

3 Le Corbusier and the city without streets

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Le Corbusier's concepts of urban form were the target of heavy criticism from their first appearance at the Salon d'Automne in Paris in 1922.¹ Nearly 80 years later, they are still criticised, often in much the same terms, and it is safe to say that they now have very little influence, if any at all. In the UK, however, we are now again examining the question of urban form in light of the projected massive demand for new housing, particularly in the South East, and the fear of consequential further encroachment on the countryside. High density urban living is widely promoted as the solution, and suitable models are sought. Le Corbusier was an advocate of high-density urban living (even if his later proposals for linear industrial cities imply partial dispersal), and his ideas concerning urban form are certainly worth re-examining, together with the criticisms levelled at them. In this paper I propose to do so with particular reference to two schools of criticism, which I shall label the 'Cambridge' school (based on the theoretical work of Professor Sir Leslie Martin and his circle there from the 1960s) and the 'New York' school (based on the writings about New York of the architect/planner Rem Koolhaas of the late 1970s, with roots in those of the author Jane Jacobs 20 years earlier). These may be characterised as criticisms founded respectively on mathematical and on emotive grounds.

Summary of Le Corbusier's urban models

Le Corbusier's model of urban form was not static but evolved during his lifetime. Its first definitive form was the *City of Three Million* of 1922, a remarkably ambitious study for an entire capital city (with particular reference to Paris), in which a high density high-rise residential and administrative core for an élite was to be surrounded, beyond a green belt, by an extensive band of low density suburbs.² This was followed in 1932 by the *Radiant City* (with particular reference to Moscow) – the model to which this paper will particularly refer – in which it was envisaged that the entire population would live in high density conditions, with low density suburbs banished altogether.³ Finally, in the *Three Human Establishments* of 1941–2, it was proposed that industrial employment and population would be dispersed into loose linear cities linking compact 'radial-concentric cities of exchange'.⁴ Housing in the form of 12-storey enlarged-courtyard blocks, landscaped and communally-serviced, was proposed as the predominant form in the core of the *City of Three Million*,

which retained something of the character of traditional urban streets between them. In the *Radiant City*, these were abandoned in favour of 15-storey serpentine blocks 'à redents' set in parkland and following a pattern independent of the road layout, thus departing from the concept of a 'street' altogether, but retaining some of the feeling of horizontal continuity of a traditional city (Figure 3.1). Finally, the *Linear Industrial City* was associated with the *Unité d'Habitation*, a free-standing 20-storey slab block combining residential accommodation with the essential sources of domestic supply, in which the traditional continuity of urban form was completely abandoned. But a constant feature remained throughout his commitment to achieving a *green city*, a landscaped city offering its inhabitants 'sun, space, and greenery', and at the same time to ensuring adequate circulation of transport within the city without which it could not perform its economic and cultural functions effectively. His solutions involved the progressive elimination of the Street as the dominant organising principle of urban form. This was and has remained the most controversial aspect of his proposals, and it is one on which both the schools of criticism to be discussed focused in their quite different ways.

NOTE - This illustration contains an error of design: a refinement of "corridor-street" (running in the horizontal axis) has been allowed to remain. For correct version see plates V.R. 2 and V.R. 17, pp. 158 and 171.

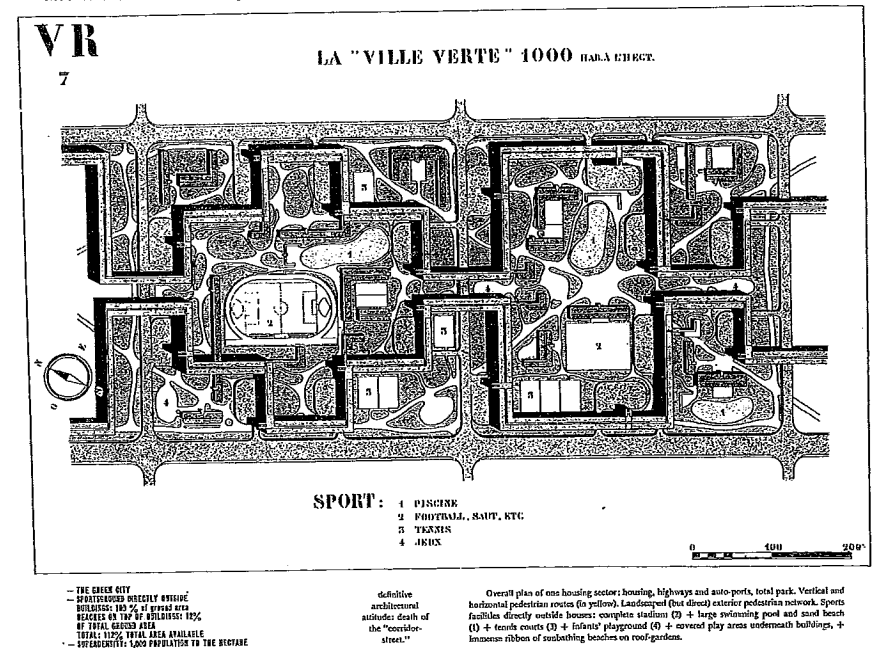


Figure 3.1 Le Corbusier's Radiant City, 1932. A typical residential area, with housing in the serpentine blocks called *à redents*, elevated roads, and ground surface devoted to swimming, football, tennis, athletics, and games. Plan FLC 24902 © Fondation Le Corbusier

The 'Cambridge' school

Professor Sir Leslie Martin, the key figure in the 'Cambridge' school, whose career dates from the pioneering world of Modern architecture in Britain in the 1930s, has carried very considerable authority. He was joint-editor with the artists Ben Nicholson and Naum Gabo of the review *Circle* in 1936, a notable early British affirmation of Modern constructive and abstract values in art and architecture, and in 1948–51 was in overall charge of the design of the now Grade-1 listed Festival Hall in the London County Council (LCC) Architect's Department, of which he subsequently became head. He was appointed Professor of Architecture at Cambridge in 1956, and established a substantial, largely academic, architectural practice. In the 1970s he was credited with having proved by his later theoretical work that 'tower blocks' were inefficient in the use of land, and his arguments were influential in Britain in moving housing design away from 'high-rise, high density' towards 'low-rise, high density' solutions – and hence away from the supposed influence of Le Corbusier.

There had in fact always been a 'low-rise high density' strand in Le Corbusier's urban thinking, starting with his student housing published in *Towards A New Architecture* in 1923,⁵ continuing with projects such as the 'Lotissement' housing for Barcelona of 1933 and the 'Roq et Rob' projects for the Mediterranean seaboard of 1949, and culminating in the Venice hospital project of the 1960s. His focus was on the need for light, greenery and a sense of space rather than on the question of height in itself. But the proposal that taller, more widely-spaced blocks – exemplified by his phrase the *Vertical Garden City* – could be used to this end was an important part of his theory, and the influence of his ideas was felt in the UK mainly as promoting high-rise living. They were most influential during the 1950s, the decade of the LCC's Roehampton Estate and the start of the Park Hill estate in Sheffield. But already in the mid-1950s, and from an avowedly Modern Movement point-of-view, Martin (who had had overall responsibility for Roehampton at the LCC) was working with Patrick Hodgkinson on low-rise high density designs for housing as an alternative to high-rise. The unbuilt designs of 1957 for 'cross-over section' terrace housing for St Pancras Borough, developed by Hodgkinson in Martin's office, are an example.⁶ Atelier 5's Siedlung Halen at Bern, a notable housing development of this kind inspired by Le Corbusier's 'Roq et Rob' project, was built in 1960, and in 1968 Martin set up the Land Use and Built Form Study Centre ('LUBFS', now called the Martin Centre) at Cambridge essentially to study the high density alternatives to high-rise. He hoped to demonstrate mathematically the properties of different built form and land use configurations, as Gropius had done in his 1931 demonstration of the advantages for day-lighting or density (or both) of building taller, more widely-spaced blocks in the parallel rows of *zeilenbau* estates – but with very different conclusions.⁷ It was in the potential of low-rise courtyard forms that Martin was interested rather than in taller parallel blocks, perhaps inspired by the courts of the Cambridge colleges now surrounding him, and by more recent examples such as Aalto's Säynätsalo Town Hall of 1949–52 or the 'extroverted' courtyard of Le Corbusier's monastery at La Tourette of 1957. The courtyard was a plan type from which the Modern Movement had hitherto largely turned away, on a number of

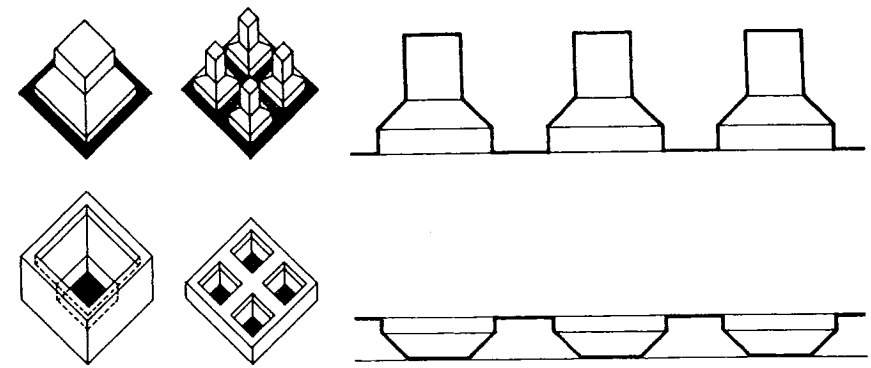


Figure 3.2 Leslie Martin's diagram showing courtyard and pavilion forms offering equivalent floor spaces, from 'The Grid as Generator' 1967

grounds: the impossibility of ensuring correct solar orientation for all sides, the difficulties of planning at the internal angles, as well as for its urban and spatial consequences. But Martin believed that a 'stepped section' – with the courtyard walls stepping inward at the base – could mitigate the problems of overshadowing on northern faces, and he had a positive preference for the enclosed urban forms – streets and squares – that it generated. His basic diagram (Figure 3.2) illustrated a courtyard and its equivalent tower form on an identical site. The tower needed to be three times as high as the courtyard to provide the same amount of floor area. Mathematical studies of three typical 'built forms' – the tower (or pavilion), the street, and the courtyard – showed that:

When the built potential is plotted against the number of storeys for each one of the three built forms described, assuming all other factors are constant, then it is seen that after a certain height the tower form ceases to use land with increasing efficiency and lower towers more closely packed together, but with no change in the angle between contiguous towers, will give the same degree of built potential. . . . This could be one reason that the 'City of Towers', free standing towers in a park-like setting, has never been built. It is inherently inefficient in terms of land use. In comparison to the pavilion or tower form at its maximum, the built potential of the street form has twice its value, and the built potential of the court form is no less than three times as great.⁸

A reference to Le Corbusier can be presumed in the phrase 'towers in a park-like setting'. The lower height of the courtyard form was generally presented as an overriding advantage in itself, as in the quoted passage, without the need for further explanation. 'Of course no one may want this (courtyard) alternative,' wrote Martin, 'but it is important to know that the possibility exists, and that when high buildings and their skyline are being described, the talk is precisely about this and not about the best way of putting built space on to ground space.'⁹ A subtle shift has here occurred from 'alternative' to 'best'.

Martin's basic diagram can be read as an inversion of an equally programmatic sketch by Le Corbusier of 1937 (Figure 3.3). The sketch illustrates a 'new way of using the ground' embodied in the Ministry of Education at Rio de Janeiro, for which Le Corbusier was consultant architect, by comparison with the 'traditional' way of using such a site. He writes of the sketch that 'The left hand side shows the usual way of using such sites in Rio: facades facing narrow streets and internal courtyards. The project under construction constitutes a great urbanistic innovation: it has drawn an acceptable solution from the noxious grid of streets and blocks, and will re-introduce space to the urban scene, as well as offering an effective means for dealing with traffic.'¹⁰ So eager had Le Corbusier in fact been to provide the civil servants of the Ministry with an open view of the 'splendours of Rio bay' that he insisted on making design proposals for a site on the foreshore, different from the one intended, using a slab of horizontal overall proportions, like his Pavilion Suisse of 1930–2. By building a slab (not a 'tower') across the centre of the site, rather than a block around its perimeter in the traditional 'courtyard' manner, he hoped to provide more light, calm, green, and view for the office workers, as well as more space for pedestrians – and for the car. The Ministry, however, would not be moved, and it was the Brazilian architect Lucio Costa, with Oscar Niemeyer, Eduardo Affonso Reidy and others, who realised that this design idea could effectively be transferred to the original site by adopting a vertical format for the slab. But it is a solution that Le Corbusier was ready to present with his own sketches and supporting text in the *Œuvre Complète* by implication, as his own. Though the dramatic landscape of Rio, so lovingly rendered in the drawings for his preferred site, is now absent, the grandeur of the open forecourt defined by the slab, softened by vegetation, and dramatised by the colossal statue of a seated figure, remains. What was built is a worthy embodiment of his conception of urban space, and has high civic quality.¹¹

Martin's diagram (Figure 3.4) showing that Portland House, a 28-storey office slab with forecourt near Victoria Station in London could be rebuilt on the same site and with the same floor area in the form of six- or ten-storey 'stepped-section' courtyards, was effectively an applied counter-example to Rio, on a similar site,

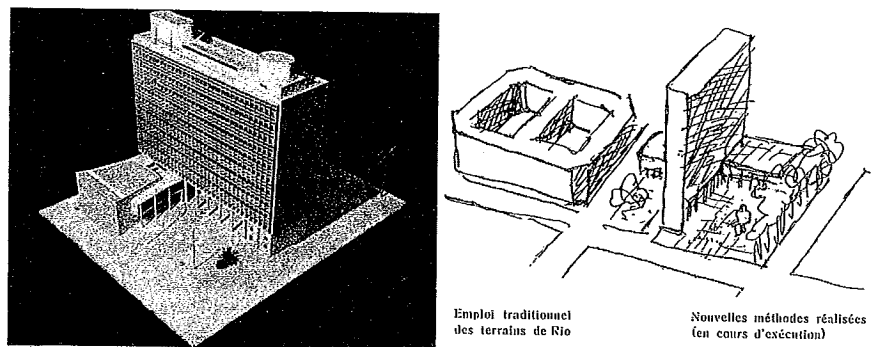


Figure 3.3 Le Corbusier shows how courtyards – 'the traditional way of using a site' – can be replaced by a slab, in the context of Lucio Costa's Ministry of Education in Rio de Janeiro, 1936 © FLC

reversing Le Corbusier's message.¹² Some of the built designs that emerged from Martin's practise based on his courtyard theory, such as Harvey Court in Cambridge of 1958 (a student residence designed with Patrick Hodgkinson), and the Brunswick Centre in Bloomsbury of 1960–70 (a mixed housing and commercial development taken over wholly by Hodgkinson) (Figure 3.5), show the hard interior courts that were the result, sometimes with a problematic relationship to the exterior generated by the stepped section. The predominant justification offered for this approach, as in the huge unbuilt Whitehall Plan of 1965, was that existing heights would not be exceeded, integrating the new building with the surrounding fabric and street pattern. But this was often denied by the scale of the new building, and the issues of urban space, greenery, and outlook which pre-occupied Le Corbusier were sidelined. More attractively, Martin also showed that a section of central Manhattan itself – between Eighth and Park Avenues and 42nd and 57th Streets – could be rebuilt with the same floor area in the form of large landscaped courtyards the size of Washington Square surrounded by stepped-section buildings only eight storeys high (Figure 3.6).¹³ At the other extreme of scale his Cambridge colleague Lionel March demonstrated in *Homes Beyond the Fringe* of 1967 that it was possible to build semi-detached two-storey houses in a hexagonal grid of extended courtyards at a density of 200 persons per acre (500 per hectare), a density normally thought to call for high-rise.¹⁴ This arrangement he called 'dispersed high density', and proposed that it might be extended across the whole country.

Density comparisons

Examination of the courtyard theory suggests that a number of quite disparate factors were in fact embodied within it. For example, the possibility that a section of Manhattan could be rebuilt in seven-storey garden courtyards was in reality the product not of the mathematical properties of the Fresnel Square, as one was encouraged to think, but of suppressing the cross streets and allocating their area to

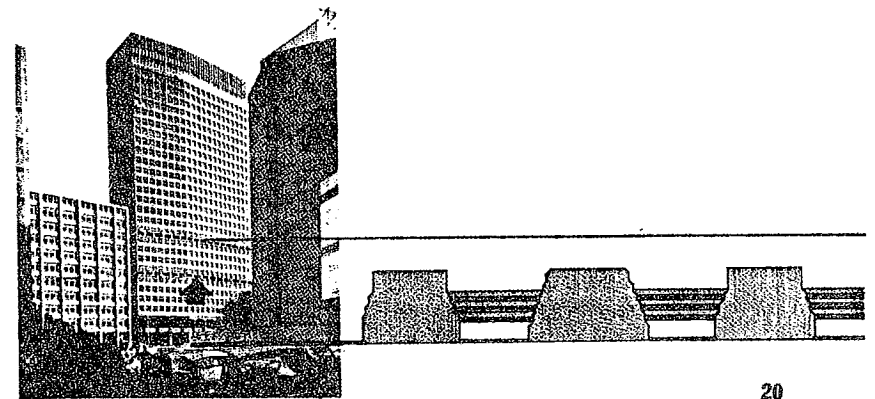


Figure 3.4 Sir Leslie Martin shows how a slab – Portland House near Victoria Station, London – might be replaced by a courtyard

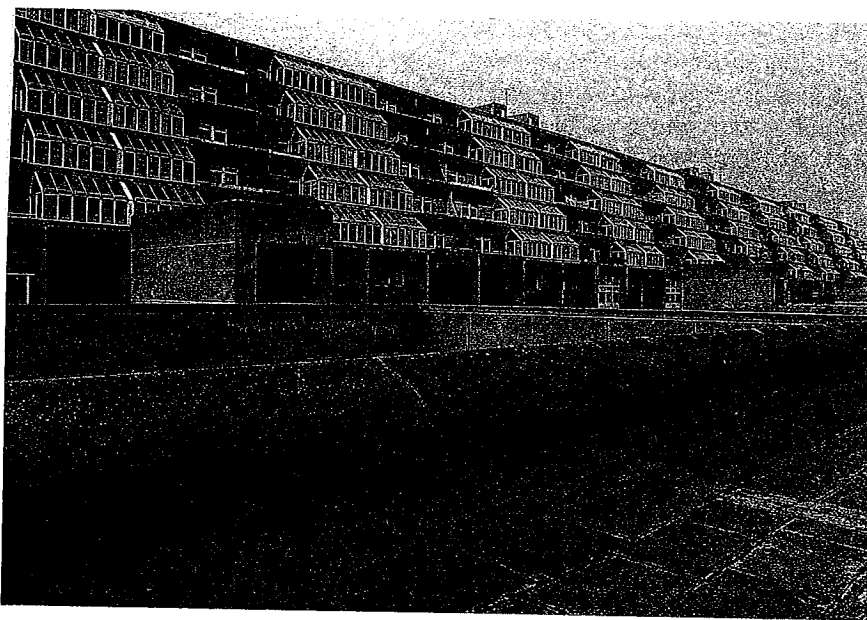


Figure 3.5 The Martin model: Patrick Hodgkinson's Foundling Estate in Bloomsbury, London 1967

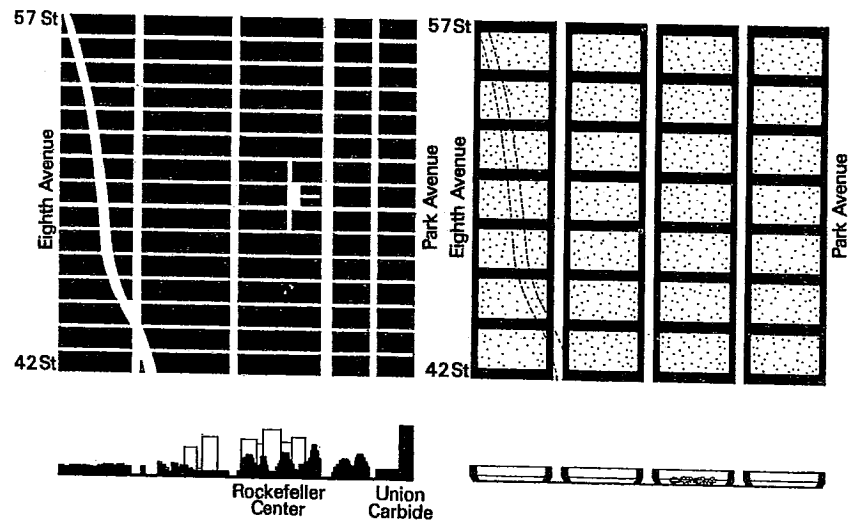


Figure 3.6 Manhattan rebuilt in the form of courtyards, as proposed by Sir Leslie Martin

the gardens. This idea had been anticipated in Raymond Unwin's essay *Nothing Gained by Overcrowding* of 1912, in which a group of terraced houses was compared to a looser group around a communal garden.¹⁵ Martin's *Speculation 6* deals with a very similar specific example in the case of a plot of ground the size of Parker's Piece, a familiar open space in Cambridge (Figure 3.7). He showed that with a four-

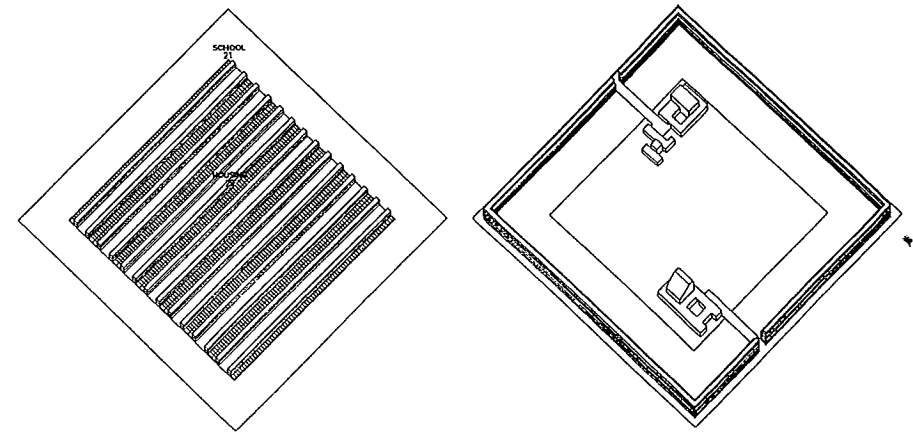


Figure 3.7 Parker's Piece in Cambridge, England, as it might be developed with terraced housing (left), or with perimeter blocks and schools in the centre (right) – comparison by Sir Leslie Martin and Lionel March, 1968

and-a-half-storey perimeter development overlooking a single central open area, a school, open space, and playing fields could be accommodated in addition to the housing, whilst a development of parallel two-storey terraced housing on the same site could accommodate little else.¹⁶ This attractive result in terms of open space, sympathetic to Corbusian ideals, was again due, apart from the modest increase in height and elimination of private gardens, to the saving in road space: nine per cent of the site is devoted to roadway in the case of the perimeter development, nearly 25 per cent in the case of the parallel terraces. These examples were influential, for example on linear projects such as Neave Browne's Alexandra Road Estate in Camden of 1970 onwards and Richard McCormac's Duffryn housing of 1978 which, however, tend to show that the extended unbroken lengths of low building resulting from this theory are difficult to manage architecturally.

In relation specifically to Le Corbusier's work, the fundamental question that seemed to require explanation was: if two-storey semi-detached housing could be built at 500 persons per hectare, as claimed by Lionel March, why was Le Corbusier achieving only 1,000 per hectare with about 17 storeys in the Radiant City? Analysis shows that March's sensational claim was based on the fact that the ground over which his semi-detached houses would look out was not included in the site area for the purpose of density calculations. This is a quite different theoretical principle from the Fresnel Square or the economy in road length resulting from perimeter developments. His site comprised essentially only the ground occupied by the houses themselves and half the width of the roadway in front (Figure 3.8). March was quite explicit about this. He wrote:

The matter of density is essentially a matter of how much or how little private open space a household is to have. The confusion of road, open space, and house plot areas in the general term 'residential area' disguises the fact that

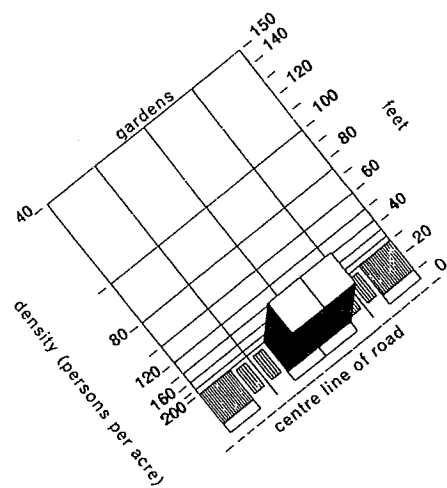


Figure 3.8 Lionel March's diagram showing how semi-detached houses might be built at 200 persons to the acre (500 to the hectare), from 'Homes Beyond the Fringe', 1967. Plan FLC 14918 © FLC

less and less residential land is owned and maintained by the occupiers, and a growing amount of land is becoming public open space although not accounted as such. [My diagram] shows a group of semi-detached houses along a small farm road. The house stands with its back to a paddock and has a small flower border in front. The arrangement is typical of many pleasant cottage developments in the country. There is room for a car alongside the house. This is semi-detached living at 200 persons per acre.¹⁷

The key word here is 'paddock'. It means that the land onto which the houses back directly is classified as agricultural land and is not included in the residential site area for the purposes of density calculations. The 'outlook' area of the houses is thus not included as part of the site when calculating the density.

If the same principle is applied to the Radiant City, remarkably high densities are also achieved. Le Corbusier claims a density of 1,000 persons per hectare of residential land, and says that only 12 per cent of the ground surface is built over (see Figure 3.1). Calculation reveals that of this, ten per cent is covered by the residential, and two per cent by other uses, but that the areas devoted to roadway and parking are not included. A total of about 29 per cent of the ground surface is occupied by residential buildings, roadway and parking. If the remainder of the land is excluded from the residential site area for density calculations – as well it might be because it is occupied by football fields, schools, nurseries, tennis courts (all non-residential land-use classifications) – then the density becomes not 1,000 per hectare but 1,000 per 0.29 hectare, or 3,448 per hectare. This is some seven times the density of Lionel March's semi-detached houses which might readily be explained by the Radiant City having seven times as many storeys. This is simply to re-assert the commonsense expectation, which had seemed to be questioned, that if you build taller you get more people onto the

land. But this kind of super-density is only achieved statistically if the open space around the buildings is not included in the site area for the purposes of density calculation. It does, however, seem reasonable to exclude it provided it really is of a kind that can be used for another function. The 'super-density' is only achievable if the two distinct use classifications – housing/offices, and recreational/educational – are interwoven. In this case, it does achieve real economy on the use of land.

Ministry of Housing and Local Government Circular 36/67, current at the time of March's paper, stated that the density was to be found by 'dividing the number of bed spaces by the site area in acres'. The site area was to include space occupied by dwellings, cars, private gardens, 'small incidental open space such as drying yards and play areas', and roads internal to the layout. But it should exclude '1: land proper for appropriation for public open space. 2: land used for all other types of development, e.g. schools' (my emphases). On both these counts, 71 per cent of the ground area of the Radiant City should be excluded from the 'site area'. The point is that if the blocks of the Vertical Garden City were built sufficiently far apart, then the spaces between them, rather than being 'small incidental open spaces' (included in the site area), would be large enough to be classified as 'public open space' (excluded from the residential site area), or used for alternative purposes such as playing fields, schools, and libraries. Furthermore, because the principal buildings of the Radiant City were to be raised on *pilotis* three storeys high, they would overlook lower structures of this kind. This is as we see them illustrated in Le Corbusier's drawings (Figure 3.9). They can be compared to a development such as the Hallfield Estate in Paddington of 1948 by Lasdun and Tecton – very much influenced by the Radiant City ideal but at half the scale and without *pilotis* – where the spaces between the blocks, pleasant and well-treed though they are, are not large enough to be used for anything much beyond looking at (Figure 3.10).

There is a paradox, however. If 71 per cent of the ground surface of the Radiant City was to be Public Open Space, its performance would be nearly optimal in terms of the LUBFS 'Proximity to Open Space Indicator' because the distance to reach any given area of Open Space would approach the radius of that area.¹⁸ But in terms of total area of Public Open Space per head of population the Radiant City would appear to have a serious deficiency. In the planning of the GLC's proposed Hook New Town in the 1960s, for example, 16 acres or 6.4 hectares of public open space were to have been provided per 1,000 population, of which 2.4 hectares were to be sports fields in line with the recommendations of the National Playing Fields Association.¹⁹ In the Radiant City, however, only 0.71 hectares of public open space at most are shown as provided, of which no more than 0.5 hectares could be playing fields. Accessible and visible though it would be, the green space provided by the Radiant City would thus appear to be very limited in quantity in relation to the population – despite Le Corbusier's claim to have designed a city for the Leisure Age. The shortfall in playing fields and open space could, however, arguably be easily made good outside the built-up city boundaries, at no great distance because of the City's compactness.

As designed, the Radiant City would indeed be compact. Of Le Corbusier's three principal models of urban form, it alone provided that all housing and most

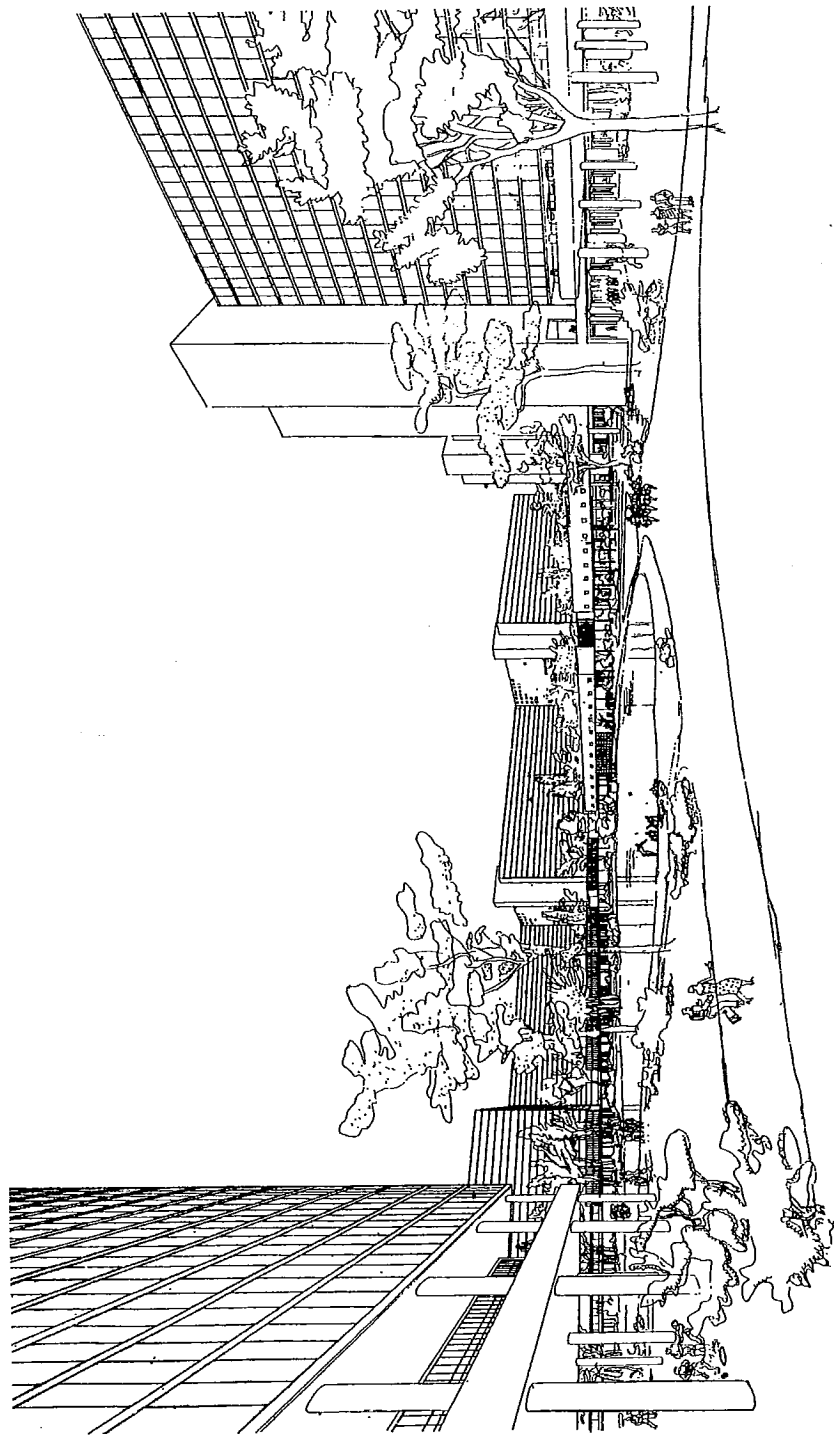


Figure 3.9 The Radiant City model applied to Antwerp: perspective view of anywhere in the residential quarter of Le Corbusier's plan for the Left Bank of the Scheldt, 1933

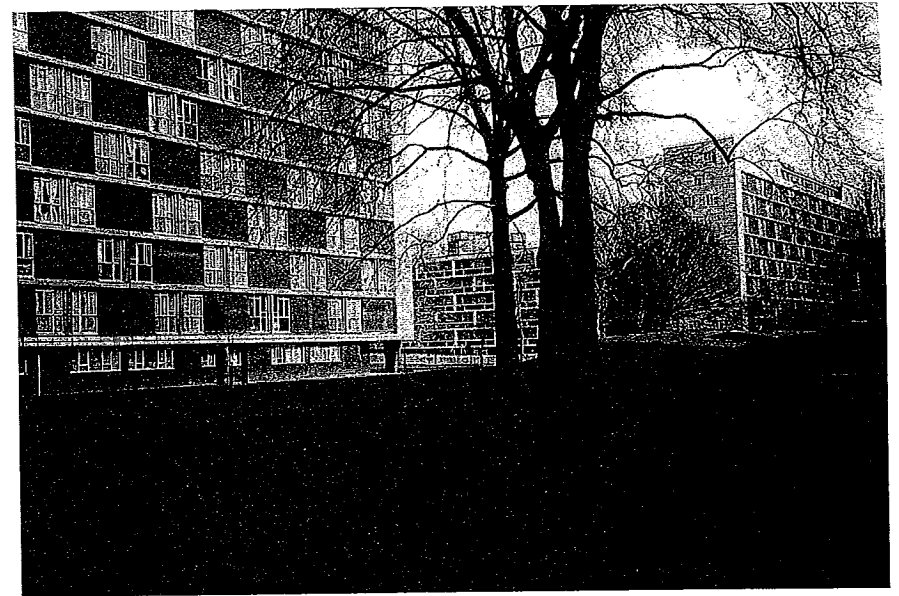


Figure 3.10 The Corbusian model: the Hallfield Estate, Paddington, London, 1948, by Tecton, succeeded by Drake and Lasdun, 1948

employment would be high-rise: housing in linear blocks of 14 storeys, offices in 'Cartesian' skyscrapers of 70 storeys, and manufacture mostly in flatted factories of seven storeys. This intense use of the land, combined with the limited amount of open space and the extremely high residential density achieved by combining the housing with other land uses as described above, produced a city of remarkably compact dimensions. A comparison with the city of Cambridge for example, with a population of about 100,000, shows that the Radiant City occupies an area of similar overall dimensions with an apparent population of 1.5 million – some fifteen times larger (Figure 3.11). A planned 'theoretical' city can always seem very efficient in land use compared to one that has grown up haphazardly. Nevertheless, this does demonstrate the potential for very significant economies in the use of land, a demonstration which may well have relevance to those currently considering where and how to accommodate the extra 4 million homes considered to be needed in Britain. In fact, similar economies need to be found in all land uses, including industrial and commercial, because residential areas, as their density increases, play a decreasing part in a city's total land take.

Transport in the Radiant City

The compactness of the Radiant City would not only save land but would also clearly help the transport problem. It would suit public transport, to which Le Corbusier devoted a considerable amount of detailed attention especially in his 1932 plan for Antwerp (closely modelled on the Radiant City), and it would also suit

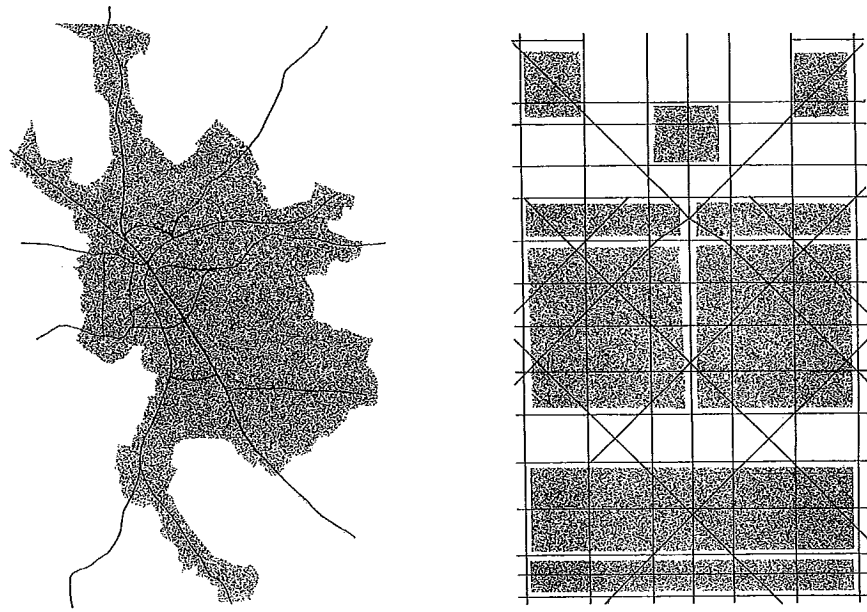


Figure 3.11 Le Corbusier's Radiant City (right), population 1.5 million, and Cambridge, England (left), population 100,000, to the same scale

pedestrian traffic.²⁰ But it was to the problem of how to accommodate the car that he devoted most energy, and the drawings of this aspect of the Radiant City are technically amongst the most impressive and intriguing. He seemed to have found a very comprehensive answer to this thorny problem. There was to be pedestrian segregation by level (pedestrians on the ground, vehicles in the air – not the other way round), grade-separation at all major vehicular crossings, widely-spaced limited-access dual-carriageway highways without any building frontages, and parking structures at every door. Local distribution would be on foot within the buildings. It was a solution that required a radical break from the traditional city street which combines vehicles, pedestrians, and building frontages in a single hard-surfaced channel. On the contrary, the city floor is green, crossed by a light network of elevated roads remote from the buildings (thus removed from the noise and fumes of traffic), and with the car apparently kept visually well under control. Why then has this not been achieved? Why does the environment in so many housing estates which reflect at least some Corbusian urban ideas, such as Stuyvesant Town in New York, tend to be dominated at ground level by cars and tarmac rather than greenery? And why did elevated motorways neither solve the urban transport problem nor in practice fit as neatly into the urban fabric as they seem to do on the plans of the Radiant City?

The principal answer is that, as with Public Open Space, and despite the ideological importance Le Corbusier gave to accommodating the car and the ingenuity of his principles proposed for doing so, his plans actually make little provision for the car

numerically, even by the standards of the time. The small amount of space given to the car is, in fact, one factor contributing to the compactness of the city. In the text of the book *The Radiant City*, Le Corbusier writes of the office towers that their 'four autoports provide parking for a thousand cars at the level of the bay itself, a thousand more on the ground beneath, and another thousand still in the auto-basement. Total 3,000 cars per skyscraper – far more than will be needed!'.²¹ Yet each skyscraper was to house up to 30,000 employees, which means that little more than 10 per cent could come to work by car – much less than was already normal in many places in the United States in 1932. Similarly, only about 150–200 parking spaces are shown at each apartment house, though these house 2,700 people each. At a modest rate of one car space per household, at least 1,000 spaces would be required. The road network does not appear to be totally adequate even for the number of cars envisaged. If all 42,000 cars for which parking is provided in the Business City of the Radiant City were to set off on the homeward journey in the hour between 5.30 and 6.30 p.m., they would require 30 traffic lanes at a typical current flow rate of 1,400 Passenger Car Units per hour, but only 15 lanes are provided in each direction. A system of reversing the direction of flow on some lanes might help – but there would be a further difficulty: the traffic flow per lane would in fact be much less than this because the cloverleaf intersections have very tight radii of curvature. My diagram shows Le Corbusier's cloverleaf intersections for the Radiant City as compared with those recommended by the Ministry of Transport in Roads in Urban Areas (1967) for a turning speed of thirty miles an hour (Figure 3.12). His

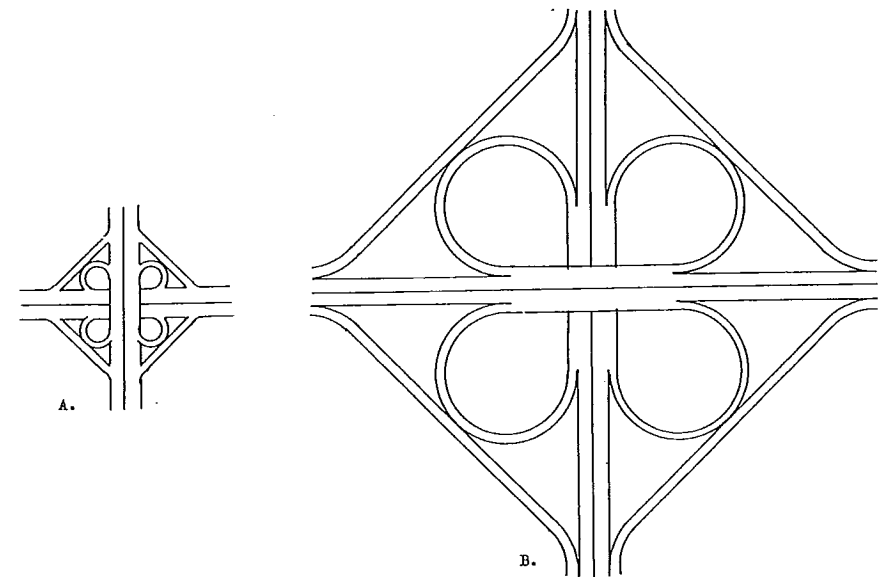


Figure 3.12 A cloverleaf intersection as proposed by Le Corbusier for the Radiant City (left), with a radius of curvature on the loop roads of 10 metres, compared to the same scale with a cloverleaf as proposed by the British Ministry of Transport, 1966, with a curvature of 55 metres on the loops, to allow a turning speed of 25 mph

cloverleaf intersections fit in well because they are much too small by current standards (though more typical of the few pre-war examples), and the parking is unobtrusive because there is not much of it. On the other hand, calculation of the office and industrial floorspace in the Radiant City suggests that considerably more is provided than necessary, thus also overstating the traffic generated. An industrial city with a population of 1.5 million (based on the amount of residential accommodation), is unlikely to need space for 420,000 office workers in addition to very substantial manufacturing and service employment, assuming an economic activity rate of about 45 per cent of the population as in the UK at present.

Only six years later, after Le Corbusier's visit to the United States in 1935 (sponsored by the Museum of Modern Art), his tone had changed when the scale of the motor car problem had really become apparent to him. He wrote of the Radiant City in the third volume of the *Œuvre Complète*: 'The new city is compact – the transport problem solves itself. We learn to walk again – the motor car (there are 1.5 million of them in New York every day) is a malady, a cancer. It will be valuable at the weekend or even everyday to disport oneself amidst the tender verdure of nature, two steps away.'²² The tender verdure of nature was what Le Corbusier craved above all, and he thus came to value the car primarily as a means of reaching it. If easy pedestrian movement and public transport were the primary means of circulation, and the car was indeed used primarily for leisure purposes, it is conceivable that the scale of the provision for it could be as modest as in the Radiant City.

The insistence on the omni-presence of nature is the distinguishing and perennial feature of Le Corbusier's urban ideals and distinguishes them from those of many others of the time – from the Futurists', and from Hilbersheimer's lugubrious medievalism as much as from contemporary film images of the city of the future such as Fritz Lang's *Metropolis* (Figure 3.13). Nature for him was not just greenery but also space, light and form – the desire to enter into a dialogue with the forms of the surrounding hills and mountains, which can be seen clearly and evocatively in the drawings for Chandigarh and St Dié, and experienced at the Unité at Marseilles. Though the demand for a green outlook was recognised by Leslie Martin, the dynamic and open relationship with nature and landscape envisaged by Le Corbusier is not one that was compatible with his proposed enclosed garden court-yards.

In fact, the valuable principle of mathematical analysis established by Martin allows different conclusions from his own to be reached. The built form conception of the Radiant City can be shown to have achieved a high efficiency in land use. As regards transportation, it is arguable that the motorcar was allowed more influence in the design than was justified by the numerically small contribution it made to transport needs. But the principles by which Le Corbusier sought to deal with it, radically widening the spacing of the street grid, keeping the roads segregated from pedestrians (except in the case of certain 'parades'), and remote from the buildings except at points of transfer, are widely accepted. Public transport and pedestrian movement were by no means disregarded, and the conditions were well suited to them. As a model of urban form, the Radiant City was potentially viable for a

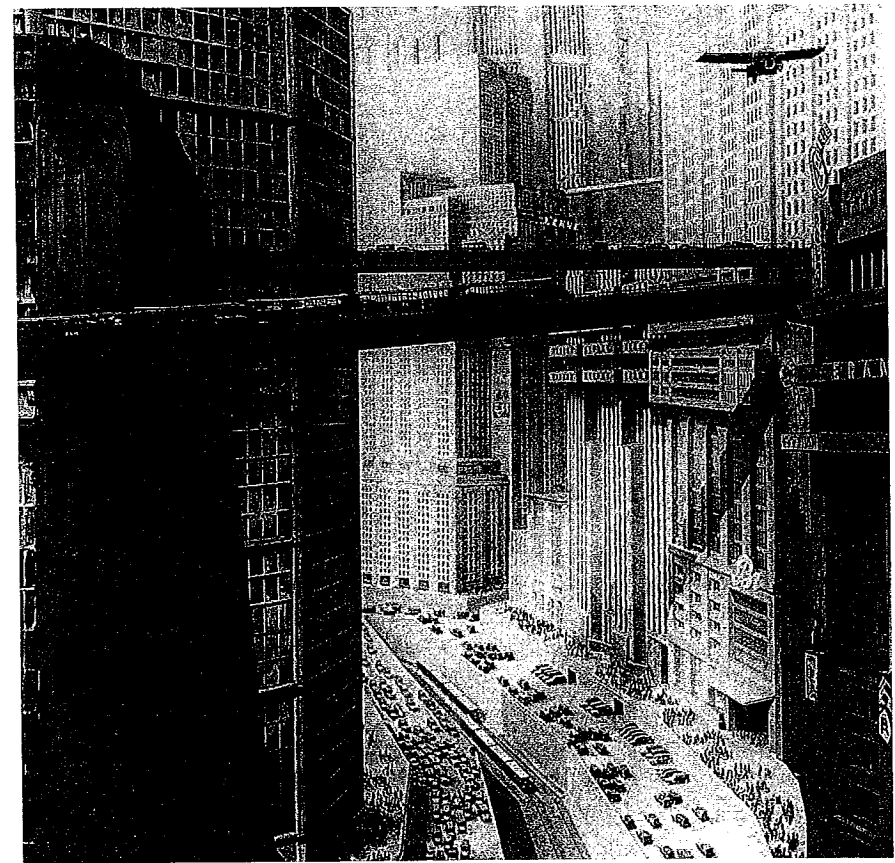


Figure 3.13 A scene from *Metropolis*, the would-be architect Fritz Lang's 1926 film, inspired by a visit to New York two years earlier. The ruling class lived in sun-dappled gardens above

community wishing to live in apartments in a green, cultured and highly serviced environment, with low car use.

Those seeking to perpetuate the city broadly in the form that it exists today will have to find solutions to the environmental and transport problems addressed by Le Corbusier. Residential middle-class communities have indeed survived in the centres of the very largest contemporary conurbations where distant greenery is effectively beyond reach, kept there by the social, cultural, and economic facilities of the city. But the general desire for a green environment has been amply demonstrated at least in Northern Europe by the general move to the suburbs. Despite his love of nature, Le Corbusier was himself too dedicated to the cultural and productive role of the city based on close physical proximity to wish to abandon it. The Radiant City would make enjoyment of a green environment possible without exile from the facilities of the city.

The 'New York' school

Leslie Martin attempted to establish objective criteria of assessment, but the most common criticism of Le Corbusier's urbanism is based on the subjective argument that, by opening up the city, by abolishing the sense of compression generated by the street, he was destroying the essence and excitement of urban life. I have called this the 'New York school' (though it is widespread) because Jane Jacobs, in her book *The Death and Life of Great American Cities* of 1961, was one of the first and most effective exponents of it, whilst one of the most recent – the one I wish to deal with here – has been Rem Koolhaas, in his book *Delirious New York* of 1978.²³ It is a criticism that prefers chance to order and sound to silence.

I argued in *The Architecture of Silence* that Le Corbusier's vision of the city was as a place of meditation, of cultural creativity inspired by the example of Cubist art which was both highly urban and which he saw as 'meditative'. He wrote in *The Four Routes*:

Many years ago I threw into the confused discussion of styles, fashions, snobberies, this argument which was a 'knock out': 'the house is a machine for living-in'. A thousand staves have been produced to beat me with for having dared that utterance. But when I say 'living' I am not talking of mere material requirements only. I admit certain important extensions which must crown the edifice of man's daily needs. To be able to think, or meditate, after the day's work is essential. But in order to become a centre of creative thought, the home must take on an entirely new character. And that necessitates for its realisation a change in the entire layout of the city, a new arrangement of transport, a new and daring concept of space relationships, a new method of construction for human habitation.²⁴

And in *The Radiant City*:

To a healthy body, to a mind kept in a continual state of optimism by daily physical exercise, the city if the right measures are taken can also provide healthy mental activity. This would take two forms: first, meditation in a new kind of dwelling, a vessel of silence and lofty solitude, secondly, civic activity achieved by the harmonious grouping of creative impulses towards the public good.²⁵

The contact with nature would in itself contribute to this end because, he wrote to the Russian architect Moisei Ginsburg 'Intimacy with nature (radiant spring, winter storms) is a stimulus to meditation, to introspection'.²⁶

Meditation requires calm and serenity, 'lofty solitude' and 'nature', and to see that these might be compatible with urban life was perhaps Le Corbusier's most significant contribution to town planning. One of the ways he sought to provide for them was by opening up the city with taller and more widely spaced buildings, offering a sense of distance and space. The Radiant City might be described as 'the only city where you can be alone with nature'. In this light he had long presented

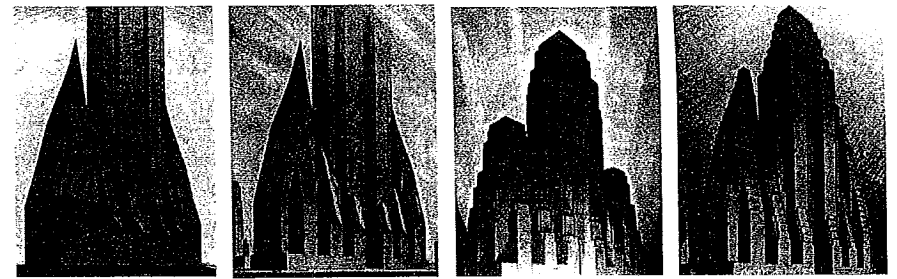


Figure 3.14 Hugh Ferriss' proposed translation of New York light angle codes into built form, from his 1929 book *Metropolis of Tomorrow*, as reproduced with horror by Le Corbusier in *The Radiant City*, 1933, and with enthusiasm by Rem Koolhaas in *Delirious New York*, 1978

New York as the antithesis of what he sought to achieve: an illustration of Broadway and the Flatiron Building in his book *The City of Tomorrow* of 1925 is captioned 'Here is the exact opposite of what the Voisin scheme proposes for Paris'.²⁷ He presented New York as the chaotic, exploitative, inhuman 'city of hard labour'. He opposed the bristling skyline and density of Manhattan to the calm and spacious openness of his *City of Three Million* with its horizontal roofline. The ziggurational configuration of American skyscrapers of the time, stepped back at the summit in accordance with statutory light angles, he dubbed 'The City of Panic', and the renderings of them by Hugh Ferriss illustrated 'Tumult, bristling chaos, the first explosive state of a new medievalism' (Figure 3.14). When Le Corbusier actually visited New York, he found things to like – such as the Avenues running north-south along Manhattan for nearly fifteen kilometres in a straight line, the banks of elevators and automatic doors in the Rockefeller Center, and the Renaissance-style skyscrapers which, with conscious paradox, he found to be of much better quality than the Art Deco ones:

In New York then, I learn to appreciate the Italian Renaissance. The oldest skyscrapers of Wall Street add the superimposed orders of Bramante all the way up to the top with a clearness of moulding and proportion which delights me.²⁸

When he was appointed onto the advisory committee for the design of the UN headquarters on the East River in 1947, he saw it as his opportunity to introduce his own spatial conception to New York. There is little doubt that the UN building as executed is based on his concept, though not realised by him in detail, and it may be considered the nearest he came to realising his ideas for the modern Western city.²⁹ The experience of emerging from the dark chasm of 42nd Street onto the light and openness of the UN Plaza is a stunning experience for those who understand his intention. The proposed second office slab at right angles to the first, had it been built as intended, would have articulated the space even more dramatically. He captioned an aerial rendering of the UN complex in its surroundings (by Ferriss) as 'The first appearance of the 'Ville Radieuse' in the urban fabric of Manhattan',

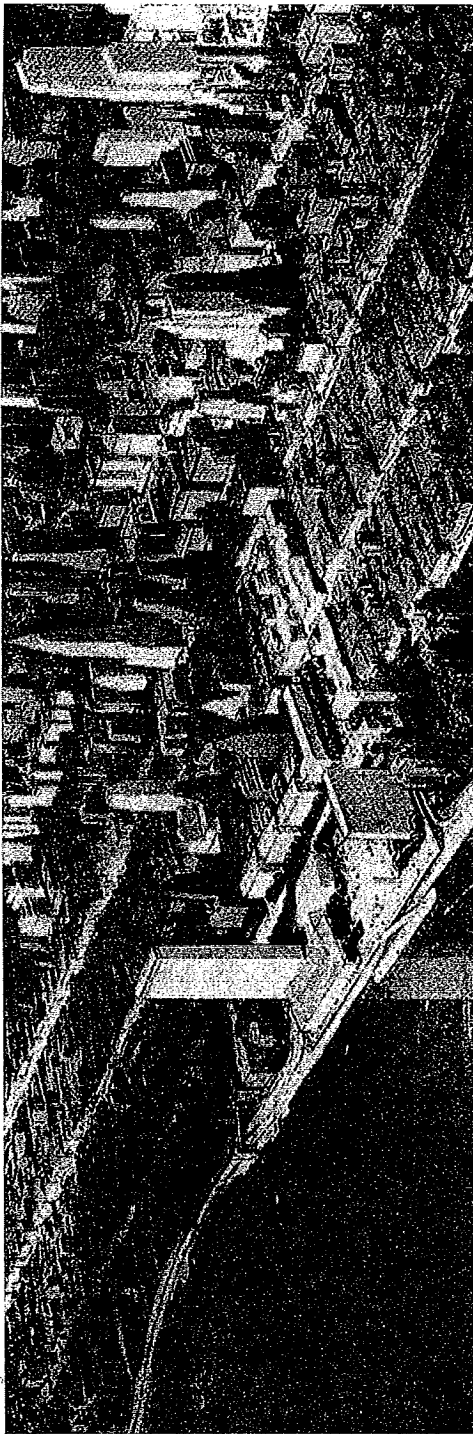


Figure 3.15 The United Nations Headquarters in its context, rendering by Hugh Ferriss reproduced in Le Corbusier's *Complete Works 1928–46*, with the caption 'First appearance of the Radiant City in the urban fabric of Manhattan'

and a silhouette of it as the 'Appearance of a Cartesian skyscraper in the New York sky' (Figure 3.15)³⁰. Well-maintained as it is, beautifully landscaped, and competently detailed by the executive architects Harrison and Abramowitz, it is a convincing demonstration of the principles illustrated in his sketch of the Rio 'Alternatives', on a larger scale and, finally, on a water-front site (Figure 3.3). He created offices that were indeed 'vessels of silence and lofty solitude'.

This aspiration to calm and space, however, is to Rem Koolhaas the antithesis of the city. His book *Delirious New York* is an extended rejection of Le Corbusier's objectives for the city and an attack on the UN building. It is precisely the dense, bristling, congested New York of 42nd Street, which he terms 'delirious' (borrowing the dubious phraseology of Salvador Dalí), that he extols. His book is a 'Blueprint for the Culture of Congestion' and a 'Retroactive Manifesto for Manhattanism'. Even the end-papers of the 1994 edition of the book present as quintessential opposites a typical area of the New York street grid at the front, and the UN Plaza at the back. Koolhaas lauds the romantic-expressionist imagery of Hugh Ferriss decried by Le Corbusier, and the focal ideal of his book is the dense Rockefeller Center of 1930 onwards (by Raymond Hood and others). He wrote of Le Corbusier's 'Cartesian' skyscraper that it:

means business only. Its lack of a base (no place for a Murray's) and a top (no seductive claims of competing realities), the merciless overexposure to the sun implied by the thin cruciform of its plan, all preclude occupation by any of the forms of social intercourse that have begun to invade Manhattan, floor by floor.

[Le Corbusier] introduces honesty on such a scale that it exists only at the price of total banality. The glass walls of the Horizontal Skyscraper enclose a complete cultural void. In designing the Cartesian Skyscraper as universal accommodation for business, to the exclusion of those indefinable emotional services that have been built into the Ferrissian Mountain, Le Corbusier has been the credulous victim of the pragmatic fairy tales of Manhattan's builders. But his real intention in the *Radiant City* is even more destructive: to really solve the problems of congestion. Marooned in grass, his Cartesian convicts are lined up 400 meters apart (i.e. eight Manhattan blocks – about the distance between Hood's super-peaks *but with nothing in between*). They are spaced out beyond any possible association.

The dullness of Le Corbusier's urbanism has never been more ruthlessly exposed than in the modest renderings [of the UN building] by Manhattanism's automatic pilot [i.e. Ferriss].³¹

There are several points here open to question. On one not unimportant detail, Le Corbusier's Cartesian Skyscrapers would not, at 400 metres, be eight Manhattan blocks apart, but two or five blocks apart depending on orientation: Manhattan blocks are typically 213 × 81 metres (700 × 266 feet) including roadway. It is also incorrect to say that Le Corbusier envisaged no facilities for social life in his office skyscrapers beyond their business function. He painted this romantic picture of life

in the City of Three Million in his article 'The Street', first published in the newspaper *L'Intransigeant* in 1928:

In the new business centre office work will be performed, not in the persistent dimness of joyless streets, but in the fullness of daylight and an abundance of fresh air. Its 400,000 clerks will be able to scan a landscape such as that one looks down on from the lofty crests above the Seine near Rouen and behold a serried mass of trees swaying beneath them. When night intervenes the passage of cars along the autostrada traces luminous tracks that are like the tails of meteors flashing across the summer heavens. Two hundred metres above it lie the spacious roof-gardens of these office skyscrapers, planted with spindleberries, thuyas, laurels, and ivy. Overhead electric lamps shed a peaceful radiance. The depth of the night makes the prevailing calmness but the deeper. Armchairs are scattered about. There are groups in conversation, bands playing, couples dancing. And all around are the suspended golden disks of other gardens floating at the same level. The offices are in darkness, their façades obscured; the city seems to sleep.³²

Le Corbusier was not quite the Puritan Koolhaas imagines. He was a sensualist, as study of his figurative work as artist (if of nothing else) must reveal.

A more fundamental question is whether there would be 'nothing' between Le Corbusier's office skyscrapers, as Koolhaas avers. The image of the ground surface between the tall buildings presented in Le Corbusier's drawings, and visible in the part model of the Radiant City illustrated in the book, is remote from the blank and featureless spaces with which we are familiar in countless high rise housing estates. The 'open space' as illustrated is replete with the ancillary functions and facilities of urban life, sporting, educational, and recreational – quite apart from its luxuriant vegetation. A particularly well-known drawing shows tiered structures in the parkland with restaurants and luxury shops opening onto terraces overlooking the skyscrapers (Figure 3.16). The parkland could be open and public – or, like the garden squares of London, railed off and private to the blocks traversing it, as explained in *The City of Tomorrow*.³³ What interested him was the presence of greenery and space, rather than the nature of its ownership. There is no question, however, but that the quality and quantity of the planting and its maintenance at ground level would be as critical to the environment of the Vertical Garden City as to the horizontal, and that it is neglect of this factor that has so often undermined attempts to realise the idea.

The nature of the 'Open Space', the space between the principal buildings, is thus a key question both in the assessment of the Radiant City in relation to Cambridge land use criteria and to the New York criticism of the 'sterility' of his urbanism. If this space is, in fact, such that it can be used for a definite purpose, it can permit enormous economies in the use of land. At the same time, if it has a use it will not be 'sterile' but a cared for and valued part of the urban fabric. Its ability to accommodate these secondary uses seems dependent, as discussed above in relation to the 'Cambridge' school, on its being of a sufficient scale to do so without

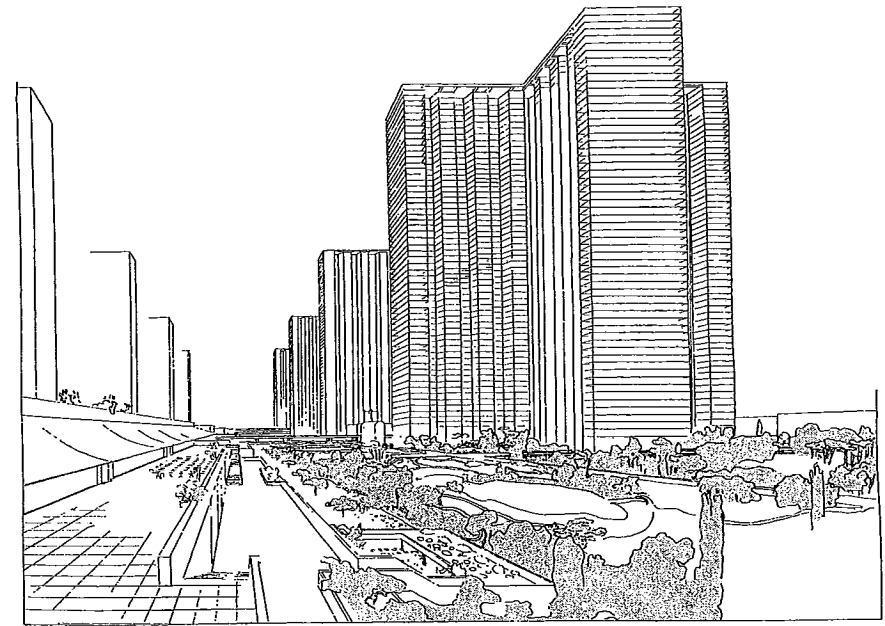


Figure 3.16 'A Contemporary City' – rendering by Le Corbusier of his *Plan Voisin* for Paris, 1925, based on his earlier *City of Three Million*. Plan FLC 31910 © FLC

interfering with the primary functions around it. It should also be recognised, however, that space and greenery are 'in use' even when they are only gazed at: they provide the relief and calm which the human eye craves.

It is this relief and calm of which Koolhaas sees no need. He prefers the 'congestion' of the New York street grid. Congestion, however, is a literary rather than a visual value. It is a value of which Le Corbusier was far from unaware but which he rejected through conscious choice. Earlier in his article 'The Street', Le Corbusier had made clear his understanding of the drama of street life (as though we might have doubted this in the disciple of Camillo Sitte that he had been), and his decision to reject it:

The street consists of a thousand different buildings, but we have got used to the beauty of ugliness for that has meant making the best of our misfortune. Those thousand houses are dingy and utterly discordant with one another. It is appalling, but we pass on our way. On Sundays, when they are empty, the streets reveal their full horror. But except during those dismal hours men and women are elbowing their way along them, the shops ablaze, and every aspect of human life pullulates throughout their length. Those who have eyes in their heads can find plenty to amuse them in this sea of lusts and faces. It is better than the theatre, better than what we read in novels. Nothing of all this exalts us with the joy that architecture provokes. There is neither the pride which results from order, nor the spirit of initiative which is engendered by wide spaces. . . .³⁴

After further decrying those of a 'Balzacian mentality' who would be content to leave our streets as they are because these murky canyons offer them the fascinating spectacle of human physiognomy', he opens his description of his own *City of Three Million* with the words 'I should like to draw a picture of "the street" as it would appear in a truly up-to-date city'. He has rejected the 'sea of lusts and faces' in favour of 'the pride which results from order (and the) spirit of initiative which is engendered by wide spaces'. Le Corbusier's choice was a conscious rather than a blind one, and it is one we have to understand if we are to criticise it effectively.

Koolhaas' perception of Le Corbusier's urbanism as 'dull' reflects a failure to recognise the drama of space and potential for the play of form, and play of light on form, with which he proposed to replace the drama of the street. The interaction between landscape and city, which Le Corbusier envisaged, is incompatible with the continuation of the Street as the central organising principle of the city. The solution he envisaged to urban transport, which may be right in principle if wrong in quantity, is also incompatible with the continuation of the Street.

The Street is therefore the battleground, whose re-discovery or re-establishment (since it was called into question by the Modern Movement) is the staple of 'urban design groups', and which is now the orthodoxy entrenched in the UK planning control system. In the 1960s Leslie Martin sought to re-establish the Street between the backs of his stepped section courtyards. In the 1970s, Norman Foster made his name at Ipswich by re-establishing the street line around his Willis Faber Dumas building, albeit with a reflective glass façade. In the 1980s, James Stirling's Mansion House Square office building in the City of London, filling its site and re-asserting the street, supplanted Mies van der Rohe's free-standing tower. But the disadvantages of the 'corridor street' against which Le Corbusier inveighed, a channel for pedestrians and vehicles between walls of masonry, can still be experienced all too clearly in the principal thoroughfares of London today, as of most western cities. If the city is to attract those who have a choice, it is going to have to offer them the conditions of greenery and calm and space – and easy mobility – which the present street and urban environment denies them but which, at least in northern Europe, they seek by going out to the suburbs. We must create the city to live in, though we may enjoy visiting for short periods the tumultuous cores of our cities as they are.

The ideal of space, calm and verdure in the city is not tied to Corbusian or even Modern Movement architectural forms or technical solutions – though it may be inspired by them. At root, it is an expression of a scale of architectural values and priorities. That past attempts to realise it have very often been unsuccessful no one would deny. As an objective it can seem paradoxical, even destructive of the city. Yet the search for a new idea of the city in which it can find a place must go on. For, in whatever form, the choice for the future must surely be the *City of Contemplation* rather than the *City of Delirium*.

Acknowledgement

The permission of the Fondation Le Corbusier to reproduce images by Le Corbusier is gratefully acknowledged.

Notes

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- 31 Koolhaas: *Delirious New York* pp.255–7 and p.281.
- 32 Le Corbusier: 'The Street' in *Œuvre Complète 1910–29* pp.118–19; reprinted from *L'Intransigeant* (May 1929).
- 33 Le Corbusier: *The City of Tomorrow* pp.228–9.
- 34 Le Corbusier: 'The Street'.

The supposed rationality of the urban planning of the Modern Movement encompassed a variety of attitudes towards history, technology and culture, from the vision of Berlin as an American metropolis, through the dispute between the urbanists and disurbanists in the Soviet Union to the technocratic and austere vision of Le Corbusier. After the Second World War, architects attempted to reconcile these utopian visions to the practical problems of constructing – or reconstructing – urban environments, from Piero Bottoni at the Quartiere Triennale 8 in Milan in 1951 to Lucio Costa at Brasilia in 1957. In the 1970s, the collapse of Modernism brought about universal condemnation of Modern urbanism; urban planning, and rationality itself, were thrown into doubt. However, such a wholesale condemnation hides the complex realities underlying these Modern cities. The contributors define some of the theoretical foundations of Modern urban planning, and reassess the successes and the failures of the built results. The book ends with contrasting views of the inheritance of Modern urbanism in the Netherlands and the United States.

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11 New Fetter Lane
London EC4P 4EE
29 West 35th Street
New York NY 10001
www.sponpress.com
Printed in Great Britain

ISBN 0-419-25640-7
9 780419 256403

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EDITED BY THOMAS DECKKER

THE MODERN CITY
REVISITED