19 MASS HOUSING 1949–1968

Architecture is concerned with more than just the solving of a local accommodation problem. It strives for a more general relevance, inviting comparisons, developing and extending traditions, and breaking new theoretical ground. Above all, it sees itself as an art, not merely a practical craft. Nikolaus Pevsner made this point succinctly when he declared that Lincoln Cathedral was a work of architecture, but a bicycle shed was just a building.[1] In the nineteenth century, architecture was responsible for important buildings like churches, art galleries and town halls, while completely ignoring factories, railway sheds and urban housing for the poor. But in the twentieth century, the clear line of distinction between architecture and ordinary building became blurred, not because ordinary building aspired to the status of architecture but rather the reverse: because a new breed of Modernist architects burned with a desire to bring architecture to the masses and reconcile their ancient art with the realities of a new industrial society. The design of mass housing now became architecture's most important task. Pioneers like Tony Garnier, Ludwig Hilberseimer and Le Corbusier created visions of a new kind of city in which ordinary housing was more important than monumental public buildings. Le Corbusier experimented with various housing forms designed for healthy, ordered twentieth-century living and for efficient machine production. For example, his '*à redent*' or 'set-back' housing in the Ville Radieuse project of 1930 took the form of continuous linear blocks raised on pilotis over a freely accessible terrain, in effect a public park. Later, in his 1935 project for Zlín in Czechoslovakia, the continuous blocks were abandoned in favour of freestanding slabs, foreshadowing that great post-war built manifesto, the Unité d'Habitation in Marseille (see page 224).

Post-war Europe

After the Second World War, the reconstruction of ruined European cities presented a golden opportunity to realize this new urban vision. The vision had three main elements. First, a whole city, or at least a substantial part of one, could be designed from scratch by a single design agency, perhaps even a single architect. The old city that grew and changed gradually over a long period of time – the buildings renewing themselves but the streets and public spaces mostly remaining in place – would be superseded by a functional design that swept away the remains of the past and treated the site as a tabula rasa. Second, the city would be machine-like, with different components, or zones, for different functions – residential, commercial, industrial and cultural – linked by rapid transport systems. Daily life would be planned and managed like a business operation and the old multifunctional city quarter would be cleared away. Third, urban space would be transformed. In the old cities, streets and squares were enclosed and contained by a solid accretion of building, like canyons carved out of rock. In the new city, buildings designed optimally to serve specific functions would stand free in the fresh air and sunshine of a landscaped park.

The Ville Radieuse and the Unité d'Habitation fixed the image of the new city, and architects all over Europe set about making it a reality. In the Pimlico district of London, for example, a large area of nineteenth-century terraced housing bombed in the Blitz was replaced by 32 apartment blocks, seven to eleven storeys high, designed by Powell and Moya and built between 1949 and 1962. The development, known as Churchill Gardens, was cautious in its interpretation of Corbusian precedent. Linear slab blocks were not raised on pilotis over continuous parkland but aligned with conventional streets, and though their structural frames were concrete, their external walls were of brick. Nevertheless, these ship-like buildings, complete with fat funnels on the roof to house water tanks and lift motors, were a symbol of Modernist optimism to brighten the post-war economic gloom. A novel technical development was the district heating system, which used waste heat from Battersea Power Station on the other side of the river. Further west at Roehampton on the outskirts of the city, London County Council's architects' department designed a housing development called Alton West, which mixed low-rise terraced housing with 12-storey towers and 11-storey slab blocks, all in a park-like setting with mature trees. In architectural photographs of the estate, completed in 1958, it is the five slab blocks that feature most prominently because they were so obviously influenced by the Unité d'Habitation, though each is barely half the size of its model. The design team, led by Colin Lucas, included Bill

Alton West, Roehampton, UK. London County Council Architect, 1958. Slab blocks obviously influenced by Le Corbusier's Unité, but on a smaller scale.

Howell and Colin St John Wilson, who, with Philip Powell and Hidalgo Moya, would go on to become prominent practitioners of British Modernism in the years to come.

The new architecture of mass housing appealed in different ways to different constituencies: tenants liked the generous space standards, the central heating, the bathrooms, the fitted kitchens and the views from high windows; politicians saw an opportunity to accelerate the long and tedious process of building, making its political impact more immediate; architects enthusiastically promoted it because it seemed the fulfilment of the Modernist dream, an architecture at last in tune with the spirit of the age. But it was new building technologies that gave it its progressive impetus. For almost a century architecture had been learning how to use engineered materials, mainly steel and reinforced concrete, adapting them to a new formal and spatial conception: the structural frame with lightweight in-fill (see Chapter 4). Easily transported components such as doors and windows were now routinely standardized and mass produced, and in mostly non-architectural popular housing, simple technologies such as the American 'balloon' or 'platform' frame had been adapted for prefabrication to varying extents.

Box-frame construction

The question now was: could mass housing, in multi-storey towers and slabs, be made in factories? The reinforced concrete frame did not lend itself either to prefabrication or to the division of large buildings into smaller self-contained units. Columns and beams, which might easily be absorbed into the open plan of an office building, were awkward intrusions into domestic interiors. Solid, soundproof internal walls between dwellings were a fixed and inevitable feature of mass housing; could they perhaps be used as structural members, in effect as thin planar columns? And since the spans between them would be relatively short, might it be possible to get rid of the beams, relying only on the strength of a flat slab? These thoughts gave rise to a new conception: 'box frame construction'. It was an idea that arose in many places simultaneously in the years immediately before and after the Second World War. One version of it was developed by the great structural engineer Ove Arup, father of what is now the biggest engineering consultancy in the world.

Arup worked in England where, before the war, he collaborated with the Russian (or, strictly, Georgian) emigré architect Berthold Lubetkin, a committed Modernist who had worked in Paris in the 1920s with, among others, Konstantin Mel'nikov and Auguste Perret. Moving to England in 1931, Lubetkin set up a collaborative architectural practice called Tecton. He and Arup together designed what is now considered to be an early masterpiece of British Modernism, the Highpoint I flats in Highgate, north London. The building is of reinforced concrete construction with freestanding columns in a spacious foyer on the ground floor. In the upper storeys, however, floors are supported by the flat planes of the concrete external walls and by a central spine which is a kind of hybrid panel/frame – either a panel with very large openings or a flattened beam and columns. In the later Highpoint II next door, loadbearing concrete walls are arranged at right angles to the external walls, leaving the facade to be in-filled freely with glass and lightweight panels. These were early experiments in what, after the war, Arup developed into the fully fledged box frame. The eight-storey Spa Green estate in central London, designed by Tecton and Arup and completed in 1949, is probably the earliest example in Britain.

A structural form had been found that suited multi-storey housing and lent itself readily to rationalized construction. Formwork used to cast the concrete walls could be standardized to a degree and recycled, but the concrete was still being poured on site. A further stage of development beckoned: to move the casting process off site into a factory. Complete panels could then be delivered to the site by truck and placed carefully onto the growing house of cards (a metaphor that would eventually prove tragically apt). With the arrival of the tower crane on British building sites around 1950, all the elements of the construction kit were in place and mass production of mass housing could begin.

Precast concrete

This was not exclusively, or even mainly, a British idea. Very similar technical developments were taking place in France, Sweden and Denmark, of which Ove Arup, himself a Dane, was well aware. In 1949, the French minister of reconstruction and urbanism, Eugène Claudius-Petit, declared that it would be necessary to build 240,000 dwellings a year for the foreseeable future to deal with a desperate housing shortage. It was taken for granted that such a target would be impossible to meet without a thorough industrialization of the French building industry. In 1952, the year of the completion of the Unité d'Habitation, Petit's ministry launched a specific programme to build 4,000 dwellings on various sites around Paris using a precast-concrete system that had been patented in 1948 by the engineer Raymond Camus. Precast concrete had long been a French speciality but had hitherto been limited to relatively small components such as lintels and facing panels. Camus's system was much more ambitious, producing whole structural walls and floors on the box frame principle. Marcel Lods, a committed Modernist and a strong supporter of industrialized building, was appointed to lead a team of

Highpoint I, London. Berthold Lubetkin, 1935. A masterpiece of early British Modernism designed by an architect who had worked in Paris in the 1920s.

Highpoint II, London, UK. Berthold Lubetkin, 1938. The statues or caryatids were a kind of joke to convince the authorities that the canopy was structurally safe.

architects in the design of a range of standard blocks either five or nine storeys high. A new factory to produce the panels was built at Montesson in the western suburbs of Paris, and by September 1955 the building campaign was ready to go: 72,000 panels of 185 different types produced by 165 specially trained workers plus 20 truck drivers. Eighteen months later the first blocks were ready for occupation and the programme was being hailed as a success. According to Camus's efficient publicity machine, his system was faster, cheaper and of higher quality than conventional site-based construction.

Architecturally, the results were ambiguous. To progressive Modernists like Lods and his colleagues, these housing estates were a stage in the realization of the Ville Radieuse dream. They provided all the essentials for comfortable

Spa Green Estate, London, UK. Berthold Lubetkin, 1949. An early example of 'box frame' construction but clad in brick and tiles.

living, but more than that they represented a new freedom and a new healthy way of life. They also had artistic qualities, though of a severely abstract kind. For example, the site plan designed by Bernard Zehrfuss (architect of the CNIT building in Paris, see page 209) for the massive 3,850-dwelling estate, or *grand ensemble*, at Nanterre was an elegant Elementarist composition, like a painting by Mondrian or Malevich. An architect might also find satisfaction in the proportions of the facades with their alternating recessed and cantilevered balconies. But these qualities were of little importance to the politicians and civil servants, who saw only the impressive production figures and cost savings, or to the residents, who, though they may have appreciated the modern conveniences, saw only plain, uninteresting boxes disposed in meaningless open space. Before long there were other things to be unimpressed by. The surfaces of the external walls quickly decayed and the joints between the precast concrete panels started leaking. It seemed that the famed accuracy of Camus's manufacturing process was more theoretical than actual. These problems were eventually solved and the estate survives, now called Cité Marcellin Berthelot, part of the town's university quarter. Camus was the first and biggest of the French systems, but there were many others. Zehrfuss worked with one of them, the Balency post-and-slab system, in the design of three enormous 13-storey slab blocks on another site in Nanterre, completed in 1956. Here, though, the external walls are of ordinary rendered concrete block.

These Nanterre estates are typical of hundreds of similar projects initiated in western Europe in the 1950s and 1960s. In Denmark, for example, a distinguished team of architects, including Povl Hoff and Bennet Windinge, created a powerful architectural statement at Høje Gladsaxe to the north west of Copenhagen by lining up five 16-storey slab blocks end to end on top of an embankment. Schools, nurseries, a shopping centre and other facilities were built nearby, creating a self-contained town, completed in 1966. Equally uncompromising, the Albertslund development further west demonstrated the application of precast-concrete technology to low-rise housing, creating a uniform carpet of 1,000 identical single-storey courtyard houses. Surprisingly, the extreme, almost brutal rationality of these projects seems to have served reasonably well socially in the years since.

Albertslund used a version of the Larsen-Nielsen system, which, as licensed to contractors Taylor Woodrow-Anglian,

Slab blocks at Nanterre, France. Bernard Zehrfuss, 1956. Prefabrication on a grand scale but with architectural aspirations in the site layout and facade modelling.

(Above) **Høje Gladsaxe housing, Copenhagen, Denmark. Povl Hoff and Bennet Windinge, 1966.** Unashamed modernity: five 16-storey slab blocks lined up on top of an embankment.

(Right) **Albertslund development, Copenhagen, Denmark. Viggo Møller-Jensen, Tyge Arnfred and Mogens J. Pedersen, 1963.** 1,000 identical single-storey precast concrete houses laid out like a carpet.

had a high reputation among British architects and local authorities, particularly London County Council. The Morris Walk estate in Woolwich, south London, built between 1962 and 1966, was one of the earliest collaborations, with the architect Martin Richardson in charge. Ten-storey towers are mixed with parallel three-storey blocks linked by bridges to freestanding enclosed stairways. Joints between the roughly square, storey-height exposed aggregate panels are clearly visible, creating an insistent, rather coarse pattern, but landscaped spaces between the buildings are of a tolerably human scale. Richardson's influence on the design is clear enough, though he was working in a tight political space between the client's cost limits and the contractor's desire to make the most of the economies the system offered.

In Britain, as in France, there were many rival systems competing for a slice of the public housing pie, including Laing's Jespersen, from Sweden, Shepherd's Spacemaker and, most prolific of all, Concrete Ltd's Bison Wall Frame.

Morris Walk Estate, London. Martin Richardson, 1966. The Danish Larsen-Nielsen system adapted to the British preference for mixed developments.

All over the country, local authorities were beginning to turn not to architects but to system builders to satisfy their housing targets.

American public housing

In the United States, there were few attempts to systematize housing in this way, though many high-rise estates were built in eastern and Midwestern cities. Architectural history tends to assume that publicly funded housing was a negligible category in a country where private enterprise was the unquestioned basis of economic life. The private real-estate lobby was fiercely opposed to government-sponsored housing (though not to government support for private mortgages) and the political climate was generally hostile. The Truman administration made some attempt to tackle the housing shortage in the 1949 Housing Act, which included a target of 810,000 new units by 1955, but ten years later only 125,000 units had been built. Public housing meant housing for the poor, and the poor must never be allowed to live in better conditions than citizens who paid their way in the world. From a conservative political point of view, therefore, architectural quality in public housing was an ambiguous concept, something of which to be suspicious rather than something to celebrate.

Nevertheless, there were some early attempts to apply European Modernist ideas to American public housing – 'Le Corbusierism' as it was known at the time. For example, the Chicago Housing Authority (CHA), under the leadership of a pioneer advocate of public housing, Elizabeth Wood, employed progressive local architects such as Harry Weese and Skidmore, Owings and Merrill to design early post-war projects. SOM's Ogden Courts, completed in 1949, borrowed its details from Mies van der Rohe's Promontory Apartments (see page 198), with an exposed concrete frame and brick in-fill, though its overall form – two long seven-storey T-shaped blocks – was very different. At Loomis Courts, completed in 1951, Harry Weese experimented with open-access galleries, similar to the 'streets in the sky' favoured by British Brutalists of the time (see page 280). Wood and her supporters, such as Catherine Bauer, author of the classic *Modern Housing*, first published in 1934, eventually became disillusioned with the European, high-rise model, partly on the grounds that it was unsuitable for families with children, but also, perhaps, because it played into the hands of conservative administrators in the federal Public Housing Administration (PHA) who saw it as a way of cutting costs to the bone.

In the late 1950s, the CHA fought a losing battle against PHA cost limits, which effectively ruled out anything but the simplest and most austere high-rise layouts. Examples include Robert Taylor Homes (4,400 units) on the South Side of Chicago, Washington Park Homes nearby (1,400 units), and William Green Homes (1,000 units), an extension to the massive Cabrini estate on the Near North Side. These estates consisted entirely of unlovely, freestanding 16-storey slab blocks. British and European attempts to introduce scale and variety by mixing low-, medium- and high-rise buildings were rejected as wasteful and inappropriate.

Pre-war public housing schemes in New York, such as First Houses (so called because they were the first-ever publicly funded housing) and Harlem River Houses in Manhattan, had been built specifically to rehouse African-American slum dwellers. By the 1960s, segregation had become unofficial but the high-rise projects became de facto ghettos anyway. To what extent their rapid descent into gun crime and gang culture was due to the nature of the physical environment – the architecture, in other words – is debatable, but there is no doubt that residential towers became stigmatizing symbols of urban poverty. Minoru Yamasaki's Pruitt-Igoe development in St Louis (see page 203) was the first public housing estate to be blown up, in 1972, but it was far from the last. With the exception of Loomis Courts, none of the

(Above) Robert Taylor Homes, Chicago, Illinois, USA. CHA, 1962. In American public housing, architectural quality was an ambiguous concept.

(Below) Harlem River Houses, New York City, USA. Archibald Manning Brown, 1937. Pre-war public housing built specifically to rehome African-American slum dwellers.

Chicago estates mentioned above still exists. They were all eventually abandoned and demolished, their displaced residents given vouchers to buy or rent property in the private sector.

Khrushchev's initiative

Meanwhile, on the other side of the world, and of the Cold War conflict, an equally debased form of 'Le Corbusierism' was being promoted vigorously by the new Soviet premier, Nikita Khrushchev. In the Stalinist era, Russian architecture had abandoned its Constructivist ambitions and returned to a conservative monumentality. Investment in housing was neglected in favour of the production of armaments and agricultural machinery. By 1955, the year of Khrushchev's rise to power, most Soviet city dwellers lived either in overcrowded slums or in dormitory hostels. The sixth Five Year Plan (1956–60) included a commitment to double the rate of production of housing units, which actually rose from 1.5 million in 1956 to 2.7 million in 1959. By the late 1980s, Khrushchev's house-building programme had delivered a total of almost 70 million dwellings. The key to this success was a simple principle – quantity, not quality – which Khrushchev justified in a blunt question: 'Would a citizen rather settle for an adequate apartment now, or wait 10 or 15 years for a very good one?'

Architecture, in the traditional sense, could only be an obstacle to such a policy and, by definition, the urban environment was bound to suffer. But even if these distractions were discounted, the technical challenge was formidable. Khrushchev and his advisors, like Eugène Claudius-Petit before them, came to the conclusion that industrialization of the building industry was the only way. The new, western European, precast-concrete large-panel systems, in particular the French Camus system, provided a ready-made model that was duly copied. System building was well suited to a command economy that could insist on thorough standardization, locate factories for optimum efficiency and allocate vast tracts of land for development. Standard apartment plans were designed, as well as standard plans for the factories that would make them. By 1965 no fewer than 2,305 precast-concrete production plants were operating in the USSR. Some of the more advanced operations followed what would now be called lean manufacturing principles, minimizing warehousing by delivering components to sites 'just in time' and lifting them directly from trucks to the building itself. Building sites themselves became factories, their layouts governed more by the logic of the production process than the spatial coherence of the final product.

A key figure in the development of industrialized Soviet housing was the engineer Vitaly Lagutenko, who designed the infamous and ubiquitous K-7, a four- or five-storey walk-up block containing tiny two-room apartments. Square mile after square mile of peripheral urban land was covered with K-7s and their later, nine-storey successors. They were known as *khrushchyovki* ('Khrushchev buildings'), which very soon became *khrushchoby*, a pun on *trushchoby* ('slums'). Early estates, or 'mikrorayons', such as the Novye Cheryomushki and Belyayevo districts of Moscow, were provided with schools, shops and other communal facilities, but were often

K-7 block at Novye Cheryomushki, Moscow, Russia. The K-7 standard precast concrete block designed by Vitaly Lagutenko.

1960s apartments in Belyayevo, Moscow. Later, nine-storey versions of the K-7. Construction was notoriously shoddy.

badly located in relation to local employment, leading to long commutes on crowded public transport. As the system developed, every normal measure of good planning was sacrificed to the quantity-not-quality principle. Construction defects were rife. Gaps between panels, water penetration, poor insulation and leaking drains were so common they were regarded as normal. Local construction agencies struggling to meet targets often handed apartments over before they were properly finished. One consequence of the drive to meet targets and cost limits was that apartments got smaller and smaller, falling from 16 square metres (172 square feet) per inhabitant in the early 1960s to just 12 square metres (129 square feet) at the end of the decade. Communist East European countries such as East Germany, Hungary, Romania and Czechoslovakia all submitted to similar prefabricated house production regimes. In purely quantitative terms, it was a phenomenal achievement, the greatest public housing programme the world had ever seen. Looked at another way, it was an architectural, urban and environmental disaster on a continental scale.

A tarnished vision

In western Europe, the impact of the Corbusian urban model allied with industrialized building was less devastating. It was not long, however, before the vision became tarnished here too as the estates sank into social decay, the general public began to regret the loss of the old domesticity, and the technology started to reveal its hidden flaws. In Britain the turning point can be precisely dated: 16 May 1968, when a gas explosion caused the partial collapse of a newly completed 22-storey tower block in east London called Ronan Point. It had been built by Taylor Woodrow-Anglian using the Larsen-Nielsen system. There was an 'overshoot' of production into the early 1970s, but effectively the Ronan Point collapse brought precast-concrete system building to an end. By the 1990s, its development had not just ceased but had gone into reverse, as demolition of tower blocks by controlled explosion became a popular public spectacle all over Europe.

Intellectual opinion had shifted too. In 1961 the journalist and urban theorist Jane Jacobs had published *The Death and Life of Great American Cities*, an impassioned critique of Modernist planning, calling for a halt to the destruction of the old multifunctional streets and urban quarters. The logic of functional zoning and comprehensive redevelopment was called into question and interest in the virtues of the traditional city began to revive. Then in 1972 Oscar Newman, an architect and urban planner, published *Defensible Space*, which provided ammunition for those who saw a causal connection between crime and built form. It seemed that tower blocks really did cause social breakdown. With hindsight it seems obvious that the seeds of decline were present in the Modernist mass-housing model right from the start. The abstract rationality of its forms, which avoided any dialogue with tradition, whether in the site and surroundings, in the way of life of its inhabitants or in the language of architecture itself, eventually proved a fatal weakness. Such rationality had been foreshadowed in the pre-war German *Zeilenbau* estates of Walter Gropius and Ernst May (see Chapter 8) but after the war it became an unquestioned orthodoxy that dazzled and seduced its creators. Though it was architects themselves who first proposed the model, in doing so they were exposing their art to judgement by shallow, instrumental criteria, and thereby jeopardizing their own *raison d'être*. Le Corbusier's 'magnificent play of forms in light' soon dissolved into a pure productionism – 'quantity, not quality'. The vision had always been vulnerable and in the end the ordinary people, who had struggled to accept its demands, insisted on its destruction.

Ronan Point, London, UK. Taylor Woodrow-Anglian, 1968. This progressive collapse caused by a gas explosion signalled the end of the precast-concrete era.