the problem. The problems of financing and sociological reorganization are
too large to be swept away by a simple statement of goal. But, most importantly, the physical problem of organizing this growth was not even discussed; on the contrary, the city was designed as a series of areas which confine each other. Certainly there should have been some way to enlarge the business center without disrupting the luxury dwellings. As was previously noted, the park was to provide for expansion of the business center but in the process the park itself would be destroyed.

Industrial Area
This solution is remindful of Garnier's much earlier arrangement and seems to be an extreme development of the functional differentiation that can be seen in the architecture of the time. The consolidation of all industries, bulk merchandizing, freight yards, etc. has much to recommend it, but it also raises serious problems in the daily transportation of workers. The distance from home to work becomes very great and even with rapid transit is an hardship on the worker. Corbusier did not give much attention to this problem.

Circulation
A grid circulation system was imposed on the city with some of the streets extending out forming highways connecting with the garden cities and going on to become main highways. This system was on a different scale from the grid of existing cities for it formed a pattern of 150 foot wide streets intersecting every 1200 feet in the business district and, in other parts of the city, forming a rectangular grid, 1200 feet by 1800 feet. Four major streets on a diagonal form a huge square containing
the business district and the larger part of the luxury housing (see
diagram on page 25). In another manifestation of functional differen-
tiation Corbusier classified traffic into three types and provided
separate circulation for each. His three types were: "(a) heavy goods
traffic; (b) lighter goods traffic, i.e., vans, etc., which make short
journeys in all directions; and (c) fast traffic which covers a large
section of the town."\textsuperscript{35} Streets were to be built in two levels: the
ground level for heavy traffic; and, above this, a roadway, supported
on \textit{pilotis}, forming "the delicate network of the ordinary streets taking
traffic in every desired direction."\textsuperscript{36} The two main axial streets were
to be between 360 feet and 540 feet wide with a third level forming an
expressway for fast traffic. Ancillary roads would connect the express-
way and other levels every half mile or so.

Corbusier seems to have been just as intent on establishing a precise
geometrical pattern as a well-functioning system; nevertheless, his
projected circulation system would have been more efficient than exist-
ing ones. The vertical separation of traffic remains the most interesting feature. This idea was not totally original with Corbusier — in the
nineteenth century, New York's Central Park separated pedestrian, cross-
town, and carriage lanes by bridges — but Le Corbusier was the first to
apply the principle to the city as a whole.

The \textit{Voisin} Plan for Paris

There was evidently a general feeling that Corbusier's city was an
impractical futuristic dream. Strongly convinced in his own mind that

\begin{itemize}
  \item \textsuperscript{35} \textit{Ibid.}, p. 168.
  \item \textsuperscript{36} \textit{Loc. cit.}.
\end{itemize}
PROJECT, THE VOISIN PLAN FOR PARIS, 1925

Œuvre complète, 1910-1929, p. 111.
the plan could be accomplished, he thought it necessary to apply his ideas in a real solution. As the largest city in France and one of the great cities of the world Paris afforded a fine opportunity for replanning. In 1925 Corbusier found a sponsor in the Voisin Company and chose for redevelopment an area north of the Rue de Rivoli running from the Hotel de Ville to just past the Palais des Beaux Arts. The area is L-shaped, the short arm of the L reaching north to the Gare de l'Est.

The plan was organized similarly to the hypothetical one of three years earlier. The business center was planned as a unit extending from the Gare de l'Est to the Rue de Rivoli, and the residential area was located in the district between the Gare Saint-Lazare on the north, the Rue de Rivoli, the circus on the Champs Elysees to the west, and the Rue des Pyramides on the east. The central station was situated between the two areas around the Palais Royal and Bibliothèque Nationale, and was completely underground.

The Gare de l'Est was to be destroyed and the Boulevard de Sébastapol was to become a strong north-south axis. The main street, however, was a new east-west fast traffic boulevard through the whole area and shown on the plan as continuing through the city. Old buildings of historic or esthetic interest are kept, and it is provocative to try and visualize how they would appear with sixty story skyscrapers as a backdrop. The skyscrapers themselves and the apartment houses are the same as in his earlier scheme.

37 The Voisin Company were manufacturers of automobiles. Cf. Ibid., note pp. 277, 278.
This scheme is eminently more capable of realization than the one for an entire city. It is remedial planning and Corbusier had the advantage of an existing sociological and physical organization which acted as a restraint on his exuberant imagination. Within the limitations and in a confined area Corbusier's plan has much to recommend it from a functional point of view even though it is not made clear how transportation systems will be revised to cope with the tremendously increased density of the business center. However, the new 400 feet wide east-west street for fast traffic, the extension of the Boulevard de Sébastapol, and the addition of another north-south major street show an awareness of traffic problems brought about by the growing use of the automobile. Strangely enough he did not really follow through on this kind of thinking for there is no improvement in access across the Seine.

One important consideration in planning seems to have been of little concern to Le Corbusier, and that is the interaction, the harmonizing, of the old and new. Although he has a great respect for architecture of the past, he has been unable to translate this into an understanding solution to the problem of integration. The fact that the older buildings of some interest were not to be destroyed hardly assures that the new work would be in harmony with them. From a more general point of view one questions the esthetic effect of the enormous scale of Corbusier's proposals on the character of Paris. Esthetic considerations which, of course, are basic are the most serious objections to these two schemes and are serious enough, it seems to me, to invalidate them. The real contribution of these planning ideas is in their boldness in physi-
cal scope and realization of the need for new methods.

Le Corbusier's early planning schemes are the product of an ingenious imagination and not the fully systematic developments of an idea. He attempted to approach the subject systematically, but had neither a sufficient background nor enough time. It should be remembered that the contemporary city for three million was planned and presented in less than six months. Le Corbusier had no formal education in the field of planning nor did he have any practical experience. However, sometimes those who have no need to cope with the everyday exigencies found in working closely within a discipline, by their very ignorance of detail, can grasp the fundamental philosophy and contribute to its progress. Fearlessness of technical difficulties sometimes results in important theoretical advances. This seems to have been the function of Corbusier. He knew very little of the complexities of finance and to a great extent ignored sociological factors. He was able, so to speak, to see part of the forest by chopping down some of the trees.

38 The Massachusetts Institute of Technology began a city planning curriculum in 1920. As far as I can ascertain this was the first one set up anywhere. Planning had largely been an outgrowth of an architectural education until this time.

39 For instance, there is no discussion of the problems of rehousing families removed from construction sites nor is there any reflection of differing family or personal needs in his apartment designs.
CHAPTER III

THE RADIANT CITY

Between the publication of Urbanisme in 1924 and La Ville Radieuse in 1935 Le Corbusier's planning theories matured and developed. During these years he designed architectural schemes and planned several city projects, but unfortunately even to this day no occidental city has been built or rebuilt in accordance with Corbusier's plans so we must depend upon our imagination in order to visualize their three dimensional quality.\(^1\) This is especially demanding for his ideas are rather radical departures from anything we know today and consequently we lack visual standards for judging his designs.

La Ville Radieuse represents the sum of his development in planning up to 1935. There seems to be little change in emphasis from his earlier book but the proposals are more detailed and the statements more self-assured, but his assertive style is more telegraphic than in Urbanisme. In the following discussion of La Ville Radieuse only the general statements are considered; some of the specific applications are discussed in the chapter on his later development.

All of Corbusier's writing has a tone of propaganda. He was seeking public acceptance for the idea of planning itself as well as for his own proposals. His books were widely read and occasioned rather violent

\(^1\) Chandigarh, India which is in process of construction is discussed later.
reactions. The critical comments especially from other architects must have had an effect on his writing. A statement from the beginning of La Ville Radieuse will illustrate Corbusier's vigorous approach to the subject.

It (city planning) expresses the mark of contemporary life, a belief quickened and intensified by a new phenomenon: city planning; the explosion of accumulated discomforts, bursting of crises; the blind alleys; a desire for optimistic sane action, courageous; the time in the destiny of a new civilization; the feeling that the world is not old, but, to the contrary, young and agile; the impending awakening of a modern conscience; the joy of action, the approaching launching of huge tasks; the sureness of regaining basic human values; the possibility of attaining the essential joys.

Modern society rejects the worn-out herds, prepares itself to reinstate a decent plan: the radiant city. [W.D.]

2 Urbanisme has gone through editions in French and was translated into English five years after it was first published. For a rebuttal to his critics and commentary on these criticisms see E. B. Mock, Le Corbusier's Swiss Pavillion, American Magazine of Art, vol. 27, pp. 18-19, Jan. 1934. Corbusier himself commented, "I received, like a true cab-horse, many blows of the whip...." Presentation of the Royal Gold Medal to Le Corbusier at the R.I.B.A., Royal Institute of British Architects Journal, vol. 60, pp. 215-218, April 1953.

3 The expression "city planning" is perhaps the most accurate translation of the French urbanisme, although the meaning in English is not as general as in French. Some commentators have adopted the French by dropping the e to get urbanism; the English use the phrase "town planning".

4 Le Corbusier, La Ville Radieuse, p. 7.
"Il exprime le martèlement de la vie présente, la croissance accélérée et violente d'un phénomène neuf: l'urbanisme; l'explosion des malaises accumulés, l'éclatement des crises; les impasses; une volonté d'action saine, courageuse et optimiste; la foi dans les destinées civilisation nouvelle; la certitude que le monde n'est pas vieux, mais au contraire, jeune et agile; le réveil imminent d'une conscience moderne, la joie de l'action, le proche déclanchement des grandes travaux; la certitude d'une reprise des valeurs humaines profondes; la possibilité de'atteindre aux joies essentielles. La société moderne rejetant les hardes usées, s'apprête a réintégrer un cadre décent: la ville radieuse."
Corbusier attempted to uncover the basic conditions that city planning must satisfy. He believed he had arrived at these conditions in what he called the essential joys of life: "the satisfaction of the psycho-physiological needs; participation in the group; and individual freedom." The psycho-physiological needs are the demands of the body and mind for personal health and spiritual well being. Although it is doubtful that Corbusier had much detailed knowledge of modern investigations into man's psychological and physiological being, the emphasis on these fundamentals points out an awareness of them and some understanding of their importance. Both man's gregariousness and desire for individual freedom are innate, and the statement of them is hardly new. It seems to me that the important thing is that with his "essential joys" Corbusier has established the fundamental standards of planning. Certainly any successful planning must satisfy these conditions. As stated they are of course too general for practical application for they can be interpreted in many ways.

In a list of planning principles Corbusier tried to relate these general considerations to more specific criteria, but the list is a curious mixture of method and intent, and has more the quality of a rallying cry than a disciplined statement of principle. However, even if the purpose was partly to spirit his readers into action, important principles

5 Ibid., p. 7. "Les joies essentielles: satisfaction des besoins psycho-physiologiques, participation collective et liberté individuelle." Corbusier has not been consistent for in his Poésie sur Alger, (Paris: Falaize, n. d.) p. 16, he becomes, fittingly perhaps, more poetic and calls sunshine, space, and verdure the joies essentielles.
are implied.

The plan: dictator
Death of the street.
Separation of the natural pace and high speeds.
Arrangement made to accept the LEISURE imminent in a mechanical civilization, leisure which could become the menace of modern times.
Use of the ground in the city, bound to the territory of the country.
The dwelling considered as an extension of public services.
The green city.
The civilization of the road classified above the civilization of the railroad.
Conservation of the country.
The radiant city.
The radiant countryside.
The twilight of money.
The essential joys: satisfaction of the psycho-physiological needs, group participation, and individual liberty.
The rebirth of the human body.\(^6\)

The street as it existed in contemporary cities (and still exists twenty years later) was looked upon by Le Corbusier as an evil to be destroyed

\^6 Le Corbusier, *La Ville Radieuse*, p. 7.
Le Plan: dictateur.
Mort de la rue.
Classement des vitesses simples et des vitesses vingtuples.
Disposition prises pour accueillir des LOISIRS imminents de la civilisation machiniste, loisirs qui pourraient devenir la menace des temps modernes.
La mobilisation du sol des villes, du territoire du pays.
Le logis considéré comme un prolongement des services publics.
Le ville-verte.
La civilisation de la route surclassant la civilisation du chemin de fer.
L'aménagement des campagnes.
La ville radieuse.
La compagnie radieuse.
La crépuscule de l'argent.
Les joies essentielles: satisfaction des besoins psycho-physiologiques, participation collective et liberté individuelle.
La renaissance du corps humain.
and replaced by a new system of circulation. But Corbusier thought the disadvantages of the corridor street (rue corridor) were more profound than just inefficient circulation, for to him the evil of city slums could be traced to it. The block system forced building against the sidewalk, and the pressures of population growth jammed rooms into the center of the block so that often only token air space existed there. These slums were what prompted Corbusier to say that "the machine that we live in is an old coach full of tuberculosis." He believed that this old concept of the city street had to be replaced before any progress could be made.

His planning has been criticized from time to time as socialistic or even communistic and his statements coming through his telegraphic style and radical viewpoint would have caused more disturbance than perhaps they warranted. There is certainly some validity in the socialistic argument as the extension of public services which he proposes might suggest. Many of the functions done by the individual would be handled by public organizations; however, it is not clear whether these would be connected with the state or privately administered. Sometimes the implication is that the city would be the owner and developer, in other

7 Le Corbusier, Towards a New Architecture, p. 257.

8 For instance, the attack by Von Senger in the paper "La Suisse Liberale" of Neuchatel published after judgment of League of Nations Competition in 1927. Cf. Le Corbusier, Oeuvre Complète, 1929-34, (Zurich: Les Editions d'Architecture, 1947), 14th ed., p. 17. Corbusier was very much disturbed by the reaction his work aroused for many of his critics seemed to have missed the point of the new planning.
places collective ownership is assumed, and yet he speaks highly of the potential of private enterprise.\textsuperscript{9} Again we can see Corbusier's unwillingness to enter into the field of finance - or politics - to explain the processes by which his schemes could be realized. The political implications of his planning interested him but little except in his emphasis on individual liberty.

"The twilight of money." This is a strangely phrased statement to come upon in a work which purports to be a technical explanation of the science of planning.\textsuperscript{10} The implications, of course, are immeasurable, and yet Corbusier did not elaborate his point. It is tempting to speculate that he went into the matter no further because of some lack of understanding of economics. Certainly he seems to have no idea how modern society might change from a money economy; there is not even a suggestion as to what would be the new basis of commerce. However, Corbusier's intention might not be clearly conveyed by his words for he may simply have been hoping for the death of uncontrolled speculation where profit is the only consideration and looking forward to a more enlightened use of finance in which money will be the means of satisfying human needs - the essential joys as he would say.

\textsuperscript{9} Corbusier hardly held in reverence the products of the building industry, but he has always been impressed with the automobiles, airplanes, and ships built by modern mass production techniques and by private capital. Cf. Eyes which Do Not See, \textit{Ibid.}, pp. 81-121.

\textsuperscript{10} Corbusier often refers to the \textit{science} of city planning and considers his writing something of a technical treatise.
There are several points in the above list which suggest that a broader scope is given to the planning process than in his early work: planning for leisure; conservation of the country; and the radiant countryside. However, in *Urbanisme* a six hour day had already been foreseen, and Corbusier was greatly concerned with man's increasing leisure and its effect on city planning. Consequently he directed a great deal of his energy to housing and its relation to recreation facilities. The residential apartments were basically the same as proposed thirteen years earlier, but there seems to have been a concentrated effort to plan in detail for the services, schools, and playgrounds which form part of a neighborhood. Corbusier showed a more mature consideration of those functions so necessary to urban life, integrating garages, gas stations, schools, restaurants in the residential environment.

There is a clarification of the multi-levelled scheme proposed in *Urbanisme*. All the large buildings are raised off the ground on pilotis and all roads other than service drives are either elevated or underground, thus almost the entire ground is left free for the pedestrian - the extreme of traffic differentiation. Intersections and access roads indicate a more complete appreciation of the problems involved in high speed automobile transportation than the earlier scheme. Of course in

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11 Le Corbusier, *The City of To-morrow*, pp. 197 ff.

12 During 1935 intricately detailed models were built of a city of the *Ville Radieuse* type. It was extensively photographed in what was certainly a successful attempt at a sensation of reality. Some of the photographs have been published in a number of books and articles such as the various volumes of *Oeuvre Complète, La Ville Radieuse*. 
1924, the date of the earlier scheme, automobiles were not capable of the speed which was developed by 1935. However, his proposed limited access street - an idea which is probably not original with Corbusier - is efficient for high speeds even greater than we have today. An expressway can be overcrowded or its design overly complicated by sharp curves. The straight streets of the radiant city solve the latter problem by rigidly adhering to the grid pattern, but there is no provision for increasing the size of the streets, and to increase the number of them would destroy the open quality of the plan. Granted that the traffic capacity of these streets would be adequate for the city as designed, there is no hope that they would be able to carry the growth in traffic corresponding to population increase. This again brings up the fact that Le Corbusier has not reached a solution to the problems of city growth.\textsuperscript{13}

Corbusier's statement, conservation of the country, is somewhat ambiguous. He could mean either the safeguarding of the countryside from urban encroachment or the conservation of natural resources. Although it is likely that there was no such separation in his mind, he seems to have been more interested in the esthetic quality of the countryside than in natural resources. Certainly by conservation he was not thinking along the lines of the preservation of natural resources which was finding expression in this country at the turn of the century.\textsuperscript{14}

\textsuperscript{13} The incompleteness of Corbusier's thought on this subject was discussed in the previous chapter.

\textsuperscript{14} The idea of conservation of natural resources was put into practice largely through the energy of Theodore Roosevelt - especially during his terms in the presidency (1901-1909). Conservation became a major concern of government particularly during the depression when surplus labor was focused on conservation projects.
theless, there seems to be a growing awareness of the environment as a whole perhaps given strong impetus by the continually developing applications of planning on a national scale occurring in Holland.15

The term radiant countryside refers to Le Corbusier's project for agrarian reorganization of 1934.16 This project was done for a group of farmers from the Department of the Sarthe and took the form of a town for fifty families with the cooperative facilities; veterinarian, silos, repair shops, stores; and with public buildings and services. The farms themselves are still based on the old family farm. This system is somewhat similar to the organization of mid-western farm communities which has developed in this country although there is a more complete reliance on cooperative services.

"It is impossible to dream of planning the modern city if there is no thought of the organization of the country."17 With this statement Corbusier seems to be escaping the confines of city planning and delving into the idea of more complete environmental control.

15 There is some discussion of Holland's contribution to planning in Mumford's The Culture of Cities, passim. A discussion of this contribution limited to esthetics of city planning may be found in Steen Eiler Rasmussen, Towns and Buildings, (Liverpool: The University Press of Liverpool, 1951), pp. 77-93.


17 Ibid., p. 186.
CHAPTER IV
C. I. A. M.

In June of 1928 a group of contemporary architects met at the castle of La Sarraz north of Lake Geneva in Switzerland and formed the association called Congrès Internationaux d'Architecture Moderne - abbreviated as the C. I. A. M.\(^1\) This association has afforded a common ground where some of the ablest minds in contemporary architecture and planning have been brought to bear on current problems and theoretical ideas. It has unquestionably been a force of the utmost importance in disseminating information and understanding of these problems to other disciplines and in heightening public awareness of the potential of planning. Corbusier was one of the founders and has continued quite active participation in the group.

The aims of the association were originally stated in the language of architecture, but the Third Congress, held in Brussels in 1930, already showed an intense interest in planning problems and afterwards the group's emphasis was strongly directed to this field. It has been their major interest to the present. The generation of progressive young architects at the turn of the century had always concerned themselves to some extent with planning problems and had even written of it at the First Congress. The conciseness and clearness of these statements make

\(^1\) An account of the formation of the C.I.A.M. by Sigfried Gideon, a charter member and very active in the organization, can be found in his introduction to Can Our Cities Survive? by J. L. Sert, (Cambridge: Harvard University Press, 1942), p. ix-xi.
them worth quoting here.

Town planning is the organization of the functions of collective life; it applies just as well to rural places as to urban conglomerations. It cannot be conditioned by the pretensions of an established estheticism; its essence is of a functional nature. The functions it embraces are four in number:

a. Dwelling
b. Work
c. Recreation
d. Transportation (which connects the first three functions with one another).

The chaotic subdivision of urban land, as a result of real estate speculation should be corrected. Present technical means, which multiply ceaselessly, are the very key to town planning. They imply and propose a complete change in existing legislation; this change should be commensurate with technical progress....

It is impossible to know exactly what part Corbusier had in writing this, but I think we can safely assume that his contribution was a major one. Although this was written a full six years before the publication of *La Ville Radieuse*, yet it is a much more carefully considered statement than those of Corbusier's later book, a fact perhaps due to its being the product of several minds and to the necessity for conciseness in so short an explanation. The dignity of a group undoubtedly had a restraining influence on Corbusier who was typically capable of poetic flights of fanciful style. This quality of restraint characterizes the work of C. I. A. M. and gives its work a certain scientific objectivity, a contribution in itself at this stage in modern planning. After the formation of C. I. A. M., Corbusier's work cannot be separated entirely from it.

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It was said before of *La Ville Radieuse* that it showed an increase in scope of planning over early ideas as expressed in *Urbanisme*. In the definition of planning above the same trend can be noted, but it is, of course, much earlier. Other members of the group, however, seem to have consistently interested themselves in the city proper, but this may be due to the fact that they are practitioners and commissions for a more complete environmental design have not appeared. This does not mean that Corbusier was not practicing, but his vitality and drive led him to indulge in projects even if not likely of realization.

The four functions of city planning are presented in a more professional manner than Corbusier's romantic list of principles. We can see in the C.I.A.M. a group trying to establish for a new profession a framework that has some universal significance and is not just the product of an individual mind and imagination. There is an attempt to unify planning with technical progress and systemize it as much as possible. The role of creativity in planning is not made clear, but the tone of the declaration emphasizes what we might call the scientific aspect and mentions

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3 Some of these members are Richard Neutra, Walter Gropius, J. L. Sert, P. L. Wiener, Cornel van Eesteren, J. B. Bakker.

4 His project for agrarian reorganization of 1934 is an example. It is interesting as a reinterpretation of the farm community in centralizing farm buildings, equipment, and dwellings in a single unit for cooperative farm groups. It seems to have evolved from the continental idea of the farmer living in the town and going out to his fields to work. It need not be considered in further detail here. See Le Corbusier, *Œuvre Complète, 1929-34*, p. 186-191.
esthetics only in a negative way. Our technical civilization has never been able to discipline esthetics to a science or set up objective standards for creativity, and because of this difficulty of formulating, mention of these may have been left out of the declaration. Corbusier has no temerity in talking about both technics and esthetics, and it is interesting to speculate what discussion went on before the group adopted its declaration.

In 1933 the Fourth Congress was held on board a steamship en route to Athens and return with some time spent in Athens. The subject of the Congress was "The Functional City", indicating the shift of interest more completely to planning. Land use and density maps of various cities had been drawn by each national group, all to the same scale; they were displayed together and investigated by the group. This resulted in formalizing their ideas on planning in what has become known as the Charter of Athens or the Town Planning Charter which I believe to be one of the most important documents of planning literature. Corbusier's participation was vigorous, and his influence must have been consequential. It is certain that he was in accord with the ideas expressed in the Charter for he refers respectfully to it several times in La Ville Radieuse.

5 The subject of the Congresses has always been announced beforehand to allow for preparation by the members.

6 The Town Planning Charter, Fourth C.I.A.M. Congress, Athens, 1933, reproduced in J. L. Sert, Can Our Cities Survive? The Chart served as a basis for Sert's book which was originally begun in Europe by others in 1936, but because of the war the work was transferred to Sert in the United States.
A question arises as to why Corbusier's writings remained so undisciplined after this systematic work had already been done. The answer, I believe, is twofold. First, as was noted above, the group was a restraining influence curbing his natural poetic bent. Secondly, the purpose of the man and the group were different. C.I.A.M. was addressing itself to professionals and technicians as a professional society whereas Corbusier still felt the need of popularizing contemporary planning principles - indeed the very idea of planning itself. There seems to be general accord in the principles expressed, however, and the fact that actual projects of individual members of the group differ is because they, after all, are products of a creative imagination interpreting these principles individually.

Since the ideas expressed in the Charter of Athens and those of Corbusier cannot be separated, the Charter bears further discussion here. The definitions and preliminary statements point up the shift from city planning to regional planning, a tremendous step in the direction of total environmental control. This is part of a general world movement and it is perhaps too early to assess the part of C.I.A.M. in it. The date of the Athens Congress is but one year before the first volume of Mumford's trilogy, Technics and Civilization, and five years before the second, The Culture of Cities. Mumford expresses the need for greater

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scope in planning and hints at a supra-regional outlook. Whether he arrived at these conclusions through an evolution from the ideas of the Scottish planner Patrick Geddes (whom he acknowledges as his master) or was influenced by the C.I.A.M. work, I do not know, but it seems that since the group's work was so widely known it may well have been of consequential influence.

One other point should be made about the work of C.I.A.M.; the function of planning is stated in purely human terms. There is no reference specifically made to nature or industry and technics except as they affect the condition of man. Environment is reduced to human terms. The philosophical implication of this is that man can learn to control his environment at least within the broad framework of natural law. So it is essentially an optimistic idea and is compatible with modern philosophical optimism and humanism stemming from the enlightenment of the eighteenth century.

"When town planning started to develop forty years ago one could never have imagined it would have such a future."

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8 Le Corbusier, Description of the C.I.A.M. Grid, Bergamo, 1949, in The Heart of the City, ed. Tyrwhitt, Sert, Rogers. (New York: Pellegrini and Cudahy, 1952), p. 171. The forty years is a personal observation which is not sustained by history.
PLAN OF ALGIERS

PROJECT A, 1930

a. Business center
b. Expressway - dwellings
c. Apartment houses

Oeuvre Complète, 1929-1934, p. 141.
CHAPTER V
LATER DEVELOPMENT

In 1929 Le Corbusier, in his South American projects, had sketched the idea of elevating high speed highways and using the space below as one continuous apartment house. More definite proposals followed in the schemes for Algiers, the first project being planned in 1930, with a long, curving apartment house for 180,000 people stretching along the Mediterranean coast with an expressway above. The plan was organized in three parts: a business center which was largely housed in a single skyscraper; a residential city of large, freely curved apartment houses on the high land behind the existing town; and the apartment-expressway connecting Algiers proper with the resort town of Hussein-Dey (see illustration). Here is Le Corbusier at his most romantic; this grandiose scheme is the conception of a single imagination with little regard for people's desire for individual expression or for technical problems. Corbusier worked on this scheme off and on for over ten years, discarding the expressway-apartment house idea in the master plan project of 1942 but keeping the business center mainly in one large skyscraper.

This intensely romantic scheme can hardly be said to be typical. The plan for Nemours in North Africa (1934) offers a wonderfully logical


PROJECT FOR NEMOURS, NORTH AFRICA, 1934

contrast with areas well articulated according to function and yet all organized into a total design. 3 An interesting point is that the old native settlement is not disturbed. 4 The military base and business district face the harbor, and off to either side are the sardine industries and the gas and electric plants. A linear industrial zone follows the river valley. Behind the civic center, which is on a high plateau separating the harbor from the public beach, rises the residential district with areas reserved for expansion. The excessive distance of the hospital, which is beyond the residential district, from the center of activities may be seriously questioned.

The idea of a linear industrial city was developed by Le Corbusier in the master plan for the Zlin Valley in Czechoslovakia (1935) and later, during the German occupation in 1942-43, was further refined and enlarged in scope to become a plan for the industrialization of the major river valleys of Europe. 5 It is dubious that there was any real foresight shown in promoting this idea. A linear industrial organization following the valleys had developed naturally in this country in New England during the nineteenth century, blocking the potential recreational and visual value of the rivers. The reason for industry's proxim-

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4 This was also true of the Casbah at Algiers, but the proximity of the new buildings with such an increase in scale would have been less effective than the isolation of the indigenous quarter as at Nemours.

ity to water was the dependence on it for power, but by the early part of this century water had been almost completely supplanted as an immediate power source. At present, in New England, there is a noticeable trend to build industrial projects free from the rivers and streams; and, if it is mainly to get away from the danger of floods, still the water courses and their surrounding area are made available for development as parks and pedestrian spaces. Industry, and especially heavy industry and chemical manufactories, use and probably will always need immense quantities of water, but this does not imply industrialization of the river bank as in Corbusier's scheme. However, it was too late to be influential for industry, accepting the precedents established in fulfilling the need for water power, had already covered many river banks. The Monongahela River from Charleston to Pittsburgh is a case in point.

The Voisin plan for Paris was restudied in 1936 to be presented at the Exposition of 1937 in the Pavillon des Temps Nouveaux. The area chosen for redevelopment is somewhat different and is devoted entirely to business and public uses. The new plan would result in a progression of forms from the Seine to fairly low, assymetrically arranged buildings with a great deal of open space and greenery to the enclosing facades of T-shaped forty-five story skyscrapers. Combined with the refinement of building forms this would have resulted in a much pleasanter

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6 Le Corbusier, Oeuvre Complète, 1934-1938, pp. 46-47.

7 Corbusier calls this building the "cartesian sky-scraper. The name is fitting for it is certainly an idea carried to its logical extreme. Cf. Ibid., pp. 74-77.
THE "CARTESIAN" SKY-SCRAPER

Œuvre Complete, 1934-1938, p. 76.
visual effect than the brutal assertiveness of his earlier scheme. Perhaps it is an indication that Corbusier himself was not satisfied with the esthetic effect of his earlier work.

The Exposition of 1937 was grandly conceived, and, if it had been executed, would have put the principles of the ville radieuse to the test of reality. The plan was to build a group of horizontal set-back type apartment houses in the Bois de Vincenne to show the public a working and full scale model of the new city. A section of the east-west expressway first proposed in the Voisin plan for Paris was to be constructed from the model housing area to the Boulevard de Sebastapol. Corbusier hoped to use the Exposition as a nucleus for further redevelopment. The rebuilding was designed to proceed in four stages (see illustration).

Following the exposition, the next step was to increase the number of apartments and build another section of the expressway to the west of the center of the city. Work of the third stage was to join the two sections of the expressway, continue apartment house construction along the first leg of the expressway, and build the first eight skyscrapers of the business center at the intersection of the Boulevard de Sebastapol. The last step was to see a further increase in the number of apartment houses and the completion of the business district. The scheme is notable because it shows a more mature concern for the problems of redeveloping areas currently occupied. Although Corbusier did not

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8 Cf. Ibid., pp. 140-147.
put forth solutions to the problems of finance, population redistribution, or legal involvement, still the slower process of a progressive development would make the problems less severe.

In 1941 Corbusier published _Sur les 4 Routes_ in which he expounded the importance of the earthway (the automobile), the railway, the waterway, and the airway. In 1945 he set forth a short statement including these means of transportation in _Towards a Synthesis_ which bore the sub-title, "the final result of twenty years of research devoted to a doctrine of construction." The synthesis of the "accomplished architectural revolution" and the yet to be achieved revolution of the four ways would be the three human establishments: "the farming unit; the linear industrial city; and the radiocentric city of exchange, government, art and spirit, commerce, etc."

He thought that the freedom of an independent structure and consequent flexibility of plan had resulted in an architecture capable of satisfying the essential needs of both the corporeal and spiritual being. Man's newly found ability to build high and free of the ground had increased the potential of city life by making possible a recovery of nature in the machine age city. A fuller development of the four ways of transportation would bring the city together with agricultural and industrial areas in a more efficient relationship. However, Corbusier was concerned with more than

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efficiency as the last sentence of his statement suggests. "Tourism, leisure and work will find fluidness, charm, utility."

Corbusier's thought is always centered on the problems of the city. Although he has a growing concern for the total environment, there seems always to be present the feeling that all of this environmental organization exists only to satisfy the needs of the city dweller. He shows little respect for the dignity of the rural inhabitant or for the individual who simply wishes to live away from the activity of the city. "In the big country spaces, cross roads reduced to the limits of their purpose, old people will quietly accomplish their destiny (or endure it), which is to go on, or to subsist, or to disappear." Corbusier is enamored with dynamics and without respect for the inactive man.

The short description of a sketch of the new city in Towards a Synthesis gives an interesting sidelight on Le Corbusier's development. He denotes the residential area as a "garden-city, flat or upright, as wanted". In the suggested scheme for the suburban garden cities in Urbanisme he had designed the residences as three stacked two story units resulting in six story buildings. By this time (1945) he seems to have capitulated to the demands for individual houses and at last agrees that they have a place in the modern city.

After World War II there were many opportunities in Europe for planning the reconstruction of cities, and there was some good work done. All too

\[\text{11 Ibid., p. 71.}\]

\[\text{12 See the discussion on a contemporary city for three million in Chapter II.}\]
often, however, neither the governments, the planners, nor the people met the challenge with bold and imaginative thinking, and, consequently, building proceeded as before the war. Le Corbusier received several commissions and designed an eminently well organized scheme for St. Die (1945), the center of which had been systematically destroyed by the Germans. The city center is particularly noteworthy because the scale is so different from his earlier works. Although there is still one tall building - the twenty story administrative center, the scale seems almost intimate when compared with the 450 feet high skyscrapers and huge apartment blocks of the Paris projects. The master plan might well be called organic, a term which could hardly be applied to the grand geometric conceptions of the twenties. Individual family houses have a definite place in the plan of the curving roads which seem to tie the city center to the countryside. These roads intersect with the more rigidly patterned streets of the city center, and they, in turn, are joined to an expressway which by-passes the center. The civic center, which is also the shopping center, is completely freed of vehicular traffic and becomes a purely pedestrian area. This functional differentiation of traffic was to find a further development in Corbusier's theory of the seven V's.

The seven V's are his categories of circulation, from the pedestrian to the highest speed vehicle. It was evidently thought of during the plan-

ning of Bogota (1950) but was used in its more developed form in the circulation scheme for Chandigarh (begun in 1950). The result is a logical hierarchy separating traffic on the basis of velocity and, at the same time, integrating the different types into a network. It is worthwhile to quote in part Corbusier's own explanation:

The V1
It comes from afar, from the provinces, and it goes on further into other provinces. It has crossed the countryside, and it crosses the town.

The V2
This is the great collector and conveyor of fast traffic, both cars and lorries....specially designed turning-off points give access to the Vs 3. ....The V2 may be straight and imposing, or agreeably curved according to circumstances.

The V3
...(These) are the distribution roads, dividing the sectors. The Vs 3 have no pavements (sidewalks) and are used exclusively by wheeled traffic,..... they run through parkland interrupted only by service stations.... The Vs 3 feed the Vs 4.

The V4
....These roads cover the land with a harmonious network. They may be called Main Street or Broadway or "Grand Rue". It is in these streets that the necessities of daily life may be found (the butcher, the baker, the market, etc.), the trades and professions..., the pastimes..., security (the police) and so on.

The V5 and V6
The V4 feeds the Vs 5 which lead towards the houses but only their branches, the Vs 6, actually take one to the front doors.

The V6
The V6 can also be the "interior road" of the Unité d'Habitation 50 metres high, of what we have called the vertical towns.....

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14 See Le Corbusier, Oeuvre Complète, 1946-1952, (Zurich: Editions Girsberger, 1953), pp. 42-47. There was an interesting contractual arrangement with the Columbian authority. Corbusier was engaged to design the master or pilot plan, and then José-Luis Sert and Paul Lester Wiener of New York - and fellow members of the C.I.A.M. - were to put the plan into practice. I have been unable to ascertain what part, if any, the latter two had in developing the TV system; however, the form in which it is presented is typical of Le Corbusier.
The V7

The V7 has a very particular function, linked to the V6 and the V4, it serves the zones reserved for the "culture of the body and spirit", that is to say, the schools, the clubs, the playing fields. 15

This is a culmination of much of Corbusier's city planning thought. He has succeeded in logically systematizing the ideas of circulation differentiation which had begun in the multi-levelled schemes put forth in 1922. It could hardly be said that Corbusier alone was responsible for this development, but, in formalizing the ideas of traffic separation, he has, I believe, made a real contribution.

In planning Bogota the city was divided into approximately rectangular sectors about an half mile by three-quarters of a mile in size. These divisions are almost functionally autonomous containing a shopping center, schools, recreation grounds, etc. Corbusier's claim that this principle was first applied in the plan of Bogota 16 seems to be in error for a sector is not fundamentally different than a neighborhood unit which has been used as a residential planning unit in this country for some time. The strength of the design lies in the completeness of the total composition which is achieved within the framework of the well differentiated circulation pattern.

In its formation from India, Pakistan absorbed Lahore, the old capital of the Indian state of Punjab. In 1950 Le Corbusier was engaged by the

15 Ibid., pp. 109-110.
16 Cf. Ibid., p. 42.
Indian government to develop a master plan for Chandigarh, a new capital; to design the government buildings, and to coordinate the work of the other architects.\footnote{Earlier, Albert Mayer of the New York firm of Mayer and Whittlesey, and the late Matthew Nowicki as consultant had done preliminary work and designed a master plan\footnote{For a fairly complete presentation of the resulting plans see \textit{Ibid.}, p. 128-157. An interesting account of the planning process by a member of the architectural team, E. Maxwell Fry, is "Chandigarh - New Capital City", \textit{Architectural Record}, vol. 117, pp. 139-148, June 1955.}, but the efforts of Le Corbusier and his European colleagues E. Maxwell Fry, Jane Drew, and Pierre Jeanneret may justifiably be considered alone, for their plan is simply a further development of Corbusier's Bogota scheme.

The site of the city is a flat agricultural plain sloping away from the Himalayas. The regularity of the site enabled Corbusier to return to a basically geometrical pattern although it is much less rigid than his schemes of the twenties. Advantage is taken of the slope and grandeur of the mountainous background in placing the capital and other government buildings. The whole administrative complex is situated at the head of the site terminating a long, straight arterial street.\footnote{For an illustration of this plan see E. Maxwell Fry, \textit{Ibid.}, p. 141. An account of Nowicki's part in the design and illustrations of some of his sketches see Lewis Mumford, "The Life, the Teachings and the Architecture of Matthew Nowicki, Part IV, Nowicki's Work in India", \textit{Architectural Record}, vol. 116, pp. 153-159, September 1954.}

\footnote{The capital of Utah in Salt Lake City enjoys a somewhat similar site although the mountains are further in the background. The view up the street leading to the capitol is quite impressive.}
MASTER PLAN OF CHANDIGARH, INDIA, 1952

Oeuvre Complete, 1946-1952, p. 146.
The circulation scheme follows the principles set forth in the theory of the 7Vs, and the basis of the plan is a gridiron formed by streets for fast moving traffic (Vs 3). The national highways (Vs 1) come from Delhi on the one side, from Simla on the other and connecting with the former capital, Lahore. Traffic is distributed by the arterial streets (Vs 2) to those forming the gridiron. The sectors enclosed by the gridiron pattern are designed similarly to the ones for Bogota with a business street (V4) running through laterally and an open park with recreation areas (V7) dividing the sectors longitudinally.

A city park is formed along a stream to one side of the street leading to the capitol, and it extends entirely through the city. A branch of the park leads to the university which is situated near the north corner of the city.

The center of the urban complex is the commercial district which is fed by arterial roads (Vs 2). The street leading up to the capitol makes an unexplained turn of ninety degrees here only to turn back to its original direction after passing the commercial district. This jog hardly seems consistent with the logical directness of the other streets.

An industrial area - the city is not designed to support heavy industry - is situated at the southeastern edge of the city. The railway spurs serving this area are the only rail link in the city, the passenger station being further out on the main line.

We cannot tell how well suited to Indian life the scheme will be, but
looking at it abstractly the master plan of Chandigarh represents a maturing concept of city planning in which there is a synthesis of the logical development of traffic and functional differentiation with an imaginative esthetic character. In comparing this plan with his earliest schemes we can see a concern with some of the same principles and, at the same time, some rather significant differences. Perhaps the most important similarity is the scope of Corbusier's thinking by which he was able to organize the various parts of a design into a comprehensive unity. The basis for the contemporary city for three million (1922) was an attempt to solve the circulation problems resulting from an industrialized society. The plan of Chandigarh has a similar basis, but circulation is a means to the satisfaction of urban needs, from the pedestrian at leisure to high speed automobiles, while the overwhelming scale of the multi-levelled expressway of 1922 impressed itself on the city to such an extent that the vehicle seemed more important than its driver. At Chandigarh the design of sectors and their internal circulation recognizes the fundamental importance of the pedestrian, the man himself. Walking is more than just a slow form of transportation; it can be a pleasant and perhaps necessary physical and esthetic experience in a visually satisfactory environment.

The difference between Chandigarh and the city for three million is the difference between a logical system based on empirical knowledge and an intuitive idea, the product of a fertile imagination. This difference does not mean that there is no continuity between Corbusier's earliest planning scheme and his most recent city design. On the contrary some
of his earliest efforts were directed to setting up logical criteria for planning, and the design of Chandigarh is still very much the product of a creative imagination.

The proposals in *Urbanisme* (1924) were not systematic and sometimes ambiguous in spite of the fact that Corbusier's intent was to write something of a technical treatise. His second major writing in city planning, *La Ville Radieuse* (1935), clarified and put into somewhat more complete order the proposals of the earlier book. Le Corbusier planned numerous projects embodying principles set forth in the two books. These projects during the period before World War II manifested an intensely romantic approach in which his highly imaginative creative ability sometimes overshadowed logical process. After the war, however, his projects manifested a more logical order and appreciation of the human being (not the automobile) as the basis of design. This is illustrated in the master plan of Chandigarh (1952) where there is also a well organized system of circulation recognizing the pedestrian and an interesting juxtaposition of land use areas.

This is a brief summary of my investigation. In the concluding chapter I have attempted to evaluate the contribution of Le Corbusier.
CHAPTER VI
CONCLUSION

The contribution of Le Corbusier to planning has not been objectively evaluated as far as I know. Mumford dismisses him with an incompleteness which is not consistent with Corbusier's prominence, and Gideon's evaluation is inconclusive. My conclusion is based upon the two books Urbanisme (1924) and La Ville Radieuse (1935) and examination of his projects as presented in the four volumes of Oeuvre Complète. However, before discussing Corbusier's contribution to planning it is necessary to define and explain the idea of total planning (total environmental control).

Modern planning began with attempts to solve new problems arising from nineteenth-century industrialization and twentieth-century high speed transportation. The need for planning stems from the tremendous population increase following rapid technological advances; this population increase is itself progressing at an ever faster rate. Man's rapid multiplication seems to threaten his very existence by engulfing the planet on which he lives with a disordered mass of the products of human activity. To say that our environment is becoming visually less acceptable is perhaps obvious, but it is insufficient. The fact that the world we live in is getting smaller in relation to the population it supports will result in an impossible situation unless man learns to control the products of his activity and bring them in harmony with the limitations of his natural environment.
The problem of supplying food for the world's future population is alarming enough in itself.

Granting that the men of the future will consume less meat (though they certainly will want more), when the world's population grows to ten times its present size (which it will do in 230 years at the present rate) it will be consuming about a tenth of all the plant food that is produced. In such a community no competing carnivores, even as inoffensive as a robin or a pearch, will be tolerable, and the existence of a single pickerel...... will threaten the whole balance of nature.¹

This bleak outlook does not take into consideration further technological advances, as the author acknowledges, but the prediction is serious enough to necessitate decisive preventive action.

The conglomeration of people into large cities and the spreading of these urban areas has, in our time, resulted in an inefficient vehicle for human functions making the need for planning evident. The time spent in getting to and from work and recreation areas is much too great and our traffic jams result in completely wasted time. The filth in our great cities results in an esthetically unsatisfactory environment and in unhealthy living conditions in spite of the complex waste dispersal systems built by our engineers. There is absolutely no hope for improvement of these conditions except through the application of man's mental processes and creative activity in controlling his environment.

Architecture and, more significantly, town organization of the pretechnic era were small scale forms of planning, but they have become only

¹ Edward S. Deevey, Jr. "The Human Crop", Scientific American, vol. 194, pp. 108, 110, April 1956. Ecological statistics are rather inexact due to the difficulty of measurement, but the general import of predictions made on these statistics is worthy of serious consideration.
part of the concern of modern planning. The scope of this field of endeavor has been steadily enlarged until today the region - as vague as its definition might be - is established as a planning unit.\(^2\) There are tendencies toward the recognition that man's total environment must be considered and controlled for man to reach his potential in life. This is still a nebulous concept, and it will undoubtedly be a long while before planning on such a scale can be systematized, but there seems to be no reason why it can't be done. There is good cause for optimism if we can but realize the problem.

The implications of this total environmental planning are of unimaginable magnitude and complexity. It means that all of science, behavioral and physical, will have to be synthesized by man's creativity into an esthetic unity with nature. Man must assume responsibility for his own—life. Human life must not be merely existence, for we cannot be satisfied with anything less than the availability of the fullest possible life for every individual.

Control, by its very nature, is dangerous, and to lose sight of the true aim of ordering our environment would be disastrous. Its sole purpose is to offer the individual the most complete possibility of developing his personal potential without obstructing the freedom of any other individual. It must result in the subjection of natural as well as man-made environment to human functions. This is not to develop a heaven on earth but to develop to the most complete degree the potential of human life.

\(^2\) An outstanding example of planning on a regional scale is the Tennessee Valley Authority.
No one mind is sufficient to accept responsibility for this control. The planner must become a coordinator who can accept information and synthesize it with his creative energy into a unified plan. As a coordinator he cannot be dictatorial but must work as a member of a creative team, respecting the dignity of ideas expressed by his colleagues. The team itself must be representative of every field of human endeavor in order that the information on which its work is based be as complete as possible.

Le Corbusier has made definite contributions to the concept of environmental control and more especially to the field of city planning. His greatest gift has been the boldness of his thinking for he has been able to grasp a comprehensive view of the city and subordinate everything to the design of the whole. Although he may have erred in his logic at times, and even though there are functional difficulties in them, his early schemes were exciting contrasts to the usual piecemeal planning of his contemporaries. The comprehensive designs for complete metropolitan areas established a precedent which has not yet been fully developed.

Of course, Le Corbusier did not develop his theories independently. He knew Haussman's replanning schemes for Paris and had great admiration for Garnier's early project; he was probably familiar with Wagner's subway station projects for Vienna as well as Wagner's formal civic planning. From time to time in his writings Corbusier also mentions Camillo Sitte and Ebenezer Howard; hence he was evidently well versed in the
planning ideas of his contemporaries. (Cf. ante pp. 3, 4, 13, 14.) Of these men only Garnier, Sitte, and Howard had concerned themselves with the city as a whole, and Sitte had done so in only a general way. Howard attempted to force urban life into relatively small (less than 50,000 people) autonomous units deploiring the development of great metropolitan complexes.

Le Corbusier was the first to realize the real value of high density concentrations, the city centers, as a place to perform the business and cultural functions of a mechanized, highly populated society. His earliest scheme, the city for three million of 1922, made the city center the focal point of the whole urban complex, a complex which included suburban units as well as the city proper. Actually this kind of urban organization was much closer to that existing in large metropolitan areas than the garden city idea of Howard's although the latter was better accepted, at least in part, and two cities were actually built. 3 Corbusier's scheme was designed around the metropolitan center but it also provided for suburban living. (Cf. ante pp. 33, 32.) He was not attempting to change urban life but to organize the city into a more efficient vehicle for man's collective functions.

Transportation is an essential function in the city, and Le Corbusier was the first theorist to realize the potential of the automobile and its significance in urban circulation systems. He was so intensely

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3 Letchworth (1904) and the later Welwyn both in England. Gideon gives the date of Letchworth as 1903, Space, Time and Architecture, note p. 689. The garden city proposals still influence design of suburban communities in this country and in England.
aware of new problems due to the growing use of the automobile, that an overemphasis on circulation resulted. His earlier schemes, especially the city for three million, seem to have been designed for the automobile rather than for the driver. The multi-levelled network of roads dominated the city, and the pedestrian had to find his place in between the streets and the buildings. However, in the postwar schemes, especially in the plans for Bogota and Chandigarh, there is more interest in the individual. This is manifested by an emphasis on pedestrian "ways" and a return of the shopping street. The major streets are designed to carry varying speeds of traffic, but there is no longer the separation of vehicles by types. The result is a less complex network more in harmony with human scale than his earlier system.

There is a schismatic quality evident in contemporary planning practice. Two approaches to planning are manifest by what we might call the visualist and the statistician. They are not, of course, mutually exclusive, but the separation is justified for purposes of discussion. The visualist approaches planning problems from the point of view of an architect - indeed, he has most often had architectural training. He is interested primarily in satisfying esthetic considerations of the environment. From civil engineering with its history of road building, sanitary and water supply systems and from economics and sociology come the statisticians. The statistician is most interested in satisfying technical problems; he proceeds methodically step by step at the expense of a comprehensive viewpoint.
Neither of these approaches is sufficient in itself for the conditions which each attempts to satisfy are all essential to successful planning. Planning must satisfy the three conditions of commodity, firmness, and delight - the same conditions Sir Henry Wotton set up for architecture. There must be a union of the two approaches into one with the restraints and comprehensive knowledge of a team replacing the authority of the individual. The statistician can furnish the information necessary as a basis for satisfying the conditions of commodity and firmness, while the visualist must comprehend this information and, by his creative energy, give character to the design of the whole and satisfy the condition of delight.

It must be emphasized that planning cannot be separated into exclusive departments. There is little room for either pure design or the purely technical considerations. Planning is a synthesis of the esthetic and the technical into a unified whole. There must be an understanding of creative activity and technics in order to attain a unity of purpose.

Le Corbusier approached city planning through architecture, but he was also intensely interested in technical problems. He attempted to solve contemporary traffic problems as is noted above and based his designs to some extent on population and density statistics. However, there

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5 Cf. Chapter II, "The New City". Corbusier thought of Urbanisme and La Ville Radieuse as technical works (Cf. ante p. 45).
were many problems overlooked by Corbusier and he was much more interested in the esthetic effect of the new city than how the plans were to be realized (cf. ante p. 39). As a creative artist with an energetic and ingenious imagination he was a visualist, but he had an acute awareness of the technical problems which offered a challenge to his design ingenuity.

Through his highly imaginative, creative energy has come an ability to design comprehensively at an urban scale. He has shown that the city can and, indeed, must be thought of as a unified design but capable of growth - an organization of functions for a mechanized society - an efficient and visually stimulating whole.
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