INDIA'S URBAN FUTURE

Edited by Roy Turner

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III

THE MORPHOLOGY OF INDIAN CITIES

John E. Brush

Interpretation of the morphology of Indian cities begins with mapping the existing layout of streets, the arrangement and characteristics of buildings, and the associated patterns of land use. It necessitates study of their relationships to site and situation, and ultimately investigation of the historical circumstances influencing their origins and evolution. The inertia of the site and build of an Indian city is undoubtedly greater than the persistence of the functional aspects of its economy. India has a long tradition of urbanization, and an understanding of present-day cities must be based upon historical geography.

In this paper I have attempted to draw conclusions from the body of urban studies written by geographers, social ecologists, and city planners. More than 80 cities and towns have been analyzed during the past thirty to thirty-five years, and it seems appropriate to compare the results and to deduce generalizations, if possible. I am not placing primary emphasis on a few large cities, because it is apparent that the greater the geographic distribution and range of population represented, the more valid the conclusions. Perhaps in this way the merits of further urban studies in India can be enhanced and the value of existing work can be made known to agencies now undertaking to modify the traditions of urban dwellers and to increase their welfare.

CITY LANDSCAPE AND FUNCTIONAL AREAS

Indian cities have been well characterized by Deshpande as lacking in basic unity of layout and function. About twenty years ago he wrote:

A dilapidated fort, an old but partly revived "Peth"-market—, a prominent but partly neglected temple, the vestiges of past prosperity, and administrative offices, such as the Collector's or Mamlatdar's Katcheri, schools and shops, the marks of modern time, characterize almost every town of [Bombay] Province.[1]

Prabhu describes the geographic pattern of Dharwar as loosely woven and adds that, "Like most other Indian towns, it is a collection of 'period' pieces."[2]

Every city or town with pre-British origins which has grown at all during the last century shows a striking contrast between the indigenous part and the Anglicized part. The great port cities of Calcutta, Bombay, and Madras, which developed exclusively under British rule, exhibit a remarkable blending of Indian and European urban traditions, producing a modified kind of European townscape in which Indo-British culture evolved and still continues to flourish. It is also true that some inland cities, such as industrial Jamshedpur and governmental Chandigarh, have almost purely European antecedents. But the typical Indian urban center contains a congested old section, adjacent to which may be found *carefully planned* and

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[1] C. D. Deshpande, "Cities and Towns of Bombay Province: Aspects of Urban Geography," *Indian Geographical Journal*, XVI, No. 3 (1941), 284.

For the basis of the following description I am indebted to Howard F. Hirt, Noel P. Gist, Pradyumna Prasad Karan, R. V. Joshi, V. R. Prabhu, and R. L. Singh, particularly in the works cited below.

Hirt: "A Study of the Urban Geography of Aligarh," *The Geographer*, V, No. 2 (1952), 24–27; "Aligarh, Uttar Pradesh: A Geography of Urban Growth" (Doctoral dissertation, Syracuse University, 1955), *Dissertation Abstracts*, XVI, No. 5, 942; "Spatial Aspects of the Housing Problem in Aligarh, U.P., India," *Population Review*, II, No. 1 (1958), 37–45.

Gist: "The Ecological Structure of an Asian City (Bangalore): An East-West Comparison," *Population Review*, II, No. 1 (1958), 17–25.

Karan: "Patna and Jamshedpur," *Geographical Review of India*, XIV, No. 2 (1952), 25–32; "The Pattern of Indian Towns: A Study in Urban Morphology," *Journal of the American Institute of Planners*, XXIII, No. 2 (1957), 70–75.

Joshi: "Urban Structure in Western India: Poona, A Sample Study," *Geographical Review of India*, XIV, No. 1 (1952), 6–19.

Prabhu: "Dharwar: A Study in Indian Urban Landscapes," *Bombay Geographical Magazine*, I, No. 1 (1953), 56–63.

Singh: "Evolution of Settlements in the Middle Ganga Valley," *National Geographical Journal of India*, I, Part II (1955), 69–114; "Gorakhpur: A Study in Urban Morphology," *ibid.*, I, Part I (1955), 1–10; *Banaras: A Study in Urban Geography* (Banaras: Nand Kishore & Bros., 1955); "Mirzapur: A Study in Urban Geography," *Geographical Outlook*, I, No. 1 (1956), 16027; "Ballia: A Study in Urban Settlement," *National Geographical Journal of India*, II, Part I (1956), 1–6; "The Trend of Urbanization in the Umland of Banaras," *ibid.*, II, Part II (1956), 75–83; "Two Small Towns of Eastern U.P.: Sultanpur and Chunar," *ibid.*, III, Part I (1957), 1–10; "Faizabad-*cum*-Ayodhaya," *ibid.*, IV, Part I (1958), 1–6; with Mrs. B. Mukherjee, "Functional Zones of Ranchi," *ibid.*, III, Parts III–IV (1957), 117–124; with K. N. Singh, "Development of Twin-Township of Dehri-Dalmianagar," *ibid.*, II, Part III (1956), 121–127.

[2] "Dhawar . . . ," p. 63.

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often spacious sections dating from the British period. The urban morphology of India thus shows either conflict or blending of indigenous features and the hybridized European features.

INDIGENOUS PATTERN

The old cities of distinctively Indian character in the northern plains and desert borders or in the Deccan region usually exhibit a number of common features, some of which derive in part from southwestern Asia through Muslim influence. The streets are irregular in pattern, narrow, and crooked. The main vehicular thoroughfares are rarely more than thirty or forty feet in width, often without sidewalks, and encroached upon by booths and the projecting open fronts of the shops which line them. The side streets and alleys are usually much narrower and so crooked as to be almost impassable for wheeled vehicles. The ground is completely covered by structures, except for the streets, the interior courts of some dwellings, and the occasional market areas and open spaces around public buildings. One- or two-story construction is predominant, although "lofty" buildings of three, four, or even six stories may exist along the main streets. The common types of masonry construction, known as "pucka," are brick or stone laid with mortar and often covered with plaster and roofed with semicylindrical tiles. But "*kutcha*" construction of mud walls with thatch roofs is found in the peripheries. Historic palaces of Hindu or Muslim rulers often rise on a near-by hill or stand by the river. Sometimes the battlements and moats of the pre-British walled city survive. The domes and minarets of mosques and the pinnacles of temples are prominent features.

There is usually some evidence of British influence in the form of the town hall, the municipal office, an enclosed and roofed central market, and the clock tower. Bicycles and automobiles push aside pedestrians and bullock carts. There may be ferroconcrete structures belonging to the prosperous merchants and modern flats for the wealthy residents standing side-by-side with traditional structures. But one passes abruptly into dim by-lanes and secluded courtyards which appear not to have been reached by modern influences.

The main bazaar, called "chowk" or "chauk" in northern India, is not quite equivalent to the central business district of an American city. It is crowded with numberless small retail shops which deal in foods or cloth, hardware, jewelry, and other consumers' goods. Groups of competing merchants tend to occupy a particular section. Thus, there is a bazaar for grain merchants and perhaps another for greengrocers. There is a street where brassware is sold

and another for pottery. Another street is inhabited by goldsmiths, or silversmiths, and so forth. Native bankers and moneylenders, health practitioners, oculists, dentists, and public letter-writers congregate in the vicinity of the central bazaar, sometimes occupying second-story rooms above shops. But generally the upper and rear rooms are used as dwelling places by the merchants. The wholesale grain and other bulk-commodity markets are usually to be found near by. Retail business establishments may extend a mile or two along the main arteries of traffic, and subsidiary bazaars are usually developed, especially in the cities and large towns.

Surrounding and adjacent to the commercial streets are the primarily residential neighborhoods. There is a high degree of community consciousness and personal identification of the inhabitants with these neighborhoods. Brahmins and other high castes are usually in the best-built residential areas in or near the center of the old cities. Muslims are clearly separate from Hindus and are themselves subdivided into quasi castes and economic classes. The laboring castes and menial outcastes of lowest socioeconomic status occupy the poorest houses and tend to be located in the outskirts rather than the center. Gist, however, thinks this kind of segregation in Bangalore is less sharp than the segregation of Negroes in American cities.[3]

Wards, or larger and more inclusive sections of a city called "mohallas," are recognized. They usually take their names from the predominant caste or occupational group, from the founder's name or that of the original rural village on the site, or from a market, a public building, or an old city gate. The population of a mohalla may be several thousands or tens of thousands.

While segregation by commodity in business areas and by socioeconomic or religious group in residential areas is a well-developed state of affairs in Indian cities, there is not the clear-cut separation of residential land use from business or industry which is normal in the cities of Europe and America. Merchants live in the bazaars and small shops; service industries and manufacturing of all kinds are located in predominantly residential areas. In some areas, manufacturing and retail or wholesale trade are carried on in the same establishments.

EUROPEAN PATTERNS

In contrast to the patterns of the indigenous urban settlements, the former British military contonments, civil stations, railway colonies, and company towns were laid out often on preconceived plans with definite functional areas. The tree-shaded streets are

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[3] "The Ecological Structure of an Asian City . . . ."

broad, metaled or paved, and the buildings are set well back. Structures are almost exclusively pucka, and many of them stand in the midst of large fenced compounds with much space devoted to trees and grass or landscaped in formal gardens. The typical British-built residence, called a bungalow (from Bengali *bānglā*), is a large rambling house with thick walls and high ceilings, large windows, and a wide veranda (from Hindi *barandā*) with pillars running all around, and is either flat cement-roofed or sloping tile-roofed. There are, of course, the modest row-house quarters for servants, mercenary troops, and other employees.

The inhabitants of these urban areas originally were the British soldiers, officers, civil administrators, businessmen, and missionaries. Some few of the foreigners were of non-British origin. There was probably always a preponderance in numbers of native population, including Christian converts and Eurasians (Anglo-Indians), who naturally tended to congregate in such areas and still do so. Today the Indian population is strongly dominant, although made up more largely of the governmental and professional intelligentsia and less markedly segregated by caste or religion than is true in the old cities.

The military cantonments are characterized by a fairly regular alignment of streets and comprise barrack blocks with rows of living quarters for the soldiers and their families, separate bungalows for the officers, hospitals, churches, and officers' clubs, together with drill grounds and rifle ranges, ammunition depots, and military supply warehouses. Sometimes there would be manufactories for armaments and other equipment and executive offices of regional military headquarters. Cantonments were built chiefly during the 19th century and had permanent garrisons in the beginning. Most of them have long since been abandoned for military purposes.

The civil stations, with which the cantonments now tend to become functionally merged, originally contained the offices and residences of nonmilitary branches of government at the district or province (now state) level. These areas still serve the same functions for which they were established in the late 19th and early 20th centuries, although Indian officials have entirely replaced the British. Public offices, often housed in strictly European-style structures little adapted to India, usually include the administrative (district magistrate's) headquarters, the tax collector's office and court, the law court, and the police barracks and jail. Sometimes there are other public institutions, such as the government printing presses, public libraries, and mental hospitals. Post and telegraph offices, foreign banks, insurance offices, hotels, cinemas, colleges

and secondary schools following English curricula, and stores carrying goods of European types and fashions, all of which originally served the needs of the British governing class, now cater to the Anglicized native population.

The older cantonments and civil stations dating from the days of the East India Company present a good deal of irregularity in plan, and there is less predilection for straight or grid-pattern streets. The most irregular are the hill stations, situated in the mountains or uplands for climatic reasons to serve as health sanatoria and summer resorts and, because of the rough terrain of the sites, characterized by winding roads and widely dispersed stone and wooden houses. It was in the hill stations that a type of cultural landscape most resembling that of the British Isles was created. But every civil and military station, on the plains or in the hills, has its bazaar section which shows virtually all the features of indigenous urban settlement, although restricted in area and relatively small in population.

The railway colonies and other company towns probably show the greatest regularity of plan and the highest degree of separation between functional areas and economic classes. In most instances these urban settlements originated after 1870. The land was owned by the companies or held on long-term lease. The streets, dwellings, and all other structures were fully and exclusively controlled by the management. The rail depot and yards, the company offices, the extensive plants for the manufacture or maintenance of rolling stock, are common features set apart in such a settlement, e.g., Kharagpur, built after 1900 by the Bengal Nagpur Railway about seventy miles west of Calcutta.[4]

But the most distinctive features of the railway towns are the perfectly uniform grid of streets and the monotonous rows of brick dwellings, graded and rented strictly according to the wage scale and occupational status of the employees. For the lowest-paid semi-skilled workers, who were from the start invariably Indians, a single room with attached kitchen and enclosed courtyard was considered sufficient. These dwelling units are built in contiguous rows of ten and twelve, or multiples thereof, allowing little or no open space between street and entrance. The quarters designed for the intermediate grades of personnel, often including Eurasians as well as Indians, have more rooms, some in a second story, and are set back farther from the street. The two-story bungalows built

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[4] The following description of a railway town is based on the author's experience in Kharagpur, West Bengal, in the period before World War II. It would be instructive to observe changes subsequent to nationalization of the railway and political independence from Great Britain.

for the employees with the highest technical skills or managerial capacity and receiving the highest salaries, who at first were mainly British, stand amid spacious landscaped grounds with small row houses for the servants in the rear.

Each grade and wage level was assigned to a specific section of town, creating an economic and, originally, a racial or national hierarchy of status differing from the traditional caste and socio-economic segregation of the indigenous cities. The system was unlike Indian tradition, especially at the intermediate and low grades, in that families of different religions, castes, and mother tongues found themselves living side-by-side. A Punjabi Sikh would be assigned quarters beside a Telegu Christian or a Maratha Hindu. The Muslims were mixed with Hindus. The system also differed from tradition in that the highest ranks would be found farthest out from the center of town, usually on the opposite side of the railway tracks from the lowest ranks and the native bazaar. The commercial and industrial areas would be much less congested in a railway-owned settlement than in a typical Indian city. Broad streets were laid out, planted with trees alongside, and, if not paved with macadam, probably metaled with gravel and clay rolled hard.

Some company towns, e.g., Jamshedpur, resemble Kharagpur in grid pattern and segregation of employees according to wages and skills. This city has been created since 1907 on an undulating site formerly occupied by rural villages, and has grown to nearly 250,-000 in population under the benevolent capitalism of the Tata Iron and Steel Company. It covers about twenty-five square miles and achieves homogeneity without monotony and rapid growth without crowding. In the words of Karan,

. . . . Jamshedpur is distinct from other urban centers in Bihar in respect to modern layout, a marked segregation of functions and consequent absence of congestion. The factories are so widely spaced that it is not the chimneys but gardens which dominate the landscape.[5]

Extreme congestion and haphazard urban development in India are not confined to the old cities. One has only to visit the big manufacturing centers of Sholapur, Ahmedabad, Kanpur, or the Hooghly industrial towns to see irregular, narrow streets and closely built structures of indigenous types spreading rapidly in modern times. The twin township of Dehri-Dalmianagar, a commercial and manufacturing center of some 25,000 in southern Bihar which has multiplied in population eightfold since the 1920's, is an example described by K. N. Singh:

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[5] "Patna and Jamshedpur," p. 32.

There is a promiscuous panorama of chance-directed and chance-erected . . . houses of different character[istics,] aspect and layout; some are brick-built [and] tiled, some mud-walled and tiled, while on the outermost fringe of this zone come the thatched brick-built or mud-walled cottages and also some first-class modern buildings of well-to-do people. . . . On the inner side are to be found some slum residences with all their abominable characteristics and it is here that the urban proletariat lives.[6]

Such is the landscape of the inner commercial zone of Dehri. Yet, only a mile distant is Dalmianagar, developed under the direct control of the Dalmia congeries of industrial firms, in which there is

Segregation of factories and offices from the residential colony on the one hand, and [grading] of residences on the basis of economy and status from one-room twelfth-class labor quarters to first-class large bungalows of the management.[7]

POPULATION DISTRIBUTION

Two facts about urban population distribution stand out clearly from the data obtained in recent censuses.

First, extremely high densities occur in both the indigenous inland centers and the Indo-British seaports. The maximum residential concentrations were reported to be 400,000 to 454,000 persons per square mile in some wards of Calcutta during 1941 and Old Delhi during 1951. Thus, there are at least 650 to 700 people living in the area of an acre in these two large cities, which ranked first and fourth, respectively, in terms of their total metropolitan population in 1951. On Bombay Island, as a whole, the mean population density must have approached 100,000 per square mile in 1951, but Greater Bombay averaged only one fourth as much. The maximum density reported in Bombay during 1941 was 256,000 persons per square mile (400 per acre), and in 1951 it may have exceeded 300,000. The comparatively low maximum of 112,000 persons per square mile (175 per acre) recorded for Madras in 1931 must have been at least doubled by 1951 in proportion to the growth of the population in the city as a whole. It is not only in these four largest cities of the country that high densities occur. One observes that the number of persons per square mile in Poona went as high as 160,000 and in smaller cities such as Banaras and Aligarh it exceeded 90,000.

The second notable fact about population distribution is the

[6]K. N. Singh, "Morphology of the Twin Township of Dehri-Dalmianagar," *National Geographical Journal of India*, III, Parts II–IV (1957), 176.

[7]*Ibid.*, p. 178.

sharp density difference between wards in the central or old urban areas and the peripheries, particularly where there are suburbs, as in the case of Calcutta, or cantonments and civil stations, New Delhi being an obvious example. The ratio of maximum to minimum densities may be as high as 300:1 (Banaras) or 100:1 (Calcutta). In general it appears that only in Bombay and Calcutta are the central business districts less densely populated than the surrounding residential areas, as is almost always true in American cities. In the commercial center of Bombay the large business blocks of the "Fort" and the open spaces of the adjacent Esplanade bring down the density of this inmost zone of the city to 19,200 persons per square mile (30 per acre). A similar lessening of density occurs in downtown Calcutta around Dalhousie Square below Howrah Bridge and north of Fort William and the park area of the Maidan. Population data by wards do not exhibit the true details of distribution. Information regarding the actual areas of habitation would permit mapping of the real geographic patterns.

The original causes of such extreme concentration and abrupt gradients of population density can be summed up in three words: protection, prestige, and proximity. In medieval and early British times the imperial cities were wholly or partly enclosed by walls or ditches for defense. Many local rulers also fortified their chief towns. Soldiers and retainers, merchants and craftsmen crowded inside the walls for military protection and safety from robber bands. The palace, being the seat of power and wealth, became a focal point around which the people of highest status gathered for royal patronage as well as proximity to trade with all who came into and went out of the city. The levels of prestige and wealth became progressively higher along the thoroughfares going toward the city center, and the least privileged and poorest people were relegated to the back lanes and marginal areas, which sometimes were outside the city walls.

This pattern of urbanism was a pronounced feature of the pre-British period in northern India and the Deccan when Muslims and Hindus of official rank or merchant castes lived inside the walls. Despite the vicissitudes of Poona under the Hindu Marathas in the 18th and 19th centuries and the disappearance of the old walls, the most congested central ward—where a fort had been built and occupied by Muslims in 1631—still goes under the name of Kasbe-Pune ("Walled Poona").[8] In Aligarh the ancient Koil mound, which was fortified during the period of Muslim rule, is the nucleus

[8]Joshi, "Urban Structure in Western India . . . ," pp. 7–9.

of the city today. It is the site of the chief mosque and the seat of municipal government and is solidly covered with buildings and streets, although the walls are gone and urban development has spread far out on the plain below.[9] Old Delhi, built under the Mogul Emperor Shah Jahan's rule in the 17th century, is a prime example of survival of the pattern more or less intact.

From the 16th through the 18th centuries small forts and trading "factories" established by several European nations on the coast of India served similarly as points of attraction. Native Indian employees and entrepreneurs concentrated especially in Madras, Bombay, and Calcutta as British influence grew at the expense of the Portuguese, Dutch, Danes, and French. In the case of Madras, the concentration was in George Town (formerly Black Town), north of Fort St. George on a narrow peninsula of land acquired in 1639 and protected by swamps and the little River Cooum. On Bombay Island, ceded by the Portuguese to the British in 1661 and occupied in 1665, the earliest concentration was in the Fort. This nucleus was actually enclosed by a wall from about 1720 to 1862. Urban development had, however, spread outside the Fort even before it was completed, and further concentration was encouraged by the natural isolation of Bombay from the Maratha-held mainland. In Calcutta, which was permanently occupied by the British in 1690 and protected by two successive Fort Williams, the water barrier of the Hooghly River on the west was reinforced by a ditch enclosing an area two or three miles in width and nearly five miles in length. Within this area the commercial core of the city and some elite residential sections are still found.

During the 19th century, as the power of native rulers declined in India and the need for such military defenses was outmoded, proximity remained the chief advantage for city dwellers—proximity not simply to the retail trade of the central bazaar or trading "factories" on the water front, but also to the amenities of European life at first available only in the cities.

In 20th-century India, poverty must be added as the fourth and main cause of urban congestion. The unsanitary and degraded living quarters in the Bombay chawls and the Calcutta bustees must be seen to be believed. Yet, the lowest-paid factory laborers and service workers crowd into a few square feet of space, glad for mere shelter. Housing conditions are equally appalling in certain jute-mill towns along the Hooghly near Calcutta, and perhaps in the places of temporary refugee concentration in the Punjab and Delhi.[10]

[9] Hirt, "Spatial Aspects . . . ," pp. 38–39.
[10] For a description of Indian slum life, see chap. iv—*Ed.*

DECENTRALIZATION AND URBAN FRINGES

The lack of centralization in urban functions and the comparatively slight development of fringe areas are two features which appear contrary to what could be expected in India in the light of the sharp density gradients and residential crowding.

The strongly dominant central business districts so long familiar in Europe and America, in which large retail and wholesale trading establishments are located along with banking, insurance, hotel, entertainment, and communications industries, can scarcely be said to exist, except in the Indo-British seaports. In part the lack of central services can be accounted for by the tastes and traditions of the people, whose requirements are met in the small bazaar shops of the conservative inland cities. It is also to be explained by the low income of a vast majority of the inhabitants and by the development of separate business areas in the British-built cantonments and civil stations, where wealth became concentrated.

In reality, many cities functioned as dual entities during the British period and still do so. India Chauk (formerly Connaught Circus) in New Delhi and Chandni Chauk in Old Delhi are examples of a binuclear commercial pattern. Polynuclear patterns are described in Bangalore by Gist[11] and in Poona by Joshi.[12]

Such geographic patterns of double or multiple business districts are unlike the new American pattern of outlying shopping centers which compete with the central business districts in retail trade and some personal services, but remain largely subsidiary in relation to financial and professional services and communications industries. The central bazaars in the large cities of India are supplemented by neighborhood bazaars. But the Anglicized business areas—with their fashionable stores dealing in European types of goods, their banks, cinemas, hotels, and various public agencies—complement rather than compete with the indigenous bazaars. Their outlying and sometimes scattered locations seem incongruous and even inefficient as a way to provide for the needs of urban dwellers today. Centralization of all modern goods and services, however, could only intensify bazaar congestion.

It remains to be seen what patterns of business location will develop as the demand for goods and services increases in the India of the future. Two tendencies are already evident. First, there is the unrestricted accretion of small shops along the main roads and particularly along the arteries of traffic leading from the old bazaars and residential areas to the railway stations or new factories. Second, there is the haphazard filling-in of the open spaces

[11] "The Ecological Structure of an Asian City . . ."
[12] "Urban Structure in Western India . . ."

of the cantonments and civil stations. Bungalows are adapted or enlarged for offices and stores. The spacious grounds are built upon without consideration for aesthetic values or sanitary conditions. Prabhu[13] expresses concern for the future welfare of the citizens of Dharwar, a small Mysore city, where the average density is already twice as great as in many cities of comparable population and where incessant change is obliterating the basic contrast between the indigenous part and the Anglicized part, much to the detriment of the latter.

Another distinct pattern less frequently met with is that of self-contained cells. This is found in some of the new settlements which have developed under the aegis of private industry or the control of government. Modinagar, U.P., a small town twenty-eight miles northeast of Delhi, which is economically supported by the Modi family mills, is described by A. B. Mukherji as a linear grid-pattern settlement, paralleling the rail line, "with the residential units on one side and the factories on the other side of the trunk road that runs as the base line of the town." [14] The business core, near the railway station, "consists of long lines of box-type shops situated on two sides of the trunk road." [15] But there are several secondary nuclei—more or less self-contained, with stores and residential units—near the various factories. In Jamshedpur, while there is a modern business district serving the whole city, a series of industrial suburbs, with factories and adjoining workers' settlements separated from one another by open spaces and parks, is developed on a large scale.[16] At Chandigarh[17] the fifteen-square-mile site is divided into sectors by a grid of straight roads. Each sector is a self-contained residential area, with commercial and recreational services. One sector is the city center, with the complete range of specialized services. The buildings to house the functions of the Punjab state government are grouped separately.

The fringes around all but the largest urban agglomerations as yet show remarkably little alteration of the traditional forms of rural settlement. In 1951 many small towns of 50,000 or less had as much as 12 or 15 per cent of their population engaged in or supported by agriculture. Farm villages and cultivated fields are observed within the municipal limits of cities of 200,000 or 300,000

[13] "Dharwar . . ."

[14] A. B. Mukherji, "Modinagar: A Study in Urban Geography," *Geographical Review of India*, XV, No. 4 (1953), 11.

[15] *Ibid.*, p. 13.

[16] Karan, "Patna and Jamshedpur," pp. 31–32.

[17] R. M. Panjabi, "Chandigarh: India's Newest City," *The Geographical Magazine*, XXXI, No. 8 (1958), 401–414.

population. The rural look of the urban fringes may be more apparent than real, because some of the inhabitants of villages close to a city or town may have taken up urban employment—as, for example, in Modinagar[18] and Allahabad.[19] There is also intensification of farming, of course, in response to the heavy demand of city dwellers for fresh vegetables, fruit, and milk. Any American observer of India's urban fringes, however, cannot fail to be impressed by the absence of the urban sprawl so prevalent around the cities of the United States. This feature of urban morphology at first seems inexplicable in view of the persistent urban congestion of old cities and the intensified overcrowding in rapidly growing centers.

Centrifugal forces are relatively weak in India for the simple reason that most urban dwellers must walk to work. Although mass transportation by train or trolley and bus is cheap and rapid in the large cities, there are many small cities where modern means of local transportation are inadequate or almost nonexistent. Furthermore, the low wages received by the workers do not permit the expenditure of even a few *paise* for fare. They must live within a mile or two of their places of employment. Hence, most city dwellers cannot afford to escape to the less densely occupied fringes.

Contiguous urban extensions and separate suburbs have appeared around some of the most prosperous centers of commerce and trade or governmental activity. Persons of middle income, the white-collar workers, lesser civil servants, and skilled factory workers can afford public transportation or use bicycles for daily travel. It is they who are populating the modest ferroconcrete bungalows built on lots of a quarter acre or more described by Joshi[20] on the margins and in outlying sections of Poona. Rarely do persons of upper economic classes have private automobiles for daily travel; if they do, the street congestion inside the old cities makes the vehicles impractical to use. In Calcutta, Bombay, Madras, and New Delhi automobile commuting has begun, but remains relatively unimportant. Most of the automotive vehicles seen on the streets of Indian cities are public conveyances for people or goods, and they are far less numerous than bicycles and animal-drawn vehicles. The low density of extra-urban automotive traffic is indicated by the fact that only 20 to 30 buses a day travel the main roads of the 3,500-

[18] Mukherji, *op. cit.*

[19] Ujagir Singh, "Banaras—A Note on Its Urban Geography," *Indian Geographical Journal*, II, Part I (1956), 36–47.

[20] C. B. Joshi, "The Historical Geography of the Islands of Bombay," *Bombay Geographical Magazine*, IV, No. 1 (1956), 5–13.

square-mile service area around Agra.[21] H. H. Singh[22] thinks that one automobile is to be expected to pass every ten minutes on the heavily traveled streets of Jaunpur, U.P.

Local railway service is rapid and frequent to and from Calcutta, Bombay, and Madras. The growth of true residential suburbs outside these cities has been stimulated during the past three or four decades. As many as 200,000 passengers are carried daily by rail into Bombay, and suburban development is occurring as far as ten to fifteen miles from Bombay Island along the two railways crossing Salsette Island. There is a suburban belt outside Madras stretching fifteen miles or so southwest along the railway to St. Thomas Mount and Guindy and served by 70 trains a day in each direction.[23] Dormitory suburbs are flourishing on the basis of trolley or bus services north, east, and south of Calcutta as far as five or six miles from the central business district.[24, 25] The rail lines paralleling the Hooghly River for thirty miles or more northward from Howrah and Sealday have long been used by white-collar workers traveling into Calcutta. But the three-dozen urban municipalities, extending fifteen miles downriver as well as thirty miles upriver from the City, and together with it comprising a conurbation of 4.6 million inhabitants in 1951, are industrial satellites rather than residential suburbs. The Hooghlyside conurbation has an industrial base, primarily jute textiles, dependent upon the advantages of the river and parallel railways for raw material assembly and access to seagoing vessels. Most of the 1.8 million urban people living outside Calcutta are dependent directly or indirectly upon employment in the local mills and do not commute to the City.

[21] Lal Singh, "The Umland of Agra," *National Geographical Journal of India*, II, Part III (1956), 149–152.

[22] Hari Har Singh, "Evolution of the Townscape of Jaunpur City," *ibid.*, IV, Part I (1958), 35–46.

[23] N. Subrahamanyam, "Some Aspects of the Growth of Greater Madras: A Study in Suburban Geography," *Journal, Madras Geographical Association*, XIII, No. 1 (1938), 22–31.

[24] Meera Guha, "The Morphology of Calcutta," *Geographical Review of India*, XV, No. 3 (1953), 20–28.

[25] *Idem*, "Transport in and Around Calcutta: An Analysis of Traffic Conditions," *ibid.*, XVII, No. 2 (1955), 1–9.

IV

URBAN COMMUNITY DEVELOPMENT
IN INDIA:
THE DELHI PILOT PROJECT

Marshall B. Clinard and B. Chatterjee

On the basis of previous census reports and what other limited data are available, it is estimated that the slum population constitutes from 10 per cent to as high as 60 per cent of the total population in the large Indian cities. Were these slums to be judged by Western standards the percentage would undoubtedly be greater. A conservative estimate would place urban slum dwellings which are totally unfit for human occupation at about 1.15 million.[1] In the sample survey carried out by the State Statistical Bureau of the government of West Bengal in 1956, it was estimated that nearly 600,000 people lived in slums in the city of Calcutta alone.[2]

Urban slum dwellers reside in *katras*, lanes, chawls, bustees, *ahatas*, and *cheris*. *Katras* are small, single-room tenements, normally constructed in rows, within a courtyard or enclosure and with a single entrance. Lanes are narrow, winding, and often damp, with densely populated houses on either side. Multistoried buildings, called chawls in cities like Bombay, house numerous families, with many persons (often more than one family) normally residing in one room. Latrines and water taps are common. Bustees are located in quite open areas of the city, or outwards from the center, usually on unauthorized sites. They are generally thick clusters of

[1] "Report of the Advisory Committee on Slum Clearance" (New Delhi: Government of India, July 18, 1958), p. 5.

[2] *Ibid.*