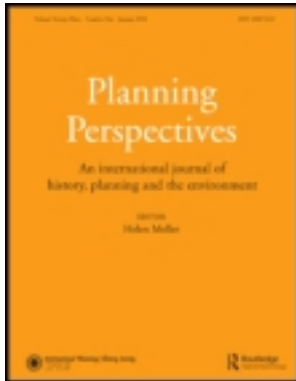


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Iain Jackson^a

^a Liverpool School of Architecture, Abercromby Square, University of Liverpool, Liverpool, L69 7ZN, UK

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Maxwell Fry and Jane Drew's early housing and neighbourhood planning in Sector-22, Chandigarh

Iain Jackson*

*Liverpool School of Architecture, Abercromby Square, University of Liverpool,
Liverpool L69 7ZN, UK*

The city of Chandigarh, India, has received considerable interest since its design and construction in the early 1950s, mainly due to Le Corbusier's involvement in the scheme. More recent work has begun to critically examine the planning of the city and its components and to challenge the misconception of Le Corbusier as the sole author. This paper is concerned with the first portion of the city to be constructed, Sector-22, designed by the British architect Jane Drew, along with housing designs by her husband-collaborator Maxwell Fry (Pierre Jeanneret's equally important work is beyond the scope of this paper). It considers the influences behind their planning and the housing-type design, with particular focus on the notions of 'neighbourhood planning'. The paper argues that Fry's work with Thomas Adams from the 1920s is of particular importance to the Sector-22 layout, which was further informed by Drew's studies published immediately after the Second World War. Finally, their housing plans are considered, along with the contributions of their Indian colleagues – an important group who have largely been ignored in previous academic studies of the city.

Keywords: Chandigarh; Maxwell Fry; Jane Drew; neighbourhood planning; sector; Le Corbusier

Maxwell Fry (1899–1987) and Jane Drew's (1911–1996) contribution to the city of Chandigarh has to date, not been fully researched and their many buildings, although carefully catalogued by Kiran Joshi, have received little academic interest.¹ Fry and Drew are extremely important figures in British twentieth-century architecture and their position as leaders in the tropical architecture field is unquestioned – yet their (and to a lesser extent Pierre Jeanneret's) considerable work in India remains largely as footnotes, overshadowed by their collaborator on the scheme, Le Corbusier and his monolithic government buildings in Sector-1 (Figure 1). The authorship of the city has subsequently been attributed to Le Corbusier, and the role played by the other architects has been, as a result, rendered less significant.² This view is finally being challenged and recent publications are reviewing the contributions made by the other 'authors' and key protagonists.³ Morris argues 'posterity should credit Mayer with originating much of the basic Chandigarh concept and also, Max Fry for his vital in-between moderating role'.⁴ This is, of course, not the popular rendition that has become mythologized, with Le Corbusier credited not only for the masterplan, but also for designing the entire city. In addition Chandigarh has been treated as a complete, coherent entity, rather than a series of individually designed components positioned within the grid-plan. The role of Indian architects (in particular J. K. Chowdhury, U. E. Chowdhury, J. Malhotra, A. Prakash, M. N. Sharma and S. D. Sharma), the administrators and engineers have also been largely

*Email: ijackson@liv.ac.uk



Figure 1. Le Corbusier's assembly building in Sector-1.
Source: Photograph by author.

ignored (as well as the role of clients, such as the shopkeepers, about which we will discuss more in detail later).

In particular, this paper examines the planning and layout of Sector-22 (the first district to be developed in Chandigarh) as well as some of the initial housing types to be designed by Fry and Drew (Figure 2). The paper argues that Fry and Drew were heavily influenced by British and American notions of neighbourhood planning and the Garden City Movement from the early twentieth century, indeed Fry's own work from the late 1920s and 1930s is of particular importance (such as the work he did with Thomas Adams and Elizabeth Denby). These ideas were developed and integrated into a low density modernist planning solution by Jacqueline Tyrwhitt and Jane Drew in the 1940s. Drew would later claim that they 'had to invent an architecture for a different climate and lifestyle'⁵ and she undertook extensive consultation with the local populace to align the architecture with what she thought of as a local *custom* and *tradition*. Despite the declarations that they had 'invented a new architecture'⁶ their approach was indebted to the Garden-City Movement, and in terms of the house plans, a previous, albeit limited, body of knowledge on low-cost dwelling that had been developed during the British Raj and early years of political independence. Their work in India was also informed by their previous commissions in British West Africa. Fry was deployed there during the Second World War as part of the Development and Welfare programme, and later joined by Drew where they designed numerous schools, town plans and the Ibadan University. Their early findings from this work were published in *Village Housing in the Tropics with Special Reference to West Africa* in 1947.⁷

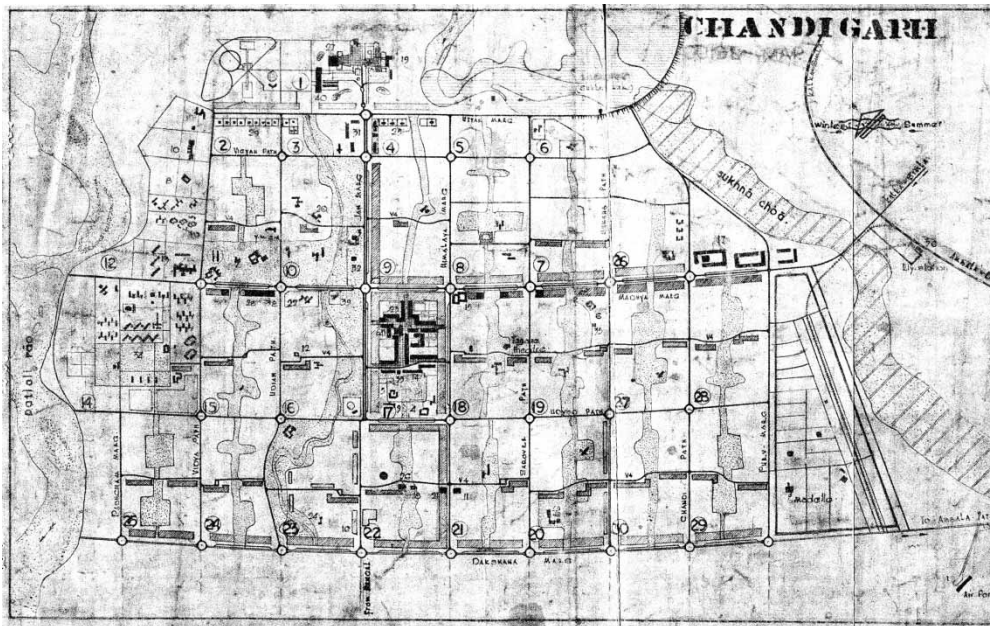


Figure 2. Le Corbusier's Chandigarh plan from 1951. Note the sector interiors have not yet been designed. Courtesy of Liverpool University special collections and archives.

Background to the Chandigarh Commission and questions of authorship

The procurement of the city is well known and has been extensively discussed by Ravi Kalia⁸ and more critically by Nihal Perera, Vikram Prakash and Ernst Scheidegger, and Maristella Casciato et al.⁹ As such, only a brief introduction is provided here. A new city or political centre was required following the Partition of India in 1948 and the loss of the old Punjabi capital Lahore to Pakistan, leaving the Indian side of Punjab without a State Capital. After some deliberations, it was decided by Prime Minister Nehru that a new capital should be constructed, rather than re-siting the government offices in an existing city. The ambition of such a project was vast and the intention was to convey the impression of a new, liberated India through large building projects. Completely built from scratch the city was to house the Punjab administration with an initial population of some 150,000 people, which it was envisioned would eventually rise to 500,000 people. In addition to the pragmatic requirements of the settlement (the practical, almost mundane requirements to even begin the project such as roads, water, building materials and eventually electricity should not be underestimated), the city was to also to embody the spirit of India's Independence. It was to be the tangible metaphor for Nehru's modern India, emerging from her colonial bondage and demonstrative of future ambition.¹⁰ Although local architects were preferred (certainly by Nehru, and arguably more suited to delivering the nationalist agenda of such a project), the Indian civil servants responsible for the project (namely Administrator P. L. Varma and Engineer P. N. Thapar) actively sought architects from 'the West', first in the form of American, Albert Mayer and his Polish partner, Matthew Nowicki, and eventually through the Franco-British team of Le Corbusier, Pierre Jeanneret, Maxwell Fry and Jane Drew.¹¹

Mayer was already working as a planner in India at the time and Nehru offered him the commission to plan the city with Nowicki undertaking the detailed architectural proposals. Tragically, Nowicki died in a plane crash and Mayer felt he could not continue with the project alone and a replacement partner was sought. The result however, cost Mayer his commission and, as Pererea explains, gave Varma and Thapar their chance to recruit European architects.¹² In part, the dismissal of Mayer was due to him not residing in India but also because of the financial pressure of paying his fees in dollars.¹³ In addition, after the Indians had managed to recruit a new team of architects from Europe, Mayer's role was largely redundant.¹⁴

Although in the popular renditions of Chandigarh's story Mayer's plan has been reduced to little more than a footnote,¹⁵ it was the outcome of substantial research. Mayer had been working in India since 1945 and his work on the Chandigarh plan was the product of 6 months research into low-cost housing.¹⁶ It was this foundation upon which Le Corbusier was able to build his own ideas and *plan* the city in little more than a couple of days.¹⁷ The largest revision to the plan was the replacement of the curved roads and fan-like design for the grid-iron arrangement. Fry felt that the Mayer plan was, 'on the sentimental side of things, being an adaption of what is known as the Rayburn plan'.¹⁸ Both plans proposed 'sectors', with each sector designed to operate as self-contained units with their own internal roads for local traffic; but Mayer preferred the 'superblock', whereas Fry and Drew sought smaller scale solutions to housing (Figure 3).

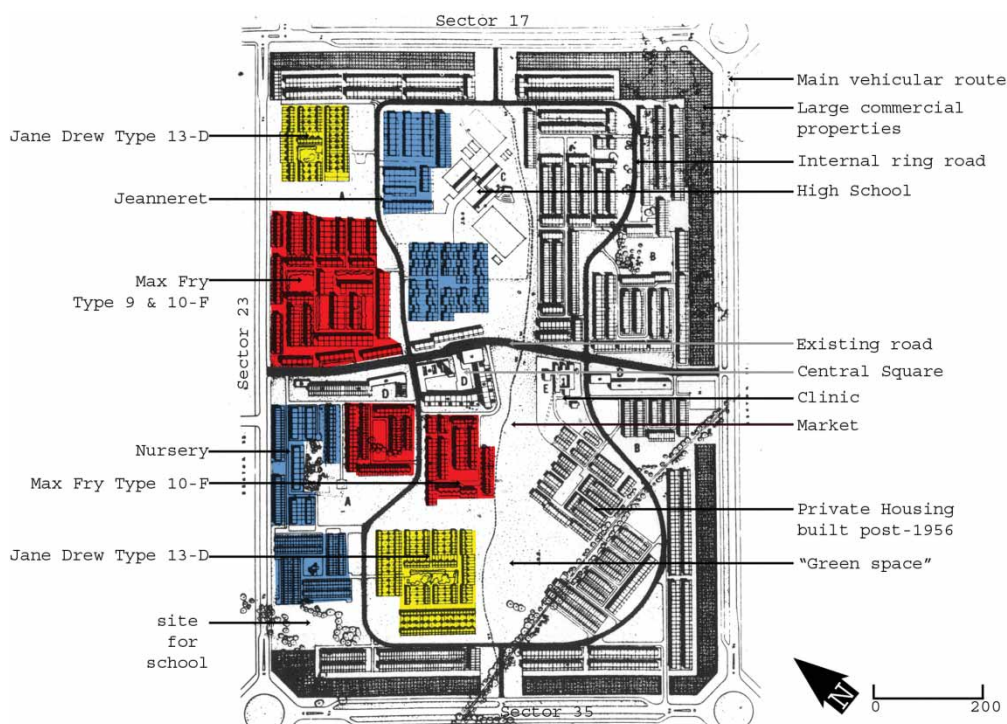


Figure 3. Plan of Sector-22, designed by Jane Drew. Original plan from private archive with additional colouring by the author.

From masterplan to building design

With the masterplan drawn up and Mayer reluctantly resigning, the remaining four architects had to decide how they were to work together.¹⁹ It was an uncomfortable working relationship at first. Drew maintained her enthusiasm for the project, but Fry was extremely reluctant. His archive reveals the rather strained relationship he had with Jeanneret, especially when they had to share quarters at Shimla.²⁰ He found Jeanneret to be

a decent man of his type but with fewer mental and cultural resources than ever I met with. He was Parisian as a man might be a Cockney, a man not only limited by his milieu, but unaware of its limitations, and though he had been Corbusier's help-mate for time out of mind up to the moment of his break with him, he reflected less of it than did *Sancho Panza* of *Don Quixote*, what though the cap fitted²¹

Meanwhile Drew described how Le Corbusier was

anxious to define his own role in the project. Namely, that he would be responsible for the design of the Government Centre which at that time comprised of the High Court, The Secretariat, The Assembly Chambers and The Governor's Palace²²

That is, the more prominent, civic and 'glamorous' works whilst the others were left with the, 'awful task of drafting the laws and doing the low-cost housing, health centres, hospital, schools, some shopping areas, etc'.²³ Le Corbusier was to spend just 4 months in India twice per year and as such, had very little to do with the day-to-day running of the project on site.²⁴ It was agreed that Le Corbusier should concentrate on the major government-administration buildings leaving the majority of the city sectors to the other three architects (working from Chandigarh and individually). Whilst the notion of teamwork and collaboration was theoretically part of the Congrès International d'Architecture Moderne (CIAM) agenda, in reality, the Chandigarh project was highly individualistic. In addition, Fry did not draw any distinction between Town Planning and Architecture and was reluctant to design buildings to fit within another architect's masterplan.²⁵ In part, this principle was maintained as he and Drew were able to plan the 'interior' layouts of each sector, which were not party to the overriding city grid, nor to Le Corbusier's Modulor system, which they also refused to adopt.²⁶

Regardless of the internal arguments within the design team, the major requirement of the city (and India generally) was good quality and affordable housing with rental charges, 'kept in tune with earnings'.²⁷ It was decided that a typical residential sector should be designed in the first instance rather than designing a smaller amount of houses spread across several sectors. Each housing sector would serve a specific socio-economic group and this approach is manifest through the size of the houses and the occupation density. Chandigarh is an administrative town and as such a large portion of the new population would be civil servants and government workers, most of whom were offered subsidized housing.²⁸ The client administrators apparently researched housing types at Oxford²⁹ and each rank was allocated 1 of 13 housing designs, 'to each of which a rather arbitrarily fixed cost had been allotted and was adhered to, making design further difficult'.³⁰ It is not clear exactly what kind of research was undertaken at Oxford, nor when this study took place.

The largest dwellings with the lowest densities (25 persons per acre) were built in sectors adjacent to the government buildings in Sector-1. The housing density is, generally, directly

proportional to its distance from the Capitol Complex. As the sector number increases so does the density of the housing, resulting in the lower rank government workers located at the greatest distance from the Capitol Complex.³¹ Some have argued that, because of this, semantically the plan fails to connect with Nehru's vision for a democratic, socialist India, i.e. the poorest (and arguably the most exploited) are the furthest removed from the seat of power – and all based, apparently, upon a method devised in Oxford!³² However, the greatest housing densities (around 75 persons per acre) are found in the sectors surrounding Sector-17 (the 'city centre'), providing opportunities for trade and employment, and a quantity of people to support the shops and markets. It would have made little sense to house tens of thousands of people around Le Corbusier's monuments regardless of the political significance of such work. In addition, there are small houses for junior civil service staff located in Sector-7, now an exclusive sector.

Sector-22: constructing the city

The decision of where to begin such a large undertaking was governed by practical considerations and decisions made by the PWD before the architects were even appointed. The Chief Engineer P. L. Varma had a clear strategy as to how the city was to develop. He outlined a 'Programme of priorities for construction', which stated that, government officials' and staff housing (including elementary schools and shopping centres) were to be undertaken as soon as possible, followed by temporary government office accommodation and then two high schools and a 30 bed hospital.³³ His programme seems to have been closely followed, and set the agenda for the construction sequence. Although Varma was not overly concerned with the architectural proposals, he was also part of the committee that agreed to the 'burning of 5 cores of bricks' (e.g. 50,000,000) in advance of the project starting in November 1949, thereby largely forcing the architects' decision to use them.³⁴

As Sector-22 was closest to the proposed bus station located in Sector-17 and was, in addition to civil servants, to contain the large numbers of manual workers, clerks and shopkeepers required to establish the settlement, it seemed like the ideal place to start. Drew described it as a

fairly low class sector which ... has a large area of open space. It is planned as are all sectors in Chandigarh to look inwards and be fairly self-contained. The traffic roads are round the perimeter of the sector and are designed to take fast moving traffic which is not encouraged within the sector ... the greens give a clear view of the Himalayas and contain the educational and recreational features of daily life, that is to say, the swimming baths, nursery schools, health centre, day school and so on, the idea being that, within a quarter of a mile of the dwelling, there should be green and school facilities³⁵

Each sector has a series of planned open spaces that contain schools, clinics and other such public and community buildings. The edges of the sector take a defensive role with the larger commercial structures such as hotels and large shops 'protecting' the dwellings located within, from fast moving traffic and associated noise. The aim was to create a peaceful 'village-like' environment for the residents to 'move from house to shopping, to school, to recreation – to all the day-to-day activities in life – in safety and with pleasure'.³⁶ This has been largely achieved and there are adequate and pleasant spaces for recreation within each

sector. In effect, there were two Chandigarhs under construction. Le Corbusier's buildings, and the mass housing schemes for clerks, office workers, and manual trades being the other. Drew was firmly camped in the latter, 'the first thing to know about Chandigarh is that it is no vain-glorious national projection, but a sober necessity for a shattered state gathering its remnants together to consider the future'.³⁷ Drew was being naively optimistic if she genuinely believed the work they were doing at Chandigarh was making anything other than a symbolic gesture to the housing requirements following the Partition. However, pragmatically, the project set a precedent and ambition for the minimum standards in Indian housing. The living conditions for many were greatly improved and Chandigarh was the first city in India where every *legal* house, 'had water borne sewage and a supply of pure drinking water and electricity'.³⁸

The sector layouts for the lower ranks can be considered an extension of the ideas pursued in the social housing schemes Fry and Elizabeth Denby undertook in the 1930s, where they attempted to provide not only the basic housing provision but other facilities required by a community, such as nursery care, clinics and social clubs.

Sector-22 was to be a heavily populated sector and would effectively function as a town in its own right, eventually housing almost 20,000 people. Newly arriving residents and visitors would simply have to cross the road from the bus station and enter into the new thriving settlement, without having to traipse through the building sites located throughout the rest of the city. It was both a practical solution and a public relations exercise. As such, the planning, facilities and housing received more attention from the three European architects on site than many of the sectors that followed. A hotel was one of the first buildings to be constructed, to house the journalists, bureaucrats and architecture-tourists who were proudly shown around. Prior to the construction of Le Corbusier's Sector-1 buildings, as far as the outside world was concerned, it was Chandigarh.³⁹ The success of the city rested on this sector attracting future residents, business and positive press reports.⁴⁰ By building one sector as a kind of 'model settlement', the designs and costings could be tested, markets and an economy could be quickly established and a flavour of the city disseminated.

Sector plan: the *pre-modernist* Neighbourhood Unit and the Chandigarh sector

The sector interiors adopt a picturesque approach to planning and are in stark contrast to the formality of the city grid. The masterplan of the city simply left the interior layouts of the sectors blank, to be 'filled in' by Fry and Drew as the city developed (as shown in Figure 2). Speed and efficiency of transportation was not the goal here, rather the relaxed, 'pack-horse' meandering of the seemingly unplanned. The influence of these designs can be, in part, traced back to Fry's work from the late 1920s. He was partner in the firm Adams, Thompson and Fry between 1927 and 1935. Thomas Adams (1871–1940) was a leading figure in Town Planning. His list of achievements is vast, including being the first Secretary of the Garden City Association, selecting the site for Letchworth, editing the *Garden Cities and Town Planning Journal*, founding the Town Planning Institute of Canada, and researching and designing the epic New York Regional Plan. In addition, he was an examiner at the Liverpool School of Civic Design and taught at MIT.⁴¹ He also authored several books, including a collaboration with Fry on, *Recent Advances in Town Planning* in 1932. The book contained many of the practice's projects as well as their research findings from within the UK, the colonies and America. One chapter sets out the criteria for forming a *Neighbourhood Unit*, the quality of which, it was suggested

is, 'even more important than the quality of the house, in connection with securing wholesome and pleasant housing conditions'.⁴² The outline criteria for forming a Neighbourhood Unit is listed below:

- (1) Provide housing for a population ... for which one elemental school is required, its actual area depending on population density.
- (2) The Unit should be bounded on all sides by arterial roads sufficient for ... 'through traffic'.
- (3) A system of small parks and recreation spaces ... should be provided.
- (4) Institution sites suitably grouped around central points or commons.
- (5) One of more shopping districts, should be laid out in the circumference of the unit, preferably at traffic junctions and adjacent to similar districts of adjoining neighbourhoods.
- (6) An internal street system: suitable for circulation about the unit and to discourage use by 'through traffic'.⁴³

There is a remarkable similarity between the 'Chandigarh Sector' and the description of the 'Neighbourhood Unit' – the list above perfectly aligns with Chandigarh's Sector-22. When the book was written Fry was designing in a classical-Georgian manner and had just designed the rather whimsical village of Kemsley in Kent, but by the 1950s, he was considered a veteran of modernism. He was reluctant to ever discuss the work he undertook prior to his modernist 'conversion', perhaps explaining why this publication was never mentioned in all of his extensive writing. Yet the principles he and Drew designed by in Chandigarh can be traced back to this early part of Fry's career. Thomas Adams was heavily influenced by Raymond Unwin and his notions of low-density housing and, although Fry claimed that he tried to avoid the 'high-pitched voice of Raymond Unwin talking Garden Cities',⁴⁴ his ideas were strongly influenced by tracts such as *Nothing Gained by Overcrowding!* Unwin's notions of terraced housing arranged around 'open space' was adopted by Ernst May in Germany and informed, albeit in a modified form, the ideas that were later manifest in the Frankfurt Seidlungs of the 1920s – which in turn heavily influenced Fry through his involvement in the Design and Industries Association during the 1930s.⁴⁵ Although Fry claimed he was trying to avoid the Garden City Movement 'like the plague',⁴⁶ in the Sector-22 plan, it is largely adhered to (whilst replacing the English vernacular cottage facades with a Modernist alternative). The neighbourhood plan idea was persistent and remained a housing solution proposal amongst the CIAM cohort. In the 1940s, Drew used the *Architects' Year Book* as a forum for these topics and the first issue of 1945 included an essay by Drew on Housing and one on Planning by Jacqueline Tyrwhitt.⁴⁷ The thrust of Drew's arguments targeted the 'semi-detached' housing boom of inter-war Britain, but her sketches showing tightly arranged terraced housing set within large open spaces containing schools and civic buildings, strongly resemble what she later proposed at Chandigarh (Figure 4), and also bear a strong resemblance to the garden-suburb-modernist blend developed by the Architectural Association (AA) student's proposal for 'Tomorrow Town' in 1937–8.⁴⁸ Tyrwhitt's essay included a plan (of unknown authorship) depicting a South African Neighbourhood Unit that also shares a very close similarity to the Chandigarh Sectors, including the central open space containing the civic amenities and faster roads around the periphery (Figure 5). She and Fry ran a Modern Architectural Research Group (MARS) summer school at the AA in 1948 so they were likely to have engaged in debate and exchanged ideas on appropriate housing,

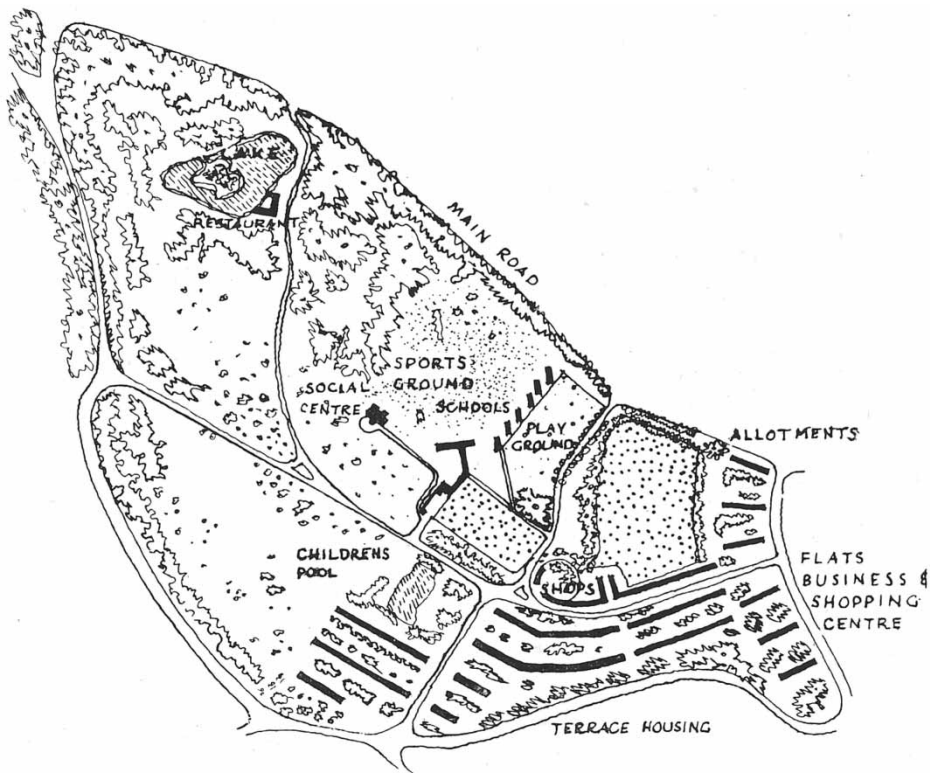


Figure 4. Drew's proposal for 'combined park and housing', as published in the *Architects' Year Book*, 1945.

planning and perhaps even *Tropical* architecture, as Fry and Drew had recently published their seminal text on the subject and Tyrwhitt had just edited the popular book, *Patrick Geddes in India* in 1947.⁴⁹ Although Tyrwhitt's book on Geddes disseminated these notions more widely (and within the Modernist circles that she associated with), his work was well known and had been recently published in various architectural journals.⁵⁰ We can also find applications of what Geddes called *constructive surgery* in Sector-22; in particular an existing crooked road that Fry and Drew integrated into their plan of the sector.⁵¹ Whereas in 1950 Mayer viewed the site as a 'blank sheet of paper', Fry and Drew became seduced by the *primitive*,

beauty is everywhere; inherent; no more in the courtyards than in the swelling tree trunk; no less in the sweetly arching ironwork of the well-head than in the mild-eyed milk white bullocks that wait their turn. All is beauty; timeless⁵²

The retained road in Sector-22 informed the design for the rest of the plan, including the *Chowk* or central 'piazza off which come the tiny traditional bazaar streets' and nearby informal markets.⁵³ Running centrally north-south through the sector was an open green space forming a

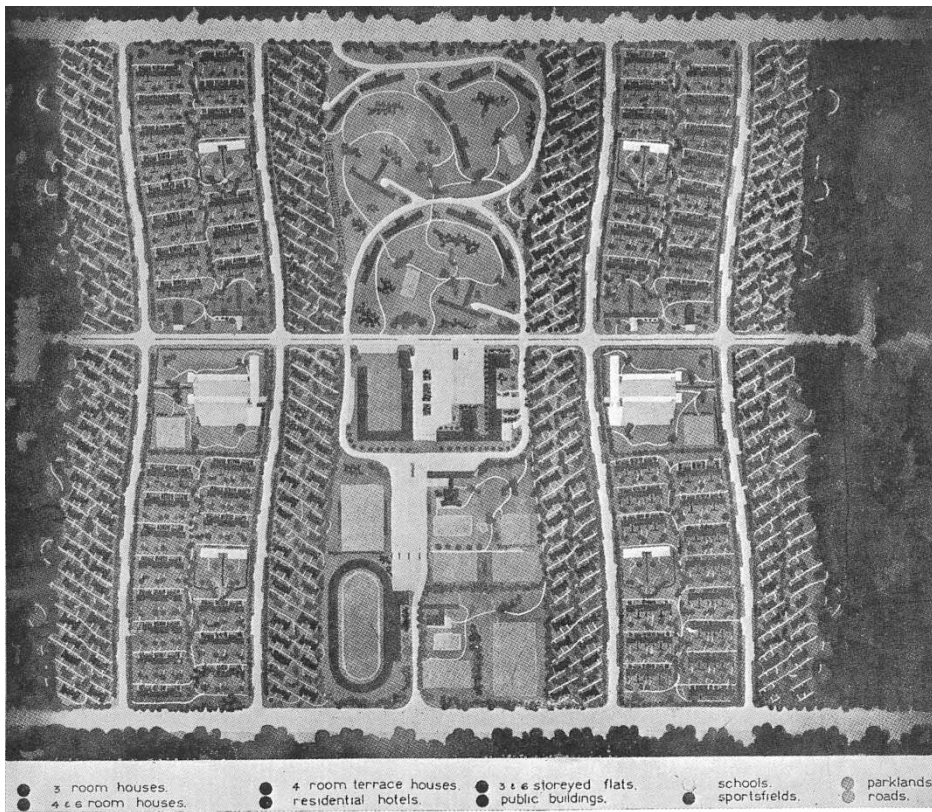


Figure 5. A Neighbourhood Unit for South Africa, published in the *Architects' Year Book*, 1945.

common, park and space for clinics, schools and community buildings. The distinct areas of housing were proposed in clusters sharing small access roads, 'with our band of open space in the sectors secured, we planned closely in urban formation, using terraces freely...'.⁵⁴ Sector-23 also incorporated the 'leisure valley', and the grid-iron plan was contorted as a result suggesting that they viewed the sector grid more as a guide rather than as a dogmatic and fixed prescription.

The theories of neighbourhood planning were tailored in an attempt to respond to the local conditions of Chandigarh. Drew had always modestly viewed her work as 'quiet'⁵⁵; it was not formalist, or sculpturally expressive. She is credited for the layout of Sector-22 and took more of an anthropological approach to design, attempting to distil what the clients required and, perhaps in contrast to the appearance of some of her buildings, sought an architecture that was homely and practical. As a result her work has been largely overshadowed by the machismo and more flamboyant displays at Chandigarh. It was Drew who consulted the 'end users' of the city and tried to formulate some useful data from which the designers could derive their solutions. In her draft autobiography Drew recalls how she 'sat with medics for hours trying to figure out solutions'⁵⁶ for the Chandigarh hospitals and clinics,

and how she consulted with the poorest workers over their needs. Coupled with their previous research into housing and small neighbourhoods, they made further, if limited attempts to respond to the Indian context. Mayer had previously warned Fry that there was very little statistical information available for Chandigarh and that the Indian circumstances 'demanded much more in the way of creative interpretation, or transfusion and synthesis of modern principles and thinking into the Indian scene, present and future'.⁵⁷ Without the data or means of procuring it, Fry and Drew set up more empirical studies involving the construction of mock-ups, informal interviews and discussions, as well as being mindful of the severe economic restraints that they faced. Fry expanded on the consultation process and claimed, 'we developed Sector-22, Jane and I, working as none of the others did, directly with the shopkeepers, the cinema owner and all the others concerned...'.⁵⁸ This collaborative approach may have been informed by Denby's writing about Swedish housing schemes from the 1930s, as well as some other developments in planning and architecture taking place in India at that time, particularly the work of the German architect Otto Koenigsberger and the UN Housing Mission to South East Asia (UNHM) from 1951. The UNHM took place when Chandigarh was under construction and many other housing schemes and new towns were visited throughout India. Although Chandigarh was not mentioned in the report, the UN rapporteur Robert Gardner-Medwin (1907–1995) had previously worked for Fry in the early 1930s and following their recent exchanges at an RIBA lecture in 1948, it is likely that some correspondence and ideas were discussed on the Chandigarh scheme.⁵⁹ Gardner-Medwin strongly supported the 'self build' idea and perhaps this informed the close collaboration and 'project management' role that Fry and Drew nurtured with the Sector-22 clients and their shop-cum-residences. Fry described how the shop designs were a

sort of simple affair they could manage with their own means but conforming with our overall designs, and so successful was the outcome that they willingly built for us with their own money covered ways connecting their colonnade with the booths for the still poorer stallholders.⁶⁰

The result was a combined design effort with the architects acting as 'facilitators' rather than form-makers. In light of this, can we view Fry and Drew's *tropical* architecture from this period, as some would claim, as being an example of a neo-colonialist approach dressed up in modernist facades? Similar ideas were developed by Tyrwhitt in the 1954 'Village Centre at the Exhibition of Low Cost Housing, Delhi', which promoted the idea of 'open space ... enclosed by community buildings' based on the 'CIAM "core"'.⁶¹

Climatic concerns

Fry and Drew had developed various techniques for dealing with the hot climate during their time in West Africa and were considered experts in what had become labelled, 'Tropical Architecture'.⁶² They did not view climatic response and modern architecture to be mutually exclusive explaining that the, 'modern movement was translated and adapted for the sub-tropics with its base rooted in climate'.⁶³ Again at Chandigarh Fry observed that climate was

the determining factor in Chandigarh architecture, and so it should be. There is no surer way to a suitable architecture, and one that is in accord with the deepest realities of the country: for it is

climate that dictates agriculture, moulds customs and affects even religion. Climate is a great element in India.⁶⁴

Chandigarh has six distinct seasons with significant diurnal temperature ranges and but it was to be, 'protection from the sun and from the dust-laden winds of the hot season' that was the 'architectural imperative, the rest was secondary'.⁶⁵ Whereas in West Africa their design approach attempted to induce cross-ventilation and reduce the thermal mass of the roof by designing a ventilated lightweight double-skin (*The Architect and Building News*, February 24, 1960), at Chandigarh they opted for larger spaces, greater volumes and shading. They avoided facing the dwellings south-west and opted for 'few and small windows on the exposed fronts and no openings of any size not protected by overhanging verandas'.⁶⁶

Extremely tight financial controls and a basic material palette also heavily influenced the designs. Availability of land and land-value was of less importance, so if cheaper materials were used then in theory larger houses could be supplied, thus helping with the climatic comfort. Brick was used almost exclusively as it was the cheapest available material. Concrete and glass were considerably more expensive and as a result the size of the window openings was reduced and 'wood shutters and louvres rather than glass windows' were specified.⁶⁷

This palette suited Fry's approach to design. He had rejected the use of concrete as a facing material and equally disliked the sculptural 'brutalist' approach,

while my fellow architects took what I thought to be the easy course in buildings of mass concrete and violent even menacing proportions ... I sought for what materials still bore the natural and human impress, using brick, slate, burnt tiles, timber, but of necessity brick in the laying of which the last building skill still flourished⁶⁸

The initial designs were humble and basic but before extensive construction of a house type could commence prototypes were built and then lived in, criticized and improved. The intention was for the new residents to 'experiment with new types of dwelling'.⁶⁹ Fry and Drew were working directly with the future, albeit limited, section of the populous, empirically testing their designs. There were extensive discussions surrounding so-called 'traditional' aspects of the dwellings, especially regarding the provision of servants' entrances (the lower classes also employed staff), cleaning of water closet (WC)'s, , *purdah* screens to balconies and kitchen worktop heights. The 'modern' alternative house layouts simply had fewer passageways for 'sweepers' and no *purdah* screens,

it became clear very early that tradition was not important except where it followed the climate and habits of living ... it should be understood that the character was produced from serious thinking about the facts of the situation, not from a wilful desire to be different⁷⁰

Fry viewed it more of a battle, 'a matter of money and space versus custom', proudly announcing, 'custom lost to a new design without sweeper's doors and passages of the *purdah* screen'.⁷¹ Fry and Drew maintained that climate was the main design driver, but *custom* was also seen as something to be eradicated, unless it neatly aligned with their aspirations for the architecture. The Indian custom of sleeping on the roof, for example, was 'always' encouraged by the architects and the *barsati* justified their desire for flat concrete roofs. They did not enforce their preferences onto the Indians, but took the approach that if only the 'natives' could experience 'the modern' they would prefer it to their 'traditional' ways. They polarized the debate so that only the

‘modern’ and the ‘traditional’ existed; regardless of the rhetoric about climate and sociological study, what they perceived as ‘old’ or ‘custom’ was always portrayed as degenerate unless it complied with the modernist agenda of their architecture. In addition, there was not really any experimentation in the housing, as only two options were presented, and neither would have a dramatic effect on how the houses were lived in.

Fry and Drew did not discuss the *kind* of architecture they were producing, preferring to view it as a product of their functionalist response to climate, budget and sociological study. Fry took this very seriously and stated that the, ‘integrity of intention is everything, and there is no place for what is meant merely to amuse or to be fashionable’.⁷² They made no reference to the other schemes in India, such as those undertaken by Mayer and the extensive work by Koenigsberger,⁷³ nor to the colonial studies of H. V. Lanchester.⁷⁴ There was a certain obstinacy to their approach, not wanting to acknowledge external contribution or precedent. Nehru on the other hand, despite his rhetoric of wanting a modern city, had a different approach when it came to housing for the poor, his view was that, ‘our cheap housing schemes should be thought of chiefly in terms of providing sanitation, lighting and water supply’, before adding, ‘we can add to this as occasion offers and resources are available. Even good huts would be infinitely preferable with these amenities than solid construction’.⁷⁵

Drew designed the Type 13 ‘peon’ housing and was convinced that Nehru’s low aspiration could be bettered⁷⁶ (Figure 6). The modest white rendered dwellings consisted of three main rooms, plus a shower room and WC set within the substantial rear courtyard (Figure 7). Economy was achieved through adopting a terrace layout and by omitting the roof altogether from the outside WC. A covered external space adjacent to the kitchen could also be used for



Figure 6. Type 13-D Housing by Jane Drew.
Source: Photograph by author.

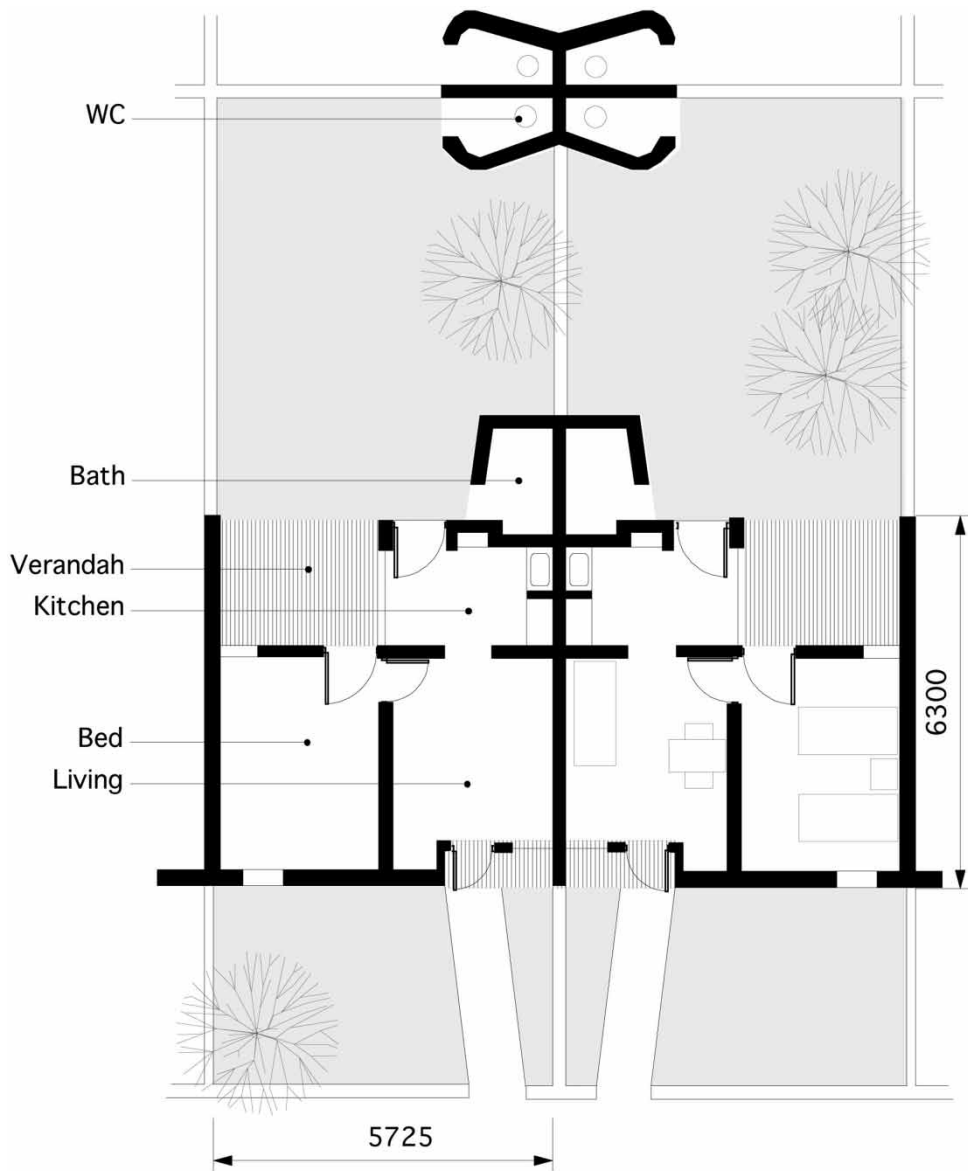


Figure 7. Type 13-D Plan, designed by Jane Drew.
Source: Drawing by author.

cooking and laundry during the dry seasons. Nehru paid Drew a half complement for her efforts, pronouncing it as, 'the only cheap housing he had seen that did not look cheap'.⁷⁷ The houses can be thought of as the *Existenzminimum* of Chandigarh – the most basic, yet efficient, response to the problem of dwelling. It was not, however, a new solution to the problem.

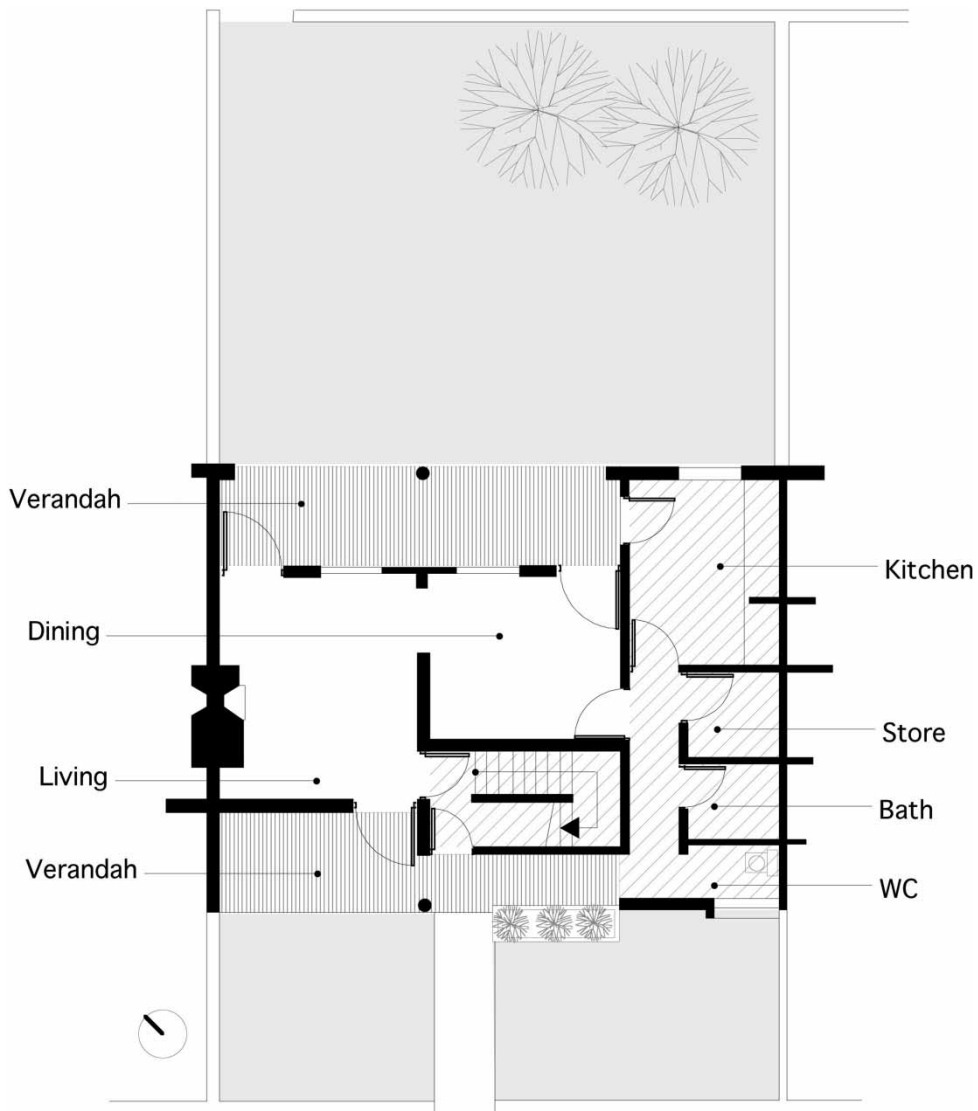


Figure 9. Type 9-F Plan, by Maxwell Fry. Hatching shows servant areas.
Source: Drawing by author.

(shown hatched on the plans) giving them access to the kitchen, store and sanitation areas. They were even given their own entrance to the staircase to enable them to access the upstairs WC without entering the house proper. The intention was to prevent 'contamination' of the house by the lower *caste* staff. Joshi unfairly perhaps, criticized these plans as being 'inefficient', but they were only an attempt to cater to the needs of the clients.⁸⁰ As well as providing a 'traditional' solution a subtly 'modern' variation of the type (9-FB) was also developed so that the



Figure 10. 9-FB Facade, designed by Maxwell Fry.
Source: Photograph by author.

inhabitants could trial both solutions. The exterior incorporated a dramatic white rendered *brise soleil*, replacing the verandah and jalis screen (Figure 10). A more 'efficient' (cheaper) plan was also possible as less circulation was required (Figure 11). The staircase is rotated 90 degrees and a distinct servant zone is still maintained in the revised plan. The plot width could be reduced as a result of these changes, enabling a greater density as well as economic savings. In effect there was very little difference between both variations internally – there was not a 'modern' or 'traditional' type – just Fry and Drew's narrow interpretations. Externally the 'modern' type had a more striking and resolved appearance.

The variety of housing types required in small numbers at this early stage caused problems for Fry,

there were not enough houses of any one type to enable us to design complete districts of our own type houses. Inevitably there was a mixing of interests and only an approximation to a comprehensive design was achieved ...⁸¹

Despite his writing on climate and function, Fry sought a unified and coherent sector design. Drew also agreed and thought the montage of types and architects was 'one of the failings of Sector-22'.⁸² She went on to conclude that it may have been better to vary the architect for each sector, but not within any one sector. They did not want Chandigarh to be likened to

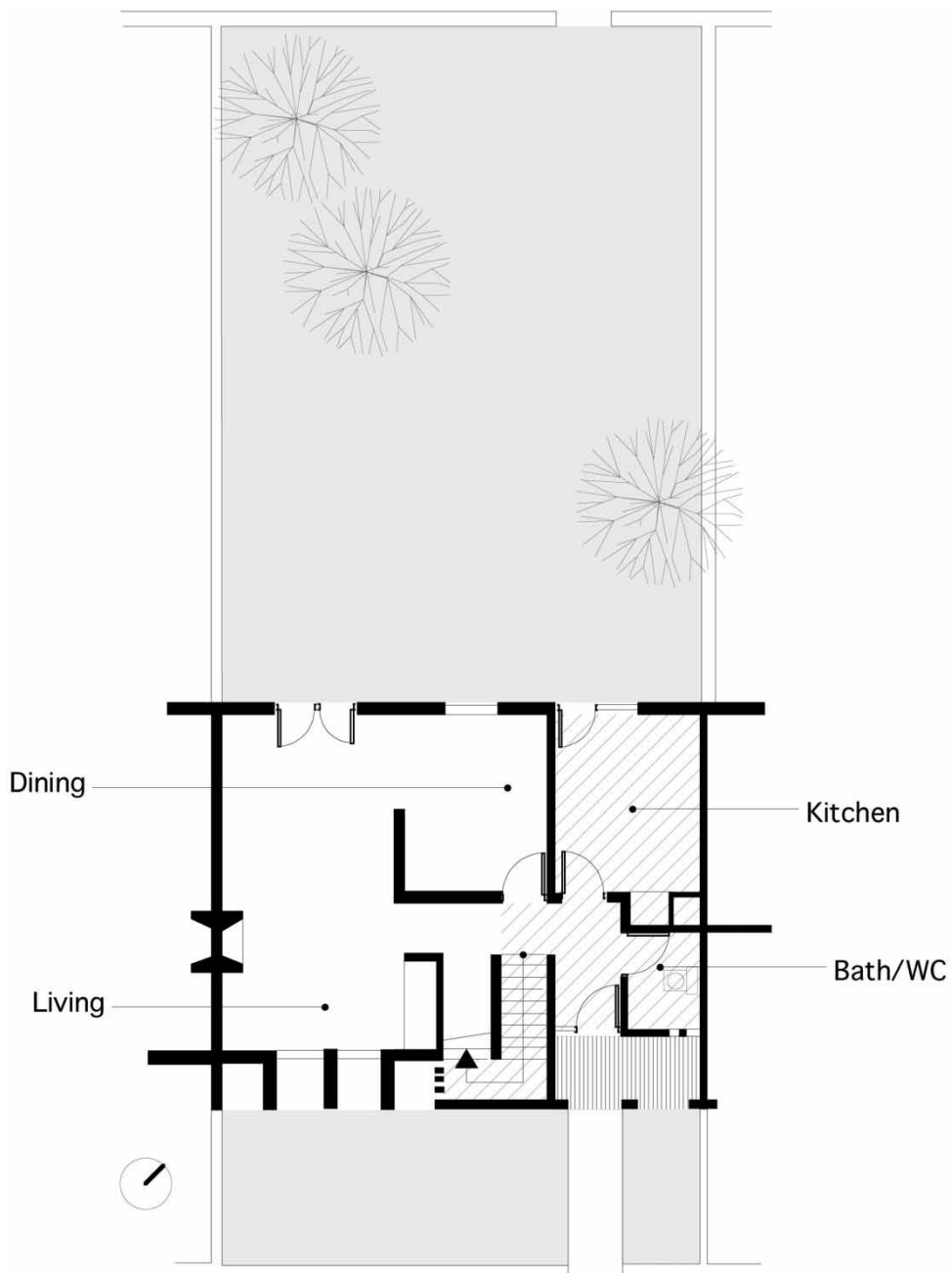


Figure 11. 9-FB Plan, by Maxwell Fry. Hatching shows servant areas.
Source: Drawing by author.

the UK 'New Towns', where many architects were used resulting in, as Fry wryly puts it, 'an endless fidgety variety ... to make the confusion beyond question'.⁸³ They viewed house design as being made up of individual types, rather than placing several types within one form – this would have been possible with Mayer's superblock. Perhaps this approach differentiates Fry and Drew from the later generation of architects, such as the students at the AA pursuing mixed-development in their Tomorrow Town, and from radicals such as Denby who proposed mixed-development housing schemes in 1936. The diversity we now see in Sector-22, however, should be considered a strength and creates some variety as well as identity and 'place', and the experience of the sector is not a motley collection of housing types, but a welcome ensemble of types, residents and styles.

Eventually attempts were made at an even cheaper 'Type 14' house, to cater for the cobblers, sweepers, laundrymen and so on, but even these failed to house the poorest workers, many of whom worked in the construction industry. The housing problem was an oversight with regard to the budget, 'we tried to make provision for them, but in a certain sense we failed. There was no economy upon which we could do it, even with the smallest houses'.⁸⁴ This problem was not specific to Chandigarh. The UN report favoured self-build because it could remove the labour costs of construction, enabling the government to concentrate on providing utilities and construction standards. In Chandigarh, this situation, it also resulted in some highly innovative solutions, as Prakash's research into mobile shops revealed.⁸⁵

The Chandigarh office: training Indian architects

The desire of Fry and Drew's London employees was for the entire practice to decamp to India to undertake the project,⁸⁶ but this was prohibited by the clients, who wanted Fry and Drew to not only employ local staff, but to train them.⁸⁷ When the London office was informed of this decision, a number of concerns were raised and an office vote was organized rejecting Fry and Drew's acceptance of the commission – the pair, of course, ignored this office dissent.⁸⁸

They slowly built up a drawing office on the Chandigarh site, employing young Indian architects, some of whom had worked in Europe (M. N. Sharma and B. Doshi). Sector-22 was to be a working-prototype – a live architecture school. Once the trainees were deemed fully equipped in the nuances of Tropical Architecture, they could then design and oversee their own sectors using Sector-22 as the mould.

The Indian architects were given considerable responsibility and Fry and Drew made it a policy to 'give the various junior members of the staff work for which they are individually responsible'.⁸⁹ This was the only way it was possible for the small team to design such large numbers of buildings within such a short period. Drew ran 'a night school' for the Indian architects and it was down to her and Fry to manage the workloads, create the design teams and effectively take the role of practice managers.⁹⁰ They constructed brick arches outside the drawing office to test their strength (which are still standing), as well as other 'building science' experiments. Drew even dispensed what Fry called 'Raj Justice' to the villagers, acting as arbitrator and judge over disputes and quarrels.⁹¹

At one point, the work demands became too great for the fledgling Chandigarh practice – Drew considered the office to be 'understaffed for the quantity of work it is doing',⁹² and listed the work that each assistant was undertaking. M. N. Shama (1923–) (who later became Chandigarh's first Indian Chief Architect) was in charge of the design and construction of a

police station, housing, press building, offices, a hostel, nursery schools in Sectors 22 and 23, as well as supervising the construction of a cinema hall. Drew expressed her concern that 'we may lose Shama since he has applied for another post'.⁹³ Aditya Prakash (1923–2008) was also, incredibly, solely responsible for the design of a maternity hospital as well as housing and petrol stations. These were not minor, insignificant commissions even for experienced architects with a design team.

In addition, they were supposed to monitor the privately funded developments (only 50% of the projects/houses were government sponsored), but Fry refused, as he lacked the resources, and fallaciously claimed, 'we are not great believers in external control of architecture'.⁹⁴ Within a few months however, when the private developments were under construction, he quickly realized the error of his lenient ways. Many of the new houses developed a 'deliberate parody' of the government houses, and the more expensive ones tended to be, 'over complicated both in form and decoration, and the application of varicoloured external ornament becomes occasionally raucous'.⁹⁵ In other words, even though individuals were commissioning buildings that 'responded to climate', it was ultimately the way they looked, and the fact they had not been designed with European approval that mattered. Inevitably, 'frame controls' were introduced and rules regarding windows, doors, balconies and terraced properties were enforced. Despite their professed lack of concern over architectural aesthetics, they quickly developed an aesthetic agenda when designs that did not conform to their notions of good taste (i.e. modernist) were proposed.

Conclusion

It is overly simplistic to view the Chandigarh plan merely as a grid-iron arrangement made up of city blocks. It is deceptive in this regard as the city is not experienced as a grid, it is the richness of the interior sector layouts and the intricacy of individual districts within each sector where the city of Chandigarh exists. Le Corbusier provided the overall strategy in his masterplan, but the everyday arrangements and sector design 'in-fill' were produced, in the initial stages of the city's development by Fry, Drew and Jeanneret, along with their team of Indian architects.

Sector-22 was the culmination of 30 years work for Fry. Within this sector, we see the ideas he and Adams laid out in their epic *Recent Advances in Town Planning* publication. Coupled with that work is the influence of Elizabeth Denby and her desire for integrating housing schemes within a broader context of social reform and the inclusion of amenity. She also encouraged self-build and community consultation which Drew was fully engaged with at Chandigarh. An important characteristic of Sector-22 is the open space, parks and play areas, within which sit clinics, schools and health centres; again these facilities all contribute to well-being, a sense of community and a certain amount of pride. In addition, Thywitt's influence must also be noted, not least because of her writing on Geddes in India, but also because of her influence with CIAM and the MARS summer schools. It seems likely that she and Fry would have discussed 'the tropics' and India specifically prior to Fry and Drew's selection at Chandigarh. The generation of ideas is always complex, and particularly when it involves planning and housing, however in Sector-22, Fry and Drew's work seems to be the direct outcome of their relationship and exchanges with Adams, Denby and Tyrwhitt.

The individual houses lack the radical edge of Fry's social housing schemes from the 1930s, not least because of the small scale of the dwellings and the lack of apartments, however this is a

different context where labour was inexpensive and land availability and value was not forcing a high density dwelling solution. In addition, there are always external factors that influence architectural solutions, and at Chandigarh the role played by the City Engineer and the PWD was very significant – their ‘programme of priorities’ and their foresight in the supply chain of building materials ensured that the building work was not delayed. It made best use of Fry and Drew’s time on site, but also dictated their architectural designs and generated a vocabulary that they may not have picked, given the choice.

The low-rise low-density option may have seen prosaic and too conservative for Fry (which is possibly why he rarely spoke about or publicized his work at Chandigarh), it was too close to the Garden Suburb solution that he wanted to avoid; but for Drew it offered the chance to work closely with ‘the users’ and to offer genuine, if modest improvements in facilities, sanitation and services. Her housing designs, especially for the poorest residents provided many with quality housing that exceeded the expectations of Nehru and today is still highly regarded and in good condition. The house plans, whilst derivative of others being built in India at the time need to be viewed not as individual dwellings but at the community level. Their ‘internal’ streets and generous gardens/outside spaces provide lots of flexible space whilst ensuring a suitable degree of privacy and security.

The internal layouts of all the houses adopt conventional arrangements, with the facade offering in some cases, features that mitigate against the bright sunlight and heat. However, despite Fry and Drew’s claims about climate driving the design, the same houses were arranged to form ‘village squares’ and parks with the same facades facing in all directions. As a result, their climatic ability has been seriously compromised. It would seem that Fry and Drew accepted this in order to form the tight knit housing arrangements with each house overlooking or adjacent to an open space, again borrowing from *Recent Advances*, which states that the neighbourhood plan is ‘even more important than the quality of the house’.⁹⁶

In a similar fashion, whilst they claimed to have made attempts at catering for ‘traditional’ living, in reality only a very limited number of experimental houses were constructed. It seems that aspects of ‘tradition’ were only incorporated or encouraged when it suited the aesthetics of the modern movement. The programme, material availability and funds were such that Fry and Drew were left with the task of generating as much floor space as possible for the funds available for that housing type. Indeed, their earliest solutions included separate houses for servants – even in the modest Type 9 housing type. This approach was quickly abandoned and it became apparent that the best solution was to offer as much space as possible, with high ceilings, and to let the occupiers define how the space was to be used.

Therefore, it is of no surprise to read that today Chandigarh has one of the highest income levels per capita in India, and its record in health and education is equally impressive. The ‘architectural qualities’ alone are not responsible for these statistics, but viewing the city as a whole, its design and social infrastructure must be credited for playing a part in this success (*The Indian Express*, May 1, 2012).

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Notes on contributor

Iain Jackson is an architect and lecturer at the Liverpool School of Architecture, University of Liverpool, currently researching Maxwell Fry and Jane Drew's work, with a particular focus on "the tropics".

Notes

1. Joshi, *Documenting Chandigarh*.
2. See, for example, Takhar, *Celebrating Chandigarh*; Frampton, *Le Corbusier*; Chandigarh-Administration, *Chandigarh [1954–2003] Souvenir*.
3. See Joshi, *Documenting Chandigarh*; N. Perera, "Contesting Visions, 175; Barbey et al., "Remembering Pierre Jeanneret," 24; Jackson and Bandopadhyay, *Authorship and Modernity*, 697.
4. Morris, "Chandigarh," 229, 234.
5. Drew, "Jane Drew Autobiography," Part 3, p. 6.
6. *Ibid.*, 6.
7. Drew et al., *Village Housing*.
8. Kalia, *Chandigarh*.
9. Prakash, *Le Corbusier's Chandigarh*; Scheidegger et al., *Chandigarh 1956*.
10. Kalia, *Chandigarh*.
11. In addition to Kalia's account, the original letters and reports can be found in *Selection of Architects and Town Planners for Chandigarh, Visit of P. N. Thapar and P. L. Varma to Europe* file, at Chandigarh's City Art Museum, Sector-10. Other UK-based architects considered include Berthold Lubetkin and an RIBA suggested collaboration between Peter Shepheard and F. R. S Yorke.
12. See *Selection of Architects and Town Planners for Chandigarh, Visit of P. N. Thapar and P. L. Varma to Europe* file at Chandigarh City Art Museum and Kalia, *Chandigarh* and Fry, "Le Corbusier at Chandigarh."
13. Mayer's work in India requires further research. According to <http://www.lib.uchicago.edu/e/su/southasia/mayer.html> he continued to work in India until 1960 – in which case did he accept payment in rupees?
14. Christopher Rand, 'City on a Tilting Plan', *The New Yorker*, April 30, 1955, 35–58. According to Rand the foreign exchange issue also prevented American architects such as Frank Lloyd Wright being offered the post.
15. Scheidegger et al., *Chandigarh 1956*.
16. See Gardner-Medwin, *United Nations Mission*, D688/2/1/2.
17. According to Fry, "Le Corbusier at Chandigarh."
18. Fry, "India," 12.
19. Kalia, *Chandigarh*.
20. Fry, "India," 10–11.
21. *Ibid.*
22. Drew, "Le Corbusier and the relevance," 3–4.
23. Drew, "Jane Drew Autobiography," 6.
24. In addition, he had managed to secure a very lucrative contract at Chandigarh; he was to receive a 4% build-cost fee for each building he designed, plus £35/day whilst in India, plus an honorarium of £2000 per annum.
25. Fry, "India," F&D/4/2. This is a view he had held since working with Thomas Adams, See *Recent Advances*.
26. Fry, "Le Corbusier at Chandigarh." Although Fry always remained sceptical of Le Corbusier, Drew held him in high regard commenting that she had met him at a CIAM conference, "I had recently returned from the seventh meeting of the congr s which had been at Bergamo, Italy. I had been very impressed by Le Corbusier", See Drew, "Le Corbusier and the Relevance," 3.
27. Drew, "Jane Drew Autobiography," 6. Keeping rental levels affordable was also a major concern for Denby, as discussed in Denby, *Europe Re-housed* (London: George Allen & Unwin, 1938).
28. Ten per cent of the worker's salary was paid in rent. See Krishan, *Inner Spaces – Outer Spaces*.
29. Bahga and Bahga, *Le Corbusier and Pierre Jeanneret*, 131.

30. Fry, "Problems of Chandigarh Architecture," 20–25.
31. Sharma. *Corb's Capitol*. Sharma makes an interesting observation, if you do not know a persons address in Chandigarh, just tell the taxi driver their job title and he will take you to the right sector.
32. Gethin, "Chandigarh: A Memorial," 291–294; Sarin, *Planning and the Urban Poor*.
33. Letter from P. L. Varma to the Secretary, Secretaries Committee, Simla, 17 February 1950, *Selection of Architects and Town Planners for Chandigarh, Visit of P. N. Thapar and P. L. Varma to Europe* file at Chandigarh City Art Museum.
34. Letter from P. L. Varma to The Secretary, Secretaries Committee, Simla, 27 February 1950, *Selection of Architects and Town Planners for Chandigarh, Visit of P. N. Thapar and P. L. Varma to Europe* file at Chandigarh City Art Museum.
35. Drew, "Living: Sector-22," 22–25.
36. Fry, "Chandigarh: A New Town," 217–221.
37. Fry and Drew, "Planning and Development of Chandigarh," 4.
38. Drew, "Le Corbusier and the Relevance," 7.
39. Drew, "On the Chandigarh Scheme," 19–23; Fry, "Chandigarh: A New Town," 217–221.
40. The Indian Government only had the finance to pay for half of the construction and land costs, circa £6m – the remaining £6m had to come from private sale of land and buildings.
41. Hulchanski, *Thomas Adams*.
42. Adams et al., *Recent Advances in Town Planning*, 298.
43. *Ibid.*, 299.
44. Fry, *Autobiographical Sketches*, 137.
45. Swenarton, *Building the New Jerusalem*.
46. Fry, "Chandigarh," 87–94.
47. Drew, *The Architects' Year Book*.
48. Darling, *Re-forming Britain*.
49. Tyrwhitt, *Patrick Geddes in India*. Fry also dedicated a book, *Art in a Machine Age* to Tyrwhitt, suggesting they had a close relationship.
50. Lanchester, "Indian Cities and Their Improvement," 116–120.
51. Drew, "Living: Sector-22," 22.
52. Fry and Drew, "Planning and Development of Chandigarh," 2. The photograph album on display at the 'Le Corbusier Centre' in Chandigarh also reveals a number of photographs taken of the villagers and existing settlements suggesting a curiosity and intrigue into the existing conditions.
53. Drew, "Living: Sector-22," 22.
54. Fry, "Chandigarh," 87–94.
55. Drew, "Full Autobiography," 101.
56. *Ibid.*
57. Kalia, *Chandigarh*, 90.
58. Fry, "Max Fry – Inspirations, Friendships," 52–58.
59. In the Gardner-Medwin papers held at the University of Liverpool there is a plan of Chandigarh amongst the notes prepared by Gardner-Medwin from his UN trip to South East Asia – someone from the Chandigarh design office must have given him the plan. ...
60. Fry, "India," 41.
61. Tyrwhitt, "Village Centre at the Exhibition," 430.
62. Drew et al., *Village Housing in the Tropics*. See also Uduku, "Modernist Architecture," 396–411.
63. Fry, "Harmony out of Discord," 526–529.
64. Fry, "Problems of Chandigarh Architecture," 20–25.
65. *Ibid.*, 20.
66. Fry, "Chandigarh: The Capital," 91.
67. Fry, and Drew. "Planning and Development of Chandigarh," 10.
68. Fry, "Old Man's Epilogue," 4–5.
69. Drew, "Jane Drew 'Reflections,'" 4.
70. Drew, "Living: Sector-22," 25.
71. Fry, "India," 33.

72. Fry, "Problems of Chandigarh Architecture," 20–25.
73. Koenigsberger, "New Towns in India."
74. Lanchester, *Architecture and Housing in India*, 94–95; Lanchester, *Indian Cities*, 116–120.
75. As quoted in Boesiger, *Le Corbusier the Last Works*, 58.
76. Each type relates to the Civil Service rank, plus the architects responsible for the design would add their initial, e.g. 13-D indicates it was designed by Drew.
77. Drew, "Le Corbusier and the Relevance," 6.
78. Hare, "Factory Housing for India," 217–218.
79. The intention was to prevent the lower castes from 'contaminating' the main rooms of the house. Various purification rituals would have to be performed as a result of any 'contamination'. Discrimination on the basis of caste was declared a sin by Gandhi and outlawed following partition, but the practice continues.
80. Joshi, *Documenting Chandigarh*, 78.
81. Fry, "Problems of Chandigarh Architecture," 21.
82. Drew, "Living: Sector 22," 23.
83. Fry, "Collection of Texts," n.p.
84. Fry, "Chandigarh: The Capital," 87–94.
85. Prakash, "Mobile Shops in Chandigarh."
86. Drew, "Full Autobiography," 101.
87. Kalia, *Chandigarh: The Making*, 39.
88. Many thanks to Ms Ann Colin (Fry's daughter) for this information. Telephone conversation with author, 9 December 2011. An agreement was made that Denys Lasdun and Lyndsey Drake would manage the practice in Fry and Drew's absence.
89. 'Division on work within the office', Draft Letter from Jane Drew. It is not known to whom the letter was to be sent to, nor is it dated. Papers on Fry & Drew's work on the Chandigarh Capital project, Punjab, India, 1954–1975, Fry and Drew Papers, RIBA Archive, F&D/4/2.
90. Drew, "Jane Drew Autobiography," 6. Mr M. N. Shama also confirmed that they established an evening architecture school. Interview with Author, 25 April 2012, Chandigarh.
91. Fry, "India," 28.
92. Photocopy of letter from Drew, date and recipient unknown, Fry & Drew's work on the Chandigarh Capital project, Punjab, India, 1952–1956, Fry and Drew Papers, RIBA Archive, F&D/1/1, 3.
93. Ibid.
94. Fry, "Chandigarh: A New Town," 217–221.
95. Evenson, *Chandigarh*, 55.
96. Adams et al., *Recent Advances*, 298.

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