POPULATION REVIEW

Vol. 2. No. 1. January 1958

Editor
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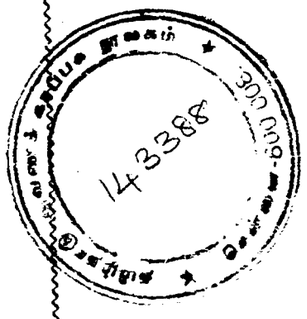
INDIAN INSTITUTE FOR POPULATION STUDIES
GANDHINAGAR, MADRAS-20, INDIA



POPULATION REVIEW

A JOURNAL OF ASIAN DEMOGRAPHY

January 1958 Vol. 2. No. 1.

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Published twice a year by the Indian Institute for Population Studies, Madras 20. Subscription: Rupees Ten per annum; Single copy: Rupees Five. Issued free to members of the Institute. Entered as Second Class printed matter at the Madras General Post Office. Copyright by the Indian Institute for Population Studies. Edited and Published by Dr. S. Chandrasekhar and printed by Shri T. K. Venkatesan at the Jupiter Press Private Ltd., 109-C, Mount Road, Madras-18.

The Ecological Structure of An Asian City: An East-West Comparison

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The spatial distribution of population and institutions has been a focus of interest to numerous social scientists, notably sociologists, economists, and geographers. Over the past two or three decades a considerable body of literature, much of it based upon empirical studies and having a theoretical orientation, has emerged. One of the major developments in sociology is the field of *human ecology*, which is concerned primarily with spatial patterns of people and institutions, changes that are occurring in these configurations, and the cultural, political, economic, psychological, or geographic elements that may influence, or be influenced by, such developments.

Most of the theories relating to human ecology have been based upon researches in metropolitan areas in technologically advanced countries, notably the United States and France. Whatever may be the validity of the theories concerning the ecological structuring of cities in these countries, it is hazardous to assume that these principles have universal application. Indeed, a limited number of sociological researches conducted in Latin American and Asian cities indicate that the ecological patterns of cities in industrialized and highly urbanized countries of the West are not necessarily duplicated in pre-industrial or semi-industrial societies having their own distinctive history, culture, and economic organization. Caplow found that the ecological structuring of Guatemala City, capital of Guatemala, was in some respects the reverse of the cities in the United States.[1] Similar observations were made by Ghosh in Calcutta.[2]

1 Theodore Caplow, "The Social Ecology of Guatemala City, *Social Forces*, 28 : 113-33. (December, 1949)

2 S. Ghosh, "The Urban Pattern of Calcutta," *Economic Geography*, 26 : 257. (January, 1950)

Urban sociologists have been particularly interested in social phenomena which they conceptualize as *centralization, decentralization,* and *segregation.* Centralization has reference to the tendency for people to assemble at some pivotal point in a city in order to satisfy their interests, fulfil their needs, and carry out designated social and economic functions. The most obvious manifestation of this tendency is the development of a so-called "central business district" in the city. Considerable research has been conducted by sociologists and other social scientists on the characteristics of the central business district, changes that are occurring in it, and the factors associated with these ecological patterns and their changes. Of increasing interest is decentralization, which may be interpreted as the tendency to move away from, rather than toward, a pivotal point. The extensive shift of population to residential suburbs, the development of suburban shopping centers, and the movement of industry from central metropolitan locations to outlying positions are examples of decentralization in certain industrialized countries.

Segregation in the ecological sense is concerned with the tendency for individuals to reside near others with similar interest and attributes. This seems to be a universal tendency, although it may be manifest in a variety of forms. Probably every large city has districts that are populated mainly by persons who are similar in race, religion, nationality, occupation, income, or style of living. Ecological segregation may reflect either preferences or prejudices, or both ; it may be voluntary or involuntary, or both. Viewed in perspective most cities exhibit a number of these segregated areas each of which has its own distinctive character. In the processes of urban growth or decline

these configurations are constantly undergoing changes as existing patterns break down and new ones are formed. The concept of segregation has also been applied to the tendency for similar commercial, industrial, or other enterprises to cluster together in space. Certain kinds of enterprises can compete more effectively when they are situated in close physical proximity than when they are spatially separated. The financial district of a large metropolis is a case in point. Wholesale establishments are likewise usually found close together, but a short distance from retail concentrations.

The present study is essentially comparative. In the following pages the ecological structure of an Asian city will be examined, described, and compared with the characteristic ecological features of American cities. But the generalizations concerning both similarities and differences should be considered tentative.

BANGALORE: ITS HISTORY AND GROWTH

With these observations in mind, we shall examine the ecological structure of Bangalore, the capital city of Mysore State, South India. As the largest metropolis in Mysore State and the seventh largest city in India, Bangalore has well over three-fourths of a million inhabitants. In recent years its growth has been rapid; during the 1941-51 decade the population almost doubled. Industrialization is proceeding at a rapid pace, and mechanized mass transportation is replacing some of the older forms.

From 1809 to the late 1940's the city was divided into two separate administrative units: Bangalore City on the west side, which was independently administered, and the Civil and Military Station (Cantonment), under British jurisdiction. With the merger of the two divisions after India's independence, the larger municipality assumed integrated administrative functions as the Bangalore Municipal Corporation.

Until the second decade of the present century the growth of Bangalore Municipality was comparatively slow, and the number of inhabitants was less than the number in the Cantonment. By 1921, however, the two administrative divisions were about equal in size (118,000 each). Thereafter the Municipality outdistanced the Cantonment in population growth. In the 1941 census the Municipality had a population of a quarter of a million compared with about 160,000 for the Cantonment. There is no doubt that the spatial arrangement of institutions and people was greatly influenced by this dual administrative organization and the presence of British military and civil personnel.

Since the terrain upon which Bangalore is located is comparatively level, without any sharp topographic contrasts to limit seriously or restrict the character of land usage, the ecological structure must therefore be interpreted mainly in terms of *social* factors that have operated to give the city its distinctive patterning. These factors have never functioned in a competitively *laissez fare* environment; in recent times, at least, planning procedures have been systematically applied with the result that the city's ecology has been considerably affected. Large parks in the central part of the city, mainly in the Cantonment, are patently products of municipal planning.

But the scope and degree of planning have, nevertheless, been limited. Certainly there is no rigidly planned economy, nor have tight restrictions been imposed specifying the location of economic establishments. Presumably most establishments related directly to the economy have been relatively free to compete for favourable sites and to locate without much interference from the government.

The rapid growth of Bangalore in recent decades has had the effect of increasing the over-all density of population, especially in the old Municipality. In 1941, before the merger, the Municipality had nearly 19,000 persons per square mile as compared with a density of about 12,000 persons in the Cantonment. Between 1901 and 1941, the metropolitan area increased by 35 per cent (from 9.8 to 13.2 square miles), but the population increased by 258 per cent and the density by 164 per cent. This rapid growth of population without a corresponding increase in occupied area has greatly accentuated the piling up of people in the metropolis. Actual increase in density has been considerable for all sections, but the range in density for different areas has been even more impressive. In 1941, the most sparsely settled section (which included a fashionable residential center and the palace grounds) was 6,485 persons per square mile, but in the most densely settled area the corresponding density figure was 135,311, or twenty times as great.

THE ECOLOGY OF BUSINESS

Bangalore has a major retail and wholesale district, near the largest municipal market (Central Market), in the old Municipality, but the area has limited resemblance to the central business district of an American city. Central Market itself is a commercial nucleus, a center of buying and selling, mainly of articles for household or personal consumption. Within the vicinity of the Market are streets lined with shops specializing in such merchandise as silk, cotton, and leather goods; silverware, hardware, and musical instruments; drugs, jewelry, and household furnishings; supplies, books, and hemp products. In the district are also numerous small boarding and lodging hotels, pawnbrokers' establishments, lawyers' offices, and offices of various merchants' associations. Shops carrying the same type of merchandise tend to cluster together, creating small districts or sectors more or less specialized in character. One may find, for example, clusters of shops dealing with silverware or brassware or other clusters of shops selling bicycles or drugs.

This district is by no means limited exclusively to retail merchandising. As in American cities wholesale establishments are located conveniently near the retailers. Some of the retail and wholesale merchants receive certain kinds of merchandise directly from small-scale manufacturing enterprises located in the same area. On side streets, for instance, are weavers and ribbon manufacturers who supply nearby retail shops with finished articles. Certain merchants, notably dealers in indigenous drugs and silverware, perform dual functions of manufacturer and distributor, fabricating and selling commodities in the same building.

A wholesale district is located about one-fourth mile to the west of Central Market, on a major arterial thoroughfare and not far from the south-western boundary of the city. Wholesaling activity here is confined mainly to agricultural products such as grain, vegetables, ginger, garlic, and fruits, which are piled on the sides of streets or under shelters, to be disposed of to retailers. Even in this area open-air retail venders operate sidewalk businesses alongside the wholesalers. Hence there is no clear-cut areal differentiation based on the nature of distributive functions.

Nearly a mile north of Central Market, beyond the perimeter of the shopping district, is a "big business" street (Kempe Gowda Road) on which are concentrated banking and insurance firms, film distributing companies, offices of out-of-town newspaper correspondents, a large transportation firm, and the Bangalore Chamber of Commerce. Within a distance of about two or three blocks on this street are seven large motion picture houses, the largest concentration of theatres in the city.

About a half mile south of Central Market, and likewise beyond the major shopping district, is another area devoted mainly to banking and the financing and management of cooperatives. In this district there is a variety of co-operative institutions, including several cooperative banks, a land mortgage bank, a grain merchant's cooperative society, a house-building society, and government departments dealing with various cooperative enterprises.

Some two miles northeast of Central Market, in the Cantonment, are two important business areas. One of these, strung along the south side of Mahatma Gandhi Road for a distance of three or four blocks, and including portions of two intersecting streets, specializes mainly in luxury goods and services. Here are offices of airlines, movie theaters, photographers' establishments, expensive jewelry stores, a department store, a large artcraft shop, book stores, radio and automobile sales houses, apparel shops, and pharmacies.

The other area, a few blocks north of Gandhi Road, is adjacent to Russell Market, which is similar to, but smaller than, Central Market. The main shopping avenue in this

area is Commercial Street, three blocks long, where almost everything, ranging from luxury items to household necessities, may be purchased. Many of the shops in this district are operated by Muslims, for the district itself is next to the principal Muslim residential section.

Ecological theory based on American studies has emphasized the importance of large-scale organizations, particularly business and industrial chains, in the centralization of functions in the central business district. Large corporate enterprises are commonly "headquartered" in the American central business zone although operations may be widely scattered. Furthermore, the department store has been an important feature of the central business district of the large or medium-sized city in the United States.

Most business in Bangalore is conducted in small shops. The chain-store type of merchandising organization has never developed to any extent, although a few enterprises, such as a small department store, a book store, and several banks, are links in regional chains of fairly small dimensions. Perhaps the nearest approach to the department store carrying products for mass consumption is the municipal market, dealing mainly in fruits, vegetables, flowers, hardware, inexpensive clothing, baskets and the like. But in the market place the stalls are privately managed. The nature of business is therefore not such as to foster the growth of complex bureaucracies so characteristic of the American metropolis. Hence the centralized office building housing an army of bureaucratic functionaries, including clerical staffs to do paper work, is almost nonexistent.

The distribution of banking and insurance in Bangalore differs considerably from the prevailing patterns in large American cities. In the United States banking and insurance tend to be rather highly centralized. There is decentralization, to be sure, but outlying banking institutions are commonly branch banks whose parent establishments are in the central business area. This also is the prevailing pattern for insurance, although there seems to be a trend toward decentralization.

In Bangalore, there are four principal clusters of large banks, with a few banking houses located somewhat apart from these clusters. None of these major banks is in the heart of the major business district, although there are numerous small-scale money-lending establishments in the area. One cluster of major banks is about a half mile north of Central Market; another about a mile south of the Market; a third in the Gandhi Road shopping area; and a fourth in the retail district near Russell Market. The Imperial Bank of India, for example, is located two or three blocks south of Gandhi Road, in a spacious setting on the edge of an attractive residential district. Another, a comparatively small bank, British-owned, is located on the second floor of a building opposite the municipal offices, about a mile east of Central Market.

The distribution of hotels likewise represents a departure from the highly centralized pattern characteristic of American cities. There are numerous small hotels in the major business district and near the central railroad station, but the luxury hotels are some distance from concentrations of business or transportation facilities. For these hotels spacious and attractive surroundings appear to be more important considerations than proximity to business activities. No doubt attractiveness of location is important because many hotel residents are permanent or semipermanent guests rather than transients. The West End Hotel, Bangalore's well known hostelry, is located at least a mile and a half from Central Market, and almost as far from the railway station, in a spacious semirural setting. The British apparently liked it this way.

The foregoing observations concerning the ecological patterning of business enterprises point up two facts relating to intercultural comparisons: First, ecological centralization of business is much more marked in the average American city than in Bangalore. Second, commercial areas of comparable size in an American city tend to be strikingly similar in their institutional characteristics, whereas each of the areas in Bangalore, described here briefly, is more or less specialized and therefore somewhat distinctive. This distinctiveness, born of specialization, is in part the result of Bangalore's political and military history. But the distinctiveness of business areas also reflects the differential buying power and cultural interests of the population. For example, British personnel resided mainly in the Cantonment, and the luxury goods enterprises in this area, especially those on Gandhi Road, were largely maintained by them.

THE ECOLOGY OF INDUSTRY

Although Bangalore is in the emergent stage of large-scale industrialization, much of the industrial output is still from small, independent industries, many of the cottage type. The smaller industries are widely scattered, mainly over the western part of the city, some of them near the railroad yards. As noted earlier, within the major business district, or in its vicinity, considerable manufacturing is carried on as an adjunct to the wholesale and retail establishments in the area. Indeed, manufacturing and selling is sometimes combined under one roof. A number of machine shops, including those with lathes and grinding equipment, have sprung up in the vicinity of Binny Mills, a large British-owned textile factory employing some seven thousand workers and located a short distance west of the principal business district. In this area also are builders and repairers of bullock carts and wheels, transportation vehicles used by wholesale dealers who are located close by. About a mile southeast of Central Market is the bamboo bazar, and near it a slaughter house and a number of welding, forging, and weaving establishments.

But the larger industries tend to be rather highly decentralized. The extent to which decentralization of manufacturing has occurred depends on the kind and size of the particular industry. Three major textile mills are located near the western periphery of the city; a large tobacco factory is situated on the northeastern edge. Others similarly located with reference to the peripheral settlement area include a porcelain factory, a lamp works, and brick and tile works, all on the west side. The major exception to this ecological pattern is the government soap factory, located in the central area occupied by public buildings.

Recent industrial developments are even more decentralized in location. Plants manufacturing airplanes and telephones are located five or six miles east of the municipal boundaries, and a factory producing electrical equipment is even farther removed on the west side. Henceforth all large-scale manufacturing will be located in a peripheral zone reserved by the Improvement Trust Board for industrial development.

ECOLOGY OF PUBLIC INSTITUTIONS

In American cities most public buildings are usually located in or near the central business zone. Most of the public buildings in Bangalore are some distance from the main centres of commercial activity. The municipal building (city hall), for example, is located on Narasimharaja Square, about a mile east of Central Market. Nearby is Town Hall (city auditorium). The main post office, the telephone and telegraph office, and the central police station are a mile and a half northeast of Central Market. Each of these organizations, of course, has sub-offices in other sections of the city. The public library is in the center of Cubbon Park, at least a mile from a business district.

Most of the city's major hospitals, on the other hand, are concentrated in a medical center on the south side of Market Square, within hailing distance of Central Market. This appears to be the reverse of the pattern in American cities, where hospitals tend to be decentralized, or at least distributed rather widely over a metropolitan area. Clinics and dispensaries in Bangalore, however, are rather widely scattered, and there are a few hospitals removed from the major medical center.

The location of public and semi-public institutions definitely indicates the role of municipal planning, especially in the Cantonment. A number of institutions are located within, or at the edge of, spacious Cubbon Park; these include the university, the city YMCA, Occupational Institute, the state government secretariat, and several cultural institutions. A mile or two south of Central Market, beyond the hospital area, is another cluster of cultural, religious, and educational institutions. Farther on, in Basavangudi, is the Indian Institute of Culture, a well-known intellectual center. Some institutions are removed from the city: Far to the northwest, beyond the

municipal boundaries, is the Indian Institute of Science; to the southeast, also beyond the city, is a large mental hospital. Several agricultural experiment institutions are also located on the fringe.

Whether or not this planning represents the most efficient use of public institutions it is difficult to say. In some instances, such as the case of a public library set in the center of a large park, it apparently does not.

RESIDENTIAL SEGREGATION

Urban ecologists have taken account of the tendency of people to select residential sites in cities on the basis of racial, cultural, religious, or ethnic preferences or prejudices, to choose residential locations that are symbolic of wealth, power, or social prestige, or to gravitate to low-income and low-prestige areas whose costs of occupancy are within the limits of their purchasing power. Ecological literature concerning American cities contains abundant examples of such segregative tendencies.

These tendencies are exhibited in Bangalore, as in western cities, except that caste preference or prejudice forms an additional basis for residential segregation. The importance of any of these factors depends, in the main, upon the values attached to them by particular individuals or families, although low purchasing power may override actual social preference in the selection of a residential location.

Viewing the ecological patterning of Bangalore in perspective, one may discern "natural areas" that are occupied predominantly or exclusively by members of a particular caste or religion and areas in which there is a mixed occupancy of people with different social affiliations and backgrounds. These segregative tendencies probably reflect the strength of communal sentiment, but they may also reflect prejudices against particular groups, especially low-caste or religious groups. By and large, the segregative tendency is probably stronger among the uneducated than among families on the higher income and educational levels where caste or religious interests and loyalties, if they exist, become secondary or even unimportant factors in selection of a residential site.

Data are not available to indicate the residential locations of all Hindu castes, of which there are upwards of a hundred in the city. Even where a number of castes are considered collectively—"depressed" or "scheduled" castes, for example—the broader categories conceal segregative tendencies of particular castes. Residential locations of "depressed" castes in the city therefore do not tell us anything much about the locations of, say, the Adikarnataka, Korama, and Koracha castes. But since the various depressed or untouchable castes have a social position and style of life that are fairly comparable, we are able to secure some idea of their ecological position in the community. It is clear that the depressed castes manifest a tendency toward segregation, with some areas having more than half the residents in this class of castes. No doubt within these larger areas would be smaller areas in which occupancy by particular depressed castes would approach one hundred per cent.

It is interesting to note that areas of highest occupancy by depressed castes are on or near the city's outskirts. This is the reverse of the situation in the United States, where the major "depressed caste"—Negro—lives mainly in the deteriorated sections of the inner zones of cities. Undoubtedly there is more pronounced segregation of American Negroes than of depressed castes in Bangalore. Only five districts in Bangalore had no low-caste residents, but most of the white residential areas in American cities are occupied exclusively by Caucasians.

Members of the Brahmin caste, at the other extreme of the social hierarchy, show similar segregative tendencies. This is evidenced by the fact that 14 census districts have less than 1 percent Brahmin residents, whereas in four districts more than half the inhabitants are Brahmins. There is a strong tendency for the Brahmins to concentrate in the western part of the city in the original Bangalore municipality. In general, areas occupied heavily by Brahmins and other high caste Hindus are attractive residential districts, among the most attractive in the city. But not all Brahmins live in fashionable districts, whatever may be their position in the social hierarchy. Some of them, in fact, live in physically deteriorated houses under conditions of congestion.

Of the religious minorities in Bangalore none is perhaps as tightly segregated as the Muslim "community." There are four important Muslim concentrations, most of which represent extreme congestion. Segregation of religious groups, however, involves something more than mere religious differences; it is segregation based on a whole complex of beliefs and behaviour patterns that differentiate Muslims, Hindus, Christians, Parsees, and other groups one from the other.

Europeans, Indian Christians, and Anglo-Indians are heavily concentrated in the Cantonment. Europeans by virtue of their comparatively superior incomes tend to live in areas of high quality houses, or at expensive clubs and hotels. Indian Christians are widely distributed according to their purchasing power, the affluent living in areas having superior housing accommodations.

Anglo-Indians show a marked tendency to develop their own community life and therefore to reside in areas occupied by others of the same racial mixture. Most of them are concentrated in the southeastern portion of the Cantonment in districts locally known as Richmond Town, Langford Town, and Austin Town. As a culturally marginal group which, in the past, chose to be identified with Britain rather than with India, but whose members were often socially unacceptable to both British and Indians, the Anglo-Indians developed a "birds of a feather" consciousness which was manifest in residential segregation. To what extent they actually preferred to live apart it is difficult to say, but since they were *persona non grata* to the British and to many Indians as well, particularly Hindus and Muslims, spatial isolation was a logical outcome of their social isolation.

The familiar ecological picture of an American slum is a zone centering around, or adjacent to, the central business district, with perhaps radial extensions of deteriorated areas along transportation routes or waterways, or around manufacturing establishments. Ecological theory has interpreted the American slum as an "area in transition," the result in part of a continuous process of invasion and succession by population, industry, and business. This invasion is most spectacular in expanding cities where competition for favourable locations is intense. The unstable character of the area is reflected in physical deterioration and, commonly, social disorganization. For the most part it is the city's low rent area, and for this reason tends to be the port of entry for impoverished in-migrants.

Bangalore presents no such picture. The central business district around Central Market has never experienced an areal expansion comparable to the pattern so common in American cities. Consequently there has been no significant ecological invasion by business of adjacent residential districts; hence no "zone of transition." Until the past thirty years or so the population and economy grew slowly. Only in recent years has rapid economic expansion occurred, and it has been mainly industrialization. Although the residential areas surrounding the central business district and the more important secondary business centers are characterized by high density and by various manifestations of social and personal disorganization, they are by no means the areas of poorest housing, nor are they occupied by the lowest income groups.

The most conspicuous slums, at least in the physical sense, are located elsewhere, some of them on or near the periphery of Bangalore. Unoccupied fringe areas are often settled by in-migrants who cannot afford to pay rents charged in the inner zones, even if they could find housing accommodations, which is not always the case. Furthermore, by settling on the periphery they may retain their communal solidarity if there is a considerable migration of persons representing a particular caste. It is therefore easier and cheaper for them to erect mud huts on the fringe than to find rental housing in areas already occupied. There are several such areas, all of them located outside the immediate vicinity of the business districts. Some of these settlements have been surrounded by the expand-

ing city but continue to exist at points intermediate between the outer fringe and the central zones of the city. This pattern of outlying slums appears to resemble more closely the ecological configuration of Latin American cities than of cities in the United States.

UPPER-CLASS AND MIDDLE-CLASS DISTRICTS

The residential areas of highest prestige are not on the outskirts, as is usually the case in American cities, but are somewhat centrally located. Probably the most fashionable district in the city is on or near High Ground, a slightly elevated area in the northwest sector, about two miles north of the central business district but well within the city. Just south of High Ground, north of the "big business" district on Kempe Gowda Road, is another high-income residential area, presumably somewhat less fashionable than the High Ground district. Still another, Basavangudi, is about a mile south of Central Market. Many of the homes in these areas are spacious and luxurious. Most of the middle-class residential districts are well within the city limits.

RESIDENTIAL DECENTRALIZATION

Suburban developments beyond the settled portions of Bangalore simply do not exist. Wealthy or well-to-do families have shown little inclination to shift to fringe areas. No doubt inadequate transportation in the past tended to discourage residential location very far from the center of activities, but even with modern transportation facilities available—automobiles and buses—there is still little evidence that Bangalore residents are interested in suburbia as a way of life. Since residence in certain areas within the city (High Ground, for example) is a symbol of prestige, high status families presumably prefer to be identified with residential localities that support or enhance their own claims to status. Certainly the suburban mode of living does not have the popular appeal it enjoys in the United States.

Nor have workers shown any marked tendency to develop industrial suburbs adjacent to the outlying manufacturing establishments. Even Hindustan Aircraft and the Indian Telephone Industries, located five or six miles beyond the city's boundaries, have not become the nuclei of satellite factory towns. The thousands of workers who are employed in these industries reside in Bangalore and commute by bus, work train, or bicycle. These industries are relatively new, however, and it may be that in time they will act as a magnet for suburban developments of workingmen's homes. At any rate, the absence of any marked pattern of suburbanization gives the city a compactness that is not characteristic of most American metropolises.

This is not to say that fringe residential developments are completely absent. Public housing programs, mainly for working-class or lower-white-collar families, are located on or near the city's edge. Housing construction under private auspices likewise tends to assume this pattern—extensions of the outer edges of metropolitan settlement rather than the development of detached satellite communities. Basavangudi, a new upper-class district on the south side of the city, is a case in point.

CONCLUSIONS

The present ecological structure of Bangalore bears the heavy imprint of the city's historical past. That past was characterized by limited industrialization, slow economic growth, divided political authority, and extensive planning, especially in the Cantonment. Today there is an upsurge of industrialism. Bangalore is the industrial boom town of South India. A planned economy is in prospect, both for the city and the nation as a whole. There will undoubtedly be continued population growth, and rapid growth at that.

What effect, if any, will these changes or others have on the basic ecological structure of the city? Will industrialization, along with developments in trade, transportation, and communication, evolve a pattern similar to the Western configuration? Will communal segregation (caste and religion) decline in the wake of measures taken to strengthen political and economic democracy? Only a self-assured prophet would attempt to provide specific answers to these questions.

A possible clue to future ecological changes may be found in Latin American cities. Dotson,[3] Caplow[4] and Hayner[5] observed a tendency for the classical pattern to change under the impact of technology and North American or European value systems. The most industrialized metropolis of Latin America, Mexico City, has exhibited rather striking changes in the direction of ecological configurations similar to those of cities in the United States or western Europe. It is possible, then, that the impact of industrial technology, large-scale economic organization, modern transportation, and Western status values will bring about similar changes in the ecological structure of Bangalore.

There is reason to believe that industry will become increasingly decentralized and that industrial districts will eventually emerge. In fact, the Improvement Trust Board has already delineated several fringe districts for new industrial developments, and all of these areas are well beyond the borders of the city. What is not so clear are possible trends in the ecology of business. Fundamental changes in the organization of trade, such as the growth of large-scale chain enterprises, would likely make for greater centralization of controls and hence stimulate the growth of a central business area. But such changes will likely come slowly. For a long time Bangalore will be a city of small shops.

Nor is it clear what the trend will be in patterns of residential segregation. The removal of caste barriers penalizing the untouchables or scheduled castes, together with a general improvement in their economic position, may make it possible for them, as well as other minority groups, to achieve a more favourable ecological location. But the ties of caste, family, and religion are strong, and existing ecological patterns so deeply imbedded in custom, that changes will probably come slowly for most of the groups. Possibly the most effective force making for re-distribution of the various caste, ethnic, or religious groups will be slum clearance and public housing programs in which occupants will be selected on the basis of need rather than social or cultural attributes.

The foregoing observations demonstrate clearly a fundamental problem of ecological theory as well as of sociological theory in general. It is the hazards involved in developing theories of society based upon observed data from a single society or culture area. Generalisations derived from a single culture tend to give American sociology a rather narrow provincialism which seriously limits its usefulness outside our national boundaries.

3 Floyd Dotson and Lillian Ota Dotson, "Ecological Trends in the City of Guadalajara, Mexico," *Social Forces*, 32 (May, 1954), pp. 367-74.

4 Caplow, *op. cit.*

5 Norman S. Hayner, "Mexico City: Its Growth and Configuration," *American Journal of Sociology*, 50 (January, 1945), pp. 295-304.

The Phenomenon of Longevity

By PROFESSOR CHESTER ALEXANDER, Ph.D.
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One of the most impressive facts derived from studies in the fields of population is that the lifeline of mankind is steadily growing longer. This is of immense significance, whether viewed from the interests of the individual, or from the range of social affairs. In the former case there are many matters which depend on the continuity of life such as the homogeneity of the family, the changing physical needs of the individual from childhood to advanced years, and the necessity of arranging for interests and occupations which will keep people occupied over a longer series of years.

From the angle of social interests it is readily seen that such major affairs as an increase in the proportion of adults in a population, the factors involved in medical services, and the kinds of housing needed as the ratio of children to adults changes. These are but a few of the examples of problems which follow in the wake of changes in the mean age, and the standard deviation of ages, and they cannot be disregarded excepting at the expense of some social disorganization.

Meditation on the number of factors which may be involved in this changing human lifeline resolves into two sets of problems. First, the causes bringing about this extension of life averages, and second, the social consequences. Taking the first of these, we observe quite readily that there are several areas within which one may search for causes, genetic influences, the natural environment and culture.

LONGEVITY AS A GENETIC TRAIT

It is clear that these three areas just mentioned cannot be completely separated for leisurely examination, but we can select certain specific data from each of them and subject them to measurement.

If longevity is a heritable trait then one would expect to find that long-lived parents would produce long-lived children, if enough samples are examined, while short-lived parents would bear children who would also live relatively short lives. Certainly one would expect to find exceptions but several samples containing thousands of cases should exhibit some statistical relationship which would be enlightening.

TRENDS BY COUNTRIES

Data were gathered showing trends in life expectancy at birth for males and females in 20 countries over a period of 21.65 years. The following increases were noted :

Countries	Increases *Males* years	*Females* years
Norway	.595	.513
Germany	.565	.551
United States (non-whites)	.561	.708
Netherlands	.530	.505
Switzerland	.402	.408
Japan	.397	.536
Canada	.386	.246
United States (whites)	.378	.495
Italy	.360	.406
United Kingdom	.334	.348
South Africa (whites)	.323	.340
Sweden	.312	.307
Finland	.304	.382
Australia	.296	.296
Scotland	.295	.316
Denmark	.292	.264
France	.291	.331
Belgium	.271	.286
New Zealand	.255	.239
Bulgaria	.154	.178
Ireland	.109	.204

INFANT DEATH RATES VS. LONGEVITY

The table given above indicates that there is a slow, steady increase in mean longevity of the populations in the 20 countries listed. One of the most commonly stated explanations for this increase is that a larger proportion of newborn infants is saved each year, thus contributing to the mean lifespan of the whole populations. Few of us would doubt that infant death rates are falling, but we wish to know their relative effects on longevity. As an example, Census data for the United States of America show a steady decline in infant death rates since the beginning of this century, from 162 per 1000 live births in 1900 down to 54 in 1949. This indicates a decline from the loss of one newborn infant in about every half-dozen born to one out of every thirty births. Such figures, while they contain welcome information, do not in themselves prove that the mean extension of the human lifeline is fully explained by the diminishing frequency of infant deaths.

If the upward trend in the average length of human life were to be explained solely by the proportion of infants saved each year there should be a close inverse correlation between infant mortality and the expectation of life at birth. A test of these data, however, yields a factor of — .22, which is not high enough to support that supposition. We cannot even say that it plays a very significant part in extending mean longevity, nevertheless more specific data should furnish some illustrations. The following table will present figures for the mean gains in life expectancy by 9 age groups.

Age Groups Years	Males Years	Females Years	Male-female Years	Mean in % of the total mean increases
Under 1	.3331	.3568	.3450	26.00%
1–10	.2485	.2840	.2663	24.00%
10–20	.1730	.1985	.1858	14.00%
20–30	.1465	.1687	.1576	12.00%
30–40	.1061	.1290	.1176	9.00%
40–50	.0752	.0937	.0845	6.00%
50–60	.0496	.0674	.0585	4.00%
60–70	.0381	.0493	.0437	3.00%
Over 70	.0231	.0375	.0303	2.00%

The material used in this table was derived from population data from the countries just listed, and over a span of 21 years. A moment of study shows that nearly three-fourths of the gains indicated were made by people beyond the stage of infancy. The per cent of gains made by infants together with those made by children up to ten years of age account for about 50% of all gains over the 21 years. Stated otherwise, half of the gains in longevity were made by the rest of the population. Another angle is that 24% of the gains were made by people 30 years of age and older, or we may say adults. It is obvious that the mean increases decline as the average age of the groups increases, but it is also significant to note that 9% of the gains are made by persons who are over 50 years of age.

SEX DIFFERENCES IN GAINS

Another point of interest is that females are registering higher gains than males in nearly all cases. While the differential is greatest for the younger groups, the females exceed their opposites in all of the nine age classes.

As pointed out previously the extension of the life span is being registered by all age groups, even those beyond the opening of the seventh decade of their lives. Data available for the United States show that the death rates for persons between 75 and 84 years of age was 123.80 per 1000 during the first part of this century, while in 1949 it had fallen to 94.50. Even those persons over 85 showed a reduction from 260.90 to 238.00 during the same period which is a significant advance.

LONGEVITY AS A FAMILY TRAIT

We are still considering the possibility that longevity is a genetic trait, passed on from parents to children, and even that it might occasionally skip a generation. In order to explore this approach the direction of this research was turned toward studies of biologically related groups, and for comparison, to several non-related control groups.

FATHERS AND SONS

Several samples, containing 5380 cases, were analyzed statistically, only to find the factor of correlation to be .08, which could

not be said to be greatly significant as evidence of the genetic transmission of traits of longevity.

FATHERS AND DAUGHTERS

Another set of samples, containing 4216 fathers and daughters, were used in a search for the factors of genetic inheritance of possible traits of longevity. The mean r. is .03, positive indeed, but of lowly significance in showing longevity to be biologically inherited. We note that fathers seem to have contributed little to either sons or daughters.

MOTHERS AND SONS

One could suggest that perhaps the hypothetical genes which govern longevity are transmitted only through the mothers, but samples containing, to date, 5318 cases produce an r. of .08, which resembles the father-son results, but of no more statistical significance.

MOTHERS AND DAUGHTERS

A check of 3012 cases yielded a factor of .04, which yields no greater support for the belief that longevity is parent-child linked through birth than did previous thousands of cases. Since we have found little mathematical support for the contention we might examine the possibility that grandparents are the real donors of long or short lifespans.

GRANDFATHERS — GRANDDAUGHTERS

Several samples, totalling 3374 cases up to the present time, present a correlation of .08 which is the same as the one found existing between fathers and sons, yet of small significance.

GRANDMOTHERS — GRANDSONS

In these 2384 cases we likewise, have found little to support the hypothesis for r. was found to be only .09.

GRANDMOTHERS — GRANDDAUGHTERS

Here again, in analyzing 2226 cases to date, we discover that r. is .08, similar to the father-son and grandfather-granddaughter analyses.

MEAN PARENT AGES VS. THEIR CHILDREN

Since none of the parent-sibling or second generation comparisons produced high factors it seemed appropriate to use the mean age of parents vs. children's ages in the search for the genetic transmission of traits of long-life or short-life. The 10 samples, containing 9862 cases to date again were limited to .08 or nothing better than was found earlier, or little above the .04 found in comparing 2658 cases of grandfathers-grandsons. Undoubtedly parents do transmit life itself, and certain elements of robustness or frailty, but direct mathematical evidence is lacking for large groups, of longevity being passed on as a distinct genetic trait.

CONTROL GROUPS

Whether data are large or small is not easy to judge unless one has some background against which they may be evaluated. This may be made up of a few control groups. The first is a set of 5000 husbands and wives compared according to their longevity, and of course retained in their marital pairs. There may have been a few first or second cousin marriages but very probable it is that the great majority of them were not known to be of kin.

The factor of correlation proved to be .05 which might be considered as a marker for future comparisons of related persons. While the factor is still small one notes that it is larger than some of the mean factors of previously presented groups. Likewise we observe that there might be certain similarity in length of lives between husbands and wives which are not directly ascribed to genetic traits. Such matters in selecting mates, as health, known communicable disease, kinds of homes from which the mates do come may be similar. Likewise, after the wedding there would be sharing of foods, mutual protection, attention to quality of clothing available, and similarity of ages. Whether these would be sufficiently effective to produce an r. of .05 or not, we have no proof.

The second control group consists of 600 parents (300 pairs) which were correlated with 968 children who were offspring of other parents in the study, and not kept in sibling groups. No kinship was visible in the sample. The correlation factor was found to be .05, quite within the range of previous findings for kinship groups.

The third control group was composed of 400 adults, 200 men and 200 women who were paired, quite unrelated by any known bonds, excepting that they all belonged to the species Homo Sapiens, and r. was found to be .02, or as near zero as some of the kinship pairs were.

SIBLINGS AND LONGEVITY

Even if the preceding evidence regarding the hypothetical genetic factors involved in human longevity did not prove to be very convincing there remain some other approaches which should be investigated. Among these is the brother-sister factor of correlation in longevity.

Six samples, totalling 7332 cases, show a mean factor of .21 which is quite large compared with the kin, and non-kin samples, yet by no means of great significance. Children do tend to resemble one another in lifespans more than they do their parents.

But we are not at liberty to state that these resemblances are due to genetic influence only, because children probably receive equal care in the home, when rated in terms of survival. It should be pointed out here that children under their 10th birthday were not included in the count. This was done to minimize the effects of high infant death rates in certain countries, and at certain times.

DECENNIAL AGE GROUPS

The process of dividing parents into 10-year age groups was tried in order to find out what would be the results when the mean ages of their children were introduced. A total of 3260 cases have, so far, been included in this phase of the present study. The following table sets off some of the data found:

Mean Ages of Parents	Mean Ages of their Children
Under 30 years	64.13
30 to 40 „	56.00
40 to 50 „	56.16
50 to 60 „	54.16
60 to 70 „	55.98
70 to 80 „	58.41
80 to 90 „	61.69
90 to 100 „	63.37

There is little evidence of a positive inclination of the curve of mean ages of children as parental ages increase. It may not have much significance at the present time but we do note that the shortest lived parents had the longest lived children. Future data may stabilize the series as additional thousands of cases are added. Obviously the last named parent group is not a large one since they have so far exceeded the mean age that they are infrequently encountered.

LONGEVITY OF MOTHERS VS. NUMBER OF BIRTHS

Whether this part of the study may be considered from the common belief that much child-bearing shortens a woman's life, one must keep in mind that short-lived mothers, whatever may have been the cause of their early termination of the lifeline, would not have had time to bear many offspring. Further work is being done on this phase of the whole investigation, but to date, comparing data for 1026 families we find a correlation of .62 for length of lives of mothers in correspondence with the number of children they bear. We note that it is positive, and fairly high, which, among other interpretations, one might conclude that child-bearing coresponds fairly well with maternal longevity.

SUMMARY OF FINDINGS REGARDING GENETIC FACTORS IN LONGEVITY

The preceding analyses, paired in numerous combinations, cover specific data for more than 20,000 persons at the present stage of this investigation. The factors of correlation, given below, do not bear strong evidence that longevity is a heritable trait.

Major Analyses	Cases	Mean r's
1. Fathers and Sons	5380	.08
2. Fathers and Daughters	4216	.03
3. Mothers and Daughters	3012	.04
4. Mothers and Sons	5318	.08
5. Grandfathers-Grandsons	2658	.04
6. Grandfathers-Granddaughters	3374	.08
7. Grandmothers-Grandsons	2384	.09
8. Grandmothers-Granddaughters	2226	.08
9. Siblings	7332	.21
10. Longevity of Mothers vs. Number of children	1026	.62
11. Mean of parents' ages vs. Longevity of Children	9862	.08

This section of the study which has just been presented represents a cross-section of sixteen sub-problems which are designed to inquire into the assumed heredity of factors governing the length of the human span of life. The sizes of the samples are being increased steadily, with the intent of testing these factors that have been given.

There are 10 more of these approaches which are being studied which may yield light on some future date. Among these remaining parts of the study of the genetic traits in longevity are :

(1) Analysis of data covering a series of 10 generations of fathers in succession, and similar material for the mother side;

(2) Longevity of children compared with the size of the family;

(3) Data for some European populations;

(4) Longevity of children compared with the order of their birth;

(5) Sampling by centuries;

(6) Data for race groups;

(7) Data for persons who are placed in hospitals for mental disease.

These studies will appear from time to time.

THE NATURAL ENVIRONMENT

The first area within which one may search for factors which have been of major significance on human longevity has just been presented. We do not consider the subject exhausted, either in scope or in depth, indeed that part of the research is steadily moving onward into a more intensive investigation. The second area into which inquiries will now be made is that of the natural environment. The present hypothesis is that such natural elements as climate, quality of the soil, conditions of water supply, minerals, humidity, insects, forests, deserts, are all among the factors which might be considered. To these might be added others as the investigations proceed.

Undoubted is the statement that we have so far no precise records of large groups of people facing any of these natural elements without the intervention of some parts of culture. Man, unaided, would hardly be able to exist in an untouched natural setting without the presence of fire, cooking methods, shelter, and a few other primary essentials. Thus we come to realize that an equilibrium between a people and their land depends on an unknown number of elements and processes, which simply means that an optimum population is a variable, difficult to maintain, or predict for any given time.

MACHINES AND THE BIRTH RATE

Through the introduction of inventions or borrowed culture traits man's social environment is under constant change in most of the inhabited parts of the earth. Agriculture is several thousands of years old. Mechanized industry is probably much younger, yet the two do affect social life, affect one another, and affect longevity.

In examining this hypothesis about the inter-relationship of industry and agriculture the author gathered data from 36 countries (total population 938,014,771) regarding birth rates and the proportion of women engaged in agriculture, then similar material concerning the number of women engaged in industry. The factor of correlation between birth rates vs. women engaged in agriculture was found to be .34. For the birth rates of women engaged in industry the factor became —.33.

From these figures it seems that the introduction of industry into a given agricultural area will have an adverse effect on the birth rates, consequently on the age distribution of the population, likewise on the mean age of the people, and finally on the death rates. The effects of machine industry will eventually reduce the birth rates, bring down the infant death rates, and, since infant death rates, correlated with mean gains in longevity over 21 years, show that such reductions equal only 26% of all gains in life expectancies, one may predict that longevity will increase.

Stated otherwise, machine culture and longevity have a positive relationship, measured mathematically. This, we realize, is an effect of a cultural intervention into what has been an environment more directly faced with nature herself. Farmers live on the

soil, and work it. Factory people work under roofs, under artificial lights, probably milling goods brought from far places. Indeed industry is governed to some extent in its location by raw materials, but we may also say it is governed by transportation and markets as well.

We may, deducing what we can from the data just given, hold that where industry exists longevity increases, due largely to the falling birth rate, and the mean age of populations will go up.

LAND DENSITY VS. DEATH RATES

The factor of correlation between the density of population per square mile and infant mortality rates for 35 countries (population 1,174,140,000) was found to be —.21 which suggests that world-wide, infant death rates fall as density increases. Further, as infant death rates fall longevity will take an upward turn, even when the number of people occupying the land is also increasing. And still further, it appears that the infant death rates, also longevity, are not necessarily dependent solely on land occupancy. Stated otherwise, they seem to be more directly related to the degree of culture, or what people do for a living, than on how many people live in a given area. Certainly there are limits on both ends of such a continuum, but the sample of 35 countries does not show clearly where the limitations are.

It was just stated that the factor of —.21 applies to infant death rates, but the same reasoning does not necessarily apply to adults directly, for the correlation between density and general death rates is only .03, or very little inter-relationship. We recall that the samples given constitute nearly half of the population of the earth, but we do not necessarily imply that similar factorial results would be obtained over half a century for a given country with figures taken annually. That is still to be considered in a future investigation.

Certainly there are a few countries where density, death rates and longevity are closely related, to the detriment of the last named. Countries such as Surinam and Ruanda show this. The opposite, however, appears in such countries as Belgium and Netherlands. The explanation may be sought in such cultural traits as literacy, general education levels, sanitation, medical services and others.

BIRTH RATES VS. DENSITY

Pearl found a correlation of r. — .175 with a probable error of .057 between birth rates and density, but he did not have a very large sample. A much more comprehensive analysis was made of 37 countries with a population of 1,569,929,000, covering their birth rates and degrees of land occupancy, for which the factor was found to be —.34, negative as Pearl's was, but twice as large, and probably statistically more significant. This factor gives some support to the view that birth rates fall as density increases, or as pressure on the land grows the birth rate falls, then the infant death, and eventually a longer life span. We must point out, however, that while this is based on over half of the earth's population, it may not apply to a few individual countries at present.

DENSITY AND LIFE EXPECTANCY

Having examined the data and found that death rates and density are related by r. .03 and birth rates with density by —.34, we may next inquire regarding the effects of density on life expectancy at birth. Information gathered from 36 countries, which have a total population of 1,438,808,000 show the two are related by a small factor, i.e., r. .08, which does not support Deevey and Hutchinson's suggestion that longevity rises or falls as density varies (*Ecological Studies of Population*, N. Y. 1949).

It seems, then, fairly accurate to state that countries which are considering their population policies, with respect to the welfare of their people, will not be greatly concerned over the belief that death rates will rise as density increases, for the factor of correlation, as given above, is only .08 at this mid-century, based on a very large world sample.

Apparently the mean length of life may continue to increase whether density changes or not, but up to what limits we do not know. It seems, however, that the state of culture at a given time is the conditioning factor, not land. Longevity continues to rise in lands where there is not even one whole acre per person. Canada and Switzerland,

to take two examples, have densities of 1 and 112 persons per square mile while their life expectancies are 62.95 and 62.68. If this is an acceptable premise then the cry for "more land" might well be changed to "more cultural development".

DENSITY OF POPULATION AND ARABLE LAND

The term "density" is frequently considered to mean the number of persons per given unit of land, but that view tells us little about the quality of the soil. Arable land, the better sort for crops and grazing, is in lesser quantity, and much more sought after, consequently having a higher density. Data for 35 countries, with a total population of 1,466,298,000 persons show that the quantity of arable land compared with the population renders an r. –.91. This being negative obviously means that the good earth is at a premium. We shall next inquire whether this concentration of peoples has anything to do with their longevity.

ARABLE DENSITY AND LIFE EXPECTANCY

Having found an r. .08 between gross density and life expectancy at birth, and an r. –.91 between density and arable land per capita, we may be inclined to assume that mankind tends to occupy the good soil in constantly increasing numbers, and at the same time the lifeline keeps on growing. The present worldwide statistical data, however, do not show that r. between the degree of occupancy on the most fertile soil and the life expectancy of those people is high. For 34 countries, having a population of 1,461,663,000 it is .18. Since it is not greater we may suggest that other factors are involved such as the amount of industrial development which has taken place, and the degree of general education.

There is little occasion to doubt that the inter-relationships between physical man, his natural environment, and his culture are so closely interwoven that complete separation for study is not possible. At birth the effects of culture are probably at a minimum but in a short time those persons around the newborn become busily engaged in placing culture in operation, which in time will begin to have its effects on longevity. One of these effects will be literacy.

DENSITY AND LITERACY

This, as well as others of the areas of investigation to be mentioned shortly, will serve to illustrate the paragraph above. To this point, since the quantity and quality of soil do not have a high correlation with longevity they indirectly become related to other factors. In time good soil will provide wealth which will be used to elevate the standards of living, among which will be printing, books, schools, and in time, general literacy. The complementary assumption is that poor soil and illiteracy have a tendency to cling together. Certainly we could list countries with high density and low literacy, we also could mention lands where the opposite situation prevails.

Since literacy is a measurable trait it can be readily compared with density. The factor found to exist between density and illiteracy was .0002, in 30 countries with a total population of 725,866,821. This definitely means that, in present worldwide figures there is no consistent relationship at all, so we cannot say that people who live on the good soil will inevitably have more education than those who live on poor soil. Other factors must be given major consideration also.

Further evidence of the intervention of culture is found in a study of 25 countries, with a population of 424,993,945 the mean degree of illiteracy varies from 46.27 per cent for persons over 60 years of age, downward to 23.54 per cent for children 10 to 14 years of age. It seems, however, that the cultural trait of literacy may change considerably within given countries, and even within one living generation, at the same time when the density of population is increasing.

SCHOOLS AND THE ARABLE LAND

It is quite obvious that literacy is the product of the primary schools, and one might expect that the better schools would be found where rich soil is most abundant per capita, yet the correlation between the proportion of children in primary schools in 27 countries with a population of 1,421,849,000 people, and the quantity of good soil per capita is only .26, positive, but not very high.

Among other implications this suggests that the wealth which is necessary to establish a fairly comprehensive primary educational system is derived from other sources as well as from the richness of the land. It also indicates that geographic density, even on good land, is not closely identified with illiteracy, or even with the level of culture in a given country, neither does it have a close relationship to longevity.

CULTURE AND LONGEVITY

Neither natural environment nor biological inheritance has been found to be highly significant in terms of factors governing human longevity, so in the search for more information we turn to the third major area, human culture.

ILLITERACY VS. LIFE EXPECTANCY AT BIRTH

As we found only a limited interdependence between the per capita quantity of good soil and the degree of illiteracy we may postulate other factors which intervene. The degree of literacy is one of them, almost the complement of the data we just mentioned. Its counterpart, illiteracy, does appear to be closely related to longevity in a negative manner since r. for 23 countries, with a population of 773,854,000 people was found to be –.87, with a probable error of .03. This is one of the highest factors we have found to date in the search for data related to the length of human life.

It becomes evident that the inability to read is a barrier between the individual and all printed information, whether they convey news, matters about health, warnings about contagion, and many other similar matters. Verbally transmitted information could not be of sufficient volume, nor of similar accuracy to replace the effectiveness of literature, hence literacy. The absence of a fairly high degree of literacy also indicates a culture in which there are other forms of poverty—economic, sanitary, dietary and housing—all of which may affect health conditions.

FOOD VS. LIFE EXPECTANCY AT BIRTH

A comparison of figures which show the number of calories of food available at the retail level, per day, per person, in 26 countries, population 954,319,000, with the life expectancy at birth in the same list of countries, provides an r. of .87 which is indicative of a close relationship. It does not indicate, however, that the food supplies are necessarily produced in the soil of these given areas, for some of them are well industrialized, hence able to export manufactured goods in order to purchase foods in exchange. It is also significant to note that the getting and distribution of such foods are processes which evolve from the culture of a people, hence serving as an illustration of the close ties between certain cultural traits and longevity.

FOODS VS. INFANT DEATH RATES

A large proportion of the total number of death rates for many countries is occasioned by the losses of infants under one year of age. We cannot say, however, that these infant death rates are major factors in governing longevity of a population for we recall that, of the total gains in longevity over 22 years, in a score of countries, 74% of these increases were made by persons beyond their first birthdays, and shared by persons up to 70 years of age.

In a listing of food data for 32 countries, population 1,439,774,000, and a comparison with the infant death rates of those countries the factor of correlation was found to be –.78. This seems to bear evidence that the food supply has an adverse effect on infant death rates. Such, of course, does not prove that hunger is the direct explanation, yet inadequate foods may affect longevity in several ways.

FOOD SUPPLIES AND ADULT DEATH RATES

Apparently an inadequate food supply for the whole population is more harmful for infants, directly or indirectly, than for adults, because a parallel series of correlations were run off, in order to find what r. would be. The factor showing the statisti-

cal relationship between available calories of food per person, per day, and death rates proved to be –.59, still high, but considerably below the –.78 for infants. Again, we do not assume that insufficient food is the only cause of a restricted lifespan but a well-fed country may also have other life-preserving cultural devices such as good housing, high literacy, ample medical attention, and a fair family income with which these devices become available to a large majority of the people.

FOODS AND THE DENSITY ON ARABLE LAND

In the preceding discussion regarding the relationship between geographic density and the quantity of good soil per capita, where the correlation was found to be –.91, we mentioned that people seem to be strongly inclined to cluster on the fertile areas of the earth. We may also suggest that there may be a high correlation between the calories per diem, per capita and the quantity of good earth in a given area. In actuality, however, r. falls to .31, with a probable error of .01, when we explore the interdependence between among 1,607,783,000 people in 36 countries and food supplies, which can mean that people may be well fed without having a large amount of good soil. This indicates, as was pointed out previously, that culture intervenes in other ways.

Where density is high, and land inadequate to provide food in sufficient variety and quantities to keep standards of living high there are three things which people may do: migrate, reduce their standard of living, or develop industrial-commercial occupations to produce goods in exchange for calories.

Examples of high calorie countries are: Australia, 3,210 per day; Denmark, 3,180; United States of America, 3,170; Canada, 3,140; Norway, 3,140; and Finland, 3,100. In addition to these, of course, one could name others, but on the opposite side of the scroll we find India, 1,620; Ceylon, 1,800; Burma, 1,990; Pakistan, 2,130; Italy, 2,370; and Egypt, 2,480. There are several other approaches which could be used in a statistical investigation of factors which are related to longevity, but space limitations make it necessary to withhold some of these for future reference. One more, however, still demands consideration in a discussion of the relationship between culture and longevity.

LONGEVITY AND EMINENCE

Studies reported upon a number of years ago, made by Galton, left the impression with some that eminence is purely the result of superior innate mental capabilities which are handed down from one generation to another. The present point of view is that one's position in a given culture has a lot to do with his attaining eminence, or missing it. Superior mental ability requires a lot of cultural development. At any rate when the eminent are listed one finds a fairly consistent, positive relationship showing their life expectancy to be above that of their respective general populations. In order to test this, data on 9,400 persons, none living now, were gathered from bibliographical compilations of eminent people, and these compared with the life expectancies of the countries in which they lived.

The mean age for the 9,400 persons was found to be 67.105 years, while the mean ages of the countries in which they lived ranged from 26.74 to 65.31 years. Among the professional groups we found the following means, the number of persons being included in brackets. Educators (167) 72.56 years; Lawyers (270) 72.38 years; Engineers (168) 71.10; Naturalists (218) 71.09; Social Scientists (219) 71.01; Philologists (209) 70.85; Astronomers (116) 70.35; Historians (343) 70.12; Inventors (141) 70.09; Chemists (143) 69.67; Theologians (745) 69.28; Military Leaders (706) 65.53; Poets (684) 61.94; Explorers (196) 59.16; Royalty (523) 57.03. It should be stated at this point that only persons over 20 years of age were included, although their presence would have had little effect on the means presented.

These data, which have been taken from a much larger study by the author concerning longevity versus occupations, show that in almost all cases the eminent live longer than the adult population. Certainly one must keep in view that eminence is not easily earned in those countries which were used in this part of the study. Part of this restriction is due to the considerable amount of training which is needed before one is accepted by those who judge eminence. Another factor of importance is that the professional groups, known as the arts, quite generally reach a state of eminence earlier than do the scientists.

Further, it is evident that eminence nearly always requires both superior mental ability and considerable training. Now since eminence is being held to be so closely related to mental ability, and that the eminent tend to outlive the general population, therefore it seems that superior mental ability and longevity are also closely related.

If this premise is held to have some substance, then native mental ability may prove to be related to longevity whether the individual becomes eminent or not, even allowing that becoming eminent may increase one's social security. Then, as culture rises, longevity may be expected to increase, in which case culture might be viewed as the factor which liberates potentialities to a longer mean lifespan. To what extent this continuation may proceed we have no way at present of finding out. We are, however, faced with two major facts, longevity is increasing throughout most of the census world, and culture is expanding.

As far as the preceding reasoning may go humanity may look forward to an increasing life-span for an unknown number of years. This is held to be possible even in view that the top of the population lifeline is not advancing as fast as the mean, and despite the observation that the mean could remain fixed though the top figures might change, or the reverse can also happen.

We also realize that the basic and applied sciences have been industriously applied to finding the causes of infant deaths, and eliminating or minimizing them. We realize too that the same fields of science have not been so vigorously applied to the illnesses of the older people in the populations. A sort of mystic, fatalistic philosophy still exists amidst many millions of people that the illnesses of the elderly cannot be escaped, and, by the same token, are to be tolerated.

When we recover from the view that we have no stable evidence that human longevity is dictated by biological factors, or that the natural environment is an unconquerable obstacle, perhaps we shall turn our attention to the sources of the greatest effects on the lifespan. Then we may proceed to develop it for the benefit of all men in order that their lives may be long, fruitful and pleasant.

ACKNOWLEDGEMENTS

The author is indebted to many persons and sources for the data as well as for the inspiration for this research, both to resources which have printed some of his studies and to libraries from which original information has been received. To mention all of them would burden the printed page, but a few may be mentioned.

The Statistical Abstracts of the United States of America; The United Nations *Statistical* and *Demographic Yearbooks*; Sir G. H. Knibbs, *The Laws of Population Growth*, J. Am. Statistical Assn.; American J. of Sociology, 35: 402-10; Review of Pearl's *Biology of Population Growth*; Social Forces (Lundberg), Biology of Population Cycles; Notestein, *Proceedings of The Academy of Political and Social Science*, 1945; Census Bureau of the United States, *International Population Reports*; *Southwest Social Science Quarterly*; Vitality Indexes (Alexander) in *Research Quarterly*; *Midwest Sociologist*, Machines and the Birth Rate (Alexander); Dublin and Lotka, *Length of Life*; and many others.

Papers by the author have been presented at the University of California, University of Omaha, The National Meeting of the American Sociological Society in Washington, The Meetings of the American Statistical Association in New York and in Detroit, and the Meeting of the North American Biometric Society in Atlantic City, N. J.

Appreciation must also be expressed to the Department of Health, Education and Welfare for support of this project by grants, and to the Genealogical Society in Salt Lake City for the services of its library assistance, likewise to the New England Historic Genealogical Library in Boston for the services which it has rendered. We must also mention our appreciation for data made avail-

able by the Library of Missouri University, and the John Crerar Library in Chicago, likewise for genealogical data supplied through books from Westminster College Library.

A note of gratitude must also be expressed to Professor S. Chandrasekhar, distinguished population authority, for his penetrating suggestions in the preparation of this paper. In addition to the mention of persons and societies referred to above one should include a full vote of gratitude to the ten students and several adults who have assembled the large mass of vital statistics, analyzed them, and assisted in the machine calculations. Finally, one should mention that this research will proceed to much greater length than this paper presents upto this time.

"To maintain the present standard of living — a standard under which two-thirds of mankind never get enough to eat— the world's agricultural production would have to be increased at the same rate as the world's population. To achieve any perceptible improvement, this increase in food production would have to be stepped up to at least two and a half or three per cent per annum. As things now stand, there is not the slightest prospect that such an increase, on a planetary scale, can be made or maintained over a course of years. Meanwhile, as though the facts of biology were non-existent, the world's politicians and soldiers, its bankers and traders, its clergymen and ideologists, continue to play their respective games in the style to which they are accustomed. Rome burns to the accompaniment of a whole orchestra of fiddlers."

Aldous Huxley, "Politics and Biology"
Esquire (New York) April 1957. p. 46

Spatial Aspects of the Housing Problem in Aligarh, U.P., India

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To the student of India's population it is evident that the problem of housing her rapidly increasing numbers of people reached long ago a critical stage. Inextricably coupled with the problem of building the houses themselves is the problem of finding the *space* in which to put them. This study of the distribution of population in the city of Aligarh, U. P., may provide insights into the space problem of Aligarh that may be of value in understanding the conditions in other North Indian cities.

The city of Aligarh is located eighty miles southeast of Delhi on the Grand Trunk Road in Aligarh District, Uttar Pradesh. During its long history Aligarh has experienced the successive influences of Hindu, Muslim and British rule. Present-day Aligarh reflects these influences in its layout, its appearance, and in the distribution, density and characteristics of its population.

Aligarh was founded by Hindus or Buddhists as a caravansary town more than one thousand years ago on a flat, poorly drained site. Eventually, by fortification and the accumulation of debris, the level of the city was raised to nearly eighty feet above the plain. The city was conquered by the Muslims in 1194 A.D., and during the next 690 years the city spread out onto the lower land surrounding the nuclear hill. The Muslim influence is responsible for the narrow winding streets, congested residential and workshop quarters, and colourful bazaars that characterize the old part of the city.

After a brief interlude of Maratha rule during the breakup of the Moghul Empire, the city was captured in 1803 by the British. On the flat plain two miles north of the old city they established a military cantonment and the 'Civil Lines', a European residential area with wide, straight streets and large bungalows surrounded by gardens.

The Delhi-Calcutta railway line, which was completed in 1864, raised a massive physical barrier between the Civil Lines and the old city. The improvement in transportation, together with the rise in India's cotton exports in the latter half of the nineteenth century, caused the development of a new industrial area between the old city and the railway, with large cotton presses and cotton gins. The lock and hardware industries, which were outgrowths of a postal equipment factory established in the Civil Lines by the government, spread through the old city in small workshops.

In 1875 the Muhammadan Anglo-Oriental College, which became the Muslim University in 1920, was established on the cantonment lands. In the period between World Wars I and II two Hindu colleges and a college for Muslim women were founded.

Thus Aligarh today serves many functions. It is the administrative and judicial headquarters of Aligarh District. It is an educational center of world renown. It is a railway junction, an industrial city, and the commercial headquarters for a large trading area. It is the home of nearly 150,000 people.[1]

FUNCTIONAL STRUCTURE OF ALIGARH

The map of Aligarh's *functional areas* (Figure 2) shows graphically how the past has influenced the layout and appearance of the present-day city. These areas are sections of the city that exhibit a broad unifor-

[1] In the *Census of India* for 1951 the population of Aligarh was shown to be 141,618.

mity in land use, building styles, street pattern, and population characteristics. Each of them makes a recognizable contribution to the life of the city or to Aligarh District.

Densely built up old city: The ancient nucleus of Aligarh is represented in the present-day city by the densely built up residential and workshop areas of the old city. These areas are almost completely built over. They have a large proportion of multi-storied residential and commercial buildings, many of which are in a bad state of repair.

The contribution of these areas to the economy of the city is very great, since here in small workshops are made many of the locks and hardware that Aligarh sells to other parts of India and overseas. The workshops are in most cases near or combined with the residences of the workers and owners. Few of the workshops manufacture entire locks. Instead, the various components are cast, machined, assembled, and polished in hundreds of separate locations by workers who have become specialists in some phase of lockmaking.

Two different densely built up areas are shown on the map. One of them is predominantly Muslim in religious composition. It occupies the ancient nuclear mound and several *mohallas*[2] on low land west of it. It includes the Friday Mosque and the headquarters of Tahsil Koil, the subdivision of Aligarh District in which Aligarh city is located. The other area has a predominantly Hindu population. It occupies the remainder of the densely built up part of the old city.

Moderately built up old city: Adjacent to the densely built up areas are the moderately built up areas of the old city, located on the low land to the west and southeast. Their contribution to Aligarh's functional importance is similar to that of the densely built up areas. They manufacture locks and other metal products. They are also divided into a predominantly Muslim area on the western side and a predominantly Hindu area on the southeastern side. Because of their lower building density, as shown by more vacant land and far fewer multi-storied buildings, these areas are much less crowded than the densely built up areas.

Factory, grain market and hospital area: Located between the railway and the old city, and north of the railway on the eastern side of the city, is the factory, grain market, and hospital area, which forms a transition or zone of contact between the old city and the Civil Lines. This area grew up after the British conquest and the construction of the railway, and it contributes greatly to Aligarh's importance as a manufacturing, commercial, and service center. In the large factories where cotton was once ginned and pressed, the manufacture of vegetable fats and milling of *dal* is carried on. Here are the hospitals that provide general and specialized medical services to Aligarh's tributary area. Several large grain markets facilitate the movement of food grains from the producing areas to the grain shops in Aligarh and other cities. Here also are the municipal offices, a public park, several cinemas, and an important Hindu temple. Scattered among the industrial, commercial, and public buildings are the residential *mohallas* whose buildings are predominantly single-storied, in a poor state of repair, with much vacant land intermixed.

Bazaar streets: Winding through the old city and the factory, grain market, and hospital area are the bazaar streets, in whose small shops much of Aligarh's retail commerce is carried on. Groups of competing enterprises tend to occupy a particular section of a street. Thus one may pass from the cloth bazaar to the shoe bazaar to the hardware bazaar, etc., all located in different sections of the same narrow street. The individual retail and service establishments are usually very small, specializing in only one or a few kinds of merchandise or service. Very often there will be living quarters for the proprietor behind or above his shop.

[2] The *mohalla* is the characteristic neighbourhood unit in the North Indian city. It usually takes its name from the caste or occupation of its inhabitants, the name of its founder, or the name of some notable public building, caravansary, gate, or market. Its population may reach several thousand, predominantly of the same religion. Each *mohalla* has one or several mosques or temples, dozens of small commercial and service establishments serving its residents, and several wells. There seems to be a well-developed sense of identification or community consciousness in the *mohallas*.

Railway: Bisecting the city from the northwest to the southeast is the main Delhi-Calcutta line of the Northern Railway. Ever since its construction in 1864 it has served as a barrier between the old city and the Civil Lines. Only recently has any construction of factories, workshops, or residential *mohallas* taken place north of the railway. This expansion of the factory, grain market, and hospital area occurred only on the eastern side of the city onto land that had formerly been part of a village.

Civil Lines: North of the railway is the Civil Lines, whose broad, straight streets and large bungalows and gardens stand in striking contrast to the narrow, winding streets and crowded slums of the old city. In the Civil Lines are carried on the three functions of residence, administration and education.

Civil lines residential areas: There are two Civil Lines residential areas. The smaller one is adjacent to the railway on the western side of the Civil Lines, and the larger one is located in the center. These residential areas serve the wealthy people in Aligarh, the staff members of the Muslim University, and government officials. Scattered among the purely residential dwellings are the evacuee property bungalows that have been taken over by the State and Central Governments for use as government offices.

District headquarters: The district headquarters area, which is devoted to the performance of administrative and judicial functions for Aligarh District, is located adjacent to the railway in the western part of the Civil Lines. Here are the Collector's Court, the Judges' Court, the police barracks and jail, the District Board Headquarters, the Collector's Office and residence, the Imperial Bank of India, the Government of India Press, the District High School and the main Post and Telegraph Office.

Higher education areas: The areas of higher education together account for the largest area of land devoted to a single purpose. In the northwestern part of the Civil Lines is the Muslim University, with its associated high school, shopping area, and some faculty bungalows. The smaller area of higher education in the Civil Lines is the Women's College of the Muslim University. South of the railway on the eastern side of the city is a small area devoted to the two Hindu colleges affiliated to Agra University.

Rural-urban fringe: Surrounding the city on all sides is the densely settled, fertile, irrigated agricultural land of Aligarh district. Where the rural land and the urban land meet is an area of transition that is called the rural-urban fringe. On the northern and western sides of the Civil Lines, where the boundary of the city is the railway branch to Chandausi and the edge of the University property, the change from urban to rural land use is abrupt. On the eastern and northeastern sides of the Civil Lines the rural-urban fringe is marked by an intermingling of agricultural land and vacant land, with large bungalows and compounds scattered haphazardly about.

South of the railway, the densely and moderately built up residential and workshop areas are abruptly succeeded by intensively cultivated fields of vegetables and grains within the political limits of Aligarh city. Only on the main roads leading out of Aligarh do you find 'ribbon' development of commercial, service, transportation, and residential land uses. South of the railway on the western side of the city is a large area several hundred acres in size that is used for the district exhibition, which is held annually in February.

Thus the functional structure of Aligarh reflects the influences of its history of Hindu, Muslim and British rule, and of its gradual change from a small fortified caravansary town on the Grand Trunk Road to an important industrial, commercial, educational, and administrative center on the Northern Railway. The buildings, streets and vacant land form the urban habitat in which the people of Aligarh live, work and multiply.

THE DISTRIBUTION OF POPULATION

Aligarh's population is far from uniformly distributed throughout the city. The density, religions and occupations of the people vary

widely from place to place. In the table of population are presented some statistics of Aligarh's population derived from the Census of India for 1951. These statistics are classified according to census wards, and they show the numbers, religions and occupations of the people. Figure 1 is a map showing the location of the eight census wards of Aligarh.

DISTRIBUTION AND DENSITY

Inspection of the table of population and of Figure 1 reveals a striking lack of uniformity in the distribution of Aligarh's population. The Civil Lines, with fifty-seven per cent of the area contains only twelve per cent of the people. The range of densitiès is from a low of 7.7 persons per acre in the Civil Lines to a high of 213.1 in Kankariganj ward, while the overall density for the whole city is 37 persons per acre. The wards may be grouped into those with a high density (Kanwariganj, Mamun Bhanja and Shahpara), those with a moderate density (Raghubirpuri, Turkman Gate, Achal Talab, and Jaiganj), and the Civil Lines with a low density.

Comparison of the table of population and the map of census wards with the map of functional areas (figure 2) reveals that the seemingly moderate population densities found in Turkman Gate, Jaiganj and Achal Talab wards are in reality the statistical averages of two strikingly different areas. The majority of the people in these wards live in the densely and moderately built up sections of the old city and in the factory, grain market, and hospital area. Large parts of these wards include the rural-urban fringe, which is relatively unpopulated agricultural land south of the railway line.

On the basis of the table and the maps the distribution and density of Aligarh's population may be summarized. The Civil Lines and a more or less continuous band of rural-urban fringe surrounding the built up area south of the railway constitute an area of low population density. Between the Civil Lines on the north and the old city on the south is an area of moderate population density that includes the factory, grain market, and hospital area. The densely and moderately built up sections of the old city constitute an area of extremely high population density, in one ward (Kanwariganj) reaching the fantastic figure of 136,384 per square mile (213.1 per acre).

DISTRIBUTION BY RELIGION

The table of population also presents the statistics of religion for each of Aligarh's census wards. The statistics are classified into Muslims, Hindus, Scheduled Castes and Others, including Sikhs, Christians, Jains, Zoroastrians, etc.

Muslims: Inspection of the table reveals a marked concentration of the Muslim population of Aligarh in Kanwariganj, Turkman Gate and Civil Lines wards, where the Muslims are in the majority, and in Raghubirpuri, Mamun Bhanja and Jaiganj wards where the population is more than twenty-five per cent Muslim. In Shahpara ward and especially in Achal Talab ward there are relatively few Muslims. The most predominantly Muslim ward is Kanwariganj, with 60.2 per cent, and the most predominantly non-Muslim ward is Achal Talab, with only 3.5 per cent.

Hindus and Others: The Hindus and Others are much more widely distributed than the Muslims. They form the majority of the population in five out of the eight wards, reaching a high of 80.9 per cent in Achal Talab. Their lowest concentration is 36.6 per cent in Turkman Gate ward. Even in Kanwariganj, which has the highest proportion of Muslims, the Hindus and Others amount to 37.1 per cent.

Since there are no large colonies of Sikhs, Jains, Christians, Zoroastrians, or Jews in Aligarh, it seems safe to assume that the category 'Hindus and Others' means essentially Hindus.

Scheduled Castes: The concentrations of Scheduled Caste persons vary from a low of 2.7 per cent in Kanwariganj ward to a high of 15.6 per cent in Achal Talab, where there are more Scheduled Castes than Muslims.

The statistics presented in the population table are limited to the census wards. They do not show the religious characteristics of the *mohallas*, or neighbourhoods of the city. On the basis of field observations in the

mohallas themselves, and on the basis of detailed statistics collected for the individual *mohallas*[3], it appears that they tend to be occupied predominantly by the members of one religious group, and very often by the members of one caste or occupational group.

DISTRIBUTION BY OCCUPATION

The occupational characteristics of Aligarh's population are also shown in the table, classified according to the categories used by the Census of India. For the city as a whole, production (manufacturing) and services (including miscellaneous activities not included elsewhere) were the leading occupations, with 31.1 and 31.8 per cent respectively. Twenty-six per cent of the population was supported by commerce, and 6.4 per cent by transportation. Only 4.7 per cent was supported by agriculture.

Inspection of the population table reveals that there are marked differences in the occupational characteristics of the various wards. Also, the occupations are distributed differently, so that the importance of any given occupation varies greatly from ward to ward.

Production: The occupation of production varies the most in its importance from ward to ward. It is least important in the Civil Lines, with only 10.8 per cent of the population. It is very important in Turkman Gate, Kanwariganj, Shahpara and Jaiganj wards, where most of the old city's small workshops are found. In Raghubirpuri, Mamun Bhanja, and Achal Talab wards, where most of Aligarh's large factory enterprises are concentrated, the proportion of the population engaged in production is somewhat smaller than in the old city.

Commerce: A somewhat different distribution exists for the occupation of commerce. Mamun Bhanja is the leading ward with 41.1 per cent, and the Civil Lines is again the lowest ranking one, with only 10.3 per cent. Mamun Banja's lead is due apparently to the fact that it is bounded on all sides but one by important bazaar streets. Yet even in the wards that are remote from the bazaar streets there are substantial numbers of people engaged in commerce. This fact would indicate that the hundreds of small food shops, tobacco and betel leaf shops and other small convenience goods shops — whose primary function is to serve the residents of the *mohallas* — may be equally if not more important numerically than the large bazaars that serve the whole city and its external trading area.

Transport: The importance of transport varies from a low of 4.4 per cent in Achal Talab ward to a high of 8.4 per cent in the Civil Lines, where the railway employees live. The wide distribution of bicycle-rickshaws, horse-drawn carts, and bullock-carts is demonstrated by the small disparity between the highest and lowest wards.

Services: A radically different distribution exists for the services and miscellaneous occupations. The Civil Lines is the leader, with 60.1 per cent of the population engaged in these occupations. Its dominant position is doubtless due to the Muslim University, with its three thousand students and hundreds of staff members, to the District Headquarters area, with its government officials, and to the large number of domestic servants employed by the wealthy residents of the Civil Lines.

Even though the Civil Lines has the highest percentage of people employed in the service occupations, every other ward has at least twenty per cent. This fact demonstrates the importance of the hundreds of small service enterprises, such as tailor shops, shoe repair shops, restaurants, flour mills, bicycle repair shops, etc., that serve the residents of the *mohallas* in which they are located.

Agriculture: Although only 4.7 per cent of Aligarh's population is supported by agriculture, and 2,383 out of the total of 6,581 are non-farming landowners, the presence of a farming population of 4,198 in this heavily industrial and commercial city is of considerable interest. In some wards, such as the civil Lines, Raghubirpuri, Turkman Gate and other wards that include parts of the rural-urban fringe, the presence of the cultivators is due to the farms that are found in this area of transition from urban to rural

[3] Census of India, 1951, *District Population Statistics, Uttar Pradesh, No. 6, Aligarh District* (Allahabad: Superintendent, Printing and Stationary, 1953), pp. 10-13.

land use. Yet even in Kanwariganj ward, which is entirely surrounded by built up urban land, there are 120 people whose livelihood is farming.

SPATIAL ASPECTS OF THE HOUSING PROBLEM

This analysis of the functional structure and population characteristics of Aligarh suggests that the problem of finding space to house its increasing population is different in the different areas of the city. These differences are due to the differing social and economic characteristics of each area. The functional areas whose space problems are most critical are the old city, the factory, grain market, and hospital area, the Civil Lines residential areas and the rural-urban fringe.

The old city : The space problem of the old city obviously has atained critical dimensions. The statistics of population are now nearly seven years old, and the crowding has undoubtedly worsened since 1951. The existing houses are in many cases old and in poor repair. There is little vacant land on which to build new houses. The population of the old city, made up as it is predominantly of artisans, small shopkeepers and laborers, has not the resources necessary to build new homes.

It is also true that the old city is the area in which the lock and hardware industry is concentrated. The small workshops and houses in which the locks, lock parts, and hardware are made, finished and assembled are located in the old city in a spatial structure that has evolved during one hundred years of lock making. The specialists in the different lock making trades have grouped themselves into clusters of workmen performing similar operations. The movements of the products from foundry to machine shop to polishing shop to assembly shop have developed into established routes of transportation. Therefore any plan to improve the housing conditions of the lock workers must take into account the functional and spatial relationships of the workers to the lock industry as a whole.

It seems evident that the transfer of the lock workers away from the crowded areas of the old city would most probably lead to a dislocation of the workers from their occupations and a reduction in their ability to compete with the workers who remained close to the workshop areas. For this reason the improvement of the existing housing conditions for the artisans of the old city appears to be a wiser procedure than the construction of new housing for them in other parts of the city.

The method of "Conservative Surgery", which was developed by Patrick Geddes between 1915 and 1919,[4] would be the most economical and efficient first step in improving the existing housing conditions. By its use the worst buildings would be removed and the remaining buildings would be repaired or enlarged. The functional and spatial relationships of the workers to their jobs would not be destroyed, and the attachment of the people to their *mohallas* would be preserved.

Factory, Grain Market, and Hospital Areas : The problem of housing in the factory, grain market, and hospital areas seems to be quality rather than density. There are substantial amounts of vacant land for the construction of new houses. The existing houses, however, are in large measure of very poor quality and layout, and in a bad state of repair.

It is essential that the remaining vacant land in the factory, grain market and hospital areas be kept free from the uncontrolled encroachment of slum housing. This land provides promising sites for planned low income housing of high quality. Once the mud or straw houses of the poor are erected it is difficult to remove them since the occupants have no place to go.

The Civil Lines and the rural-urban fringe : Only in the Civil Lines and the rural-urban fringe are there large areas of vacant land suitable for residential construction. Yet to allow the Civil Lines residential areas to serve as uncontrolled dumping grounds for the excess population of the old

[4] Jacqueline Tyrwhitt, ed., *Patrick Geddes in India* (London : Lund Humphries, 1947) 103 p. This small book of extracts from the reports that Geddes made on eighteen Indian cities is a good introduction to Geddes methods.

FIGURE NO. 2

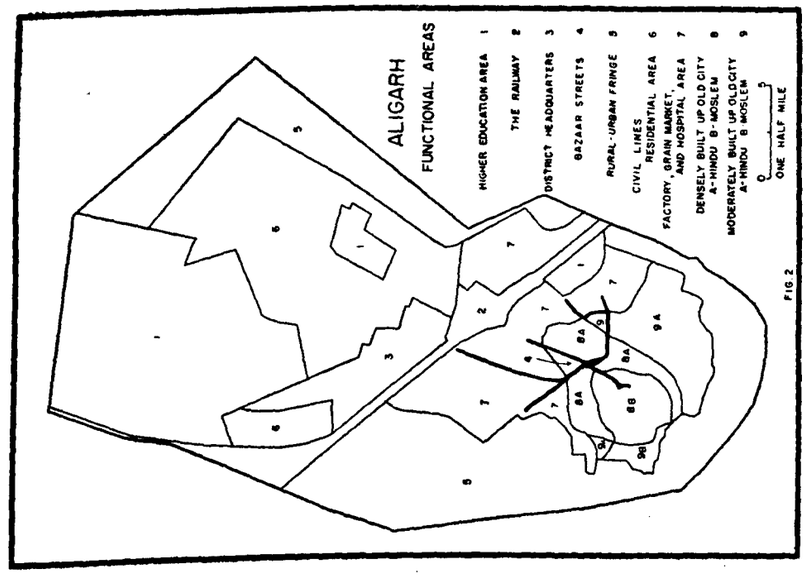

FIGURE NO. 1

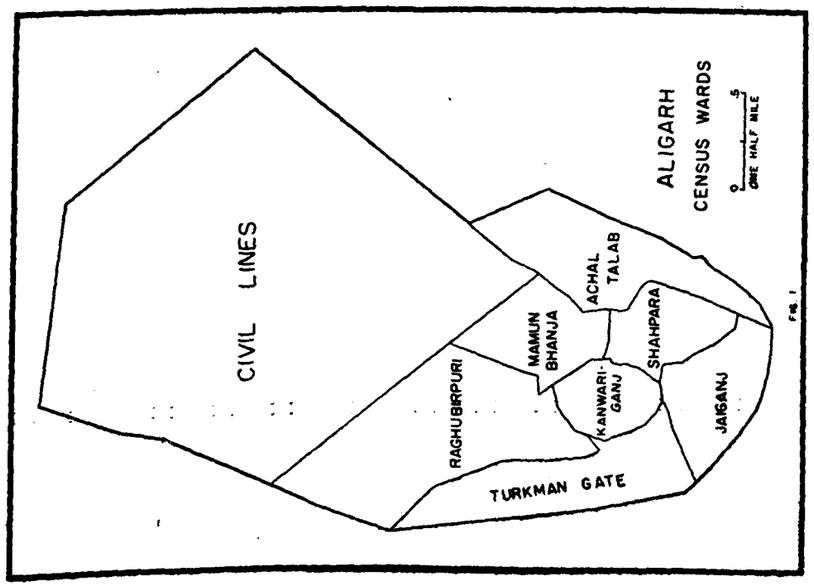

Table No. 1.

AREA, POPULATION, POPULATION DENSITY, AND POPULATION CHARACTERISTICS OF ALIGARH, U.P.*

Ward	Civil Lines	Raghubir-puri	Turkman Gate	Kanwari-ganj	Mamun Bhanja	Shahpara	Achal Talab	Jaiganj	Whole City
Acres									
Area ..	2.184.4	488.8	270.8	109.2	170.4	133.3	290.4	180.8	3,828.1
Per cent ..	57.1	12.8	7.1	2.8	4.4	3.5	7.6	4.7	100.0
Population									
Numbers ..	16,836	19,937	13,770	23,233	17,277	19,551	15,482	15,532	141,618
Per cent ..	11.9	14.1	9.7	16.4	12.2	13.8	10.9	11.0	100.0
Density									
Persons per acre ..	7.7	40.8	50.8	213.1	101.6	146.3	53.4	85.3	37.0
RELIGIONS :									
Muslims									
Numbers ..	8,461	6,601	7,128	14,030	4,273	3,401	540	4,462	48,896
Per cent ..	50.3	34.4	52.0	60.2	25.1	17.5	3.5	29.5	35.0
Scheduled Castes									
Numbers ..	1.027	2,497	1,562	644	1,803	1,877	2,401	2,340	14,151
Per cent ..	6.1	13.0	11.4	2.7	10.6	9.7	15.6	15.5	10.1
Hindus & Others									
Numbers ..	7,315	10,071	5,004	8,622	10,898	14,118	12,381	8,303	76,712
Per cent ..	43.5	52.6	36.6	37.1	64.3	72.8	80.9	55.0	54.9
OCCUPATIONS :									
Production									
Numbers ..	1,825	5,589	6,574	8,854	3,975	6,488	4,843	5,966	44,114
Per cent ..	10.8	28.0	47.7	38.1	23.0	33.2	31.3	38.4	31.1
Commerce									
Numbers ..	1,737	4,370	2,821	7,916	7,151	5,571	3,932	3,352	36,850
Per cent ..	10.3	21.9	20.5	34.1	41.4	28.5	25.4	21.6	26.0
Transport									
Numbers ..	1,407	1,437	1,104	1,218	1,262	984	688	909	9,009
Per cent ..	8.4	7.2	8.0	5.2	7.3	5.0	4.4	5.9	6.4
Services									
Numbers ..	10,115	7,515	2,822	4,957	4,459	5,830	5,280	4,086	45,064
Per cent ..	60.1	37.7	20.5	21.3	25.8	29.8	34.1	26.3	31.8
Agriculture									
Landless Laborers ..	582	280	283	95	100	186	353	522	2,401
Tenant Farmers ..	206	92	94	25	36	76	170	203	902
Landless Labourers ..	41	454	54	nil	8	52	53	233	895
Non-farming									
Landlords ..	923	200	18	168	286	364	163	261	2.383
Total ..	1,752	1,026	449	288	430	678	739	1.219	6,581
Per cent ..	10.4	5.1	3.3	1.2	2.5	3.5	4.8	7.8	4.7

* *Source* : Census of India, 1951, "Primary Census Abstract, Tahsil Koil, District Aligarh, Uttar Pradesh" (Unpublished manuscript, Office of the Superintendent, Census Operations, Uttar Pradesh, Rampur, U.P.). Areas of wards and of whole city computed by map measurement.

city would rapidly destroy their present value as decent residential areas.

The rural-urban fringe south of the railway includes much valuable agricultural land. To allow the uncontrolled building of homes on this land would tend to aggravate the already serious shortage of good farm land.

It is fortunate that—up to the present time—there has been relatively little tendency for encroachment of slums on the Civil Lines residential areas to take place. But there is another kind of encroachment that has taken place in the Civil Lines. This is the uncontrolled extension of streets and erection of large bungalows on the northeastern and eastern sides of the Civil Lines in the rural-urban fringe. This has gone on while large tracts of land remained vacant within the Civil Lines that are more than adequate for the construction of new upper class houses.

SPACE FOR THE INCREASING POPULATION

The rural-urban fringe on the eastern and northeastern sides of the Civil Lines thus appears to be the most suitable area in which to establish new planned residential areas for the excess population of the old city and the increased population of the future. Here can be settled the people whose work does not require that they live in the workshop quarters of the city, such as those employed in the District Headquarters or in the Muslim University. With good planning, the new residential areas would provide good quality housing for the poor, and yet not have a deleterious effect on the upper class housing of the Civil Lines.

FINAL CONCLUSIONS

This study of the distribution of population and the functional structure of Aligarh has shown that the spatial aspects of the urban housing problem in India are extremely complex. They are affected not only by the location and extent of the built up land and vacant land, but by the social and economic characteristics of the population.

Before any new housing developments are erected, extensive surveys must be carried out. Detailed information needs to be obtained about the distribution, density, and social and economic characteristics of the population, so that the relationships between residence and workplace may be maintained or improved. Detailed maps need to be made of the city, so that potential sites for new construction may be delineated, buildings capable of being repaired may be identified, and the available land may be put to its best use now and in the future.

Psychiatric Institutional Services in India[1]

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I

MENTAL HEALTH IN A DEMOCRACY

In 1952, India's 33 mental hospitals were populated by 13,103 patients.[2] Although this figure represents an infinitesimal proportion of the country's total population, it has been estimated that nearly one million Indians are in need of hospitalization for psychiatric disorders.[3] One receives the impression that the introduction of any mental health programme adequate to meet the needs of India is rightly regarded as a 'frill'. Can a democratic government that is dedicated to the ideal of the welfare state treat lightly, particularly in time of rapid cultural change, matters relating to mental health ? A democracy should attempt to maximize the participation of its citizens in guiding their own destinies. To that end the democratic state assumes a number of functions designed to protect its people from life's incapacitating hazards. One of these responsibilities is to provide the mentally ill person with treatment facilities that are directed toward his eventual rehabilitation and independent functioning.

A country's provisions for its deviant and dependent population are a reflection of its philosophy. The democratic philosophy which expresses concern for the helpless members of society has these elements: (1) Conviction about the worth and dignity of the individual and belief in his potential capacity and right to determine his own destiny. (2) Respect for and acceptance of individual and group differences compatible with social responsibility.

Social workers will recognize this familiar philosophical base of their profession. This philosophy is shared by most of the 'helping' professions; otherwise, their work has no *raison d'etre*. A society which subscribes to this democratic philosophy will rest uneasy so long as these principles are not implemented in the case of any of its disenfranchised, deviant, or dependent groups. The mentally ill have all these handicaps.

WHAT PRIORITY FOR MENTAL HEALTH PROGRAMMES?

India subscribes to these democratic principles ; however, this is not reflected in her provisions for the mentally ill. Undoubtedly the problems of the mentally ill are overshadowed by the many other problems of a new republic. The order in which the government should address itself to solution of its many problems is difficult to determine. Should the government tackle first its economic problems? Should priority be given to education? To physical health? Is the determination of priorities to be influenced by the extent of the number of people who are affected or by the intensity of the effect of the problem upon individuals?

Actually, all fronts must be advanced at the same time. For example, concentration on industrialization will, in proportion to its success, create conflict between the new behaviour patterns introduced by urban industrial life and older values. The former Union Health Minister, Rajkumari Amrit Kaur, has warned that even if the incidence of mental illness was relatively low in India as compared to other countries, there was no reason to believe that there are any inherent factors involved which might be able to resist the onslaught of those forces which

[1] Based on a report of a survey made in 1956-57 at the request of the Delhi School of Social Work, University of Delhi.

[2] Preliminary draft, *Annual Report of Director-General of Health Services* (in preparation).

[3] Dr. M. V. Govindaswamy, " Social-Psychological and Mental Hygiene Problems ", *Social Welfare in India* (New Delhi. Ministry of Information and Broadcasting, Govt. of India, 1955) p. 408.

went with industrialization.[4] The adverse effect on mental health of post-partition migrations was noted in the last report of the Director-General of Health Services.[5] On the other hand, vocational rehabilitation of mental patients is an herculean task without the job opportunities that industrial development may create. The success of a physical health programme may bring a problem of an aging population vulnerable to senile psychiatric disorders.

All these aspects are inter-related and none may be ignored; however, programmes for prevention and treatment of mental illness have received little attention for many years. The 1947-48 Report of the Director-General of Health Services describes facilities for the care and treatment of mental patients in India as very unsatisfactory.[6] The 1952 Annual Report deplores the fact that 'facilities continue to be very meager'.[7] There was no change in the sanctioned capacity of 10,409 beds from 1949 to 1952 while the number of new admissions increased from 6,986 patients in 1949 to 8,546 in 1952. Little change has occurred since previous reports.

Recently the Government have announced a plan to establish child guidance and psychiatric clinics throughout India. Lack of personnel will probably postpone its implementation indefinitely. One hopeful development is the establishment of a training center for psychiatric personnel. The All-India Institute of Mental Health in Bangalore has training programmes for psychiatrists, psychologists, nurses, and plans for a programme for training psychiatric social workers. The nature of this latter curriculum has not been determined. It is not enough to provide more training facilities; even trained personnel may be demoralized if they do not obtain public recognition and backing. If the Government does not give them tangible evidence that the health problem with which they work is important, and if these psychiatric personnel are not supported by adequate facilities, the additional training will lead to frustration. In fact, some of the most highly trained staff, and those who felt most secure in their professional competence, seemed to be the most disheartened in carrying out their duties. The difference between their standards for psychiatric care and their actual level of achievement was so marked as to lead to discouragement.

Health is defined in the Report on the First Five Year Plan as a "positive state of well-being in which the harmonious development of physical and mental capacities of the individual lead to the enjoyment of a rich and full life. It is not a negative state of mere absence of disease. Health further implies complete adjustment of the individual to his total environment, physical and social." [8] These comments reflect the planners' acceptance of modern concepts of health. They imply recognition of the fact that measures that are designed to promote mental health have an important place in overall health planning; however, a mental hygiene programme as such is not found among the health priorities which were envisaged as forming the basis of the health programme. Funds were budgeted for the upgrading of the institutions in Bangalore and Ranchi, and for the establishment of the All-India Institute of Mental Health at Bangalore. The need for remodelling other hospitals and establishing psychiatric clinics was simply noted in the plan. The social welfare section also alludes to the need for clinics. The planners advocate the establishment of a minimum of at least one municipally-operated child guidance clinic in every state; but point out that implementation is likely to be handicapped by lack of trained staff.[9] The health section of the Second Five Year Plan inexplicably drops any reference to mental health. The section on social welfare services mentions provisions for the welfare of the mentally handicapped, a term apparently used to refer to the mentally retarded rather than to the mentally ill.

[4] Speech at Bangalore reported in the *Times of India*, March 18, 1957.

[5] *Annual Report of the Director-General of Health Services (1947-48)* (Simla. Government of India Press, 1955) pp. 218-19.

[6] *op. cit.*,

[7] *Preliminary Draft, Annual Report of D.G.H.S., op. cit.*,

[8] *The First Five Year Plan* (New Delhi. The Planning Commission, Govt. of India. 1952) p. 688.

[9] *op. cit.*, p. 624.

Perhaps omission of reference to mental health may be due to the hope that the general success of the plan will have favourable mental hygiene implications. These beneficial results may be considerably over-estimated. A rise in the level of living will not necessarily be followed by a rise in the level of mental health. The experience of the United States certainly suggests that one's standard of living, i.e., the manner in which one would like to live, usually stays ahead of one's level of living, i.e., how one actually lives. The Indian standard of living will undoubtedly rise along with the level of living. The gap may well, in India as in America, give rise to psychopathological developments in many individuals.

We have found in the United States that we may not treat expenditure on prevention and treatment of mental illness as an unnecessary frill. Mounting costs of custody of increasing numbers of patients have confronted state after state with the need for a review of its mental health programme. The result has been an increasing legislative support of preventive and treatment measures in the belief that not only is this a more humane approach, but one which will be more economical in the long run. This point of view has been supported by a study done in a well-known American mental hospital.[10] The investigators found that increased expenditures on staff and programme yielded a dollar saving. The drop in the number of patients, attributable to the better therapeutic programme that was made possible by increased appropriations, obviated not only the need for capital plant expansion, but also the increased cost of daily care of an increased patient population.

At this time when India must be keen to cut unnecessary costs, the mental health programme may seem to be a particularly likely spot at which to effect economies. So long as the patients are living in as comfortable a manner as many people who are not in institutions, why be concerned about improvement of the mental health programme? Legislators and responsible health authorities might profitably read the above-mentioned report which gives a convincing, research-based answer to that question. Social workers are among the staff who are trained to contribute to the economic efficiency of a hospital in achieving its goal, namely, the restoration of each patient to the highest level of functioning of which he is capable. Professional social work, as it is practised in the U. S. A., is an essential staff service if the main function of the hospital is to be effectively implemented.

[10] Alfred Paul Bay, M.D. and Paul E. Feldman, M.D. "The Economy of Increased Appropriations" *Mental Hospitals* (Washington, D.C. American Psychiatric Association, 1955)

II

SOCIAL WORK ENTERS THE PSYCHIATRIC HOSPITAL

Social work in psychiatric hospitals is not a "new wrinkle" in psychiatric treatment.[11] The first social worker in a psychiatric hospital began her professional employment fifty years ago as the culmination of a movement to offer to released patients help in effecting a successful community adjustment. After-care societies, formed to aid patients with their post-hospital social problems, had been in existence in several European countries for many years. The first after-care organization was introduced in 1829. In the last decade of the 19th century, leading American psychiatrists and social workers had recommended the establishment of similar associations in America. A plan was finally implemented in 1906 when a private social welfare agency in New York hired a trained social worker to help former patients to resume normal lives in their communities. This private venture proved its worth; five years later the work was taken over by the state hospital which sanctioned the social work position as an integral part of the hospital organization. From that time, the social worker was recognized as an essential member of the state hospital staff team, and an increasing number of hospitals throughout the United States have requested the services of a social worker. Currently the demand so far exceeds the supply that some states are subsidizing the training of psychiatric

[11] See Lois M. French, *Psychiatric Social Work* (New York. The Commonwealth Fund, 1940) pp. 32-74. See also Albert Deutsch *The Mentally Ill in America* (New York. Columbia University Press, 1949) pp. 286-91.

social workers who are committed to employment in state hospitals for a given period of time after completion of training. The scope of responsibilities of the psychiatric hospital social worker has also increased; not only because the pioneers demonstrated the contribution which social service could make to the objective of hospitalization, but also because psychiatry began to "emerge from isolation", as Deutsch puts it. Psychiatry was moving from an emphasis on the classification of symptoms and study of the individual in isolation toward an emphasis on the meaning of symptoms and study of the individual in inter-action with his social environment. The doctors found that the social worker's training enabled the latter to make a contribution to the diagnosis and treatment of the social factors that affected the patient, not only after his release but also during hospitalization. In fact, the superintendent of a New York hospital, Dr. Adolph Meyer, had even prior to the establishment of the first after-care position, used the services of his social worker wife to talk both with his patients in the hospital and with their families at home. Mrs. Meyer helped to obtain information on the patient's social environment, thereby increasing the doctor's understanding of the patient's abnormal behaviour.

As social workers gained experience in carrying out their initial after-care responsibilities, it probably became abundantly clear that effective treatment of post-hospital adjustment problems could be started at the time of the patient's admission and continued through the period of hospitalization. One of the early statements concerning the specific duties of the social service department called for the social worker to take the social history of new patients, to assist in diagnosing and treating social problems, to see that the family understood the medical advice, and to be a liaison between the doctors and the community. In many cases the social worker unfortunately became simply the handmaiden of the physician and did miscellaneous clerical tasks unrelated to her training. When trained social workers tended to prefer working in the psychiatric clinics and to avoid psychiatric hospital positions, the hospitals perforce turned to untrained and inexperienced social workers who were unable to maintain and develop standards for social service. In other psychiatric hospitals social work became a highly developed service that made to the patient's welfare its own contribution based on the special competence of the social worker.

ROLE OF SOCIAL SERVICE IN THE TOTAL INSTITUTIONAL PROCESS

One of the best statements of the functions of social work in a psychiatric hospital has been made by a committee of psychiatrists. The committee views treatment in the hospital as a total institutional process, rooted in medical responsibility, but with the psychiatrically oriented participation of every staff member, each contributing to the total process on the basis of clearly established administrative allocations of responsibility and of well-grounded and disciplined professional attitudes.[12] The committee warns that inadequate clarification leads to ineffective, inappropriate, and wasteful use of social workers, and outlines the functions of the social worker in relation to the total institutional process:

1. *Intake*: The process of making hospital services available to those who can benefit from hospital care. In relation to the intake process, the social worker:

(a) Interprets the hospital's facilities and programme to the patient and his family.

(b) Helps the family with problems that arise from the patient's admission.

(c) Formulates plans which might reduce the urgency of hospitalization or prevent ill-advised admissions.

(d) Begins a relationship with the family which will facilitate their optimum cooperation in treatment and post-hospital plans.

2. *Reception:* The process of helping the patient to accept his hospitalization and to make maximum use of the hospital's therapeutic potential. In relation to this function the social worker:

(a) Participates in explaining to the patient hospital procedures.

[12] *The Psychiatric Social Worker in the Psychiatric Hospital* (Topeka, Kansas. Group for the Advancement of Psychiatry, 1948).

(b) Explains to the patient his role in maintaining the patient's family and community ties.

3. *Diagnosis*: The process of analyzing the patient's situation with a view to determining the cause of his disorder. This involves collection and analysis of physical, psychological, and social data. The social worker obtains the social history, including information about the patient's past and present social environment, and his responses to it. The history, constantly reformulated, is a product of a purposeful relationship with the patient, his family, and other community resources and is important in the diagnosis as well as the treatment of the patient.

4. *Treatment*: The process of applying remedial measures to restore the patient to normal functions. The psychiatrist may utilize the skill of the psychiatric social worker both in direct work with the patient and work with those significant in his life, in an effort to strengthen the patient's social relationships and to resolve environmental problems that are contributing to the mental disorder.

5. *Pre-convalescence* : The process of helping the patient to make general and specific preparation for his release from the hospital. In relation to this, the social worker helps the patient with his possible ambivalence concerning release, his future relationship with his family, and with the community. Specifically, he may help the patient to formulate plans for living arrangements, employment, etc.

6. *Family Care* : This is the placement of a patient with a family other than his own for care and treatment. The social worker finds homes, interprets the patient's needs to the family, supervises the arrangement to maintain standards of care and facilitates the patient's social adjustment.

7. *Convalescent Care* : The process of assisting the released patient to make a satisfactory community adjustment. Here the social worker would, on an extramural basis, continue to offer help with the same problems toward which pre-convalescent assistance was directed.

The above aspects of the institutional process follows the chronological phases in a patient's hospital career. In addition to executing the functions described above, the social worker has a contribution to make in regard to community relations, in-service training programme and research. Community interpretation involves communicating to the people served by the hospital information about its programme and its problems, and to encourage various communities to use the hospital as a mental health resource. The social worker, whose graduate training includes study of the community organization process, has an important role to play in implementing the community interpretation programme.

The Group for the Advancement of Psychiatry suggests that the social worker should contribute to the education of the hospital psychiatric staff in order to broaden their knowledge of the social forces that impinge upon the individual and to interpret the content of social work professional activities. Research, directed toward solution of administrative problems, the testing of theoretical assumptions, evaluation of treatment, etc. are often neglected aspects of the institutional process. The social worker has in his graduate preparation developed a competence in research so that he can participate in research undertakings related to the total hospital programme or initiate projects related to the work of the social services.

The above list of functions is a far cry from the limited after-care responsibilities which first brought psychiatrists and social workers together into a working relationship fifty years ago. The social worker now offers a professional service at each phase in the institutional process, from pre-admission to discharge. This expansion of service is based on the recognition that social factors are important at each of these points. After-care programmes which begin at intake are more successful and efficient than those which begin at the point of the patient's exit from the hospital.

III

THE FRAME OF REFERENCE OF THIS STUDY

Realizing that few social workers were to be found in India's hospitals, an attempt was made to ascertain how certain aspects of

the institutional process which in American hospitals are normally allocated to social workers, were handled ; hence, even hospitals without social service departments were visited. One may no more assume that absence of social service means that certain functions are not performed than one may assume that the presence of a social worker means that these functions are performed. The writer assumed that the desirable institutional processes in India did not differ significantly from that in the United States, that certain aspects of the process are usually best handled by social workers who have had graduate training in case work, plus specialized field work in a psychiatric setting. Reinforcing this assumption is the remark of one Indian psychiatrist who guided the writer on a tour of his hospital. When the writer noted that the behaviour of many of the psychotic patients resembled that of patients at American hospitals, the psychiatrist responded that the difference in culture appeared as a difference in veneers. The psychosis stripped the cultural veneer, exposing the basic patterns common to both cultures. Although this analogy may not stand the strain of further elaboration, it does seem to this writer that the claim that India is different is as often a rationalization of unwillingness to tackle problems as it is an objection to mechanically transplanted foreign ideas. Certainly one should not slavishly import foreign ways of doing things ; at the same time, an empirical application of the principles underlying 'foreign' techniques is desirable. The similarities in the behaviour of people of varying cultures are probably greater than the differences. The patient who enters India's psychiatric institutions presents the same problems as one in the United States. He and his family are concerned about the admissions procedure and separation of the patient from his family. They are concerned about what may happen to the patient after the doors are locked behind him. They are concerned about unfamiliar treatment procedures and about the conduct of family affairs in the patient's absence. They are concerned about release from the hospital, sometimes evidencing ambivalence about this eventuality. If treatment is to achieve a maximum degree of success, these concerns must be recognized.

HOSPITALS INCLUDED IN THIS SURVEY

Major mental hospitals and others were visited, giving the writer an insight into half of the public institutions. Having seen the presumably best institutions and having no reason to assume bias in the selection of lesser institutions, the writer may state that any under-estimate of the adequacy of the psychiatric institutional process may not be attributed to the sampling.

THE INSTITUTIONAL PROCESS IN THE HOSPITALS SURVEYED

Intake : This important component is generally absent except in those cases where a hospital maintains an out-patient clinic. Only one hospital sometimes has contact with the patient prior to the latter's hospitalization. No service is offered prior to the patient's arrival in most of the hospitals, and the family probably has no expert assistance in their time of crisis. Neither the family nor the patient knows much of the hospital. Negative attitudes toward mental illness and the mentally ill may become crystallized before the hospital staff can forestall such an undesirable development. When asked whether the hospital offered any assistance with problems arising from the patient's admission, two superintendents replied that we had "no funds of that kind"! Probing revealed that they interpreted assistance as monetary and did not think in terms of helping the family to make plans to cope with the current crisis, or to help them with their feelings in regard to the patient's certification. It has been the writer's experience that on these occasions the feelings of guilt which plague sensitive relatives and the feeling of rejection on the patient's part may lead to the formation of attitudes which will interfere with the treatment programme. Guilt-ridden relatives may besiege the hospital with demands for the patient's premature release. At the other extreme, they may see hospitalization as the final phase of the patient's incurable illness, and turn their backs on him. The former problem is reflected in those who are released against medical advice ; the latter, in the number of patients who must be detained in the hospital after the hospital staff has decided that his mental condition warrants his release. Estimates of the number

The following were visited at the time indicated :

State	*Hospital*		*Month of visit*
Bihar	Hospital for Mental Diseases	Kanke	May 1957
	Indian Mental Hospital	Ranchi	May 1957
Bombay	N. M. Mental Hospital	Thana*	Sept. 1956
	Central Mental Hospital	Yeravada*	Sept. 1956
	Mental Hospital	Baroda*	Feb. 1957
Hyderabad	Govt. Mental Hospital	Jalna	Sept. 1956
Kerala	Hospital for Mental Diseases	Trivandrum	Dec. 1956
	Govt. Mental Hospital	Calicut	Dec. 1956
Madras	Govt. Mental Hospital	Madras	Dec. 1956
Mysore	Govt. Mental Hospital	Bangalore	Dec. 1956
Punjab	Punjab Mental Hospital	Amritsar	April 1957
U. P.	Mental Hospital	Agra	Sept. 1956
	Mental Hospital	Banaras	Sept. 1956
West Bengal	Lambini Park Mental Hospital	Tiljala 24 Parganas Calcutta†	May 1957
	Mental Observation Ward	Bhowanipur	May 1957

* Hospitals which had social workers, one each.
† Receives only partial public financial support.

In addition to these government supported hospitals, the writer visited two private hospital-affiliated clinics in Bombay, one in Baroda, and independent clinics in Ahmedabad and Lucknow, the latter having in-patient facilities.

of such patients in each of these groups were unreliable since the Annual Reports do not ask for such data. Some superintendents said the problem was negligible ; others, that the problem was not an unusual one.

Most of the hospitals reported waiting lists of up to three months in length and few had any plans to deal with the problems which resulted from the delay between certification and admission. The existence of waiting lists makes it even more imperative that the hospital offer some pre-admission service. For example, consider the situation of the Calcutta patient who is found to be psychotic. If he has been fortunate, he will have undergone observation at the mental ward in Bhowanipur ; if not, he will be completely bewildered by subsequent events. Following certification he is scheduled for admission to the Indian Mental Hospital, Kanke, which has a two to three month waiting list. Even if the patient is at Bhowanipur, scarcity of beds for observation demands that he be detained during the waiting period either at home or in jail. The latter is frequently the choice. We clearly see the need for some one who can help the family to bear up under the strain, who can help them to maintain a non-rejecting attitude toward the patient, and who perhaps might contribute toward reducing the urgency of an admission which perforce might be delayed. A trained social worker might help to equip the family to keep the patient at home until he is admitted. A good pre-admission service cannot, of course, solve the problem arising out of the inadequacy of institutional care. For example, inappropriate admission of the mentally deficient must be effected because of the Indian Lunacy Act and the absence of other facilities. The hospitalization of children who are mentally deficient or epileptic is particularly tragic.

The hospitals cannot depend on the meager psychiatric resources in the patient's community to perform the intake function for them ; on the other hand, the size of the areas which each hospital serves renders impractical any sustained pre-admission contact between prospective patient and the hospital staff. Until such time as the availability of personnel makes possible the establishment of permanent clinics, it appears that a limited number of trained staff could be utilized to make a circuit of the hospital's district, stopping in key places to offer a diagnostic service which would also include elements of the intake process. The key places would be selected on the basis of population concentrations and the availability of other psychiatric services. The staff of this travelling service would consist of a physician, social worker, and clinical psychologist, all based at the hospital. While not on tour, they would attend to the hospitalized patients. The site for the travelling clinic could be any meeting place which offers privacy, e.g. a room at a local hospital, in a school or in any other public building. The only other additional expense incurred is the cost of travel and subsistence. It is anticipated that the clinic space would be made available free of charge. These clinics could also, as will be pointed out later, be able to carry other after-care responsibilities.

RECEPTION

An attempt was made to find out what happened to the patient in his first days at the hospital and what the content of his orientation, if any, was. It is possible that in some hospitals the staff does undertake to deal early after admission with the patient's feelings about his hospitalization and to help him realize that he is not at the end of the road ; no one identified this as a part of the initial hospital routine. Some believed that Indian family ties are close and not easily broken ; hence, that the patient needs no assurance nor does an outsider need to encourage the family to maintain interest. This view is inconsistent with the numbers of patients now considered to be chronically ill and incurable who have no contact with their families.

One may speculate on how this situation developed. Travel from outlying areas to the hospital is expensive and time-consuming. Correspondence alone is unsatisfying over long periods, and is rendered impractical in many cases because of illiteracy. Some doctors complained bitterly that too great a time had been permitted to elapse between the onset of illness and hospitalization. This delay, in turn, may be attributed to failure to see the mental hospital as a treatment facility, and instead to view it as a place of custody to be used only, perhaps, when the patient has failed to respond to indigenous forms of therapy or when custody at home is no longer feasible. In any event, the longer the duration between the onset of symptoms and hospitalization, the more likely it is that the relatives and the patient have negative attitudes about mental illness. This makes it imperative that provision be made to carry out the reception process. The social worker should see every new patient to assure him that he has a link with the community, and to ascertain what unsettled home situation or attitudes might interfere with the patient's making maximum use of his hospitalization.

DIAGNOSIS

The patient is usually placed in an observation ward for about two weeks. During this time his physical status is evaluated and notes are kept on his behaviour by the ward personnel, usually the doctor and nurses. At the end of the observation period all reports are reviewed by the superintendent who makes the official diagnosis. Diagnostic staff meetings, with notable exceptions, are unheard of. Under these circumstances, one should think, the diagnosis would tend to be sterile labels of symptom complexes. Dynamic diagnosis, which seeks to explain the meaning of the symptoms in terms of possible etiological factors, can be arrived at only after study of the physical, social, and psychological factors operative in any given

patient's situation. Some hospitals attempted to get coverage of the social factors by getting the relative to fill out a mailed questionnaire ; the items of which would elicit a meaningful answer only from a psychiatrically oriented respondent. The concept of the dynamic history as a product of a continuous relationship with the patient and people significant in his life is nowhere in practice in the state hospitals that this writer visited.

The social history serves two purposes. First, it provides the relevant social data, which, with the physical and psychological data must then be studied by the staff. Analysis is directed toward finding causes for the effect, i.e., the disordered behaviour which confronts the hospital's staff. Second, in the process of giving the data the relatives get a better understanding of the patient's behaviour. The interviewer has an opportunity to correct false ideas, to help the relatives to see antecedent events in proper perspective. Treatment takes place in a good social history interview, as the relatives begin to see what modifications in their own behaviour are advisable when the patient returns home. For example, a relative who initially dates the psychotic behaviour to some dramatic incident of recent date may realize that the psychosis started much earlier. His expectation of the result of treatment may be much more realistic. The relative reviews his handling of the patient and the patient's response. He may begin to see at this time what adjustments in his own behaviour or in the home situation will have to be made before the patient can expect to have a successful post-hospital experience. There is a dearth of social workers to interview relatives and community people whose relationship to the patient may be significant, or a lack of interest in obtaining such social information. The latter may be due either to the fact that there are no facilities for specific treatment based on dynamic diagnosis, or to the fact that the importance of such information is not recognized, or to a combination of any of the foregoing. In view of the incomplete diagnostic procedures, one wonders how the data on causes, both "precipitating" and "exciting", that appear in the Annual Reports can have the degree of reliability that warrants their collection.

TREATMENT

Somatic types of treatment, chemical and electrical, prevail in the state hospitals that were visited. Three hospitals undertake group psychotherapeutic sessions with limited numbers of patients. Psychotherapeutic sessions with individuals are rare. Although the writer is not a physician and did not attempt to evaluate the efficacy of treatment there are certain principles of treatment, adherence to which may be commented on. Treatment should be based on accurate diagnosis. It is dubious whether diagnosis is sufficiently precise to result in individualized treatment of the patient. Certainly there is little attempt to involve in treatment people who are significant in the patient's life. The physicians have no time for adequate interviews with relatives. When the only qualified psychiatrist is the superintendent, it is probable that the other staff physicians would not know how to engage the families. The psychiatrist-superintendent in such a case is probably so bogged down with administrative duties that he is unfamiliar with his patients. One harrassed superintendent who, because he could not or would not delegate responsibility, apparently made a practice of himself writing all letters to relatives regarding any patient's condition. The writer happened to observe this doctor in the process of responding to relatives' inquiries. A large number of patients had been herded to his office ; each was interviewed for not more than two or three minutes, whereupon he dashed off a reply. One can well imagine the hackneyed language in which such replies were probably couched.

Involving the relatives in treatment means having a meaningful series of interviews with them at home or in the hospital. These interviews deal with their reactions to the progress or lack of progress in the patient, help them to play the role that current treatment plans require, help them to make plans consistent with the patient's prognosis. According to the Annual Reports, the leading predisposing and exciting cause for mental illness is "domestic worry". If this is so, we see a fertile field for the application of the social worker's talents to problems of intra-familial relationships.

The social worker also knows how to enlist the help of community resources in treating certain social problems, e.g. support of a family while the bread-winner is hospitalized. One doctor, when asked if there were any community resources in a country that was as undeveloped as India said there might be a few formal social agencies, but that there were private sources that the professional social worker could tap and develop further. This kind of activity means that the social worker must not be "hospital-bound" during the period of the patient's treatment. Unfortunately, none of the hospitals which had social workers had any budgetary provision for the cost of travel. What home visiting and community contacts these social workers make must be done at their own expense ; therefore, these contacts are confined to the vicinity of their homes. The travelling clinics, suggested earlier, could provide opportunities for carrying out social service responsibilities related to the treatment process. It is true that an interview in the patient's own home may sometimes contribute more to understanding of his situation than a clinic office interview : however, limited staff and finances make the clinic plan a reasonable alternative.

PRE-CONVALESCENCE

Most of the hospitals reported no activities that were directed toward preparing the patient to terminate hospitalization. In most cases it appears that the patient's discharge is suggested to the superintendent by the physician in charge of the patient's ward. The patient's hospital record is reviewed, and his social adjustment, mental and physical status are considered. The patient is not examined at a staff meeting, but may be seen by the chief physician, who, if he believes discharge is indicated, will recommend the patient's release to the hospital visitors who meet monthly. Sometimes the patient is permitted a short trial visit at home prior to discharge.

The pre-discharge procedure as it appears to be carried out does not take into account the particular problems faced by the patient at this crucial point in his hospitalization. It has been my experience that most patients give little conscious thought to the problems of readjustment ; on the contrary, they look toward release as the solution to their problems. Both the hospital staff and the patient must realize that release frequently marks the beginning of a number of problems involving the patient, his family, and community. The patient may be troubled by insecurity, lack of confidence in himself and in the stability of his recovery. A patient's return to his family, in some cases, may upset the adjustment his family may have made in his absence. The unwillingness of relatives on the patient's return to relinquish the new roles that may have been forced upon them by the patient's illness may be a source of conflict. The stigma of mental illness and a primitive attitude of community toward the mentally ill may be another source of trouble. The patient may be unable to resume activities that had been interrupted by his hospitalization, e.g. employment, academic pursuits.

Anticipation of these problems and making plans to cope with them while the patient is still in the hospital is more effective than waiting until they actually confront the patient. The shock of post-hospital problems may be minimized by prior discussion while the patient is still awaiting release. Preconvalescent planning has long been recognized as a social service function, the emphasis in such planning being on the patient's social relationships and environmental problems rather than on his particular pathology. The ideal procedure is to precede release by an investigation of the home situation and a series of individual interviews with the patient that are based on an analysis of his particular situation. It is recognized that such a routine would make heavy demands on a small social service staff.

This writer has described elsewhere a group discussion technique used to ready patients emotionally for leaving the hospital.[13] A group of patients who are candidates for early release may be convened for discussion under the leadership of a social worker. No attempt need be made to arrive at specific answers to individual problems ; instead an effort is made to discuss common types of problems and the general approach to their solution. The discussion leader would make his knowledge of the experien-

13 "Group Therapy with Pre-Convalescent Patients." *Journal of Psychiatric Social Work* (New York. Columbia University Press) Apr. 1953.

ces of former patients available to the group. It was believed that the "group meeting technique, which offered each patient the opportunity to share his feelings with others about to leave the hospital, facilitated the consideration of common problems and paved the way for a more effective post-hospital case-worker-patient relationship".[14] Having observed group discussion techniques used in another connection in an Indian hospital, the writer has no question about its applicability. He would suggest, then, that this generally useful technique could be specifically used in the process of pre-convalescent preparation.

FAMILY CARE

This kind of arrangement, which provides an emotionally protected environment between hospitalization and full resumption of normal activities was, the writer was informed, completely inapplicable to Indian culture. An outsider would have no place in the joint family structure; the family was too strong an in-group to tolerate a non-related patient. Even if the patient's care was subsidized, suitable families would be disinterested in participating in any family care programme. Not having expert knowledge of the Indian family, this writer could not dispute these arguments; however, he was disappointed because his experience with family-care placements had convinced him of the therapeutic and economic benefits of such programme.

It was, therefore, with a feeling of satisfaction that several instances of the successful use of family care placements were found, not actually identified as such, at the Punjab Mental Hospital. In one instance a nurse and her husband had sponsored the release of a patient and had taken her into their home. Their affectionate care helped the patient to make a social recovery. In another case a physician had offered hospitality to a patient, acted toward the patient as a foster father while his children acted as foster sisters. The patient responded to this relationship after other prescriptions had failed, and was able to join her natural family. Surely there are other warm-hearted Indian families who might, with supervision and a nominal subsidy, provide foster homes to selected patients.

Family care of the mentally ill has a legendary beginning. Dymphna, a princess of ancient Ireland and now the Catholic patron saint of the mentally ill, was converted to Christianity against the wish of her father. Dymphna and the priest who was responsible for her conversion left Ireland to escape the king's wrath. The pair was captured in Gheel, Belgium, where they were beheaded before a public gathering. Some people, known to have been mentally ill, returned to normality after viewing the execution. Gheel became a Mecca for the mentally ill, who became paying boarders in the homes of the local residents. Nursing the mentally ill became a family hereditary occupation. In 1853 the Belgian government subsidized the plan, and located a hospital and psychiatrists in the town. The hospital screens new patients and cares for those who have relapses while in family care placement. "The entire maintenance of patients, including the costs of the small institution, is probably less than any known place where medical care and humane understanding treatment is given."[15]

India would do well to study the plan, which has been adopted by diverse cultures in Europe and in the United States, each adapting the idea to its own conditions. The plan has two features to recommend it. It has proved to be a less expensive way of caring for the mentally ill. Maryland, in the United States, which introduced a family care programme, reported a study of the cost of family care programmes at two state hospitals in 1949-50.[16] According to the study, the average cost per patient in family care was $315.48; in hospital, $609.39.

The second feature is its value for those patients who have no living relatives to sponsor their release, for those who require temporary care between hospitalization and normal living, and for those who require a home free of the emotional strains present

[14] Ibid.

[15] Hester B. Crutcher, *Family Care of the Mentally Ill*. Publication No. 9. (Washington. D.C. The American Association for the Advancement of Science) p. 83.

[16] *Proceedings of the Second Mental Hospital Institute in St. Louis*, 1950 (Washington, D.C. American Psychiatric Association).

in their own family relationships. The patient is not transferred from the hospital to a family care home and forgotten. A social worker should not only select the homes, but also supervise the placements. An excellent manual on the organization of a family care programme is published by the State of Ohio, which has introduced this progressive programme.[17]

AFTER-CARE

Only those hospitals with social workers reported any programme for post-hospital contacts with patients. Failure to reimburse social workers for travel severely limited the programme. Some encouraged the patient to write to the staff about his adjustment at home, but the number of patients who maintained even this kind of erratic contact was small. The quality of assistance given by unsustained correspondence is probably dubious. The invitation to write is a token of the hospital's friendly interest, but correspondence alone is an ineffectual way of dealing with problem situations. One hospital with a social worker made good use of a mental hygiene clinic to which patients were referred for after-care. The hospital reported a significant decrease in the rate of relapse, following institution of this arrangement. No one could provide anything but a rough guess on the rate of relapse at the end of specified lengths of times following releases, because these important data are not required for the Annual Report. These data reflect the efficacy of treatment and the quality of the discharge selection procedure. The discharge rate, unaccompanied by the relapse rate, may have little value.

Most hospitals in the United States do not discharge patients directly from the hospital. At the time of his release, each patient is presumed to have achieved maximum benefit from hospitalization and to have been restored to his pre-psychotic condition, or to have been sufficiently recovered to warrant release. Recognizing the possibility of relapse, the final discharge is conditional on his completion of one year in the community. The Indian patient is normally discharged directly, but the mental status presumably should be the same as that of American patients, who are released on what is generally called "convalescent leave", formerly known as "parole". For some period after the patient's release the hospital should provide services which may help the patient either to maintain a satisfactory level of remission or to return for further care if needed.

The social worker is prepared by his training to carry major responsibility for the convalescent phase of the patient's illness. It will be recalled that the need for after-care services led to the affiliation of social workers with psychiatric hospitals a half-century ago. The problems which make pre-convalescent preparation an important part of the institutional process cannot always be resolved prior to the patient's release and demand continued social case work service. After-care service has been administered in various ways in American hospitals. Some states have regional offices, each of which offers after-care service to any patient who takes up residence in its area. Some use their own staff to follow up the patient, visiting him in his own home or meeting him at some specified place at which other patients may be interviewed. Some refer the patient to a community clinic. Wherever possible, this writer favors the giving of after-care service by the hospital's own staff, particularly by the person who has followed the patient from intake. He understands best the pre-morbid social situation without compelling the patient to repeat his story and has developed the requisite relationship with the patient. Here again, the hospital-based travelling clinic offers an opportunity for giving after-care service. The clinic staff could be overwhelmed if they attempted to follow every patient in a routine fashion. Many patients have no urgent need for after-care services. Experience will help the staff to identify those likely to relapse and to concentrate attention on that group. Research, subsequently, might well take this out of the area of clinical judgment.[18]

[17] Magnolia G. Culver, *Family Care Programme: A Handbook for Social Workers* (Columbus, Ohio. The Division of Mental Hygiene, Ohio Dept. of Public Welfare, 1957).

[18] See my article, "Prediction of Outcome of Convalescent Leave of Patients From a Public Psychiatric Hospital", *The Psychiatric Quarterly Supplement* Part II (Utica, N.Y. State Hospitals Press, 1955).

COMMUNITY INTERPRETATION

Most Indian hospitals have made no effort to develop any public information programme in their district. Requests from organizations for talks on mental hygiene and the work of the hospital were rarely received. One hospital superintendent was a notable exception in that he actively solicited such invitations. He believed he had a responsibility for disseminating principles of mental hygiene. The hospital visitors, who could be one avenue of community interpretation, rarely lend themselves to this use. Board members are not selected for their interest in mental health, nor have the superintendents been consulted in the appointment of board members. Nor do the visitors represent particular community segments whose interest in the hospital they could enlist. There was no sustained volunteer programme. The only positive community relations activity was the relationship that hospitals had with local medical schools which sent students for clinical demonstrations and lectures on psychopathology. The hopitals must reduce their isolation from the communities they serve, and must take leadership in advancing mental health. Physical isolation should not be allowed to lead to cultural isolation. The Indian Mental Hygiene Society appears to be, to all practical purposes, defunct. The hospitals need to bring their own problems before their constituencies. The public needs to know that the state of the mental hospital, the chief mental resource in their areas, is a matter of concern to all. Psychiatric social workers in India should have special competence in community organization tasks. They should know how to help communities ascertain their psychiatric needs and to develop the hospital as a resource to meet their needs. They should have special aptitudes for getting representatives of various groups to work together in matters relating to mental health. Community organization skills are an important qualification for the pioneer psychiatric social worker, particularly when other social welfare resources are undeveloped. Hospital staff members may not complain that hospitalization is too long delayed if they have done nothing to improve the community's negative attitudes which have contributed to the delay.

IN-SERVICE TRAINING

There is only one hospital which offers training to social work students, but the circumstances, i.e., poor administrative structure and inexperienced supervision, were hardly conducive to produce competence of the kind needed in a worker in what is practically a virgin field. The social worker who is to participate in the training of other hospital staff must be secure in his knowledge of the social components of human behaviour and the way in which social work contributes to attainment of the hospital's objectives.

In-service training should be directed toward preparing people to participate on the hospital team ; it is not simply the teaching of certain skills. Actually, this writer did not sense much acquaintance with the concept of the team approach to the study, diagnosis, and treatment of mental illness. Many of the doctors had never worked in a true team situation. The concept of the clinic team developed in the United States in child guidance clinics following the First World War, was given considerable impetus by private foundations. These clinics were organized to provide a therapeutic approach to the whole child. "It was recognized that disturbance of personality was a compound of disturbed inter-relationships in which biological, psychological, and sociological processes are present and interwoven. In recognition of these inter-relationships the provision of effective psychiatric service in the child guidance clinics became a collaborative activity of several professional disciplines particularly psychiatry, clinical psychology, and psychiatric social work, functioning together in the interests of the patient and of the persons important to him." [19] This approach was adopted in adult clinics in the U.S.A. and has become important in physical medicine as well. These professional disciplines had worked together prior to the child guidance clinic movement, but their employment in the same hospital did not *ipso facto* constitute a team approach. In a truly collaborative approach, the psychologist and social worker

[19] *Psychiatric Social Work in the Psychiatric Clinic* (Topeka, Kansas. Group for the Advancement of Psychiatry, 1950).

do not simply do whatever the doctor has no time to do himself. Throughout the entire course of the case, they have their own responsibilities based on their special field.

In this paper, the writer has focused on the social worker's responsibilities in the institutional process. The team has actually expanded beyond the original clinic trio and includes nurse, occupational and recreational therapists, attendants, nurses, volunteers, and religious advisors. In order for a team to be effective the several disciplines must work together toward common professional objectives. All must share a common orientation to the hospitals' purpose, which is the rehabilitation of each patient to the highest level of adjustment of which he may be capable. This common orientation must be achieved by in-service training. The aide, for example, may see the patient only as a hospital worker whose release may impair the institution's operating efficiency. Similarly, other employees may have distorted views of the hospital objectives. The operation of a team is also hampered when there is lack of knowledge of the functions of team mates or lack of confidence in the capacity of the other to do his part. One of the obstacles to recruiting clinical psychologists and psychiatric social workers for American hospitals is that the psychologist and social worker are frequently better trained for their role on the team than is the physician for his role. Although urgency to accept employment in India is greater than in the United States, the same objection to state hospital employment is operative in India and will certainly become a greater obstacle as the country's progress creates a demand for professional social workers in other fields of service. Social workers, like other professional groups, require a sense of appreciation of their professional contribution, an opportunity to develop on the job, and treatment as colleagues in a collaborative effort.

RESEARCH

Indian psychiatrists at all hospitals ought to engage in coordinated research on well-defined problems. This is still an elusive goal in the United States but the failure of the West need not impede India's efforts. There is an unexplored research potential in state hospitals. Small studies in the various hospitals, undertaken under controlled conditions, may yield valuable generalizations. India must put "Western" psychological theory and treatment to the test. She must develop her own psychological instruments. These are subject to cultural variations, particularly when tests are largely verbal. The purposeful direction of research and of planning based on it requires some coordinating body. The Indian Psychiatric Society might provide leadership but not the financial support ; further, its members are probably too busy with other duties to give this matter the attention that it deserves. The 1957 Annual Conference of the Society did not draw enough of its membership to establish a quorum. The centre and state governments should take leadership in reducing the isolation of hospitals from each other, not only to facilitate research but to make possible the sharing of ideas, and raising the level of treatment.

IMPRESSION OF OTHER PSYCHIATRIC FACILITIES

If one needs any proof of the variety of emotional disturbance and the variety of people in distress in India, it can be found at the out-patient clinic of the King Edward Memorial Hospital, Bombay. The number of patients, many of them transferred from other hospital services, creates a staggering burden and the techniques used to deal with it are necessarily unorthodox. Work at the other clinics visited seems to be less overwhelming, perhaps because of more restrictive intake policies or lack of demand for service. Most of the clinics suffer from the inability, because of lack of special staff, to put the team approach into practice. The Institute of Psychology and Child Development, Ahmedabad, and the Nur Manzil Psychiatric Centre, Lucknow, offer the most complete diagnostic and treatment service of all the psychiatric facilities that the writer saw in India. The former is supported by a foundation established by a private industrialist ; the latter, by the Methodist Church. The Lucknow institution has also in-patient facilities. Completion of a new building will enable it to care for only 26 patients; hence, comparison with the government institutions would be invidious. The institute at

Ahmedabad has an ambitious research programme which, when fully implemented, can be expected to make important contributions to knowledge of behaviour and development of emotional disorder in India. These two facilities are perhaps the only ones where the team idea is apparently in effect. Not only is this approach practiced, but the necessary climate for collaboration is present. The simultaneous presence of these two features is a commendable achievement.

IV

SUMMARY AND SUGGESTIONS FOR ACTION

The importance of developing an adequate mental health programme in India is predicated on the assumption that :

1. A democratic government should attempt to maximize the participation of all of its citizens in guiding their own destinies ; therefore, it should strive to protect them from incapacitating conditions. India's dedication to the welfare state ideal strengthens the basis for this assumption.

2. A country's provisions for its already handicapped population is a reflection of its social philosophy ; therefore, a democratic government attempts to rehabilitate, and not merely to isolate, its deviant, disenfranchised, and dependent population.

3. The general status of mental health is particularly vulnerable in a country which is undergoing rapid change in material culture ; further, economic advances do not necessarily improve mental health because the gap between the level of aspiration and that of achievement may widen.

4. Certain expenditure on mental health is economical even when viewed in the short run ; therefore, a country with limited financial resources is ill-advised to let such matters slide.

The employment in 1906 of the first social worker in a psychiatric hospital in the United States was the culmination of a 75-year-old "after-care" movement to offer released patients help in achieving successful community adjustment. Psychiatry became increasingly receptive to social work as the former moved from an emphasis on cataloguing the patient's particular disorder and study of the patient in isolation to emphasis on the meaning of the symptoms and study of the individual in interaction with his social environment. Contributing to the extension of social work responsibilities was the increasing realization that effective treatment of post-hospital adjustment problems, which was the first social worker's responsibility, could best be started at, or before, the patient's admission and continued throughout the period of hospitalization. The institutional process is viewed as a continuum, from pre-admission to after-care, on which social factors are important at each point ; hence, the social worker has a contribution to make throughout the patient's hospitalization.

Many aspects of the institutional process are neglected, and many of the responsibilities normally allocated to social workers are carried by no one. State hospital psychiatry in India suffers from being carried on in isolation. The patient is studied in isolation from his social environment, including those persons who are significantly related to him. The concept that behaviour is a function of the interrelationship of social, psychological and physical forces does not appear to be implemented. The psychiatrists and general practitioners who staff the hospitals cannot make up for the general absence of social workers and psychologists from the hospital team. Treatment, largely organic in nature and directed toward the reduction of symptoms, seems to do little or nothing about the social environment. After-care programmes are practically non-existant, and the patient is returned to the essentially unchanged situation where his illness started. Not only does the patient appear to be isolated from family and community, but the hospital is isolated from the community. Where employed, the social workers, who should take a leading role in community relations programmes as well as in involving the relatives in treatment and in after-care planning, are limited to the hospital and close

vicinity by lack of budgetary provision for travel. The only relationship with the outside world appears to be through the teaching of medical students from nearby schools. Visitors' boards, as they are now constituted, do not operate to reduce hospital-community isolation. Few hospitals were doing anything to break this isolation and to encourage community interest in mental hygiene and mental health. This important job may not be relegated to the Indian Mental Hygiene Society which seems to be inactive or ineffective at this time. Staffs of various hospitals seem to be isolated from each other ; indeed, some complained of being insulated from important planning that was going on at the next higher echelon. News of plans, in the formation of which the hospital chiefs should have participated, filtered down as rumours. The Indian Psychiatric Society cannot bear the burden of removing effectively the inter-hospital isolation. Its conferences have been poorly attended, perhaps because the members must spend from their restricted earnings to pay for travel to such meetings.

The absence of the psychiatric team approach is likely to produce another type of insularity between services within a hospital. True collaborative effect requires not only the employment of people with special skills but also the sharing of a common objective, the understanding of how each team member contributes to its achievement, confidence in the competence of other team members to their jobs, provision for staff meetings at which diagnosis and treatment are considered, and a willingness to abide by team decisions under the leadership of the psychiatrist-physician. In some hospitals (notably the Punjab Mental Hospital) almost all the ingredients for effective team work were present except the actual personnel ; in others, it seemed that there were additional deficiencies in the administrative climate that is required for team work. Research programmes need to be strengthened. India cannot afford to be inactive and unimaginative. The application of "Western" psychological theory, treatment and testing devices needs study in order to develop appropriate adaptations. New methods of care, e.g., family care, day care, group treatment, need to be introduced and evaluated.

SUGGESTIONS FOR ACTION

1. Hospital staff must be strengthened. Positions for psychologists, social workers, occupational and recreational therapists should be sanctioned ; where they are now sanctioned but vacant, an active recruiting campaign should be launched. This campaign also needs to be directed toward encouraging suitable people to undertake training. The possibility of subsidizing their training in return for work commitments should be considered.

2. Institutes for staff should be organized, and travel allowances should be authorized for attendance at professional conferences. This would help to reduce the isolation of hospitals from each other. The concept of the team approach to the diagnosis and treatment of mental illness should be promulgated. This should lead not only to more effective utilization of present staff but also to a recognition of requirements for additional personnel.

3. The establishment of part-time travelling clinics, one for each hospital's area and manned by the hospital's staff should be considered. Initially, these clinics would offer diagnostic and pre-admission service, and would be a center for social service contacts with relatives of hospitalized patients and the released patients. In view of the length of time between travelling clinic appointments in a given locality, treatment of new out-patients would not be attempted until more staff became available. These mobile clinics would eventually give way to permanent clinics when the public was ready for them and when trained staff would be obtained.

4. Volunteer programmes, which involve community people in the hospital's work, should be encouraged ; advisory boards composed of representatives of community groups should be selected for the purpose of aiding each hospital to carry out a programme of mental

health education, develop community support for hospital programmes. This would help reduce the isolation of hospitals from the communities that they serve.

5. A coordinated research programme under competent direction needs to be set up. This would make possible the execution of small corroborative investigations in the various hospitals. These would not only be infinitely more valuable than the isolated studies which have been reported in the past, but also would serve to provide necessary professional stimulation to the staffs of the various hospitals. The continuous reporting system also should be overhauled to make it useful in administrative research. A useful model exists in a new reporting system for mental hospitals developed by the U.S. Public Health Service. The possibility of more current publication of the Annual Reports also should be explored.

6. Revision of the Indian Lunacy Act should be pursued.[20] Inasmuch as the Indian Psychiatric Society's draft act is now seven years old, it should be returned for revision, with comment on whatever points that have been preventing its adoption to date. A joint committee of representatives from government and the Psychiatric Society should be appointed to write another draft, action on which should be vigorously pressed.

7. The inspection function of the hospital visitors' boards needs to be critically reviewed, and the possibility of setting up a central mental health division, in charge of inspection, research and development, needs to be considered. Establishment of a department of mental health is suggested in the Indian Psychiatric Society's revision of the Lunacy Act, but this is a more complex problem than revision of legal provisions and should be considered separately.

8. Hospital construction programs must receive attention. Although the strengthening of the treatment potential of a hospital will reduce the per capita length of hospitalization, the hospital also tends to be used by more patients. Further, many of the hospitals are overcrowded. Construction is also necessary to provide separate institutions for the mentally ill and the mentally deficient, groups which require different programs and facilities.

In general, the above recommendations all look toward an accelerated change from a custodial to treatment orientation. A democratic country, dedicated to the ideal of the welfare state, must do its best to restore the mentally ill to full citizenship.

[20] Considerations of space have led to an exclusion of a critical review of this Act: the Act is important because the legal conditions under which a patient begins treatment affect the success of therapeutic programmes.

The Composition of India's Population according to the 1951 Census

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A fruitful and widely accepted way of studying human populations is to approach them from three clearly demarcated points of view : facts, problem and policy.

Perhaps the most important and the basic minimum needed for any demographic study is factual data. These include total numbers, trends of growth or decline, composition and characteristics or what is sometimes called formal demography, movements and distribution, the vital processes involving births, marriages and deaths, and last, quality, both positive and negative aspects.

The second approach is to consider the total group in terms of a problem—economic, social or cultural or whatever the criteria adopted. The problem arises from the social or economic or other values in contemporary vogue. These by their very nature may vary from time to time. The problem in a country's population may arise from "too many people" and in another country from "too few people". It is also possible that in the same country the population phenomenon which was once considered "too many" may be considered at another time as "too few." It is also true that a country's population problem may not be viewed as such by her neighbours and vice versa.

The third approach stems directly from the second. If a problem of population is granted to exist, something can or should be done about it. Hence the need for social action. But such action is possible only when there is both awareness of desire and capacity for social action. Therefore, all demographic problem areas, no matter what the exact nature of the problem, may not embark on governmental or non-official policies. And such policies when embarked upon may differ from country to country depending on the nature of the political system, traditional cultural and religious values and cherished political, economic and other goals.

This paper is confined to an analysis of the first aspect of India's population, namely the composition of the population according to the 1951 Census. It is proposed to examine the other two aspects of India's population in later communications.

GROWTH OF INDIA'S POPULATION

The 1951 Census was the eighth regular Census of India and the first Census in a free India. However, a partial and unsystematic Census of the country was attempted between 1867 and 1872 ; and since 1881 when the first regular Census was taken, India has had a regular Census every decade. Thus the official record of India's population growth is available for only the last seventy years. It may be mentioned that in the United States the first Census was taken in 1790 and in Great Britain in 1801.

No reliable picture of the population of India prior to the first regular Census of 1881 is available. However, certain estimates, or better "guesstimates", have been made periodically and while these figures cannot be taken too seriously they represent certain approximations and are not without value. In the sixteenth century, according to some very rough estimates, the population of India was supposed to have been around a hundred million. In the middle of the eighteenth century the figure rose to about 150 million. These rough figures are not comparable as the area has been changing

through the years. After the formation of what was called the Indian Empire as a part of the British Empire, and until 1937 the population of India included, besides geographical India, the area that is now the Republic of Burma, which was then a province of India, and even Aden which was classed as a part of the Indian Empire, but excluded the island Dominion of Ceylon, then a British Crown Colony. However, the Government of India Act of 1935, which came into force in April 1937, effected the political separation of Burma and Aden from India proper, and the population figure till the 1947 partition of India into India and Pakistan, was for geographical India alone. Since 15th August 1947, when India regained her political freedom, her population has been reduced because of the partition of the country. Table No. 1 sets forth the earlier estimates and the Census figures for the later decades.

TABLE No. 1

Growth of India's Population 1600—1951 (in millions)

	Source	Population	Increase due to inclusion of new areas	Improvements in methods	Real increase	Percentage
1600	Moreland's estimate [1]	100	–	–	–	–
1750	Shirras' estimate [2]	130	–	–	–	–
1847	McCulloch's estimate [3]	133	–	–	–	–
1850	Mukerjee's estimate [4]	150	–	–	–	–
1861	Our estimate	164	–	–	–	–
1872	First partial census [5]	206.2	–	–	–	–
1881	Regular and rather complete census [6]	253.9	33	12	3	–
1891	Third and complete decennial census [7]	287.3	6	3	24	9.6
1901	Census [8]	294.3	3	–	4	1.4
1911	Census [9]	315.2	2	–	19	6.4
1921	Census [10]	318.9	–	–	4	1.2
1931	Census [11]	352.9 [14]	–	–	34	10.6
1941	Census [12]	388.2 [15]	Loss due to separation of Burma		50	14.8
1951	Census [13]	356.8	Loss due to the creation and separation of Pakistan			–

1 W. H. Moreland. *India at the Death of Akbar.* (London 1927.) p. 71.

2 Findlay G. Shirras. *Poverty and Kindred Problems of India.* (London. 1931), p. 26.

3 J. McCulloch. *Descriptive and Statistical Accounts of the British Empire.* (London. 1847).

4 Radhakamal Mukerjee. *Food Planning for 400 Millions.* (London. 1938), p. 3.

5 to 13 *Census Reports of India.* Government of India publications.

14 The apparent marked increase in population between 1921 and 1931 was, according to R. R. Kuczynski, due largely to more accurate enumeration in 1931. This factor is also partly responsible for the increase of population between 1931 and 1941. R. R. Kuczynski, "Population Trends in the World" *Statist.* (London) December 25, 1937.

15 Up to 1931, the Census figures as pointed out in the text indicate population for both India and Burma. In 1931 the population of India alone was 338.1 million and the population figure for 1941 is for India alone.

Table No. 2 presents the growth of India's population for the last five census decades, 1901-1951, adjusted to the present area of the Republic of India.

TABLE No. 2

Growth of India's Population, 1901—1951 [1]

Census Year	Population in millions	Increase or Decrease over the previous decade in millions	Percentage Change [2] to the Mean Population of the period	Percentage Change during the decade
1901	235.5	– 0.4	– 0.2	– 0.17
1911	249.0	13.5	5.8	5.73
1921	248.1	– 0.9	– 0.4	– 0.36
1931	275.5	27.4	10.4	11.04
1941	312.8 [3]	37.3	12.7	13.73
1951	356.9	42.0	13.2	14.09

1 Excluding Jammu and Kashmir, the population of which was estimated in 1951 at 4.41 millions.

2 Percentages of the *mean* population of the period during which the increase or decrease occurred.

3 Deducting 20 lakhs from the 1941 Census figure of 314.8 million as an allowance for inflation of returns in West Bengal and Punjab.

THE 1951 CENSUS

The total population of India including the estimated population of Jammu and Kashmir (4.41 million) and Part B Tribal Areas of Assam (0.56 million) on the 1st March 1951 was 361.8 million while the total land area was 1.27 million square miles.

However, the figures for the territories actually covered by the Census of 1951 are as follows :

Total Population in 1951	356,829,485
Total Population in 1941 for the same area	314,766,380
Net increase (1941-51)	42.06 million
Mean decennial growth	12.5 per cent
Percentage increase	13.4 per cent
Total land area	1.18 square miles
Density	303 persons per sq. mile
Number of occupied dwellings in India	64.36 million
Number of occupied dwellings per square mile	55
Number of persons per occupied dwelling	5.54 (5.45 persons per occupied house in rural areas and 6 persons per occupied house in urban areas)

REGIONAL DISTRIBUTION

In all previous Censuses the total population was tabulated according to the then various provinces and states or accepted administrative and political divisions of the country. A notable feature of the recent Census is that, for purposes of studying the significance of population change in relation to economic change, it was found convenient to use territorial divisions which reflect significant differences in physical features, soil and rainfall conditions and cropping patterns. Accordingly, India was divided into five natural regions.

According to the Registrar-General for 1951, "If we are to make an intelligent study of why the people happen to be as unequally distributed as they are in different parts of our country, it is essential we should get behind the existing political divisions of the country into states and their grouping in zones. We should visualise the country as consisting of different parts which are distinguished from one another by differences in topography, soil, rainfall—the major factors which determine how much of "land" can be used to grow food and the degree of its usefulness for the purpose. These, in turn, determine how many people could make a living on the land. From the point of view merely of

topography, the country may be divided notionally into five broad "regions", viz., (1) The Himalayan region, (2) the Northern Plains region, (3) the Peninsular Hills and Plateau region, (4) the Western Ghats and Coastal region, and (5) the Eastern Ghats and Coastal region.

"These regions, however, are very large units. Big differences occur within them because of differences in the amount of rainfall, as also to some extent because of variations in the soils. So these regions have been divided into 15 sub-regions as shown below :

Regions	Sub-Regions
1. Himalayan	(a) Western Himalayan (b) Eastern Himalayan
2. Northern Plains	(a) Lower Gangetic Plains (b) Upper Gangetic Plains (c) Trans-Gangetic Plains (d) The Desert
3. Peninsular Hills and Plateau	(a) North-West Hills (b) North Central Hills and Plateau (c) North-East Plateau (d) North Deccan (e) South Deccan
4. Western Ghats and Coastal	(a) Gujarat-Kathiawar (b) Malabar-Konkan
5. Eastern Ghats and Coastal	(a) North Madras and Orissa Coastal (b) South Madras

"These sub-regions, in turn, have been divided into 'natural divisions' each of which is either an entire state or a group of contiguous districts within a state. The data collected at the 1951 Census have been tabulated for these natural divisions and it is hoped this will facilitate more intensive study and better understanding of the significance of our basic population data." [1]

[1] R. A. Gopalaswami. *Census of India, 1951. Vol. 1. India Part 1-A—Report.* (Delhi, Government of India Press. 1953), pp. 11-12.

TABLE No. 3

Regional Distribution of India's Population, 1951

Region	Population in millions 1951	Population in millions 1941	Females per 1000 males	Mean decennial growth
India	356.83	314.77	947	+ 12.5
1. Himalayan	17.04	14.83	897	+ 13.9
2. Northern Plains	139.40	125.07	909	+ 10.8
3. Peninsular Hills and Plateau	108.60	96.22	971	+ 12.1
4. Western Ghats and Coastal	39.93	32.52	960	+ 20.5
5. Eastern Ghats and Coastal	51.83	46.09	1009	+ 11.7
6. Others	0.03	0.03	625	− 8.6

Table No. 3 gives the broad regional classification of India's population. It will be seen from this table that the Western Ghats and Coastal Region account for the largest increase in population (20.5 per cent) while the Himalayan Region comes next with an increase of 13.9 per cent. The Northern Plains Regions is the most populous of the five regions, accounting as it does for 139.4 million people.

POPULATION OF THE STATES

When the 1951 Census was taken the country was divided into the following political and administrative divisions : 9 Part A States, 9 Part B States, 10 Part C States and a few Part D Territories. And these were grouped into six Population Zones. They were : North India, East India, South India, West India, Central India and North-West India. But these divisions have now been superseded as the country's political divisions have been recast on the basis of the recommendations of the States Reorganisation Commission (1954) in accordance with the linguistic and other related loyalties of the Indian people. And as of 1st November, 1956 the Union of India consists of 14 linguistic States including the bilingual Bombay State and 6 centrally administered regions without any relevance to linguistic considerations. Table No. 4 presents the new States, their languages, area, population and capitals.

TABLE No. 4

The States of India and their Population

State	Language	Area in Sq. miles	Population in millions	Capital
1. Andhra Pradesh	Telugu	110,250	32.2	Hyderabad
2. Assam	Assamese	84,924	9.0	Shillong
3. Bihar	Eastern Hindi	67,830	38.9	Patna
4. Bombay	Marathi and Gujarathi	188,240	47.8	Bombay City
5. Kerala	Malayalam	14,980	13.6	Trivandrum
6. Madhya Pradesh	Hindi	171,200	26.4	Bhopal
7. Madras	Tamil	50,170	30.0	Madras City
8. Mysore	Kannada	72,730	19.0	Bangalore
9. Orissa	Oriya	60,140	14.6	Bhuvaneswar
10. Punjab	Punjabi & Hindi	46,616	16.0	Chandigarh
11. Rajasthan	Rajasthani	1,32,300	16.0	Jaipur
12. Uttar Pradesh	Hindi	113,410	63.2	Lucknow
13. West Bengal	Bengali	32,279	26.2	Calcutta
14. Jammu & Kashmir	Kashmiri	92,780	4.4	Srinagar
Centrally Administered				
1. Delhi		578	1.74	Delhi
2. Himachal Pradesh		10,451	.98	Simla
3. Manipur		8,658	.58	Imphal
4. Tripura		4,032	.64	Agartala
5. Laccadive and Amindivi Islands		1,900	.02	—
6. Andaman and Nicobar Islands		3,215	.03	Port Blair

RURAL AND URBAN COMPOSITION

The terms *rural* and *urban* have different meanings in different countries and at different times. The matter is decided by the Census authorities who define these terms. The Indian Census defines a village generally as a community of and less than 5000 inhabitants with pronounced rural characteristics. It is technically possible to have an urban community of less than 5000 and a rural community of more than 5000; the Census definition is not based on size alone but on socio-economic characteristics. According to the 1951 Census there were 558,089 villages and 82.7 per cent of the total Indian population lived in these villages.

In this connection the Registrar-General points out, "What is reckoned for all administrative purposes (and consequently also for the Census) as a 'village' may or may not be the same as what we normally have in mind when we speak of a village. A village in the latter sense, means or should mean a cluster of houses (or more than one closely adjoining cluster of houses) whose inhabitants are regarded by themselves as well as by others as a distinctive social unit with its identity marked by a distinctive local name. The village in the administrative sense is the 'mauza'—a settled area with defined boundaries, for which village records have been prepared. In the south, there is a further development by which contiguous administrative villages defined by land records have been grouped together for purposes of land revenue administration, and the group is referred to as the village.'[2]

The 558,089 villages in India are broken down in Table No. 5 into different groups according to their population size. The table reveals that the medium-sized village with inhabitants numbering between 500 and 2000 is the dominant type in all the six zones.

[2] R. A. Gopalaswami, *op. cit.*, p. 42.

TABLE No. 5

Percentage of Rural Population According to Village Size

Zone	Percentage of Rural Population living in			
	Small Villages (Under 500)	Medium size Villages (500-2000)	Large Villages (2000-5000)	Very Large Villages (Over 5000)
North India ..	29.8	55.3	13.5	1.4
East India ..	33.8	48.6	14.3	3.3
South India ..	9.4	38.5	35.3	16.8
West India ..	18.1	55.0	23.9	3.0
Central India ..	35.7	50.4	13.0	0.9
North-West India ..	30.4	50.9	16.4	2.3
India ..	26.5	48.8	19.4	5.3

What is an urban area? How is a town defined? Unfortunately there has never been any rigid or uniform definition of a town or an urban area in the Indian Census. The Chief Census Commissioner and the State Census Superintendents have been allowed a certain amount of latitude and discretionary powers in this matter. As the Registrar-General rightly points out, "The tests prescribed for distinguishing towns from villages in different states are based on ideas common to all states, but they are not identical, nor have they been applied with meticulous uniformity. Thus Uttar Pradesh classifies as a town: '(a) every Municipality, (b) every notified area, (c) every town area, (d) cantonment and (e) any other continuous group of houses permanently inhabited by usually not less than 5,000 persons which (having regard to the character of the population, the relative density of the dwellings, the importance of the place as a centre of trade and its historic associations), the State Superintendent of Census Operations decided to treat as a Census Town'. In West Bengal, the definition is somewhat stricter. There, a town is: '(a) an area, irrespective of population, which has been declared by the Government to be a municipality, and (b) where a municipality has not been established and yet the Government decides to call it a town for the ensuing census, if the area has satisfied the following tests: (i) it has a population of not less than 5,000, (ii) a density of not less than 1,000 inhabitants to the square mile, (iii) the area has some importance as a centre of trade or distribution or administration, and (iv) about three-quarters of the adult male population are chiefly employed in pursuits other than agriculture'. 'The fundamental criterion' in Madras is reported to be 'the existence of urban features—which can be judged by the way in which the houses are situated and how they have been built and the availability of urban amenities (such as a bazar where one could buy one's normal requirements throughout the year, facilities for education, recreation and medical treatment)'."[3]

In view of these varying definitions from State to State it is theoretically possible that places which would have been classified as villages in one State may be classified as towns in others. But the Registrar-General points out that the proportion of the urban population living in such places is very small. If we neglect the figure for townships, there is little doubt that the numbers of minor towns, major towns and cities and the statistics of inhabitants of such towns do present a comparable picture of the pattern of urban life in different parts of India.

It is interesting to note as pointed out by the Registrar-General that though there are only 73 cities among 3,018 towns, the total number of inhabitants of these cities exceeds one third of the total urban population of India. Very nearly one-fifth of the entire city population of India is found in one inhabited locality in Greater Calcutta.[4]

[3] R. A. Gopalaswami, *op. cit.*, p. 45.

Towns with a population of 20,000 and over are of four classes: towns with a population of 100,000 and over are cities; those with a population between 20,000 and 100,000 are major towns; those with a population range between 5,000 and 20,000 are minor towns; and those with a population under 5,000 are townships. Table No. 6 gives the pattern of India's urban population.

TABLE No. 6

Pattern of India's Urban Population

	Number of Towns	Number of Town Dwellers in millions	Urban Population Percentage
Cities	73	2.35	38.0
Major Towns	485	1.86	30.1
Minor Towns	1,848	1.78	28.6
Townships	612	.20	3.3
India	3,018	61.9	100.0

In 1951 the urban population numbering 61,900,000 lived in 3,018 towns including 73 cities constituting 17.3 per cent of the total population. The urban percentage varies from zone to zone. They range from 31.2

TABLE No. 7

Classification of India's Villages and Towns According to Population in 1951

Population Groups	Villages or Towns	Population in Millions
Under 500	380,019	78.35
500 – 1,000	104,268	72.92
1,000 – 2,000	51,769	71.15
2,000 – 5,000	20,508	59.11
5,000 – 10,000	3,101	20.75
10,000 – 20,000	856	11.68
20,000 – 50,000	401	11.80
50,000 – 100,000	111	7.55
100,000 and over	73	23.55

[4] R. A. Gopalaswami, *op. cit.*, p. 47.

per cent in West India to 11.1 in East India. The other four zones, in order, are : North-West India (21.4), South India (19.7), Central India (15.8) and North India (13.6).

Table No. 7 gives the total number of villages, towns and cities grouped according to their population size.

Table No. 8 presents the Rural-Urban ratio of India's population during the last six Census years.

TABLE No. 8

Rural-Urban Ratio of India's Population

Year	Rural	Urban
1901	90.2	9.7
1911	90.6	9.3
1921	88.7	11.3
1931	87.9	12.1
1941	86.1	13.9
1951	82.7	17.3

AGE COMPOSITION

Sex, age and " race "—these three characteristics of *individuals* are hereditary and unchangeable. But when these traits of a population *group* are concerned they are changeable in the sense that the age and sex composition of a population can be significantly altered by manipulating the various factors affecting the death rate. If we reduce the differentials between the male and female infant mortality rates, the age composition of a population at any given time can be different. In a sense, even the racial composition of a population can be altered by changing the marriage laws in a country. For instance, in the United States of America a ban on interracial marriages exists in some states, supported by the existing cultural mores. A change in these laws could alter the racial picture of America, as indeed it is altering decade by decade even without a radical change in these laws. Therefore, while age, sex and racial composition of a population are important in as much as several other economic and social factors are dependent on these, these characteristics are not unchangeable as such.

The importance of the age composition of any population group is obvious. The physiological age of an individual decides many things—the age at which a child can and sometimes must enter school, cannot enter the labour force, can exercise franchise, get married, retire from work and so on. The age structure has direct repercussions on the death rate, the marriage rate, the economic and occupational composition of a population, and certain cultural and social activities of a community.

There are also other aspects of the age structure such as the aging of the population and the problems of the aged. India, of course, does not have these problems as yet.

TABLE No. 9

Age Composition of India's Population, 1951
(Excluding displaced persons)

	Age Group	Population in Millions	Percentage of Total Population
Infants	Under One	11.49	3.3
	1– 4	35.85	10.2
Boys and Girls	5–14	86.69	24.8
Young Men and Women	15–24	60.72	17.4
	25–34	54.50	15.6
Middle-Aged Men & Women	35–44	41.56	11.9
	45–54	29.62	8.5
Elderly Men and Women	55–64	17.69	5.1
	65–74	7.84	2.2
	75 & over	3.39	1.0

Table No. 9 presents the age composition of India's population according to the 1951 Census. The age hunt of an individual presents certain problems in view of poor registration and consequent relative inaccurate vital statistics. People tend to give the age of their children in even numbers and round them off to the nearest integer ; sometimes urban people under-report their ages while the rural people tend to exaggerate their ages. The Indian women do not as a rule

record themselves as younger than they actually are. Despite these errors the age structure as presented in the table may be taken as a fairly reliable indication of the age situation. The Indian Census seeks the age of the individual (not the date of birth which is generally unavailable) in the sense of number of completed years at the birthday preceding the enquiry.

It will be seen that infants (under one year) numbered 3.3 per cent of the total population or almost exactly one in thirty among the people of India. Young children under five years numbered 13.5 per cent of the total population, that is more than one in eight and less than one in seven. All the adolescents, that is all those under 15, numbered 38.3 per cent of the total population. On the other side of the scale, the elderly persons (55 and above) accounted for 8.3 per cent or roughly one in twelve. The young and the middle aged (15-54) accounted for the balance. India's population is a young one. This young composition has its own problems.

The Registrar-General compares the Indian age composition with that of the United States of America in 1950. He writes : " Let us now compare the age pyramid of India with that of the United States of America. First we note that the bottom slab in America is shorter than in India. In America infants and young children are 10.8 per cent while they are 13.5 per cent in India. Looking up, we find the next slab to be even shorter. American boys and girls number 16.3 per cent only, while Indian boys and girls number 24.8 per cent. If we combine the two slabs together they are 26.3 per cent under age 15 in America, while the corresponding number in India is 38.3 per cent.

" The next two slabs stand for 'young men and women'. The lower slab of America is somewhat shorter than ours, while the higher slab is the first to be somewhat larger. Adding up, young men and women are 30.4 per cent in America against 33.0 per cent in India. The next two slabs of middle-aged men and women are both larger in America than in India—the total number in America is 25.6 per cent against India's 20.4 per cent.

" The last three slabs of elderly persons are similarly larger in America than in India. The total number in America is 16.9 per cent against India's 8.3 per cent.

" It is very important that we should take note of the enormous difference between India and America in respect of the area of the two bottom slabs. Out of every 1,000 persons, there are 271 people under age 15 in America and there are 383 in India. The number is nearly one-half as large again in India as in America. This means—even if an average Indian married couple had the same resources to spend on bringing up their children as an average American married couple, each Indian child can only get a much smaller share of these resources than each American child, because the same resources have to be spread over a larger number. Actually, of course, the resources available to an average Indian married couple are very much smaller—which makes the disparity in the number to be looked after, all the more serious. The dry figures tell their story quite clearly—in terms of food, shelter, care and attention during illness, education and every kind of preparation for life, the Indian child is handicapped unmistakably and of necessity. " [5]

SEX COMPOSITION

The sex composition of a population has several important socio-economic bearings. The sex ratio plays an important role in determining the death rate of a community. Women generally have a lower death rate than men because Nature has equipped them better to meet disease. Organically it is man, and not woman, who is the weaker vessel. So if females constitute less than half the total population, the crude death rate of the population will be affected unfavourably. Secondly, the preponderance or scarcity of any sex at the marriageable age group, say 18 to 30, will affect the marriage rate and consequently the birth rate. The importance of the sex ratio of the total population from the point of view of the growth or decline of a country's population is obvious. The immediate increase or decrease of population depends upon the sex ratio of the population in the reproductive

[5] R. A. Gopalaswami, *op. cit.*, p. 65-66.

period, since on account of old age as well as immaturity, a considerable segmant of the population cannot participate in reproduction. Thirdly, an adverse sex ratio in the sense of scarcity of females may sometimes lead to prostitution and other social problems. It is apparent, albeit paradoxical, that a society which cannot provide mature brides for all its adult males must spare some women for purposes of prostitution.

The sex ratio of a country's population varies from year to year and varies from region to region. The sex ratio of a population is determined by what is ordained by Nature at birth, or selective death rates at various ages conditioned by phenomena such as infanticide or war or by occupational distribution, migration differentials (more males go to cities in search of jobs), and socio-cultural attitudes towards one sex or another regarding its role in society.

The sex ratio in India (which is defined by the Indian Census authorities as "the number of females per 1000 males". This is after the definition adopted by the United Kingdom and unlike the definition in the U.S.A. where it is "the number of males per 100 females") for the last six Census years is set forth in Table No. 10.

TABLE No. 10

India's Sex Ratio

Census Year	Number of Females per 1,000 Males
1901	963
1911	953
1921	945
1931	940
1941	934
1951	947

The sex ratio in the various Indian States as they were constituted in 1951 (they have been reorganised since 1957) are presented in Table No. 11.

TABLE No. 11

Sex Ratio in India's States (1951)

State	No. of Females per 1,000 Males
INDIA	947
Part–A.	
Assam	879
Bihar	989
Bombay	932
Madhya Pradesh	993
Madras	1,006
Orissa	1,022
Punjab	864
Uttar Pradesh	910
West Bengal	859
Part–B.	
Hyderabad	978
Madhya Bharat	–
Mysore	948
Pepsu	844
Rajasthan	921
Saurashtra	976
Travancore-Cochin	1,009
Part–C.	
Ajmer	925
Bhopal	–
Bilaspur	948
Coorg	–
Delhi	768
Himachal Pradesh	910
Kutch	1,079
Manipur	1,036
Tripura	904
Vindhya Pradesh	–
Part–D.	
Andaman & Nicobar	625
Sikkim	907
Chandranagore	769

In 1951, of the total population of 356.83 million, 183.31 million were males and 173.52 million were females. As shown in the table, there were 947 females per 1,000 males in the country as a whole. The sex ratio was 947. The ratio varied from region to region. The highest ratio of 999 was in South India and the lowest of 883 was in North-West India. The sex ratio in the other four zones was as follows: North India 910, West India 938, East India 945, and Central India 973. While the picture all over India was one of scarcity of females there were a few divisions in East, South and West India where slightly more than a 1,000 females per 1,000 males were enumerated.

The Registrar-General summarises the facts of the sex ratio thus: "In general, the sex ratio is smaller in towns than in villages. For the country as a whole, the sex ratio in villages is 966, while that in towns is 860.

"The sex ratio in villages is lowest in North-West India (895). In the villages of South India, females outnumber males, the sex ratio is 1,004. In other zones, the rural sex ratio varies thus: 925 in North India, 977 in East India, 979 in Central India and 987 in West India.

"The urban sex ratio is lowest in East India (719) reflecting the deeply disturbing influence of Greater Calcutta. The urban sex ratio is highest in South India (977). It varies in other zones as follows: 820 in North India, 838 in West India, 843 in North-West India and 939 in Central India.

"The difference between the rural sex ratio and the urban sex ratio is very large in East India (258). It is smallest in South India (27). In other zones it varies from 40 in Central India to 52 in North-West India and 105 in North India to 149 in West India.

"The low sex ratio of towns is further emphasized if the ratio is computed separately for cities, that is to say, towns with a population of one lakh and over. In the country as a whole, as mentioned already, there are 235 lakhs of people living in cities —of whom 132 lakhs are males and 103 lakhs are females. The sex ratio for all cities of India is 787. It is lowest for East India (641) and highest for South India (940). In other zones, the city sex ratio varies as follows: 712 in West India, 801 in North India, 813 in North-West India and 934 in Central India." [6]

[6] R. A. Gopalaswami, *op. cit.*, p. 55-56.

Table No. 12 gives the sex ratios for the ten largest cities in India. The differences between Greater Calcutta and Greater Bombay with the lowest sex ratios on the one hand, and Madras and Hyderabad with the highest ratios on the other hand, are striking.

TABLE No. 12

Sex Ratio in India's Ten Largest Cities in 1951

City	Sex Ratio
1. Greater Calcutta	602
2. Greater Bombay	596
3. Madras	921
4. Delhi	750
5. Hyderabad	989
6. Ahmedabad	764
7. Bangalore	883
8. Kanpur	699
9. Poona	833
10. Lucknow	783

REASONS FOR "MALE-DOMINATION"

The relative scarcity of females or the male dominance has been a striking characteristic of India's population during the last few decades as seen in Table No. 10. What are the reasons behind this phenomenon? Do they reveal a genetic trait in the Indian population? Or is it merely underenumeration of females? Or is it socially and culturally conditioned selective female mortality rates at infancy and reproductive age groups? These questions have engaged the attention of successive Chief Census Commissioners and each has advanced a hypothesis to explain this consistent adverse sex ratio.

Upto the 1941 Census, the Chief Census Commissioners were British scholars and administrators who had been accustomed to the excess of females over males in Western Europe and therefore thought that the "large difference in sex ratio between India and Western Europe was unnatural".

The author of the 1911 Census Report of India explained the sex ratio as follows: "It is well known that the natives of India are reticent regarding their women and that in some parts women are regarded as of

very little account. It is, therefore, natural to suppose that the return of them at the Census should be incomplete.

"The age statistics show that the proportion of females is lowest between the ages of 10 and 20. This is the time of life when it might be supposed that there would be a tendency to conceal the existence of unmarried females.

"The increasing accuracy of each succeeding Census has been accompanied by a rise in the proportion of females. It is only reasonable to suppose that there is a connection between the two phenomena.

"The vital statistics for the decade 1891-1900 disclosed a relatively low female mortality and in this respect they were confirmed by the mortality rates deduced from the age return of the last Census." [7]

On the other hand, the theory of omissions accounting for female scarcity was contradicted by internal evidence. The same Census Commissioner pointed out, "The Census staff being more largely composed of permanent officials, was more efficient in the Punjab than in the most other parts of India, but it is here that the deficiency of females is most marked...If reticence regarding women had any effect, it would reduce the proportions for Mohamedans more than those for Hindus but in almost all parts of India the proportion of females among the adherents of that religion is relatively high ..... In the Punjab where the general proportion is very low, it is lowest among the Sikhs, who on the whole, are least reluctant to talk about their women . . . There is a difference of more than a hundred in the proportion per mille between two of the natural divisions in the Madras Presidency although women hold exactly the same position in both. The Animistic tribes neither scorn nor seclude their women but there are extraordinary differences among such tribes in different parts of India." [8]

The second theory explains the sex ratio on the basis of higher female infant mortality, arising from social attitudes towards females. The 1931 Census Commissioner, Dr. J. H. Hutton, observes, "The figures of population of India by sexes show a further continuation of the steady fall in the proportion of females to males that has been going on since 1901. The female infant is so definitely better equipped by nature for survival than the male, but in India the advantages she has at birth are probably neutralised in infancy by comparative neglect and in adolescence by the strain of bearing children too early and too often." [9]

Some others have offered a biological explanation. According to the Census Commissioner for Bombay for 1921, "The Indian Caste System with its exogamous *gotra* (sect) and endogamous caste is a perfect method of preserving what is called in genetics 'pure line'. The endogamy prevents external hybridization, while the exogamy prevents the possibility of a fresh line arising within the old one by the isolation of any character not common to the whole line." [10] Dr. J. H. Hutton, the Census Commissioner for India (1931), while accepting this view, comments, "Whether this proposition be entirely acceptable or not, it may be conceded that if once a caste, whether as a result of inbreeding or some totally different factor has acquired the natural condition of having an excess of males, this condition is likely to be perpetuated as long as inbreeding is maintained." [11] Dr. Hutton also admits the faulty enumeration of females as a contributory cause in giving low figures for the female population, though this source must account for only a very small error.

Mr. R. A. Gopalaswami, the author of the 1951 Census Report, points out, "The true explanation has to be found in two facts: first — males and females are not born in equal numbers; and secondly, they do not die in equal numbers either in infancy and childhood or in old age or in any particular age-group or at all ages taken together." And after presenting certain figures of sex ratio at birth for certain states in India, he proceeds, "First, in every case, there is a definite excess of male births over female

7 quoted in R. A. Gopalaswami, *op. cit.*, p. 56.
8 R. A. Gopalaswami, *op. cit.*, p. 57.
9 J. H. Hutton. *Census of India, 1931. Vol.* 1 *Part* 1. (Delhi, Government of India Press. 1933), p. 42.
10 *Ibid.* p. 197
11 *Ibid.* p. 197.

births; secondly, the excess is very much more pronounced in Uttar Pradesh (North India) than in the other three states (which may be taken to be broadly representative of South India, Central India and West India); and thirdly, the lowest and highest values recorded over a period of ten years do not differ very much; and this fact shows that the occurrence of an excess at birth is not an accident, nor is the fact that this excess is much more pronounced in Uttar Pradesh than in the other states. It would seem that we are face to face with the working of some biological law. Is that conclusion valid or is it vitiated by the fact that all births do not get registered? We know there are omissions in the registration of births. It is also true that the extent of such omissions is not the same in all the states. It cannot, therefore, be denied that it is difficult to be certain on the conclusion stated. It is, however, exceedingly unlikely that the omitted births, if registered, would alter the pattern so materially as to invalidate the conclusion. The causes which lead to the omissions of registration of births are not peculiar to female births. Female births are not much more likely to get omitted than male births. It is difficult to think of any kind of systematic bias which would lead to continuous and universal suppression of female births in such large numbers.

"We must accept the existence of a male excess at birth as a fact. A deficiency of females arises in all parts of India as a biological phenomenon. It is believed that this happens in almost all parts of the world. Nature having given rise to inequality, then appears to set about redressing it. There is a bias in infant deaths just as there is a bias in births. Male infants die in larger numbers than female infants before completing the first year of life. . . . .

"When all this has been said people will still want to know why male births should persistently exceed female births, in all states? Why should this excess of male births over female births be persistently larger in Uttar Pradesh and persistently smaller in other states? Again, it may be asked, why is it that the hand of death spares females more than males at the beginning and the end of life; and why the chances of death throughout life, should favour the females more in some states than in others?" [12]

A more detailed discussion of this subject is beyond the scope of this paper. A proper enquiry has to look into the sex ratio from conception to various age groups. The *primary sex ratio*, that is the ratio at the time of fertilization, is not necessarily the same as the *secondary sex ratio* at birth because a certain number of foetuses die. The number of male and female infants born in any random population does not follow the ratio 1:1. And the secondary sex ratio varies from the sex ratio at different age groups because of the differential mortality rates of the two sexes at various ages. The primary sex ratio, in a human population, is not accessible to direct study as it would involve the sex-chromosomal constitutions of large numbers of newly fertilized eggs. It is possible, however, to investigate the sex ratio among prenatal deaths. The surplus of male live births over female could be the result of an excessive number of deaths of females before births. This is at best a possibility. This possibility has been borne out by some data revealing the sex ratio of stillborn embroyos of infants being in favour of males.

After birth, in general, there is a greater mortality of males than of females throughout successive age groups. It has been established that proportionally more males die during every period than females, except for certain limited periods related to reproduction during which the female mortality is higher than that of males. The exact reasons why the male sex, at every stage, is less resistant to death than the female sex is not understood. It appears that biologically the male and not the female is the weaker sex. It is sometimes held that the higher rate of mortality at birth of boys over girls is related to the relative larger size of boys which may make the process of being born more hazardous for them. But this does not explain the higher mortality of males relative to females at other age groups.

The causes of the significant deviations in the secondary sex ratio from equality of male and female births are simply not

12 R. A. Gopalaswami. *op. cit.*, pp. 59-62.

known. Several variables appear to be involved in this : the age of parents, birth order, legitimacy and rural versus urban births. In some samples, the sex ratio at birth decreases with increasing age of the mother. In some countries, the sex ratio is higher among legitimate than illegitimate births. In some countries, the rural sex ratio at birth is higher than in urban areas. Regarding birth order, there is, in general, a significantly higher proportion of male births in first births as compared to later ones. The practice of contraception may also be a factor in the sex ratio. Birth control may be sex selective in the sense that when a male child is born the parents may stop having children.

In some countries such as India, the current social attitudes are held to be responsible for the differential mortality rates of the sexes after birth. Writing about India's sex ratio in 1946, the present writer observed, " The social attitudes in the country are such that a girl is looked upon as a liability, whereas a boy is welcomed as an asset. This attitude arises out of certain obscurantist factors inherent in the Indian socio-economic order. So a rural girl in her infancy is treated with a wholesome neglect —neglect nevertheless. Care and attention in her upbringing, especially when beset by infantile ailments, are conspicuously absent. . . . " [13] Early marriages, if not quite child marriages, worsen the initial balance of births in favour of male babies ; the reason for this is high maternal mortality. After the early reproductive years, the sex ratio is very much in favour of males in India.

The relevance of the social factor in this connection finds some support in China. The sex ratio in China, or rather of the population in the Kumming Lake region for which some data are available, is apparently comparable to the Indian situation. Unlike India, China has more female than male births. But the female infants lose their numerical superiority in a few years as they grow up and the sex ratio becomes favourable to males for apparently the same reasons that operate in India. Dr. Ta Chen observes, " It seems clear that in China relatively more female infants are born, but as they grow up, the male babies gradually catch up with them in numbers, evidently indicating a proportionately higher mortality among female children. This may be due to the fact that in the Far East generally, and in China particularly, parents usually set a higher value on male children for the perpetuation of the family line and for the observance of filial peity. Thus female children are unconsciously neglected, thereby leading to a higher death rate among them. " [14]

The Registrar-General of India for 1951, however, disagrees with this view. He points out, " Mention should be made of an opinion which has been frequently advanced. It is said (on the basis of general impression) that male children receive better care and attention in households than female children and it is surmised that this must have a significant effect on mortality at early age and again after infancy and consequently on the sex ratio. The implication is that this is a more pronounced characteristic of Indian households than of European households; and, within India, of North Indian and North-West Indian households than households in other zones of India. All this seems plausible but it is to be doubted whether the surmise is correct. So long as females survive better than males (and this occurs during and for sometime after the first year of life) the fact is attributed to nature. When the opposite occurs, it is attributed to nurture." [15]

MARITAL COMPOSITION

The effect of marital composition on the total demographic situation in any community is found on its birth and death rates. The total numbers who are single, married, separated, divorced or widowed and the ages at which these events take place are reflected in the community's vital statistics. The marriage, divorce, and widow rates of a community throw some light also on the educational and occupational achievements, sex behaviour and overall *mores* of a community.

[13] S. Chandrasekhar. *India's Population: Fact and Policy.* (New York. John Day. 1946), p. 34.

[14] Ta Chen. *Population in Modern China.* (Chicago University Press. 1946), p. 19.

[15] R. A. Gopalaswami, *op. cit.*, p. 62.

An analysis of the marital composition of the Indian population has in the past Censuses revealed two prominent features—(1) a great majority of the marriageable population has been found in the married state, (2) a great majority of those married did so at a relatively early age. For the last fifty years the proportion of the married to the unmarried has not materially changed. These two features have again been brought out by the 1951 Census.

According to the 1951 Census, " Out of every 10,000 persons in India (not reckoning displaced persons), there are 5,133 males and 4,867 females. Among them 2,521 males and 1,886 females are married. If we reckon males and females together, the unmarried people are 44.1 per cent of the population. "[16]

Taking widows and widowers and such groups as ascetics and mendicants into account, this means that almost every person of marriageable age was actually married.

The marital composition is, of course, not uniform all over the country. The proportion of the unmarried people is highest in South India (48.2 per cent) and is lowest in Central India (41.1 per cent). " In other zones, it varied as follows : West India (47.0), North-West India (46.1), East India (42.2) and North India (41.4). The following table presents the percentage unmarried among males and females. In the country as a whole, roughly every other male person was married ; while rather less than two out of five females were unmarried. " [17]

TABLE No. 13

Percentage of the Unmarried in India's Population, 1951

Zone	Percentage unmarried among males	Percentage unmarried among females
North India	46.3	35.9
East India	46.3	37.8
South India	54.3	42.1
West India	52.6	40.9
Central India	46.5	35.6
North-West India	50.1	41.4
India	49.1	38.8

In most Western countries, romance (love as a prerequisite of marriage), economic considerations, prolonged education and training, and eagerness for personal and social advancement and other factors contribute to the postponement of marriage to a relatively late date. Religion not only does not condemn celibacy but has a kind word for it. The current social attitudes do not normally disapprove of those who never enter the married state. Some, therefore, do not marry just for the sake of marriage. And for women the choice of advanced education and careers often negate the chances of marriage, not to speak of early marriage. The pressure of these considerations may and often does result in many remaining bachelors or spinsters.

But in India, there is no chance for individual romance to play any significant part in marriage. Marriages, by and large, are arranged by parents or guardians and the majority of young women and men are just herded into the married state in a routine fashion. Economic security or the emotional stability of the young man has never been an important consideration in contracting a marriage. Of course, the parents-in-law are anxious to see that the prospective son-in-law is employed or " fixed up well in life ", but unemployment as such which is looked upon as temporary, is not a positive disqualification, since the resources of the parental families (joint families or otherwise) can be pooled to support the newly-married couple. The dominant religion does not encourage celibacy, for a Hindu, if he is a strict one, is exhorted to enter the married state to beget at least one son. But it is not really the fear of religious ostracism that is behind this urge to get married. It is the social disapproval of the unmarried state as such that explains the universality of the married state in India.

Early marriage in the sense of marriage below the age of consent is another remarkable aspect of the marital composition of the Indian population. The Registrar-General has examined this aspect in some detail in his Census Report for 1951 and it is worth summarising the official data.

[16] R. A. Gopalaswami. *op. cit.*, p. 70.

[17] *Ibid.* p. 71.

The age of consent in India is governed by the Child Marriage Restraint Act, 1929.[18] According to the 1951 Census there were 2,833,000 married males, 6,118,000 married females, 66,000 widowers and 134,000 widows — all between the ages of 5 and 14! The number of married females aged 14 and of married males aged 15, 16 and 17 are not known. The latter marriages are punishable under law, while the former are not. If one is set off against the other, the total number counted under age 15 — nearly 9,200,000 may be regarded as the approximate number of marriages contracted under the contravention of the law. While discussing these deplorable figures, the Registrar-General, however, points out that the child marriage rate is diminishing. In 1941 the married females under 15 were 9.6 per cent of all married males and this dropped in 1951 to 7.4 per cent.

In the country as a whole, 49.1 per cent of all males and 38.8 per cent of all females were unmarried. In other words, 50.9 per cent of all males were either married men or widowers; 61.2 per cent of all females were either married women or widows.

The figures for the widows and widowers include the small number of divorced persons who have not remarried. Divorce is permissible in India but it has not become a problem. In 1951 the total number of divorced persons was 144,786. The divorced constitute less than half of one per cent (0.4) of the total population.

What about polygamy? While there were 82,253,086 married males, there were 82,387,997 married females. Polygamy is not unknown but it is extremely rare. In reality, married males and married females pair off almost equally. Out of every 10,000 persons in India in 1951, there were 2,353 married males for every 2,357 married females. A part of this small difference may be due to the fact that some men who have gone abroad have left their wives behind. Less than 0.2 per cent of the females in India are partners to polygamous marriages.

On the other hand, when these figures are analysed by zones, it is found that there is an excess of married males in North-West India and to a smaller extent in North India and Central India. This does not indicate polygamy in these zones, but temporary separation of husbands and wives for a variety of economic and social reasons.

(To be continued)

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[18] According to this Act:

(*a*) "child" means a person who, if a male, is under eighteen years of age, and if a female, is under fourteen years of age;

(*b*) "child marriage" means a marriage to which either of the contracting parties is a child;

(*c*) "contracting party" to a marriage means either of the parties whose marriage is thereby solemnised; and

(*d*) "minor" means a person of either sex who is under eighteen years of age.

(*e*) Whoever, being a male above eighteen years of age and below twenty-one, contracts a child marriage shall be punishable with fine which may extend to one thousand rupees.

(*f*) Whoever, being a male above twenty-one years of age, contracts a child marriage shall be punishable with simple imprisonment which may extend to one month or with fine which may extend to one thousand rupees, or with both.

(*g*) Whoever performs, conducts or directs any child marriage shall be punishable with simple imprisonment which may extend to one month, or with fine which may extend to one thousand rupees or with both unless he proves that he had reason to believe that the marriage was not a child marriage.

(*h*) Where a minor contracts a child marriage any person having charge of the minor whether as parent or guardian or in any other capacity, lawful or unlawful, who does any act to promote the marriage or permits it to be solemnised, or negligently fails to prevent it from being solemnised, shall be punishable with simple imprisonment which may extend to one month or with fine which may extend to one thousand rupees or with both.....provided that no woman shall be punishable with imprisonment.

From The Press Cuttings

INDIA

Rural Health

A British newspaper reports that babies born in the United Kingdom today can expect to live till seventy years of age. This is the direct result of improved medical care, proper nutrition and sanitary environment. It is pointed out that an English child born in the sixteenth century could expect to live only 21 years; in the seventeenth century it was 26 years and in the eighteenth it was 34. Even in 1880 life expectation was only 40 years. This shows how recently the average length of life has been improved in Britain. There is no reason why the same results should not be attained in Asian countries. As a matter of fact, the expectation of life in India has been raised considerably in the last twenty years and even more sensationally in Ceylon. But we are still a hundred and fifty years behind Western Enrope in this respect. Addressing the Conference of the South-East Asian Countries on Rural Health at New Delhi, Lt-Col. Lakshmanan, Director-General of Health Services, indicated that some progress had been made in India but that one serious difficulty lay in obtaining women personnel as lady health visitors, nurses and midwives. For a population as big as India's the ten thousand hospitals and dispensaries that we have are plainly insufficient. Hospitals are, of course, very expensive and it is easier to multiply small maternity and child welfare centres in the rural areas. The main cause of low life expectation in India is the high infant mortality rate and here the child welfare centre has a vital role to play. More than 200 new centres were added to the existing 1,651 centres by the end of the First Plan. Many of these centres are in the cities and towns and the Health Survey and Development Committee of 1946 felt that a network of primary health centres should be set up in the villages. This was taken up as an item in the Community Development programme and by the end of the First Plan 725 such centres were in operation. In addition, specialised programmes were worked out for the eradication of scourges like malaria, leprosy, tuberculosis and filariasis.

It is realised, however, that preventive measures are just as important as medical services and that protected water supply and drainage are essential if health is to improve. Unfortunately, this is an even more difficult problem in the villages than in the towns. But the Poonamallee Health Unit has worked out cheap methods of rural sanitation which are now being implemented. Lt-Col. Lakshmanan also drew attention to the need for family planning as an integral part of health work. This is a new field but rupees six crores has been provided in the Second Plan for the implementation of family planning and it is proposed to open 2,500 clinics. So far 186 clinics have been opened in the villages and 112 in the towns. Five regional centres are to be set up to train the social workers who are attached to these clinics. This is a small beginning but the need for family planning has at last been realised. If rural health is to be bettered, rehousing is also necessary and practically nothing was done in this direction during the First Plan. The housing needs of urban people usually get priority over those of the villagers. The time has come for a concerted attempt to improve rural housing so that the mud and thatch huts in which the rural millions live will be replaced by more modern housing, equipped with electric lighting and a modern drainage system.

— *The Hindu* (Editorial)
Madras, 17th Oct., 1957.

India has Second Largest Population

Washington, Oct. 31: The United States, the Soviet Union, India and China have about one half of the world's population, the U. S. Commerce Department said in an announcement today.

One sixth of the world's population lived in Britain, Japan, Indonesia, West Germany, Brazil and Pakistan. Each of these countries had fifty million or more population, the department announced.

Estimates for the total population of China—were 582,603,000. The second country with the largest population was India with 388,797,000. The announcement also said India was expected to have 393,702,000 people by 1959.

Estimates for the Soviet Union were 205,890,000 for next January and 209,553,000 for a year later.

The total population in the United States was to be 172,722,000 by Jan. 1, 1958 and rise to 175,644,000 by 1959.

— *Searchlight,* Patna, 4th November, 1957.

Prosperity Begins at Family Level

New Delhi, Sept. 13: "A nation is constituted of a series of family units. The prosperity and happiness of a nation necessarily commences at the family level and intelligent adjustment of the family size and spacing of children to suit the psychological, health and economic considerations must, therefore, be ensured," said Sri D. P. Karmarkar, Minister of Health, in New Delhi, today.

He was addressing the 3rd meeting of the Family Planning Board. The Minister added: "During the second meeting of the Board, I emphasised that increase in population at the present rate seriously threatens the plans for social, economic and cultural advancement. This cannot be viewed with complacency and requires vigorous action."

Following is the text of the Minister's speech:

The success of the family planning programme will, to a large measure, depend on the work done in the States. The representatives of the State Governments who are dealing with this subject were invited to attend this meeting and I am glad to find representatives of the States have come. I am conscious of the reticence amongst our people to discuss subjects like Family Planning and difficulties inherent in implementing the programme. Any task, howsoever arduous or delicate, can be accomplished by perseverance. Such perseverance is imperative as we are faced with the two main problems—to adjust our natural resources to the needs of our people and to regulate the number of people to suit our resources.

Voluntary planned parenthood is an essential part of a democratic society. Experts have suggested that we should restrict a family size to three children.

I am anxious that the message of family planning is speedily spread throughout the country and its programme is implemented expeditiously. The main difficulty is anticipated in the rural sector. I am sure that with patience and hard work we will succeed.

The real problem is to find the quickest way in which information on Family Planning can permeate throughout the country. Maternity and child welfare centres provide the setting for giving such advice. There mothers are likely to be more receptive to suggestions on Family Planning. The Family Planning programme includes establishment of a number of clinics. Clinics are valuable. But a large number of people are not likely to reach these clinics. Therefore, I feel it is very important also to emphasise wide dissemination of information on simple methods of family limitation which do not require medical consultation.

State Governments' Action

Since we met last, the Governments of Andhra Pradesh, Assam, and West Bengal have formed Family Planning Boards. Bihar has a Family Planning Committee. Kerala, Madhya Pradesh, Rajasthan, Uttar Pradesh, Punjab and Himachal Pradesh are going to form Family Planning Boards shortly. Rajasthan has appointed a full-time Family Planning Officer. Punjab and Delhi have appointed part-time officers. Andhra, Bihar, Kerala, Madhya Pradesh, Uttar Pradesh, West Bengal and Himachal Pradesh will also appoint Family Planning Officers shortly.

Training courses have been started in Ramanagram since August 12 last and in Bombay since September 2. During the last three months sanction for 15 rural and 41 urban clinics has been issued to local bodies and voluntary organisations. The total expenditure up to the end of the last month was over Rs. 10 lakhs against the budget provision of Rs. 25 lakhs this year. Of this amount about Rs. 9 lakhs were sanctioned since the last meeting of the Family Planing Board.

Grants For Clinics

The Family Planning Programme was discussed at the meeting of the National Development Council on June 4 last and by the Health Ministers' Conference held towards the end of June. The conference urged the State Governments to implement the Family Planning Programme.

During 1956-57 and up to the end of August last, the opening of 186 rural clinics and 112 urban clinics was approved by the Family Planning Board. Of these State Governments are to open 160 rural and 43 urban clinics, local bodies are to open 20 urban clinics, while 26 rural and 49 urban clinics are to be started by voluntary organisations.

During 1956-57, a total provision of Rs. 30 lakhs was made for Family Planning programmes, of which Rs. 9.12 lakhs was spent. During 1957-58, up to the end of August 1957, grants amounting to Rs. 9.17 lakhs have been sanctioned. Of these, grants for rural clinics amounted to Rs. 83,230 and for urban clinics Rs. 3,66,877. Grants for continuation of clinics opened in the first Five-Year Plan amounted to Rs. 1,68,634, for clinics attached to the C.H.S. dispensaries to Rs. 38,388, for training programmes to Rs. 29,104, education Rs. 15,190, research Rs. 1,82,296 and expenditure on the central organisation to Rs. 33,377.

Training and Research

The first regular training course for personnel to be in charge of Family Planning clinics of four weeks' duration started at Ramanagram on August 12 last and the training course in Bombay on September 2. A grant for a touring training team has also been sanctioned.

Two demographic centres were sanctioned in connection with the Family Planning programme. For the centre at the Delhi School of Economics, most of the staff has been recruited and have started work. Proposals for starting a centre at the Indian Statistical Institute are still awaited. A field study on foam tablets has been started at Ramanagram. A foam tablet has been developed at the Contraceptive Testing Centre, Bombay, and a small quantity of these tablets produced by the Medical Store Depot, Madras, are also being tested at the Centre.

Standing Committee's Report

The Standing Committee of the Family Planning Board meeting on July 20 last recommended that flexibility should mark the number of staff employed for family planning work and that expenditure on that item might be permitted within the amount sanctioned provided it was for promoting family planning. The Committee also recommended that receipt of the auditor's statement of accounts might not be insisted upon before issuing a continuation grant and that 50 per cent of the grant amount might be issued in anticipation of its receipt. Continuation grants to voluntary organisations, the Committee said, could be sanctioned at the rate of 80 per cent of the actual expenditure.

In view of the difficulties experienced in obtaining the services of qualified personnel for family planning clinics, particularly in the rural areas, the Standing Committee recommended that employment of staff nurses, auxiliary nurse mid-wives and candidates with educational qualifications up to the 8th class or vernacular final to work in the clinics could be permitted. Another suggestion made by the Committee was that family planning clinics should be allowed to purchase foam tablets directly from the market, and further grants could be made if Rs. 1,000, which is normally sanctioned for this purpose, was not considered sufficient for any clinic. It also said that contraceptives, both mechanical and chemical, should be given free at the training centre.

Lastly, irrespective of the fact that they were run by State Governments, local bodies or voluntary organisations, grants up to 100 per cent of the expenditure should be sanctioned to medical teaching institutions.

It is proposed to publish a popular journal to educate the public on family planning problems and a grant of Rs. 30,000 has been sanctioned during 1957-58 for the purpose.

For organising the touring training team a grant of Rs. 18,000 has been sanctioned to the Family Planning Association of India.

— *The Hindustan Standard,*
Calcutta, 15th Sept., 1957.

Nehru's Plea for Birth Control

Kanpur, Nov. 29 : Prime Minister Nehru said here today that the miserable plight of the Indian children in villages who were half-fed, half-clad and have no opportunity to get education made him really sad.

Pandit Nehru, who was addressing a public meeting here this evening, said " These children are the future India. They are future hopes of this country. I want the economic progress of this country at a very rapid pace.

Pandit Nehru said that the people sometimes laugh when " I suggest they take up seriously birth control and go to clinics. There is nothing to be laughed at." He said.

" We are told of the epic age of Mahabharat and the Ramayana and the prosperity of the Ram Rajya. It is allright but I do not know what exactly was the population of India at that time. It is 36 crores now and in the days of Rama, I believe, the population was not more than one crore.

Pandit Nehru said that there was a great pressure on land on account of increasing population and the economic condition was not satisfactory.

Pandit Nehru said that to eradicate poverty and squalor from this land the Government had prepared the second Five-year Plan.

Pandit Nehru said : " We are determined to implement this Plan though there are difficulties in our way ".

Pandit Nehru said that India's greatest source of wealth was agriculture but unfortunately three crops had failed successively. The people should therefore tighten their belts and step up the food production.

Referring to the health of the population, Pandit Nehru said, that in the past ten years it had made a tremendous progress in this direction. The average longevity of persons had increased from 24 years to 34 years. This showed that the infantile mortality had gone down. But the result was that population had increased.

He said, " Curiously enough the population of India had also increased in the past ten years tremendously and so it was essential to step up food production.

— *The Advance,*
Kanpur, 30th Nov., 1957.

Family Planning Boards—Centres Assurances to States

The Union Health Ministry has assured the State Governments that the Centre would meet the expenditure incurred by them on training personnel for the family planning clinics and on setting up family planning boards.

The assurance was given at the third meeting of the Family Planning Board, held in New Delhi on Friday. After the inaugural address by Mr. Karmarkar, Union Health Minister, who presided, members of the Board referred to the difficulties experienced by them in promoting family planning activities. One of the bottlenecks, they said, was paucity of trained personnel.

Mr. Karmarkar said that voluntary planned parenthood was an essential part of a democratic society and experts had suggested that the size of a family should be restricted to three children.

The real problem, he said, was to find the quickest way in which information on family planning could permeate throughout the country. Maternity and child welfare centres provided the setting for giving such advice. He considered it necessary to emphasize wide dissemination of information on simple methods of family limitation which did not require medical consultation. An intelligent adjustment of the family size and spacing of children to suit the psychological, health and economic considerations should be ensured.

During the second meeting of the Board, the Minister added, he emphasized that increase in population at the present rate seriously threatened the plans of social, economic and cultural advancement.

The total expenditure on the programme up to the end of last month was over Rs. 10 lakhs against the budgeted provision of Rs. 25 lakhs this year. Of this amount, about Rs. 9 lakhs were sanctioned since the last meeting of the Board.

— *Hindustan Times,*
New Delhi, 14th Sept., 1957.

Production and Family Planning

Speaking in the Rajya Sabha on a Communist-sponsored resolution concerning land reforms in India, the Deputy Minister of Planning, Mr. S. N. Mishra, aptly remarked that today " there was a race between production and reproduction and that unless production won the race there was no salvation." This was a very significant observation in the context of the food shortage in the country. The Asoka Mehta Food Committee, whose report was released by the Government only the other day, has also drawn the attention of the authorities and the people to the continuous increase of population in India and to the effect of that increase on the general food situation. For an effective solution of the food problem, the Committee has not only called for " determined and all out effort to step up production," but also suggested " a nation-wide campaign for family planning to check the high rate of increase in population." Since 1947 there has been considerable increase in food production, but this additional production has been offset by a rapid increase in the total population. In other words, reproduction has outstripped food production with the result that the country is still facing a grave food situation. If the rate of increase in population is not controlled or checked, it is doubtful if production will ever win the race against reproduction. More attention and effort has, therefore, to be directed to the question of family planning and birth control than has been done hitherto. Of course there has been constant talk about family planning, but no systematic campaign has yet been started in the real sense of the term to educate the masses and create in them a feeling that any further increase in population should be restricted.

Unfortunately there is inveterate prejudice against family planning in India. It is the outcome of widespread ignorance and illiteracy. It is, however, a happy augury that wherever systematic propaganda has been done and an attempt has been made to educate the people regarding the need and urgency of limiting the family, the response has been encouraging. The mere opening of a few clinics on which so much stress is laid, will not serve any useful purpose. Propaganda must be carried on on an extensive scale and those who are anxious to learn the methods of family planning should be provided the necessary facilities for the purpose. Educative propaganda should be supplemented by practical methods of imparting instruction in family planning. Intensive and extensive work has to be done among the people to remove their prejudice and change their opinion.

Of course the spreading of the message of family planning is not expected to produce any tangible results immediately. The effect of the campaign will be felt after years. But planning has to be done now and the education of the people has to be undertaken without any delay. Family planning should be considered part and parcel of the food problem. While taking steps to raise food production, the question of controlling population should not be ignored. On the other hand, this question should be tackled effectively to prevent any increase in production being neutralised by a larger increase in the number of mouths to be fed. Otherwise the food problem will always present a gloomy aspect and stand in the way of the economic development of the country. So far the race between production and reproduction has been won by the latter. The process has to be reversed if a solution of the problem of food is to be found. It may appear difficult, but the difficulty should be overcome by persistent and constant effort. People have to be told of the good effect of family planning on their economic life as well as on the economic life of their country. Once they are convinced—and it should not be difficult to convince them—they will not hesitate to adopt means to check the growth of population. Let, therefore, the work of family planning be considered as an integral part of the food problem. Only then will production win the race against reproduction.

— *Tribune* (Editorial),
Ambala, 16th Nov., 1957.

Population Control in Asia Urged

New Delhi, Oct. 14 : A seven-nation conference to discuss rural health problems of the South-East Asia region opened here today with a plea by India's Health Minister, Mr. D. P. Karmarkar, for making population control an integral part of their rural health programmes.

Mr. Karmarkar, who inaugurated the 12-day conference being held under the auspices of the World Health Organisation warned : "The South-East Asia region accounts for one-fifth of the total population and the rapid growth in the population is likely to throw all our development plans out of gear unless timely measures are taken in this behalf."

In his speech Mr. Karmarkar also emphasised that rural health measures should form part of a welfare programme for the community embracing the basic requirements of agriculture, education, economic and social betterment.

The conference at the outset elected Dr. (Mrs.) J. Sulianti Saroso (Indonesia) as its chairman. She was proposed to the chair by Ceylon and seconded by Burma. Dr. C. K. Lakshmanan, Director of Health Services, India, whose name was earlier suggested, withdrew on the ground that during the next few days he would be busy with other work. —PTI.

— *Indian Express*, Bombay,
15th October, 1957.

CEYLON

Population of Ceylon

Colombo, Oct. 22 : Men outnumbered women 111 to 100 in Ceylon in 1953, the census figures for the year just published showed. Of the total population of 8,097,895, men numbered 4,268,730. The proportion had been 113 to 100 since 1921. Between 1946 and 1953 the island's population had increased by 21.6 per cent.

The highest percentage of increase of any racial group was among the Indian Moors who increased by 33.2 per cent. The next highest was the Kandyan Sinhalese group who increased by 25 per cent and then the Indian Tamils who increased by 24.8 per cent. The Veddahs (aborigines) were the only community to decrease in number, their population being reduced from 2,361 in 1946 to only 803 in 1953.

In the 1953 census, 64.3 per cent of the total population were Buddhists. Hindus formed the next largest religious community with a percentage of 19.9. Christians formed 9 per cent, Muslims 6.7 per cent and others including "free thinkers" 0.1 per cent.

The per capita income was Rs. 574 in 1954. Of the total population in 1953, nearly three million were gainfully employed. For the whole of Ceylon, the percentage of those who were literates was 65.4 in 1953, the figures being 75.9 for men and 53.6 for women. This is known to be the highest percentage of literacy in South-East Asia.

—*The Hindu*, Madras,
22nd November, 1957.

Planning of Families Now Ceylon Government Policy

Colombo : Government has decided to actively support family planning in Ceylon. Hitherto Government did not have a definite policy on family planning.

The Government's decision to support family planning follows a request to the Cabinet by the Minister of Health, Mrs. Vimala Wijewardene, that Ceylon should accept an offer from Sweden to assist to a considerable extent a project for that purpose.

The Government has authorised the Minister of Health to accept the Swedish offer.

The Deputy Director of Health Services, Dr. W. A. Karunaratne, will convey the Government's decision to the Swedish Consul in New Delhi and to discuss details regarding the offer. Dr. Karunaratne is in Delhi attending the International Red Cross Conference.

The Swedish offer to assist Ceylon in family planning to the extent of Rs. 300,000 was made to the Ceylon Family Planning Association through the Government.

The Association, which was badly in need of assistance, could not avail themselves of this offer because the Swedish Government made it clear that the aid could be channelled only through the Ceylon Government.

The Government was so far hesitating about accepting the Swedish offer because it did not have a definite policy on family planning.

Pilot Project

The Minister of Health, Mrs. Vimala Wijewardene, told me that aid from Sweden would be handed over to the Family Planning Association to carry out a pilot project in Ceylon.

The Minister said that she was doing this as the Family Planning Association was performing good and useful work. For a start all activities by the Government in connection with family planning are expected to be done in collaboration with the Association.

The Minister also told me that next year the Government would increase its annual grant to the Association. An annual grant of Rs. 10,000 is now received by the Association from the Government.

The Government's decision to support family planning is believed to have been also influenced by the rapid increase in Ceylon's population which is estimated to be about 250,000 every year.

— *Ceylon Daily News*,
9th November, 1957.

Ceylon Government Accepts Swedish Aid

New Delhi, Sunday : The Ceylon Government has accepted the Swedish offer of Rs. 300,000 aid for family planning.

It is understood that this decision was conveyed through the Swedish Ambassador here.

The Deputy Director of Health Services, Dr. W. A. Karunaratne, now here as official delegate to the International Red Cross Conference, who met the Swedish Ambassador in this connection, said today that Ceylon's acceptance came in good time since Sweden had not received any reply from Ceylon for many months and had been considering reallocating the amount to certain other countries who had asked for aid.

Swedish assistance will come in the form of technical personnel and equipment.

Dr. Karunaratne will be contacting Indian authorities during his stay here and study India's family planning projects for which the government has allocated Rs. 100 million in the Second Five-Year Plan.

— *Ceylon Daily News*, Colombo,
4th November, 1957.

Family Planning

The Prime Minister may remember an occasion in the not too distant past when the Minister of Health in Mr. D. S. Senanayake's Cabinet stated that family planning was an essential measure which should be taken by any country which hoped to avoid undue economic peril. We remember that on that date the statement was met with by a sharp rejoinder from the Leader of the Opposition. We do not know to what degree these two leaders have either modified, strengthened or altered their views. But certainly, social scientists and economists the world over have reported *en masse* since then, that family planning is one of the simplest measures which any country could take in an effort to prevent a *deliberate* complication of economic affairs.

In Ceylon, it has been left to the *Family Planning Association* to spread this gospel, and to emphasise the fact that an uncontrolled increase in population creates problems at both family and national levels. This programme has been thwarted to some extent in Ceylon by two factors : traditional bias and the lack of adequate backing from the government. The Association has, according to all reports, had some success in pointing out that preventing the creation of life is not synonymous with the destroying of life, and that family planning, unlike, say, abortion, is neither criminal nor irreligious. But we are told that it has yet had no success in gaining tangible encouragement from the government.

Latest Blow

In fact, the latest blow to the Association's work has been delivered by the Customs Department. As the *Observer* reported a few days ago, material used by the Association was formerly allowed into Ceylon

duty free on the grounds that it was *research material*. Now, however, this directive has been rescinded and customs duties ranging from 13 to 37 per cent will be levied. This will involve payments which are around 50 per cent greater than those made by the Family Planning Association under the old dispensation.

We see no reason why the government cannot grant a duty exemption on these materials, provided they are distributed exclusively through the Association on a non-profit basis. And our information is that these materials have been distributed, todate, even below cost—prices being geared to the paying capacity of the buyers. Exemption from customs dues is a simple but essential relief which could be granted by the mere stroke of a pen, and we urge the government to grant this.

Active Part

It is also time that the government itself took an active part in supporting the work of the Family Planning Association, generally. Without labouring the point, we would like to remind the government that unless a programme of family planning is initiated concurrently with its plans for economic development, it will find that when the production targets have been hit, the population would already have run far ahead of what it was when the schemes were mooted, and that the new rate of production will be still incapable of meeting with the demands of an increased population.

In other countries, family planning measures have been undertaken on an individual level by persons who saw in this a means of reducing their private economic problems. Here, where there is so much traditional bias and misunderstanding, it is very necessary that voluntary workers should be subsidised by the government both in matters of finance and propaganda. Perhaps the government could take a leaf from the book of *New China's* economist *Dr. Ma Yen-ch'u*, who warned his government recently that priorities on industrialisation without a corresponding emphasis on population control would bring no effective results.

— *Ceylon Observer* (Editorial),
12th October, 1957.

Maternal Mortality Decreasing in Ceylon

A 30 to 90 per cent decrease in maternal mortality has taken place during the last 20 years, according to a recently published statistical report of the World Health Organisation (W.H.O.) covering 49 countries and territories all over the world.

The lowest maternal death rate is recorded in the U.S.A., where it is 0.3 per 1,000 live births (white population) and 0.5 for the population as a whole. In New Zealand, the rate is 0.4 per 1,000 live births ; in Denmark, Scotland and Sweden, 0.5 ; in France, the Netherlands and Australia, 0.6 ; in S. Africa (European population), Israel (Jewish population), Norway and England, 0.7.

The decrease is most spectacular in countries undergoing rapid development. In Ceylon, for example, the drop has been from 20.5 to 4.1 per 1,000 live births during the 20 years under review.

— *Malabar Herald*,
16th Nov., 1957.

THAILAND

Asian Women Confer

Bangkok : Asian women leaders now meeting in Bangkok emphasized poor health conditions as one of the factors hindering Asian women from taking part in public life, and they called particularly for :

Improvement of health and sanitation, especially the eradication of tuberculosis.

Better nutrition, especially by weaning Asians away from polished rice ; and

Family planning in practically all Asian countries.

The many-tentacled octopus of poverty was identified by several speakers as a fundamental cause of ill-health, as it is of many other evils, on the Asian scene.

Many of the participants called for more help from the United Nations and the specialized agencies for family planning, better nutrition, better sanitary conditions and health education in Asian countries.

Teaching better health to the Asian women, several speakers pointed out, will never be possible by Government action alone : voluntary organizations must supplement propaganda campaigns carried out by Government.

Family Planning

Mrs. Jetty Rizali Noor of Indonesia said that a family planning campaign in countries such as her own can create controversy : it is therefore wiser to stress the importance of the mother's health rather than make a direct campaign for family planning. This would avoid opposition by religious and political groups. Nonetheless, she said the idea is gaining ground and the trend of the Indonesian Government is in favour of it.

Mrs. Noor also felt that women show no reluctance to learn family planning but voluntary organizations need to work in this field.

Begum Kaisera Anwar Ali of Pakistan said that in her country a good amount of work has been done for family planning but "the question is very delicate". Some of the people are opposed to the idea, she said, "especially some men," but the women she said are keenly interested and though the work is in the initial stages a lot more can be done. But "we need more help in this area, especially from the United Nations" commented Begum Anwar Ali.

Mrs. Nobuko Tomita Takahashi of Japan said that the life of women in her country has shown a remarkable change as a result of the success of family planning ; the birth rate now is nineteen per thousand whereas it was thirty-four per thousand in 1947. Short courses in family planning have been given through women's organizations. With fewer babies to deliver, midwives in Japan now have time to teach family planning techniques. In the rural areas the Government has supplied free contraceptives to people who could not afford them.

Mrs. Takahashi also felt that it is the husband who often does not co-operate in the family planning movement, which is beset moreover by religious opposition from time to time.

Mrs. Chin Nyean Then of Malaya said that there is apparently more interest among town-dwellers in family planning whereas the problem of over-population really lies in the villages ; in the rural areas children are looked upon as additional labour in the agricultural community, and this is an unconscious pull against family planning.

A Culinary Villain

Mrs. Yu-Siung Kong of Sarawak deplored the wide use of highly polished rice which is one of the causes of under-nutrition in Asian countries. Even the Dyaks of Sarawak who knew better in former times, have now taken to polished rice, she observed.

Mrs. Rita Nilam of F.A.O. suggested various ways for overcoming the prejudice against eating brown rice which is generally considered fit "only for soldiers and prisoners", she commented. The Food and Agriculture Organization, she pointed out, has studied this problem and she suggested various ways of enriching and supplementing a white rice diet.

— *Amrita Bazar Patrika*,
Calcutta, 13th Oct., 1957.

U. S. A.

People are Filling Up

Washington, Nov. 3 : Those wide open spaces out West are rapidly filling up with people.

The Census Bureau said today that its latest state-by-state estimates, as of July 1, 1956, shows the 11 Rocky Mountain and Pacific Coast states have grown by 23.1 per cent since the 1950 census. That is double the national average, and boosted the population there from 19,500,000 in 1950 to more than 24,000,000 last year.

The 12 states of the North Central region had the biggest numerical gain of any section, an increase of 4,972,000. Those 12 states are Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas.

Missouri went from 3,954,653 to 4,197,000, while Illinois gained from 8,712,176 to 9,482,000.

Four states showed a drop in population from 1950 to 1956, with Arkansas leading this list. There the population went down from 1,909,511 to 1,761,000. The other states

to show declines were West Virginia, Vermont and Mississipi.

On a percentage basis, Nevada showed the nation's greatest increase—60 per cent. But there is still a lot of room in Nevada. The jump from 160,063 in 1950 to 256,000 in 1956 still left it the country's most sparsely settled state.

Arizona's gain of 336,000 to a total of 1,086,000 represented a 45 per cent increase and Florida gained 1,114,000 or 40 per cent with an increase from 2,771,305 to 3,885,000.

On a numerical basis, California was far ahead with a gain of 2,885,000 or 27 per cent to a total of 13,471,000—second only to New York's 15,826,000.

Besides California and Florida, three other states gained more than a million in population during the six-year period: Texas 1,233,000, Michigan 1,208,000 and Ohio 1,125,000.

Altogether, the census bureau reported, the total population of the United States jumped 11 per cent between April, 1950, and July, 1956—from 150,697,361 to 167,259,000. Today, the population is estimated at about 172,000,000.

— *St. Louis Globe Democrat,*
3rd Nov., 1957.

FRANCE

French Birth Rate is Boosted

Paris, Oct. 12: Many Americans probably will be surprised to learn that France now has the highest birth rate in Europe.

To encourage the growth of families, France has been giving allowances to couples with children since 1936. For example, a family with one child under 5 years of age is paid the equivalent of $9.85 a month. For a child between the ages of 5 and 10, the allowance is $4.98.

A Rising Scale

The scale of allowances then gradually rises. For two children the benefit amounts to $33.70 a month; for three it is $59.70; for four children $80.78 and for five $101.86. The allowances are paid until the children are grown which according to French reckoning is about 15.

In addition, the government pays for the pre-natal care, the expenses of the physician and the hospital in the birth of the child and for care after birth.

The benefits also provide that for a family which cannot afford it, the government pays a month's holiday for the children every year at a sea or mountain resort. This applies to children up to 15 years.

The Fringe Benefits

Even on public transportation the man with a family gets a break. There is a special card issued by Metro, the Paris subway which gives a flat 40 per cent reduction to all members of a family.

The efforts of the French to increase the birth-rate has a background stemming from the disastrous wars in which the nation has been engaged.

In the Napoleonic wars from 1791 to 1815 France lost more than 2 million men. In World War I approximately 1½ million Frenchmen were killed and about 5 million wounded. Before the French were knocked out by the Germans in World War II, 100,000 lives were lost. And from 1940 to 1945 thousands of Frenchmen were in German slave labor camps.

Germany Gets Ahead

Under these circumstances the population rate of France declined while that of its rival Germany gained rapidly. The French began to feel a sense of frustration at this condition and it was not until the Socialist premier, Leon Blum, instituted the family allowance plan that the downward population drift was arrested. The birth rate began to rise in 1946.

France has an elaborate social security system embracing many of the cradle-to-the-grave benefits which are paid by industry. For example, an employer paying a workman $30 a month must kick in $12 a month more for social security. This includes the family allowances, medicine, hospitalization and surgery.

— *Kansas City Star,*
12th Oct., 1957.

GREAT BRITAIN

Oliver Bird Prize

The Trustees of the Oliver Bird Trust hope to offer in each of the next five years an Oliver Bird Prize for laboratory or clinical work bearing on the control of conception in man. In making the award the Trustees will be assisted by a panel of experts in the relevant sciences. Conditions are as follows:—

1. Application must be made on the appropriate form, copies of which can be obtained from the Secretary to the Trustees.

2. The application must be supported by two copies of one or more unpublished or recently published papers written in English, and not exceeding 5,000 words in length.

3. Application must be made before 31st December each year in respect of papers published or written during that year.

4. Papers submitted should record (i) original clinical work on the control of conception in man other than by mechanical means, (ii) original laboratory work with human material, or (iii) original experiments on animals giving results directly relevant to the problem of controlling conception in man.

5. Each Prize will consist of a cash reward of not less than £250 and the Oliver Bird Medal for the year.

6. The Trustees reserve the right to withdraw the Prize in any year if no paper of sufficient merit is submitted.

The first Oliver Bird Prize is offered for award early in 1958, and applications should be received not later than 31st December, 1957, by Mrs. Clifford Smith, Secretary to the Trustees, Oliver Bird Trust, 64 Sloane Street, London, S.W.1.

— *From a communication to the Institute.*

Institute's Activities

Visiting Professorship

Professor S. Chandrasekhar, Director of the Indian Institute for Population Studies, who was appointed Visiting Professor of Demography in the Department of Sociology and Anthropology, University of Missouri, Columbia, U.S.A., for the Fall semester, left Madras on September 6th, 1957, by air for New York. Dr. Chandrasekhar is expected to return to India by the end of January 1958.

All India Radio

During August 1957, Dr. Chandrasekhar delivered a series of three talks on the All India Radio on "The Second Five Year Plan". The three talks dealt with the objectives, the scope and a criticism of the Plan respectively. A pamphlet containing these three talks will be brought out.

U. S. I. S. Gift of Books

The United States Information Service in Madras have kindly presented a set of valuable American books dealing with Demography, Statistics, Sociology and Economics to the Indian Institute for Population Studies. The books were presented by Mr. John Wiggin, Head of the United States Information Service, Madras, and Mr. S. Govindarajulu, officer in charge of Book Distribution.

The World Union of Freethinkers

At the international conference of the World Union of Freethinkers held in Paris from September 8th to 10th, 1957, the Rationalist Association of India was represented by Professor S. Chandrasekhar. He presented a paper before the Paris Conference on "India's Population Problems". A summary of the paper is published in the *Freethinker* (London) 13 September, 1957.

Dr. Gunnar Myrdal

Dr. Gunnar Myrdal, the distinguished Swedish economist, now Director of Asian Studies, Twentieth Century Fund, New York, and former Executive Secretary of the United Nations Economic Commission for Europe, Geneva, visited Mangadu with Dr. and Mrs. S. Chandrasekhar of the Indian Institute for Population Studies. He went round the village and discussed the various procedures and techniques adopted in the demographic survey of the village undertaken by the Institute. He also visited the Kaufman Family Planning Clinic run by the Institute in the village.

Dr. Myrdal said a study of this kind would be valuable in understanding the dynamics of population growth albeit in a small compact village. He stressed the need for accurate and complete registration of vital statistics for, he said, in his opinion the country's major economic problem was the population problem in the sense of its rapid growth. He felt that the food problem could not be adequately solved without controlling population growth. While he welcomed industrialisation, he felt that unless industrialisation was at a tremendous pace its good results could hardly keep pace with the alarming growth of population.

Dr. Myrdal and his two Danish associates Dr. and Mrs. Mogens Boserup are writing a book on the economic development in India and other countries in the South Asian region.

Visitors to the Mangadu Project

Mr. and Mrs. Gobindram J. Watumull and Miss Radha Watumull of the Watumull Foundation, Honolulu, Hawaii ; Miss Cecelia Johnson, United States Information Service, Madras ; Mrs. Ada Finley of the American Methodist Mission, Kodaikanal ; Miss Judy Norell, U.S.A. Fullbright Scholar at the Madras Christian College.

Family Planning Work

The Indian Institute for Population Studies have arranged to extend their rural family planning work to Kunrattur, a Tamil village near Mangadu. The family planning clinical work will be under the supervision of Dr. Lalitha Govindaraj, M.B.B.S. and Dr. Rahimunissa, M.B.B.S. and Miss Murthi Kempamma, Public Health Nurse.

Book Reviews

Underdeveloped Areas

SHANNON, LYLE W. (Ed.) *Underdeveloped Areas : A Book of Readings and Research* (New York. Harper and Brothers. 1957) pp. 496. Price $6.50.

Professor Shannon of the Department of Sociology, University of Wisconsin, has brought together in this volume some fifty articles, representative of the fields of sociology, anthropology, economics, political science and history, dealing with various aspects of underdeveloped areas of the world. The selection has been made from about 2,000 articles appearing in the last few years from various professional journals. At some places the articles have been edited and abridged but without sacrificing the central theme of the various writers. Besides the contributions of various individual social scientists, the editor has included some valuable contributions of the United Nations to the area of better understanding of the problems of underdevelopment.

There are thirteen chapters and the chapter headings will give an idea of the wide range of the areas covered in this volume. They are : Definition and Distribution of Underdeveloped Areas, the Political Status of Underdeveloped Areas, the Demographic Characteristics of Underdeveloped Areas, Communication, Mass Media and Education in Underdeveloped Areas, Economic Development and Finance Problems, the Process of Developing Underdeveloped Economies and Increasing Production, Private Industry versus Government, Technical Assistance to Underdeveloped Areas, Changing Health Practices and Reproductive Patterns in Underdeveloped Areas, Experiences Attempting to Introduce Social Change in Underdeveloped Areas, and last, Measuring the Development of Underdeveloped Areas. These general topics under which the selected articles have been presented cover just about all the important and relevant aspects of underdeveloped areas and the problems encountered in developing them.

A valuable feature of this volume is the brief and incisive introductory remarks contributed by the editor to each of the chapters. These give a kind of continuity and unity to the volume and the selected articles hang together in a logical pattern.

There are more than fifty contributors to the volume. While it is difficult to enumerate all the writers, a few names may be mentioned. They are Professors John Useem, Kingsley Davis, David Owen, Ivor Jennings, Horace Belshaw, Maurice Zinkin, Arthur Lewis, Theodore W. Schultz, Lyle W. Shannon, Margaret Mead and McKim Marriott. Asia is represented by only four contributors and all of them are Indians. They are Professors D. R. Gadgil and S. Chandrasekhar, Dr. I. G. Patel and N. Patnaik.

Professor Shannon observes in his preface, "This volume may be useful in an interdisciplinary course on problems of underdeveloped areas or in courses on underdeveloped areas prescribed by various disciplines within the social sciences. It is hoped that it will stimulate further interdisciplinary inquiry into the problems of underdeveloped areas." This emminently useful publication more than fulfills the modest objective of the editor. It is hoped that this volume will have a wide circulation in Asian and other underdeveloped countries. Both Professor Shannon and the publishers deserve to be congratulated on this venture.

Population Problems

OSER, JACOB, *Must Men Starve ? The Malthusian Controversy* (New York. Abelard-Schuman. 1957) pp. 331. Price $4.50.

This book is intended as a reply to the spate of recent books, some sober and some alarmist, on the world population and resources situation. The author admits this to be "a biased book" written to counteract the Malthusian bias which contends that

"contraception will wipe out erosion, war, hunger . . . . and the ills of the world."

To those who plead that food production is not keeping pace with the growth of population, the author offers evidence of the tremendous increase in food production in the United States of America, which production has outstripped the pace of population growth. But the world is not the United States. And America has been able to accomplish this because of her capital, technology and social organisation. The author points out that the underdeveloped areas can have all these in the course of time. It is maintained that the necessary knowledge and resources are available to assure the world's population high levels of living. This can be brought about, Oser contends, if huge military expenditures and the incredible destruction of wealth by modern warfare are avoided, freer trade between nations is encouraged, balanced programmes of industrialisation are launched and worldwide scientific agriculture is promoted. He pleads for a catalogue of reforms, from mass education to integrated systems of national transport. He takes certain imperialist nations to task for withholding good land from use by "the natives", its legitimate owners, as in Kenya and the Union of South Africa. He pleads for the creation of some kind of a League of Underdeveloped Nations which would bargain with the have-nations and see that their precious raw materials are not taken away by the imperialist nations for a song. All this is very good, but it sounds utopian in the present context of international power politics.

It is to be hoped that the author's thesis does not seriously suggest that there is no need for widespread family planning and a check to the growth of world population. While there is a great need to promote a rational outlook among and within the nations of the world on the question of sharing between the haves and the have-nots (for instance, the cost of all the A and H bombs in the United States could wipe out in no time her slums where the economically and racially under-privileged live) and project long-range programmes for the advancement of all underdeveloped territories, the immediate problems of poverty, squalor, sickness and starvation of millions in Asia and Africa should not be lost sight of. Must men starve? They need not really if all the reforms advocated by the author are carried out tomorrow. But then we should cease to be human beings and sprout wings in which case there would neither be a problem of population growth nor one of dwindling resources. In the meanwhile, however, human beings will starve, human nature being what it is. Men of goodwill like Mr. Oser constitute unfortunately a microscopic minority.

DICKINSON, ROBERT E. *The Population Problem of Southern Italy: An Essay in Social Geography* (Syracuse, New York. Syracuse University Press. 1955) pp. 116 Price $3.00.

This monograph is devoted to certain geographical aspects of the population problem in an underdeveloped region in the Western world. This area has about two-fifths of the total area and population of Italy, and like all underdeveloped parts of the world suffers from overpopulation and low levels of living. The people of this region are predominantly agricultural and obtain one of the lowest *per capita* incomes in Europe, indeed in the world.

The study, according to the author, "seeks to measure these conditions (population pressure and low *per capita* income), to determine their geographic variations, to explain them in terms of the relation of man to the land, and to reach conclusions as to how and in what degree such conditions may be relieved through the development of natural and human resources." The author does this in terms of the conditions and possibilities of agricultural production and the effective utilization of labour towards the highest possible yields.

The author finds that the problem of increasing agricultural production in Southern Italy is one of improving agricultural practices in face of adverse climatic conditions, traditional attitudes, and existing conditions of ownership and tenure. As for the labour force, they are concentrated in an area of intensive cultivation where there is not enough demand for their labour and consequent underemployment and low wages. Professor Dickinson concludes, "The problem of poverty in Southern Italy is by no means an exclusive question of economics. It is also a psychological problem. Time and time again one meets in the villages the contention from the peasants that simple improvements cannot be effected without money. Many a local problem of water supply, sanitation or sewage disposal or marketing could be worked out with the aid of strong arms and co-operation. . . . . The attitude of the peasant is born of a feudal servility that is pathetic to behold. He is also often illiterate with very little knowledge outside the day-to-day life of routine and penury to which he cannot see an outlet. The attitude of hopelessness is one that must be cured. The peaant, promised so much over many years by one government after another, is a cynic and an individualist. He is, however, far more ready to learn than the townsman or official often believes. He is ready to learn if the teacher really believes in his craft and has sympathy for his pupil. Traditional attitudes in husbandry and diet must be broken down."

There is an interesting discussion of the various official agricultural programmes to improve the lot of the Italian peasantry. This balanced evaluation of the region's prospects reveals how much there is in common between all underdeveloped areas. This study is valuable for the insights it offers into the Southern Italian agricultural situation. The material on the population problem, however, is incomplete, for there is not even a passing reference to the fertility, mortality and other demographic variables of the region. No attempt is made to evaluate the future growth of population in the region and the need for any demographic solutions. The book has numerous illustrations.

Family Planning

ROLPH, C. H. (Ed.) *The Human Sum* (London. Heinemann. 1957) pp. 232. Price 18 shillings.

This symposium of some eleven articles is devoted to a discussion of the various aspects of Britain's population problem and the pressing need for family planning. Two or three contributors dwell on the world population problem but the major portion of the book is given to a lively examination of the changes in the structure and role of the family in Britain during the last few decades. The book is sponsored by Britain's Family Planning Association to mark the twenty-fifth anniversary of that organisation.

Dr. Julian Huxley presents a fascinating report of his recent world tour which took him to Pakistan, India, Thailand, Japan, Australia and Fiji. Writing of Australia, Dr. Huxley observes, "Australia is underpopulated in the double sense that it could support a larger population and that a larger population would benefit its economy. How much larger is a question. Some say 50 million people, but this seems an over-optimistic estimate. A total of 25 or at most 30 millions seems more reasonable." But he goes on to add, "The white Australian policy remains as an affront to Asian sentiment. But it has, in my opinion, strong arguments in its favour. Certainly it cannot and should not be justified on grounds of racial superiority or inferiority: *there is no such thing.* But it can be justified on cultural grounds. Cultural differences can create grave difficulties in national development. They often do so when cultural and racial differences are combined." And yet he pleads, "As I have emphasised, the crux of the problem lies in establishing a satisfactory balance between the world's resources and the population which uses the resources." What is the way out? "Everything points to one conclusion. While every effort must be made to increase food production, to facilitate distribution, to conserve all conservable resources and to shame the 'have' nations into a fairer sharing of the good things of the world with the 'have-nots', this alone cannot prevent disaster. Birth control also is necessary, on a world scale and as soon as possible."

Bertrand Russell with his usual clarity and wit writes on "Population Pressure and War". He observes, "Wars caused by pressure are no novelty . . . . During the last few centuries population pressure in Europe has been relieved by emigration to the Western hemisphere, and, as Red Indians do not write history, we have thought of this pro-

cess as peaceable. The East, however, has enjoyed no such outlet." Mrs. Mary Stocks contributes an informative essay on the pioneering story of family planning in Britain. Dr. A. S. Parkes of the Medical Research Council writes on the possibility of a biological contraceptive. Dr. Michael Young and Mr. Peter Willmott examine the changes in the families (in relation to housing and the role of the father) in East London. Mr. Edward Blishen presents a schoolmaster's view of these families. Miss Jacquetta Hawkes examines the emancipation of women through family planning. Dr. J. M. Mackintosh draws attention to changing attitudes within the family—attitudes which affect the acceptance of family planning. Mr. James Lansdale Hodson pleads for a reform of the law on abortion so that the tragedy of thousands of fatal back street abortions can be averted. Rev. Sherwin Bailey examines the Christian (Protestant) theological view of marriage and the family with special reference to contraception. The Editor also contributes a chapter on the Family as a Legal Notion. Lord Simon of Wythenshawe contributes a preface. Alfred G. Wurmser has illustrated the book with some forty delightful line drawings.

The book is extremely readable and contains authoritative opinions on the dangers of overpopulation, not only to Britain but to the whole world, and the imperative need of spreading family planning. Abstract overpopulation apart, the emancipation of the modern family depends on spacing and limiting the number of children. The book is also a memorial to those pioneering women and men of Great Britain—the famous and the unknown—who struggled against all odds and made family planning respectable. People in other parts of the world are reaping today the victories of the battles fought by the British pioneers. This book, a homage to their memory, deserves wide circulation.

Indian Census

Census of India. Paper No. 1. 1957 : (Delhi. Government of India Press. 1957) pp. 255. Price Rs. 2.50.

With the advent of political freedom in 1947 India became India and Pakistan with consequent new national and provincial and state frontiers. With the promulgation of the new constitution the country was divided into A, B and C States and Territories. Since 1951 the country has witnessed a series of further changes in the political divisions as a result of the creation of the Andhra State in 1953, the merger of Chandernagore in 1954, the States Reorganisation in 1956 and the consequent transfer of territories between Bihar and West Bengal. These marked changes in the boundaries of the States have rendered the 1951 population Census figures for the various States out of date. Even today the State boundaries cannot be taken to be final. The Bombay State will have to be split sooner or later into a Marathi and a Gujarati State. Some minor adjustments may have to be made between Madras and Andhra States.

This latest publication of the Census Department presents general population tables and summary figures by districts of the reorganised states, taking all these changes into consideration. This paper deals with "A" and "D" series of tables published in the Census of India, Vol. 1. Part II-A-Demographic Tables. This is a valuable paper indispensable to all students of Indian affairs. The Deputy Registrar-General of India, Shri Rajeshwari Prasad, deserves to be commended for making these latest figures available so promptly.

PUBLICATIONS RECEIVED

ALEXANDERSSON, GUNNAR *The Industrial Structure of American Cities* (Lincoln. University of Nebraska Press. 1957) pp. 134. Price $6.50.

ANAND, R. L. *Agricultural Marketing and Working of Market Committees in the Punjab* (Simla. Government of the Punjab Economic and Statistical Organisation. 1957) pp. 212. Price not indicated.

BORRIE, W. D. AND DEDMAN, RUTH M. *University Enrolments in Australia 1955-1970 : A Projection* (Canberra. Department of Demography, Australian National University. 1957) pp. 20.

BROWDER, W. GORDON AND HOFLICH, HAROLD J. *Population and Income in Montana* (Missoula. Montana State University. 1953) pp. 71. Price $1.00.

CAVAN, RUTH SHONELY *The American Family* (New York. Thomas Crowell Company. 1956) pp. 658. Price $6.00

COONTZ, SYDNEY *Population Theories and the Economic Interpretation* (London. Routledge and Kegan Paul Ltd. 1957) pp. 200. Price 21 shillings.

COWGILL, DONALD O. A *Pictorial Analysis of Wichita.* (Wichita. The Community Planning Council and the University of Wichita. 1954) pp. 115. Price not indicated.

COWGILL, DONALD O. and GERLING, AMY G. *Children and Youth in Wichita* (Wichita. University of Wichita. 1956) pp. 45. Price not indicated.

DAVIDSON, BASIL *Turkestan Alive* (London. Jonathan Cape. 1957) pp. 290. Price 25 shillings.

DICKINSON, ROBERT E. *The Population Problem of Southern Italy : An Essay in Social Geography* (Syracuse University Press. 1955) pp. 116. Price $3.00.

DUNCAN, OTIS DUDLEY and BEVERLY DUNCAN, *The Negro Population of Chicago : A Study of Residential Succession* (The University of Chicago Press. 1957) pp. 367. Price $6.00.

ERICKESEN, GORDON E. *Urban Behaviour* (New York. Macmillan Company. 1956) pp. 482. Price $6.00.

GIST, NOEL P. and HALBERT, L. A. *Urban Society* (New York. Thomas Crowell Company. 1956) pp. 513. Price $6.00.

HAWLEY, AMOS H. *Papers in Demography and Public Administration* (Manila Institute of Public Administration. University of the Philippines. 1954) pp. 88. Price not indicated.

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