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SOCIAL GEOGRAPHY OF MATHURA ^{*} 7

By

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THE LAND

1. General physical background:

The district of Mathura¹ (27° 14' N — 27° 58' N/77° 17' E — 78° 12' E) occupies an area of 1,467 sq. miles in Western Uttar Pradesh (Fig. 1). There have been from time to time, changes in the boundaries and area of the district. The present administrative zones² are shown in Fig. 2.

Apart from minor Aravalli protrusions on the western border and the valley of the Jumna, the district has a gentle slope from north to south.³ The total length of the Jumna in M. D. is approximately 100 miles. Besides the *Khadar* (the low lying tract along the river liable to annual floodings) and *Bangar* (the upland margins of the river) areas, the river has also left a number of shallow depressions which provide some fish during the rainy season to the population of the neighbouring villages. The general direction of the shift of the Jumna has been eastwards.

The climate of the area is as a rule drier and hotter than that of most parts of the *Doab*⁴ (a piece of land between two rivers). Elliot and Blanford agree⁵ on the point that the average total annual rainfall of the area is less than 25". According to some old registers kept in the Cantonment, the average temperatures are 58°F for January and 93.4°F for July.⁶

* This paper is an abridged version of the writer's thesis—SOCIAL AND ECONOMIC GEOGRAPHY OF MATHURA DISTRICT—(WESTERN UTTAR PRADESH), approved for the Master's Degree of the University of London in June, 1958.

1. Henceforth M. D.

2. Henceforth the local name *tahsil*.

3. Drack-Brockman, D. L. — *Muttra — A Gazetteer*, Allahabad, 1911, p. 24; (henceforth D. G).

4. *Ibid.*

5. Elliot, Sir John — *Climatological Atlas of India*, London, 1906, p. 2.

6. No data are now kept upon this point but there is no reason to suspect that the above figures are wrong.

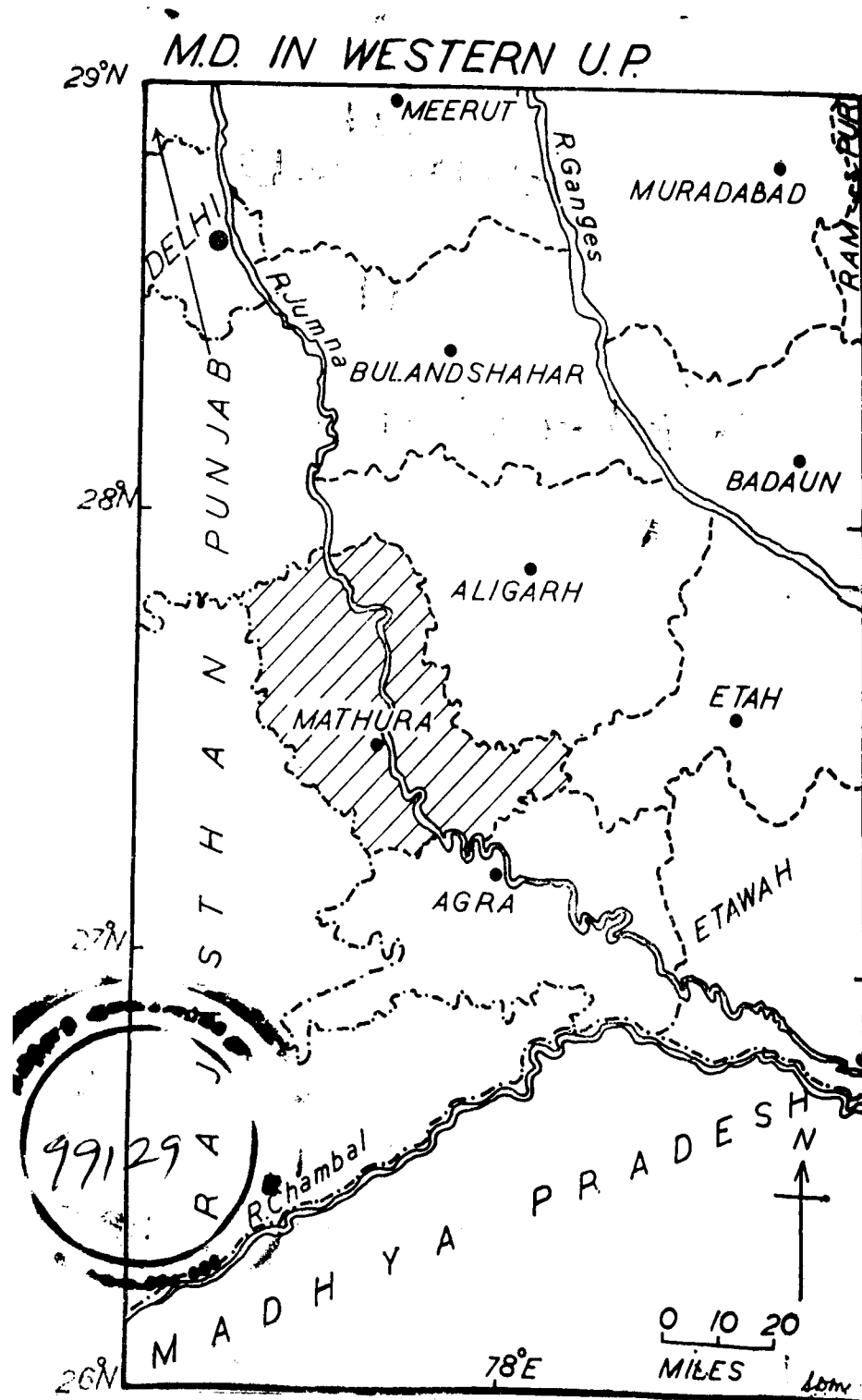


Fig. 1.

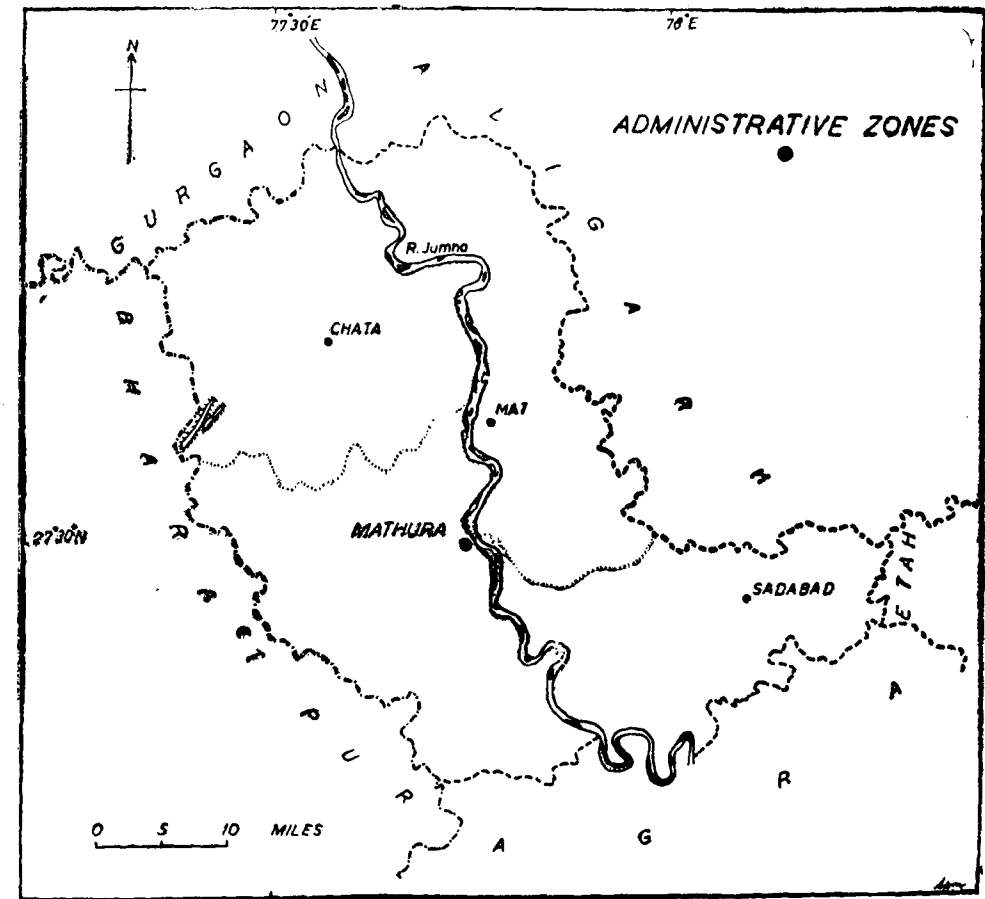


Fig. 2

An analysis of the climatological data has shown that the area has (not unlike elsewhere in northern India) three seasons. Clear skies, fine weather, low humidity, large diurnal range and light land winds are the characteristic features of the winter season. The rainfall during the winter season is scanty. As early as March the approach of the hot weather is signalled by a marked rise in temperature and the blowing of the *loo* (dry hot wind). The latter increases in intensity as the year advances. Temperature increases rapidly. May is typically a hot weather month when the temperatures, rather frequently, shoot to 115°F , especially in western M. D.⁷ There are dust storms of local origin (rarely more than a few yards in diameter accompanying high temperatures and large diurnal range). The average rainfall during the hot season is 2.8" only.

Usually the monsoons reach M. D. by the end of June. Their strength begins to diminish by the second week of September. Bursts of general rainfall alternate with breaks. The average rainfall in this season is 23.5". According to the rainfall returns kept at the district headquarters since 1861, the mean annual rainfall is 24" — the bulk coming in July and August.

7. Henceforth W.M.D. (thus E.M.D. for eastern M.D.)

8. Henceforth D.H.Q. (thus T.H.Q. for *tahsil* headquarters).

Normally, the winters are dry. E.M.D. receives comparatively better and surer rainfall than W.M.D.

There is a widespread impression that the area is drier today than it was, say 30 years ago, and that the Thar is encroaching into U. P. Naturally, therefore, the problem was given special attention during the course of field work.⁹

This problem was studied by Walker,¹⁰ Oldham¹¹ and Clarke.¹² The writer analysed 30 years' rainfall and temperature data for M.D. and had to agree with Professor Stebbing¹³ as did Ali¹⁴ almost 20 years ago. There is no evidence that the apparent desiccation has been caused by a reduction in the rainfall; probably it can be explained partly in terms of water-logging associated with the canalization and partly also in terms of the proximity to the Thar desert. The writer's findings in the matter are that the district is coming nearer to the desert by a furlong per summer season.

M.D. is not important from the geological point of view,¹⁵ and like the rest of the Indo-Gangetic Plain, contains a deep alluvial soil.¹⁶ Like most riverain areas in India, the *khadars* in M.D. are the portions worst affected by soil erosion.¹⁷ The glory of Mathura as a pasture ground has now departed. Where no commons exist, the cattle have to be grazed in *khadars*. The indigenous trees do not differ from those found elsewhere in western U.P.

2. Hydrology:

There are only two sources of supply of water to M. D. — (1) the river Jumna and (2) the annual rainfall. The Jumna and the Ganges issue from the lower extremity of a vast basin and become the sole discharging lines of the great volume of water down from the mid and outer Himalayas situated between 77°E and 79°E. Upto Agra the Jamna does not receive any important tributary, and its volume is, therefore, formed almost entirely from the drainage of the mountain region "whose limits include approximately 5000 sq. miles" (Fig. 3). The sources of the supply of water to the Jumna are, therefore, the melting snows on the peaks of the mountains of the catchment area and the annual rainfall. The amount of water causing floods in the river can roughly be judged from the intensity of the precipitation at some points in the catchment area. The result is that in the cold weather the normal depth of the Jumna at Delhi is about 4' and the stream has

9. For the purposes of this discussion the word 'desiccation' will be held to mean the deterioration of the country as regards the supply of water to support human and plant life.

10. Walker, G. T. ... *On the Meteorological Evidence for the supposed change of climate in India*, Mem. Ind. Met. Dept. Vol. 21, 1910, pp. 1-21.

11. Oldham, C. V. ... *Notes on the Lost River of the Indian Desert*, Cal. Rev., Vol. LIX, 1874, pp. 1-50.

12. Clarke, K. G. T. ... *Vicissitudes of Summer Rainfall in the Indo-Gangetic Plain*, Geography, 1932, p. 286.

13. Stebbing, E. P. ... *The Man-made Desert in Africa-Erosion and Drought*, J.R. Afri. Soc., Vol. 37, Jan. 1938.

14. Ali, S. M. ... *A Geographical Study of Ghaggar Plain*, unpublished London, Ph. D. thesis, 1939.

15. Mem. G. S. I. ... Vol. IV, Pt. III, Calcutta, 1938, p. 120.

16. Khan, A. D. ... *Planning for soil Conservation in U.P.*, U.P. Govt. Information Bureau, Lucknow, 1952, p. 7.

17. D. G., p. 17.

18. Ali, S. M. — op. cit., p. 85.

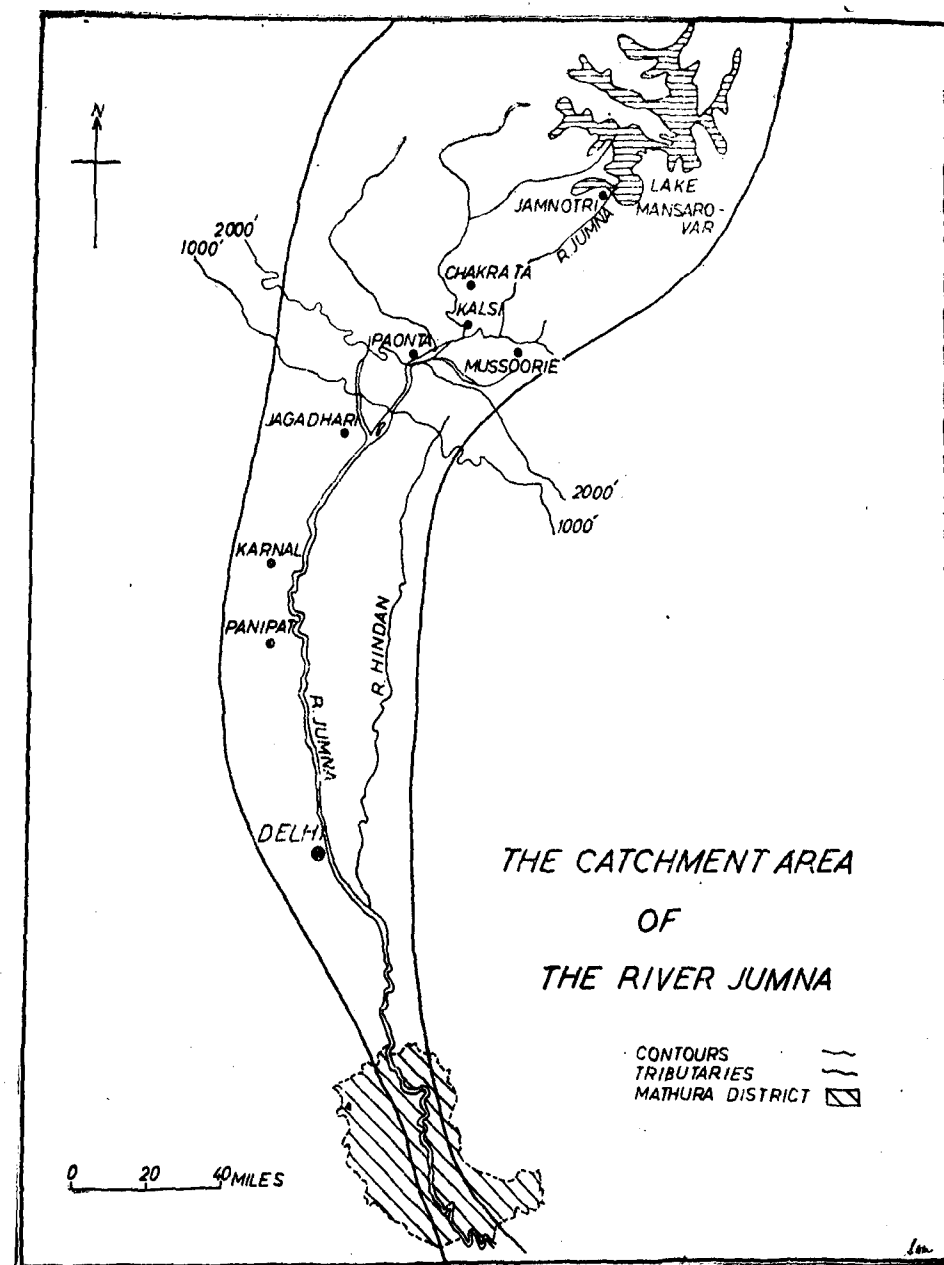


Fig. 3

hardly sufficient water to supply the three canals which draw from it¹⁹. In May, the melting of the snow within the catchment area causes some rise while in July and August the river has a considerable breadth swelling in places from 2-5 miles, with a maximum depth of some 30'. This brief

19. For details see Ali, *ibid*; — and also Dutt, P. K. — *Power Resources and Utilisation in U.P.*, un-published London M.A. thesis, 1947 p. 120.

analysis, perhaps, brings out clearly the fact that the river is not a very dependable source of water-supply for agricultural purposes.

Of the rain which reaches the ground (approximately 24"), about 1/3 is lost by evaporation²⁰ and other 1/3 goes to waste by way of run-off.²¹ So it is only about 8" of rain water that reaches the sub-soil. Of this, not all is suitable for agricultural or drinking purposes, besides the point of accessibility too, is no less important. Whiteway has classified the waters of M.D. into 12 types and he has shown that certain waters are positively harmful for crops.²² Thus, in hundreds of villages the drinking water has to be obtained from quite a distance.²³ As for its accessibility, the average depth of the watertable in 1900 was about 35'²⁴ while now it is about 45'.²⁵ Here is an interesting problem for the geologists and agronomists. Another relevant point is the nature of the sub-soil which, almost every-where in the Gangetic Plain, makes well-digging quite a task because of the presence of *Kankar* (nodular limestone).

The irrigation in M.D. is merely protective and not productive since only 45% of the cultivated area is irrigated. It would perhaps be only belabouring the obvious if we were to state that the methods of irrigation are out-moded and thus wasteful.

THE ECONOMY

1. Agriculture :

* During the Hindu-period, a collection of dwellings was a hamlet which had some arable land around it; beyond this hamlet was a ring of uncultivated land, generally under forest. As the population increased, the arable land increased at the cost of the forest ring. Later on, Akbar's settlement (rather Todar Mal's genius) allotted some pasture or waste-land to each village (usually as large as the human voice could be heard across). But since the revenue of the village was payable collectively, the question of individual proprietary rights did not arise. The result of this reform was, therefore, the definition of the boundaries of the village, while the actual division of cultivated land into fields, in spite of their soil classification, remained as

20. Leather, J. W. ... *Evaporation from a Plain water Surface*, Mem. Dept. of Agri. U. P., Vol. III, No. 1, 1913, pp. 1-15.

Also see his ... *Records of Drainage in India*, ibid, Vol. II. No. 2, 1911, pp. 73-78.

21. Blanford, H. F. ... *The Climates & Weathers of India*, London, 1889;
Also Ali, S. M. ... op. cit., p. 78.

22. Whiteway, R. S. ... *Report on the Settlement of Muttra District*, Allahabad, 1879, pp. 17-18.

23. Hence the *Paniharis* (water maidens) of Brij (M-D) are famous.

24. Molony, E. A. ... *Manual of Irrigation of Wells*, Bulletin No. 22 of the U. P. Agri, Dept., 1907, p. 61.

25. Based on the local records and field-work.

* Certain facts as the making of the field-pattern, unreliability, incomparability, and unavailability of the data, and the pattern of land-use are shared by M.D. in common with other areas of the Gangetic Plain. Only a brief summary which perhaps is necessary, is given here. For details see:

- (i) Ali, S.M. ... *A Geographical Study of the Ghaggar Plain*, unpublished Ph. D. thesis, 1939, pp. 248-269.
(ii) Blache, Vidal de La ... *Principles of Human Geography*, New York, p. 60
(iii) Dayal, P. ... *The Agricultural Geography of Bihar*, unpublished London Ph. D. thesis. 1947 (Introduction is interesting).

uncertain as before.²⁶ Under the British rule, the size, boundaries, position and arrangement of the village land was surveyed, fixed and mapped out. Further increase in population resulted in the extension of land under the plough and still further increase, coupled with the laws of inheritance (giving all the sons an equal share in the patrimony), has resulted in the present subdivided, dispersed and fragmented (thus uneconomic) holdings.

Regarding the recent agricultural returns, the semi-literate village watchman (*chaukidar*) is the chief source of information "to the heads of the local *thanas* (police stations) who are men notorious for their irresponsibility and abuse of power, and it is doubtful if they make any effort to enquire into the position regarding the accuracy of the data supplied to them."²⁷ Then the report goes to the sub-divisional officer and then to the District Officer. But these higher officials have really no effective means of testing the accuracy of the reports submitted, and can alter them only according to their own guesses. Thus, our data are "admittedly often mere guesses and are, not infrequently, demonstrably absurd guesses."²⁸ We do not know whether the area 'under water' is permanently under water, or is so only during a part of the year. It is also not clear whether such area is located along the margins of the river, or in the interior.

A careful look at Fig. 4 would show — (1) the extensive nature of the cultivated land; (2) the three (more or less) parallel belts of uncultivated land — (a) along the western border, (b) along the Agra Canal (through the middle of W.M.D.), and (c) along the Jumna; (3) a typical net of small isolated woodland patches all over the area.²⁹ This net is more open in E.M.D. compared to W.M.D. This pattern is related in parts, to some physical factors — (i) the aridity along the western border; (ii) the alkalisation along the Agra Canal, and (iii) the *Khadars* of the Jumna.³⁰

2. Industry :

There are no factory industries developed on a large scale but some urban industries are carried out on a small scale, usually in workshops. These are — (1) Art industries (silver and brass toys); (2) building materials (stone carving); (3) chemicals (salt petre); (4) Hardware (domestic utensils); (5) Textiles — a) cotton (ginning and processing) — (i) carpet, (ii) cotton rope, (iii) cloth printing (*sarees*), and (b) wool; (6) Miscellaneous industries — (a) *Mukat and Srinagar* (masks used in religious performances), (b) *Kanthi* (rosary), (c) Jail industries — (i) carpets, (ii) cotton rope, (iii) *Moonj* (a local fibre), pounding, twisting and matting, (iv) wheat grinding, (v) oil pressing, (vi) *chick* making, (vii) lime making; (d) Utilisation of slaughter house by-products — (i) bone, (ii) horns, (iii) fat, (iv) gut, (v) blood; (e) *Pera and Khurchan* (local milk products); (f) Ice making. Except for some statistical changes, the detailed account of these industries available elsewhere still

26. After Baden-Powell, B.H. ... *A short account of Land Revenue and its Administration in British India with a sketch of the Land Tenures*, Oxf. Uni. Press, 1913.

27. Dayal, P. ... Ibid, Introduction, p.x.

28. *Royal Commission on Agriculture, Report*, 1928, p. 605.

29. Based mostly on 1" to a mile sheets of the Survey of India.

30. A detailed account of the crops and their requirements is purposely omitted here, for either it is too well known or is readily available from any book on agricultural economics. The Agricultural zones of M.D. could be read from Fig. 5.

31. Zaffrey, M.H.R. ... *Report on the Industrial Survey of the Muttra District*, Allahabad, 1924.

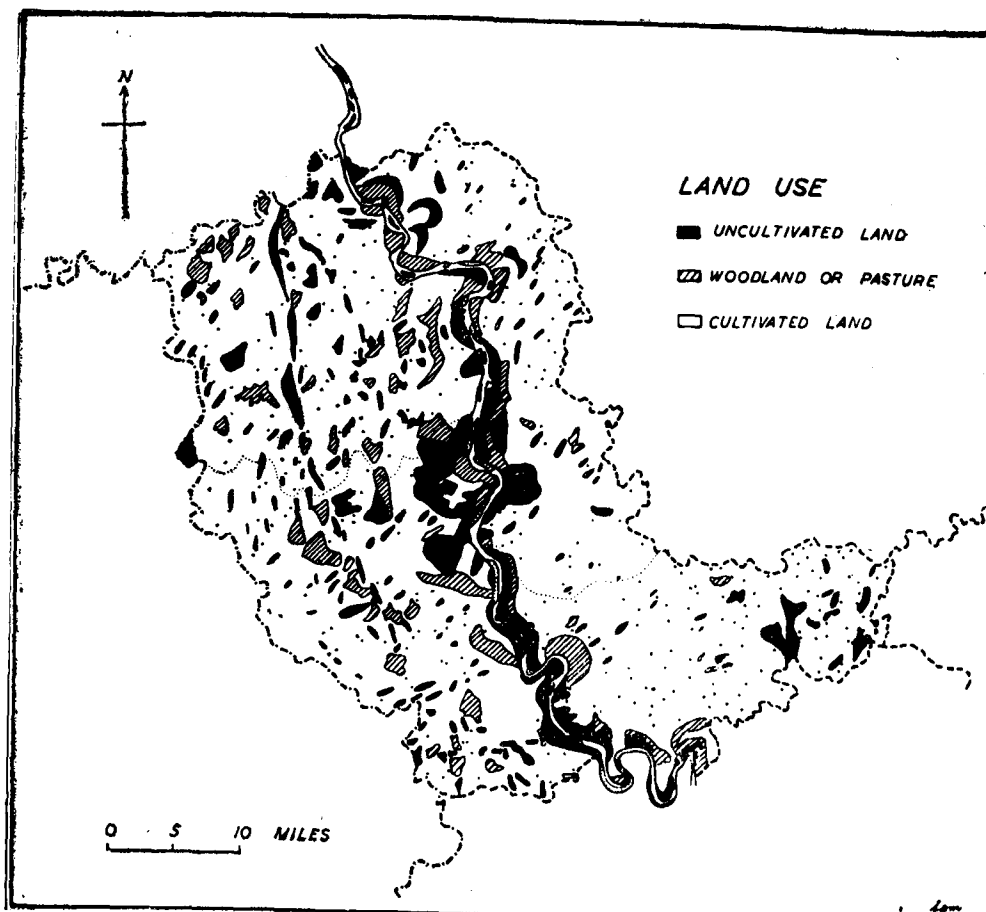


Fig. 4

holds true.³² These urban industries have been mentioned here only because they have a bearing on the subject of the paper in that they are articles of trade in which the social groups are concerned.

The rural industries occupy an important place in the economic structure of M.D. These industries are carried on in the villages and supply most of the essential needs of the rural population. Here they are distributed throughout the districts; in almost all the villages and hamlets, without showing any definite regional concentration, as the raw materials, artisans and the necessary market exist in the villages themselves. "These industries are probably as old as the rural settlements themselves for they appear to have existed ever since the establishment of sedentary population groups in villages and hamlets. Almost all the village industries are carried on by professional castes which were evolved in the past to meet the primary needs of a simple but self-sufficient village community."³³

32. Majid, S.A. ... *Industrial Geography of Bihar*, unpublished London, Ph.D. thesis, 1949, p.44.

33. For interesting details see Dorman, H.S. ... *Highways in the Punjab, past and future*, Proc. Punj. Engineering Cong. Lahore, Vol. III, 1919, p. 13.

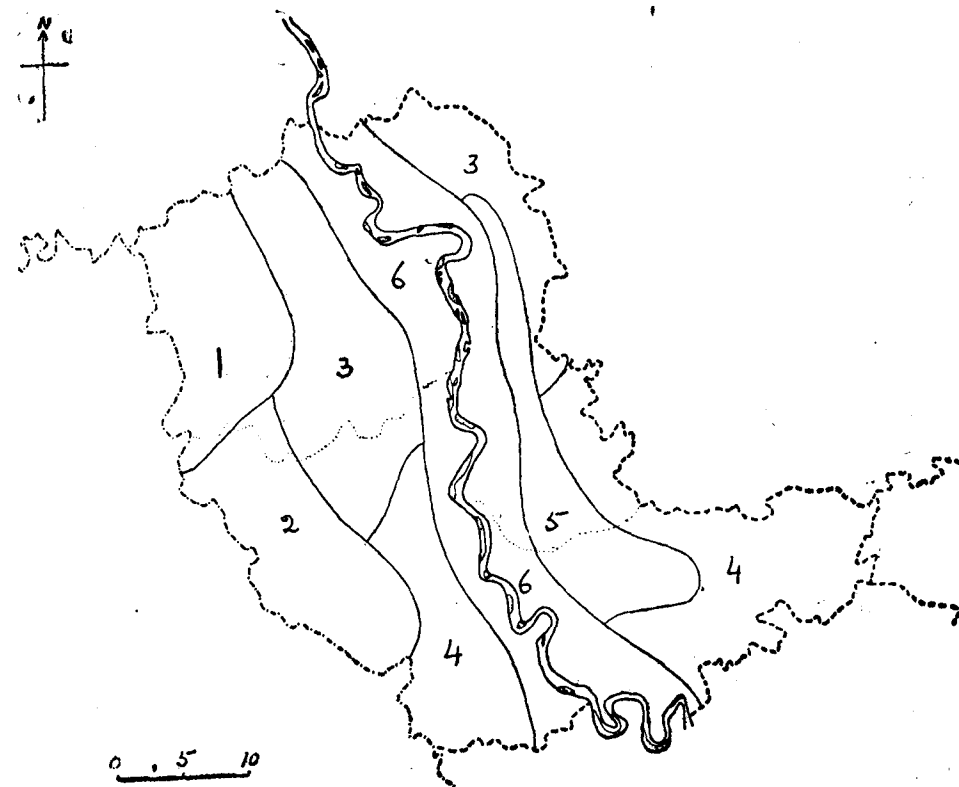


Fig. 5

- | | | |
|--------------|------------|--------------------------------|
| 1. Cotton | 3. Millets | 5. Sugarcane |
| 2. Oil seeds | 4. Wheat | 6. Fruits, Tobacco & Vegetable |

The chief rural industries of the area are grouped as — 1) The food industries, (i) Oil pressing (*Kolhu and Teli*), (ii) Grinding of foodgrains (*Chakkipisanhari*), (iii) Tobacco manufacture (*for hookah*); (iv) Gur manufacture (*for bheli, shakkar and rab*); (v) Parching of Grains (*bharbhooja*), (vi) Confectionery (*Halwai*); (2) The clothing industries, (i) spinning and weaving (*charkha and Julaha*), (ii) sewing (*Darzi*), (iii) dyeing (*Rangrez*), (iv) washing of clothes (*Dhobi*), (v) leather industries (*Chamar*); (3) The Shelter Industries, (i) brick making (*Pathi, bhattas*), (ii) house making (*Beldar or Raj*); (5) Tool making. (i) iron work, (*Lohar*), (ii) wood work (*Barhai*); (5) Miscellaneous, (i) potters' industry (*Kumhar*), (ii) gold and silver smithy (*Sonar*).

3. Transport and Trade :

M. D. presents remarkable contrasts in the development of its several kinds of communications. Its highway system is still primitive while its railway services are far from adequate. Twofold aspects of its location seem to have affected the development of the means of communication in the area, (1) Location between Delhi and Agra, and (2) Location between Lahore and Lucknow. Thus, any map of the railways or bus-routes (the arteries of inter-district and interstate communication) would show that these tracts run in N/S and E/W directions. But the older highway pattern (eg. the cart tracks) which developed as a result of the above factors of location had a

N. W. — S. E. trend, obviously connecting the Indus with the lower Gangetic plains. The trunk roads during the 14th and 15th centuries linked Delhi with Lahore and Peshawar on the one hand, and Agra on the other.

A detailed enquiry into these means of communication revealed that they are either insufficient, or inefficient, or both. The condition of the unmetalled roads during the beating monsoon, or the dusty hot weather, needs no comment. On any road, the indigenous bullock-cart is universal, besides the pack animals—ponies, donkeys and mules.³⁴

Either in the village, or in the market (*mandi*), the cultivator sells the produce to the middleman (*beopari*) who in turn exports it direct to places where they are consumed. The periodical village markets (*penths or hats*) are held once or twice a week. But the greater business is done in *mandis*; and, therefore, no wonder that some of the towns are only overgrown *mandis*.

The inter-district trade of the area was of considerable importance and steps had been taken, more than once, to ascertain the amount of traffic between it and the adjacent territories. About 100 years ago raw cotton, cotton goods, hides and crude salt-petre formed the bulk of the exports; and an overwhelming proportion of the imports consisted of food grains and salt—particularly the entire traffic being with the city of Mathura.³⁵

The present conditions show, (1) M.D. still imports salt, sugar and cotton piece-goods; (2) M. D. still exports raw cotton, salt-petre and oil seeds, besides the printed cotton-goods (*sarees*), hides and coarse grains; and (3) the Mathura/Delhi, Mathura/Agra, Mathura/Lucknow and Mathura/Bombay routes have not lost in their importance.

To sum up, the growth of better means of communication, particularly the railway and the automobile must have been responsible mainly for the development of some parts, production of better cash crops, opening of new markets, reorientation of the settlement nuclei, stimulation of trade and widening of the commercial outlook of the area; but, still the fundamental link between the field and the market, the village and the town, and the producer and the consumer remains unaffected and unchanged. The slow, clumsy and primitive bullock-cart still dominates the field of commercial activity and it is not an uncommon sight for a traveller to see a line of carts loaded with grain and other produce proceeding slowly to the nearby market city on a *Kacha* (unmetalled) road, parallel to the main railway line.

THE PEOPLE

1. Historical outline:

Of all the geographical factors affecting the social-history of M.D., perhaps, the twofold aspects of location are of paramount importance. Physically, the area is between the plains of the Indus and the Ganges; while culturally it is between Delhi and Agra which are different. Consequently, there has hardly been any period during which M.D. remained unaffected by the major events affecting the history of the sub-continent.

34. After D. G. ... p. 63.

35. District Annual Returns, unpublished. D. H. Q., 1956.

The belief that Mathura is an ancient place is fallacious³⁶ (from the Indian view-point). We have it on the authority of Hieun Tsang (629 to 645 A.D.) that the Buddha often travelled in the 'Kingdom of Mathura' and that the monk UpGupta (who converted Ashok) lived here.³⁷ Next we hear of Mathura with reference to the invasions of Menander.³⁸ Then came the Satrapas and the Kushans.³⁹ Kanishka ruled here till 150 A.D. and was succeeded by his son Huvishka (or Hushka).⁴⁰ How and when the Kushan power actually came to an end is wrapped in complete obscurity, the period from A.D. 200 to 350 being one of the darkest in all Indian history.

Then came the Huns in the 6th century shattering Buddhism (at Gandhar) and reviving Brahminism. Mahmud of Gazni made his expedition to Mathura in 1017 A.D. when the temples were burnt with naphtha, levelled to the ground and the name was changed to Mahratu-l-Hind.⁴¹ Sikandar Lodi (1418-1516 A.D.) utterly ruined the shrines of Mathura, turned the principal temples into rest houses (*Sarais*) and Schools (*Maktabas*), the stone images were given to butchers to serve them as meat weights. All the Hindus were prohibited from shaving their heads and beards and performing their ablutions, and no Hindu if he wished to have his head or beard shaved could get a barber to do it.⁴² During Shershah's time (1540-1545 A.D.)⁴³ the Delhi-Agra road was constructed. Akbar shot tigers in Mathura jungles; Jehangir's wife Noorjehan killed a tiger here in an accident, and as late as 1634 Shah-jehan killed 4 tigers in E.M.D.⁴⁴ Most of the present temples of M.D. were built during Akbar's time and of all the Moghul Emperors, perhaps Aurangzeb carried persecution to the extreme lengths. Here his eldest son Mohammad Sultan expiated the sin of primogeniture by ending his days in a dungeon while Murad's death was also encompassed in M.D.⁴⁵ Also Aurangzeb entirely ruined the towns of Mathura and Brindaban — their temples were demolished and a number of mosques were made of the materials, while the names of these places (holy to the Hindus), were changed to Islamabad and Muminabad respectively.

After Aurangzeb's death in 1707 A.D., the imposing fabric of the Moghul Empire began to totter. "So low had the empire fallen that the Hindu Jats—little more than an armed peasantry could dominate the Agra-Muttra region, even plundering the Taj Mahal and Akbar's tomb near Agra."⁴⁶ The supremacy of the Jats was not long lived. The decline came after the death of Suraj Mal and the rise of the Marathas followed after the latter besieged Bharatpur in 1771 A.D.⁴⁷ On 31st December 1802 was signed the

36. No fact of historical importance can be extracted from the legends relating to Krishna or Mathura, and the vague, dates assigned to the Great War-Mahabharata, in which he is said to have taken part have no basis in authentic history. Also in Ramayan the name occurs in the Uttar Kand which is believed by the best authorities to be a later addition. Also see Vincent A. Smith—*Early History of India*, London, 1908, p. 205.

37. Smith, Vincent A. Ibid, p. 178.

38. The occupation of Mathura by Menander depends on the authority of Garga-Samhita written about 20 B. C. (See Smith, *ibid*, pp. 205-212).

39. Cunningham, *Archaeological Reports*, Vol. I, p. 238.

40. The inscriptions of Vasudeo (grandson of Kanishka) are preserved in the Mathura Museum.

41. D. G. — p. 189.

42. D. G. — p. 190.

43. Smith, Vincent A. — *op. cit.*, p. 188.

44. D. G. — pp. 188-191.

45. Smith, *op. cit.*, Vol. VI, p. 386, also see Bernier, *Travels*, Constable edition, p. 55 and Irvin's translation of *Stories DeMogol*. Vol. I, pp. 299-306.

46. Spate, O.H.K., — *India & Pakistan*, London, 1957, p. 161.

47. D. G. — pp. 203-4.

treaty of Bassien between the British and the Peshwa. Disregarding the terms of the treaty Daulat Rao Scindhia, made further attacks against the East India Company, provoked to do so by the French Officer Perron, combined with Bhonsle of Nagpur. "Thereupon Lord Lake in 1803 started from Cawnpore with the grand Army of the *Doab* amounting to 10,500 men. On September 4th, Aligarh was stormed and Lord Lake continued his advance to Delhi. On the 14th of the same month took place the celebrated action which is called the battle of Delhi and the same day Delhi was occupied. On Sept. 24th, the march was resumed to Agra. It was in the course of this march, on Oct. 2nd, 1803, that Muttra was first occupied by the British."⁴⁸ With 1805 began a period of undisturbed peace and rapid prosperity for the city of Mathura. The city remained always a military station, but it was not until 1824 that the district was first formed. In 1832, Mathura became also the civil headquarters of the district, which assumed with some unimportant exceptions, its present dimensions for the first time.⁴⁹ It was not until Jan. 1857 that the earliest indications of Mutiny came to light.⁵⁰ Whether the affair of 1857 was the 'First War for Independence' whose centenary was celebrated in India in 1957, or whether it was simply "the last rally of the old indigenous India,"⁵¹ we are not much concerned about; for the purposes of this paper it is enough to say that the Jats, Gujars, Meos and the Rajputs were the major social groups involved in the conflict and that W.M.D., the tract between Delhi and Agra, was once again the scene of active hostilities. The subsequent period since 1857 is uneventful. Canals, roads, railways, and bridges were built. The area has been disturbed only by famines or similar calamities which affected the population of M.D.

2. Population:

The malign influence of the Three Bad Fairies, "Not Available," "Not Comparable," "Not Reliable," pervades all through the census statistics.⁵² A study of the growth of population since 1848 to 1951 has shown that the increase in numbers had been fluctuating. The reason is perhaps not far to seek for the "..... vast masses, perhaps the majority of Indian peoples, life is on such a low level of nutrition and so exposed to disease that their continued existence is 'marginal'. There are no reserves of human energy to meet the assaults of dearth and pestilence..... It seems broadly true that the social customs practically place a premium on reproduction, so that when better times do come the flow of births is overwhelming as is the mortality in bad years; there is thus a close direct correspondence between harvests and mortality."⁵³

Of the two factors affecting the growth of population (natural increase and immigration) both seem to be equally potent. The colossal amount of suffering incurred by the high birth and death rates leads us to conclude that⁵⁴ though an increase of population may occur, when agriculture and health conditions are favourable, the conditions of life in general do not justify additions to the rural population..... "what is required, perhaps, is greater fertility in the fields and lesser in the homes. The rural marriage migration from Rajasthan is heavy, the female immigrants being in excess."⁵⁵

48. D. G. — pp. 211-12.

49. Ibid — p. 212.

50. For details of Mutiny in M.D. see D.G. — pp. 213-219.

51. Spate, O.H.K. op. cit., — p. 137.

52. Spate, O.H.K., op. cit., p. ix.

53. Ibid, p. 99.

54. Gyan Chand — *India's Teeming Millions*, London, 1939, pp. 55.

55. Census of India, 1951, Uttar Pradesh, Report, Allahabad, 1953, p. 25.

⁵⁶ Apart from migrations which swell or decrease the numbers temporarily, the major factors in the growth of the population of M.D. are — (1) the natural increase, (2) the sex ratio and (3) the religious and social taboos. The census observes that "the progressive age composition of our population has potentialities of a high birth rate. On the whole, there are no prospects of a substantial fall in the birth rate. On the other hand, the falling trend of the death rate is likely to be maintained. The estimates of population are, therefore, bound to be hazardous."⁵⁷

3. Rural and Urban Settlements:

The super-imposed features of the cultural landscape viz., metalled roads, railways, canals and power-lines are still young compared with the age-long village which has survived the vicissitudes of history. The former, therefore, have not yet affected the location of rural settlements though they may have contributed to their growth.⁵⁸

In what follows, the word 'village' is used in its more restricted sense, meaning thereby this central hamlet or residential focus and not the whole area to which the term applies for the census-purposes.⁵⁹ Out of a total number of 860 agglomerations, nearly 90% form communities of less than 2,000 persons. There is a well marked gap between the agglomerations having less and more than 5,000 persons. This forms, usually, the basis of official classification.⁶⁰

The location, size and shape of the villages seem to be related to the physical as well as the cultural factors of the geographical environment. The chief village-types recognised by the writer in M.D. are (1) Wet point, (2) Dry point, (3) Strong point, (4) Rectangular, (5) Chequerboard, (6) Square, (7) Elongated, (8) Herring bone, (9) Fan pattern (10) Circular, (11) Horse-shoe, (12) Double nucleation, (13) L, C, or T, shaped, (14) Polygonal and (15) Irregular types.⁶¹ As for the distribution of these village types, the individual

56. A general discussion on the pattern of population incorporating the pattern of livelihood classes, the pattern of distribution (rural-urban including the need for rural-urban classification) is purposely left out here; since firstly this general pattern of population in M.D. is neither different nor peculiar from what is found elsewhere in the Indo-Gangetic Plains, and secondly such an account is readily available. (See Census of India, *ibid*, pp. 110-150, and also Ali, S.M. — *A Geographical Study of Ghaggar Plain* unpublished London Ph. D. thesis, 1939, pp. 294-352).

57. Census of India, 1951, Uttar Pradesh Report, Allahabad, 1953, p. 120; also see Davis, Kingsley — *The Population of India and Pakistan*, Princeton Uni. Press, 1951, p. 89.

58. For details see the interesting work of Ahmad, Enayat — *Settlements in the United Provinces of Agra and Oudh*, unpublished London, Ph. D. thesis, 1948, p. 71.

59. Census of India, 1951, op. cit., p. 110.

60. Ibid, p. 150; also see Baille, D. C. — Census of India, 1891, N. W. Provinces and Oudh, Vol. XVI, 1894, p. 103 and Turner, A.C. — Census of India, 1931, United Provinces of Agra & Oudh, Vol. XVIII, Pt. II, 1933, pp. 499-548.

61. Dr. Ahmad has recognised over 20 village types in a large area of Uttar Pradesh (op. cit.) It is probably quite interesting to discover that given microscopic attention, most of his village types could be recognised in a small area. The writer agrees more with Dr. Ahmad's views published in his 'Village Survey'. Indian Geogr. Journal, Vol. 28, No. 1 and 2, 1953, p. 1. Other useful studies are:

Demangeon, A: *Agricultural Systems and Schemes of population*, The Geo. Teacher, Vol. 13, 1925-26, pp. 199-205;

Mookerjee, R. K. *Man and His Habitation*, London, 1940, pp. 33-34; also, *Land Problems in India*, London, 1933 pp. 13-18 by the same author;

Fawcett, C. B. *The Distribution of Rural Settlements*, G. J., 1939 (Feb), p. 180, and

Baden Powell, B. H. *The Indian Village Community*, 1896, Chap. VI, pp. 225-287.

forms may occur any where according to the local conditions but the rectangular village is the predominant type and, with its allied patterns is most common in areas of clustered settlements (i. e. *Bangar*). In the zone of dispersed settlements (i. e. *Khadar*) the nucleated villages are also characterised by the rectangular and allied patterns.

Except for the city of Mathura (which too is doubtful), other towns of M. D. appear to be overgrown villages.⁶² M. D. has 14 towns out of which 9 have a religious origin. We do not know the exact nature of the origin of a large number of towns in this category, but their predominantly religious character, their association with various deities and the existence of a number of temples and shrines do not leave much doubt as to their religious nature.⁶³ But the towns with a religious origin have never remained mere centres of worship. Traders and artisans have flocked to these centres because of some scope for commerce and industry offered by the presence of a large number of worshippers and the periodic visits of numerous pilgrims.

A study of the ground-plans of the town in M. D. reveals that (1) mostly their forms are determined by the physical or cultural factors of environment; and (2) the street pattern is irregular. Besides, lack of planning the historical antecedents are probably also responsible for these winding streets.⁶⁴

To sum up, the distribution of population, siting up of rural settlements, or village patterns are to a great extent related to the natural and cultural features of M. D. We have also noticed that the towns of the area originated owing to diverse causes and that their distribution is related not only to the natural and existing cultural aspects but also to the historical antecedents.

4. Social Groups : (i)

The object of this section is to give an outline account of the evolution of the social groups and their common beliefs.

The formation of social groups did not take place suddenly but emerged from two successive processes. In the beginning the racial groups became juxtaposed and when these had settled down, social groups appeared. Upon these social groups so formed, the historical events acted and reacted with the result that at present we have '3000 castes in India'.⁶⁵ Each one of these castes has separate individual characteristics of its own. Thus each one of our social-groups is a separate caste group. Once formed, each caste developed its own code of taboos to preserve its group identity. This tradition, which the chequered events of history tried to shake (and not infrequently in vain) kept the groups alive. Nevertheless, for all our social groups there is an underlying unity (Spate calls it 'overlaying')⁶⁶ manifested in their common agricultural economy and their common primitive beliefs.

62. This kind of origin is perhaps well illustrated by the several villages which have been included in the list of towns at successive censuses. For details see Baillie, D. C. op. cit. p. 93; and also Blunt, E.A.C. Census of India, 1911, Vol XV, U.P. Pt. I, Report, 1912, p. 23.

63. Also see Growse, F. S.—*Mathura. A District Memoire*, Allahabad, 1880, Chap. XII, p. 294.

64. Also see Linton, J. A.—*Town Planning in India*, London, 1939, p. 15.

65. Spate, O.H.K., op. cit., p. 122.

66. Ibid, p. 136.

Early colonisation in M. D. was on a pattern similar to that of the Indo-Gangetic Plains.⁶⁷ Aryans were, perhaps, the first invaders who appear to have found the yellow race-scythian — in Western Punjab. Both these amalgamated and led by *Agni*, the fire God, continued their conquest as far as the banks of the Gandak. It was during the course of this migration that they encountered Dasyus whom they ultimately conquered. Thus, the existing type of man in northern India is probably the result of the combination of at least three strains of blood — Aryan, Scythian, and Dravidian as "Normans into Frenchmen, Alexandrian Greeks into Egyptians, and...half-a-dozen European races are being combined into the Yankee."⁶⁸

The literature on caste is enormous. The subject has been discussed *ad nauseum*, and so far without much definite result.⁶⁹ It seems likely that as the numbers in the racial groups went on increasing, then perhaps was felt a need to create some kind of division of labour to facilitate the smooth working of the then existing social groups. The notions of untouchability, etc. are probably the vices of the Brahmanical upperhand after the decline of Buddhism. The evil of *purdah* crept in during the Muslim period. As the Englishman never cared to mix serologically with the natives — "the principle was strengthened, perpetuated and extended to all ranks of society by the fiction that people who speak a different language, dwell in a different district, worship different gods, eat different food, observe different social customs, follow a different profession, or practise the same profession in a slightly different way, must be so unmistakably aliens by blood that inter marriage with them is a thing not to be thought of".⁷⁰

This holds good even today everywhere in India though "Individuals have...much greater facilities for breaking away, owing to the increased mobility and the increasingly economic values of modern society."⁷¹ Thus, at present "Caste faces what is probably the greatest crisis in history."⁷²

Common Beliefs :

"It is in fact, quite impossible to separate Hindus from Animists and even the converts to Islam retain much of their primitive beliefs under the thin veneer of the Prophet."⁷³ The peasant of M. D. considers that he is environed by a world of spirits which control all the conditions of his life. These spirits as a rule, affect him more for evil than for good, and, as might be expected, those that are malignant in their nature require special propitiation; while those that are benevolent are accepted as normal and receive only slight and infrequent worship. "It is extremely difficult to make even a rough classification of vague, amorphous beliefs like these."⁷⁴ The peasant, however, generally distinguishes between the spirits which animate the natural objects which surround him and the tribe of ghosts and spirits, not embodied in the form of Nature, which control his life. We shall take only the relevant ones, for the purposes of this paper.

67. For details see — Majumdar, R. C., Raychaudhri, H. C. and Dutta, K. K. — *An Advanced History of India*, London, 1949, pp. 9-11.

68. Crooke, W. — *The North Western Provinces of India*, London, 1897, p. 196.

69. Roy, S. C. : *Inadequacy of the Current Theories of Caste*, Man in India, Ranchi, Vol. XIV, No. 2, 1924, p. 1.

70. Risely, quoted by Crooke, op. cit., p. 87.

71. Spate, op. cit., p. 137.

72. Ibid, pp. 139-140.

73. Crooke, W.—*Natives in Northern India*, London, 1907, p. 224.

74. Ibid, p. 225.

The value of solar heat for tropical agriculture needs no special emphasis — hence sun worship. Moon has a cooling and soothing effect in a hot climate — hence the healer of wounds (specially those of the eye) and is believed also to preside over the growth of crops. Anything interfering with the normal solar or lunar cycle is a sign of bad omen, hence the phenomena of eclipse is the work of a demon (or a group of them) attempting to devour the Sun or Moon. The value of a perennial stream for a hot country, where the natural supply of water is irregular and ill-distributed, needs no further stress — hence Mother Jumna. Wells and tanks are also worshipped. Mountains, forests or hillocks are supposed to be by spirits, haunted again, a sign of submission to Nature. Probably, tree worship is related partly to the feeling of awe (banyan — a huge tree), partly to the medicinal properties of certain plants (as *Tulsi*) and partly to the value of shade they provide during the hot weather. With the beginning of settled life came probably the worship of the Mother Earth. Among the Hindus, the dying man is laid on the ground, and so likewise does the mother at the time of her delivery, while the newly wed couples sleep on the ground for the first few weeks of married life, for the Mother Earth "permits no evil spirit to rest upon her wide bosom." Among Meos, who bury their dead, the Earth goddess becomes connected with death and ghost, and is regarded as the patron of disease particularly that of an epidemic. Hence she manifests herself in Mari Mata (or Mother Death) who presides over cholera, and as Shitla Mata (i.e. She that loves the cool) — an allusion to the fever which accompanies smallpox.

With the establishment of the permanent hamlets, a new class of deities appears to which the homage of the peasantry is devoted. These are the *Gramdeota* or *deohar* (the godlings of the village). The character of this form of worship is that it is purely local, each village having its own shrine and its own set of gods. This fact probably has an important effect of tying these communities down to their own villages, where they have the gods they know and whom they can please.

5. Social Groups: (ii) — Communities:

It is proposed here to use the major field information to provide, as far as possible, a geographical interpretation of the different social groups. Although the social structure is complicated and the caste-system has minute sub-divisions, seven principal groups can be recognised. These groups differ in economy and other aspects of culture including their origins and social life.

Two principal geographical themes present themselves for study. First, there is the fact that in M. D. several different social groups are observed living under the similar conditions of physical environment, e.g. in E. M. D. the physical conditions are practically uniform throughout and in that area the three social groups — Jats, Rajputs and Brahmins — live together. (Fig 6). The first theme is, then, to study the extent to which difference in origin and tradition help to explain the difference in modes of life in an area throughout which physical conditions, for practical purposes are uniform.

Secondly, there is the fact that the area occupied by the Jats is divided into two by the Jumna — the area west of the Jumna is markedly drier than the area east of Jumna, and it can be observed that the economy and social life of the Jats of W. M. D. differ in an interesting fashion from that of the Jats of E. M. D. Yet the Jats of the two areas have common origins and traditions. The second interesting geographical theme is, therefore, the study of the extent to which differences in the mode of life between

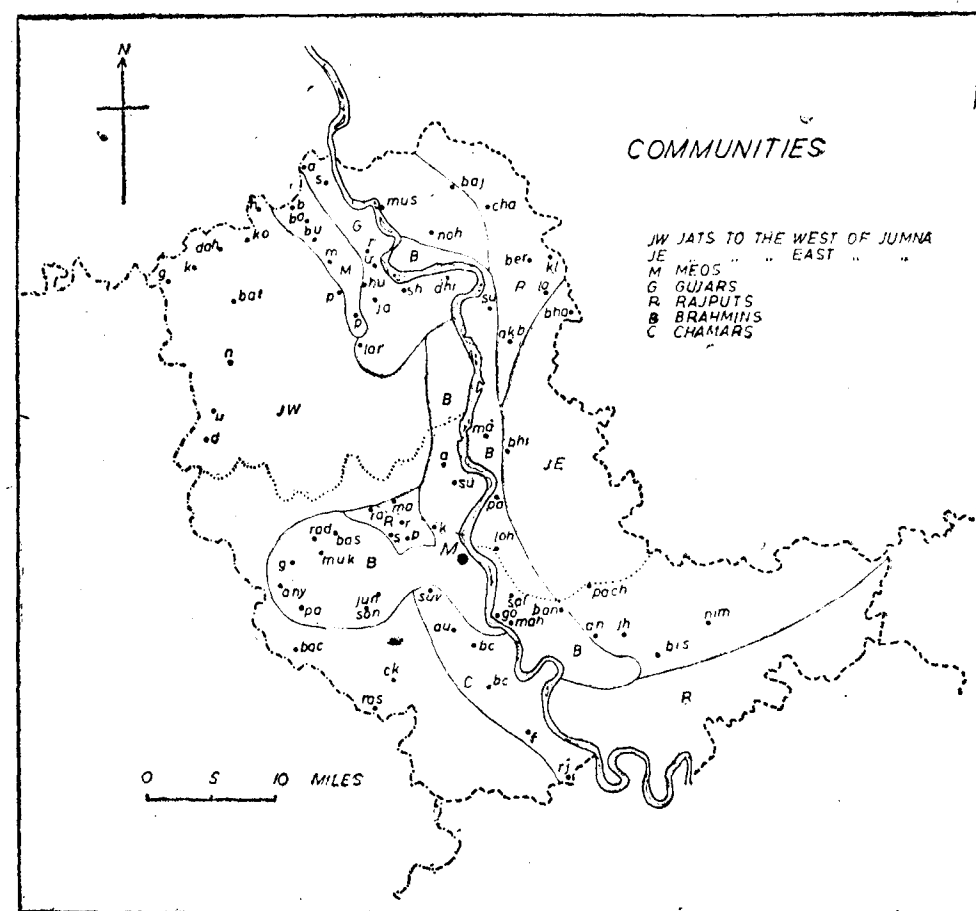


Fig. 6

one part and another of a social group can be explained in terms of differences in the physical background.

With the help of this information⁷⁵ each one of the six principal groups has been studied under the two major heads of 'The Economy' and 'The Social Life'. The matters of their origins have also been touched upon in their relevance to such treatment. Finally, attention has also been paid to the dynamic aspects of the social groups.

75. On completion of the field-work, the writer had 23,400 answers to 117 questions for each of the 200 villages surveyed. The major villages have been shown in Fig. 6. The problem was to rearrange this information in such a form that it could be of use in the description and interpretation of the communities. Some of the information was given in prose, other items were given numerically. The writer, for the purposes of his London thesis, selected 60 major villages and tabulated the data for them. He made a handy table to describe the economic and social life of these groups. For lack of space it is not possible to give the Appendices here, but attempts have been made to see that the precision does not be little the wide range of the writer's first-hand information.

A. *Jats on the western side of the Jumna* :*

This group is selected first because it poses some outstanding socio-geographic problems. The total number of Jats is 152,274 scattered in 382 villages out of which 77 are in W.M.D. and 305 in E.M.D.⁷⁶

It is beyond the competence of the writer to determine the exact origin of any one of the social groups. The available evidence indicated that these Jats were originally a pastoral people.⁷⁷ Also the writer observed for himself that the group still retains many customs which indicate a background origin in which pastoral activities were, probably, predominant; although the same customs are not an evidence that the early Jats did not at the same time practice agriculture. The customs in question are: (1) the quality and number of their cattle are superior to other groups, (2) this group, unlike others in M. D. attaches importance to the growing of fodder crops, (3) the female participation in all types of outdoor work, a common thing among the Jats, is a phenomenon of rare occurrence in other agricultural communities where the women are kept in *purdah*, (4) the degree of illiteracy is greatest among the Jats than in any other upper class agricultural groups of M. D. probably as the children are also employed in looking after the cattle, (5) the ties of joint family, a system helpful for the present day agricultural society as well, but perhaps an essential group necessity for a pastoral people, are thicker among the Jats.

A careful analysis of the facts regarding economy and social life would reveal that these facts are either related to the physical or cultural factors (or both) of the geographical environment. Probably the most striking thing appears to be that the women (*Jatnis*) are not segregated. *Jatnis* freely attend all the fairs, festivals and weekly markets. On such occasions, the exchange of ideas within the group (Jats from other villages) and outside the group (with other communities) takes place. Talks about the additional field or a plough or a bullock purchased, or a room (*Kotla*) added to the house, the grain sown, the good or bad rainfall, the manure or the seed used — ⁷⁸ — all these take place. Talks about the cattle shed (*nohra*) go on till dusk and perhaps a *Jatni* derives the same amount of satisfaction from the purchase of a *hamel* (a silver necklace) or *Orni* (upper garment) or *ghaghri* (skirt) as an English lady after a full day's shopping in Regent Street.

From this brief sketch of the Jat life in W.M.D. it might appear that the group is static in its mode of life. The writer, during the course of his field-work has, however, noted certain changing features in the economy and social life of the group. What is given above is a general description of the community and what follows is the result of the microscopic examination of the community life.

The salient features of the changing economic and social life are — a decline in the individual ownership of land, break up of the joint family system and the progressive deterioration in the numbers and quality of the cattle. Urbanisation is creeping in, decaying the rural crafts on the one hand and the good old human values on the other. The healthier changes are — the children are going to the schools in increasingly large numbers (but boys only), the gradual adoption of monogamy⁷⁹ is slowly limiting (or

trying to limit) the size of the family, a decline in child-marriages is likely to decrease the infant and female mortality. Thus the society of J.W. appears to be in a state of flux.

B. *Jats on the eastern side of the Jumna* :⁸⁰

This group, not unlike J.W., has a pastoral origin; despite this they have an agricultural economy. This change appears to be related to the desire of these Jats for a social position comparable to those of the Rajputs; also, the change was perhaps facilitated by the superior agricultural conditions of the environment of E.M.D.

A careful analysis would reveal that the facts of economy and social life of this group are related to the physical conditions of the geographical environment, or the cultural factors, or a combination of both. For example, lack of cattle, lack of fodder, lack of the consumption of milk, appear to be related to lesser bonds with the pastoral and greater with the settled agricultural mode of life. On the other hand, monogamy, female-segregation, child literacy, lack of faith in ghosts, etc. appear to be associated with the desire to associate with Rajputs — a matter of social prestige.

The changing features are — the sub-division and fragmentation of holdings, intensive cultivation of food and cash crops, lack of fodder crops, diminution of wood and pasture lands (also see Fig. 4) and an increase in crime and litigation (for J.E. are more materialistic than J.W.). In a limited number of cases the rural urban contacts appear to have resulted in little improvements; such as building a *pacca* house, purchase of some better seed and manure, a plough or an ox.

C. *Meos* :⁸¹

There are only 9 Meo villages in M.D. All these villages are in W.M.D. The Meo-zone of M.D. is only a tongue of the larger Meo-congregation (*Mewat*) of Gurgaon district (*Punjab*).⁸²

There is a widespread impression that the Meos are the Jats converted to Islam during the Moghul rule. There does not exist any evidence to support this popular view. However, the writer, on the basis of his field work, could contend that the Meo way of life appears to be a compromise between the Hindu and Muslim ways of life. In support of this argument, Crooke and Nesfield could be quoted; Crooke calls a Meo — “a half Hinduised jungle man.”⁸³ Nesfield puts the Meos under ‘Castes allied to the fishing state’ and shows their affinities with the Rajputs.⁸⁴ Both these authorities on Indian ethnology agree in so far as this group has affinities with the Hindu religion. In M.D. the Meos are not fishermen, they are agriculturists. Nevertheless, in view of the fact that the present Meo-zone of M.D. is not far from the Jumna and also because, in the past, the community was settled chiefly in the *Khadars*; there seems to be little reason to disbelieve Nesfield.

For the purposes of this paper, it would probably be enough to say that the Meos in M.D. are farmers and that there exists a close parallelism

*Henceforth J.W.

76. Source of information : T. H. Qs and D.H.Q., 1956.

77. For details see Nesfield, John C.: *Caste system of North Western Provinces and Oudh*, Allahabad, 1885, p. 11.

78. Not infrequently, also, the additional child produced or “When is it coming?”

79. Rajputs think J.W. inferior to themselves in social status because of polygamy practised by the latter group.

80. Henceforth J. E.

81. Henceforth M.

82. A personal letter from the Deputy Commissioner, Gurgaon (Ref. No. 2048/SK, dt: 21/6/57) says, “In this part of the district, they reside in Ferozepur Jhirka and Nuh tahsils”

83. Crooke, op. cit., p. 88

84. Nesfield, op. cit., p. 9

between the Meo and the JW's modes of lives. The main points of similarity noted by the writer are — (1) Kinship terminology — Father is *baap* as in JW and not *abba* as in Muslims, Mother is *maa* as in JW and not *ammi* as in Muslims, brother is *bhai* as in JW and not *munjan* as among the Muslims; (2) Meo names are half Hindu and half Muslim e.g. Khyali Khan, Lohre Khan.....; (3) Meo ladies (*Meonis*) participate in the outdoor field work like the *Jatnis*, unlike the Muslim ladies; (4) Popular beliefs — JW and M worship the same village gouds and have similar superstitions except that the ultimate God for the latter is *Malik* (not *Allah* as for the Muslims) and for the former Krishna.

The economic and social life of the Meos can be interpreted the same way as in the case of the Jats. The special features of the community life are, ill-kept houses and mis-managed fields, poor condition of men and cattle, a sort of dead silence in the village — people just lazily moving about minding their own business, an outsider being viewed with the utmost suspicion and awe (more so, if he happens to be a non-Meo). This group appears to be static. The kind of life is associated, probably, with suspicion and fear (so natural) since the group is just a freak non-Hindu minority in an area surrounded on all sides by rather sturdy Hindu groups like the Gujars and JW.

D. Gujars: ⁸⁵

The Gujars do not number more than 9,000 people, since after their sack in the Mutiny they lost 14 villages.⁸⁶ There are only 21 Gujar villages in M.D. All these villages are in the *Khadars* of W.M.D. (Fig. 6).

"Gujar is simply a variant of *Gochar* which means 'cattle grazer' — The Gujars are notorious for their predatory habits. In the Moghul times they were largely employed as watchmen, a clear proof of their thievish propensities and in the time of the Sepoy Mutiny they gave us as much trouble as the Meos, plundering friend and enemy indiscriminately."⁸⁷ Crooke calls a Gujar "the cattle breeder"⁸⁸ and Whiteway writes, "they are poor cultivators, turbulent and addicted to cattle lifting."⁸⁹

Suffice it to say, the Gujars have had a pastoral tradition and their habit of cattle lifting is probably an indication of the high premium the community puts on cattle wealth.⁹⁰ These cultural factors — pastoral tradition in the past, premium on cattle wealth in the present times, along with the prestige value of having a social status with Jats explain all the salient features of the Gujar economy and society. The last factor is also bringing a cultural change in this group as is manifested in (i) child literacy and (ii) looking more to the fields than to the *Nohra* (cattle-shed).

E. Rajputs: * ⁹¹

Rajputs number 1,000,075 souls in M.D. and are distributed in both the tracts (Fig 6).⁹² "The term Rajput means literally the 'son of a Raja'

in a sense they claim to be descended from a ruling race."⁹³ During the Moghul period only their nominal title (of Raja) remained (e.g. Raja Mansingh of Akbar's times) without any powers except that they occupied large agricultural estates (*Jagirdaris*); during the British period the Rajputs were among the biggest of the *Zamindars*, a sort of middle men between the cultivators and the government for the purposes of collecting the revenue; while now (when the *Zamindari* has been abolished) they are simply big cultivators possessing large amounts of agricultural land.

In spite of possessing the greatest amount of agricultural land, the crop yields for this group are inferior to those of JW. Crooke explains this (rather pointedly): "If a Rajput holds a farm, it is usually illmanaged because he is too proud to follow the plough himself and depends upon hired labour."⁹⁴ Details of social life reveal that litigation is at its highest in the group. In the absence of healthier forms of amusement, the Rajput often seeks to avoid ennui by carrying on a law suit. "In the land where evidence can be bought or sold, and where advocates of the best sort make a trade of chicanery, this usually supplies abundant excitement."⁹⁵

As for the changing scene, the community presents some dismal trends in the declining ownership of land, an increase in the sub-division and fragmentation of holdings, the progressive deterioration in the crop yields, quality and number of cattle and an increase in the incidence of crime. At a slow but steady rate, the literacy (for girls too) seems to be on the increase — this appears to be the only healthy trend in the group.

F. Brahmins: ⁹⁶

Brahmins are scattered all over the district in about 33 villages on the western and 60 on the eastern side of Jumna.⁹⁷ But the main concentration of this community is more or less, confined to the religious spots of M.D.⁹⁸

This group is supposed to be at the apex of the Indian caste system. "The popular theory ascribes their origin from Brahma, the Supreme Creator.....The ancients who believed in the divine descent of man and in special creation, have explained the caste-system as derived from the person of the Supreme Creator, Brahma. This theory has been described by the Hindu Law-giver Manu, with a wealth of detail which is still accepted by the orthodox section of the population in India. So long as religion keeps its hold on the minds of the people, this theory must appeal to many."⁹⁹ Our enquiry during the course of the field work has shown that religion does "keep its hold on the minds of the people" hence this theory appeals to many.

To be able to appreciate in clear perspective the salient features of the economy and social life of the Brahmins, it is perhaps necessary to know something about the cultural history of the group. During the Hindu period, Brahmins led (perhaps completely) a priestly mode of life; but with the changing times (during the Buddhist, Muslim and the British periods) its members took to agriculture, as more and more land came to the group as

85. Henceforth G.

86. Source of information, D.H.Q. 1956

87. Nesfield, op. cit., p. 11

88. Crooke, op. cit., p. 88

89. Whiteway, R.S., op. cit., p. 38

90. Perhaps associated with this undesirable habit of the Gujars is the popular aversion of the Jats towards the members of this community; nevertheless, the former always have been asserting that they are like Jats.

91. * Henceforth R.

92. Source of information, D.H.Q. 1956

93. Crooke, W. Natives of Northern India, London, 1907, p. 88

94. Crooke, op. cit., p. 82

95. Ibid, p. 92

96. Henceforth B.

97. Source of information, D.H.Q., 1956

98. It is perhaps relevant and necessary to remark that most of the Brahmin farmers supplement their incomes by occasional *pandital* (ciceronship).

99. Majumdar, D. N.,—*Races and Cultures of India*, Lucknow, 1945, p. 120.

gift (*dan*) from the other communities (chiefly the Rajputs). For our purposes, the group-life of the Brahmin is perhaps relevant only in so far as the group has a fundamental dependence upon agriculture as the main source of its livelihood.

As for the changing scene, the increase in population and the consequent partition of land with all the attendant problems, are a feature of this group as well. On the credit side there seems to be only one fact that the education is spreading faster in this group. The boys and girls after finishing their primary education go to the nearby towns for secondary education. These boys and girls discard the old taboos and also do not like to go back to the village either to marry or to live there. The ties with the land are, therefore, progressively with each successive generation, becoming loose, more and more. The blessing of literacy, thus, appears to be not unmixd.

G—Chamars: ¹⁰⁰

They number 18,066 souls in M.D. and are distributed fairly equally all over the district, but forming the most numerous labourer caste (general and agricultural) in the Chata and Sadabad *tahsils* (Fig. 6).¹⁰¹

This group is at the bottom of the social ladder, forming, as it does, a class of untouchables. The word Chamar is a derivative from the Hindi word *Charm-kar* meaning 'a tanner of hides'.¹⁰²

The poorest cultural conditions characterise this group. It would perhaps not be very far from the truth if the Chamars' mode of life be called 'static'. The constitutional abolition of untouchability and the provision of financial aid to the Scheduled Castes have gone hardly skin-deep in improving the lot of this community. In this group, the writer has seen the grimmest (and almost unthinkable) aspects of naked poverty — the semi-clothed and starving children, moving skeletons of men and women, poorly thatched huts almost falling to the ground, crawling animals and the village streets full of foul odour.

Such is the life of a Chamar in M.D., 'the eater of carrion' as he is called and for which he is despised, but for whose *charsa* (the leather bag) the water from the Brahman wells would not reach the fields. These aspects of his economic and social life are perhaps relevant, besides interesting, to a human geographer, provided he is human!

Cultural Integration:—

In our enquiry so far — the face of the land has been explained, the economy has been explained and the social and cultural lives of the peoples of M.D. has been explained. At this juncture, we have brought this study to a point when we could safely say that the fundamental economy of this little piece of land is agricultural and that all the groups, despite the differences in their modes of life, are related to this fundamental agricultural economy — some directly like the peasants and some indirectly like the village artisans. We have also seen that in a village society, stratified as it is by the caste barriers, there is work for every individual of every rank — from the village washerman or potter to the landlord. It is, therefore, seen, generally, that all these different social groups carry on their lives quite smoothly in a single village and that the general rural scene presents a picture

100. Henceforth C.

101. D.G. — p. 107, and also field work — D.H.Q. 1956.

102. Also see Nesfield, op.cit., p. 25.

in which all these differentials are combined into one composite whole. This village unity baffles definition but is always easily recognizable. In spite of all heterogeneity of the rural life, there is an underlying homogeneity manifested characteristically in a general village scene.

CONCLUSION

The object of this section is, firstly, to summarise the problems of each one of the social groups; secondly, to examine the official plans for the development of M.D. in the light of these problems; and thirdly, to suggest a more appropriate development plan for the area.

The writer's field work has brought to light numerous problems. These could be grouped as — (1) Problems affecting all the groups and (2) Problems affecting only some of the social groups.

Further, our study of the cultural integration shows that the integration is merely superficial and that the differences are fundamental. The problems of each community, therefore, appear to be associated with the fundamental differences of the community life.

A close study of the improvements made during the F.F.Y.P. * the targets proposed for the S.F.Y.P. ** and the progress achieved in the first 9 months of the S.F.Y.P. have revealed that these government plans are — (1) unsystematic in their order of judging priorities; there seems to be no integration or coherence between the different items; (2) insufficient in their contents in so far as they take into account only some of the very general problems of the area (and that too in a superficial manner), ignoring almost completely the special problems of the different social groups; and (3) defective in their working as most of the targets proposed have not been attained.

The writer's critical study into the working of these plans has revealed the extent of their inadequacy. Lack of interest, red-tapism of the government; lack of know-how, undue emphasis on outmoded sentiments, lack of civic sense, attitudes of false-dignity and misappropriation of the government funds, these are some of the major causes for the failure of these plans. On paper the S.F.Y.P. looks an attractive one, but perhaps it inclines more towards the creation of a dreamland. "With limited finances and lack of civic sense, the accumulated ills of generations cannot be wiped out in the short space of a few years. Colourful visions and a too rapid translation of thoughts into plans merely confuse the issue."¹⁰³

Some Suggestions:—

The official plans appear to have been made without taking into account the differing needs of the groups, as though it were expected that these groups would lose their identity in the not very distant future as a result of the social changes. But the writer, during the course of his field work has gained the impression that some of the social groups will persist indefinitely and that even the ones most likely to merge with others will be

* First Five Year Plan.

** Second Five Year Plan.

103. Tiwari, A. R. — *Urban Geography of Agra*, unpublished London Ph. D. thesis, 1957, p. 219.

distinct cultural entities for a long time.¹⁰⁴ For these reasons a worthwhile development plan should take account of the needs of these seven communities.

Having criticised the official plans, the writer is under an obligation to suggest a more acceptable alternative. It is maintained that the best way to set about this is to make a separate plan for each social group and then to co-ordinate these 7 plans so as to form one plan for all the social groups of the area.

The main points of the writer's plan are:—(1) Pumping the waters of Jumna in the *Khadars*; (2) cultivation of *Zaid* crops in the fresh alluvium between the arms of the ox-bow lakes; (3) controlling desiccation through— (a) better methods of irrigation which include— (i) use of tanks (artificial and natural), (ii) running the flood-water over the subsoil ground-water, (iii) preventing the loss from seepage by cleaning the channels periodically, (iv) rotating the use of stream i.e., a short irrigation period rather than a divided flow for a long time; (b) dyking; (c) diverting water by the construction of small channels, (d) regulating the use of ground-water— there should be a law to control the boring of wells, (e) forecasting water-supply, (f) controlling the flowing streams and the run off, (g) selling afforestation on a competitive basis, (h) preservation of existing groves; (4) controlling soil erosion through— (i) bench-terraces, (ii) broad based terraces, (iii) large embankments, (iv) small field embankments, (v) strip cropping; (5) gully-control through— (i) mechanised means— raising checkdams of planks, (ii) loose rock cover till a plant cover is established; (6) sheet-erosion through— extensive cover of quick growing (vegetation); (7) avoiding alkalisation through pouring the inside water out; (8) better varieties of cattle by cross-breeding and better fodder; (9) development of rural handicrafts by co-operative societies; (10) converting the III class roads into II class and the latter into I class roads; (11) birth control; (12) low-cost housing schemes; (13) impartial working of the consolidation of holdings; (14) a fair redistribution of the agricultural land; (15) emphasis on mixed farming, double cropping, crop rotation, better seed, better ploughs and other improved methods; (16) strict enforcement of the law of monogamy; (17) no child-marriages; (18) emphasis on adult literacy increase in pay of the primary school teachers, imparting education in civic sense rather than in 3 R's alone; (19) adequate medical facilities; (20) improvement in the means of transport and communication— one post office for a population of 1000 people; (21) encouraging intercaste and inter-communal marriages; (22) change in the economic outlook to a realization that no honest labour is below dignity; and (23) change in social outlook regarding untouchability and other social taboos.

It is maintained that the villagers need not depend for everything upon the Government (as proposed by Bryan)¹⁰⁵ and also that the latter do not interfere every where (as Gandhi suggested).¹⁰⁶ Probably, duly combined proportional efforts of the two are likely to produce the desired results.

"I would end, by pleading for the search for understanding of ourselves and our fellow men."¹⁰⁷

104. For example, there is no indication that the Brahmins and Chamars would ever amalgamate into one group. On the other hand it appears that by inter-marriage and other social and economic changes the JW and JE might well become indistinguishable, say in the next quarter of a century.

105. Fleure, H. J. — *Some problems of Society and Environment*, I.B.G. publications, No. 12, 1947, p. 37.

106. Bryan, F. L. — *Better Villages*, Oxford University Press, 1937.

107. Gandhi, M. K. — *Rebuilding Our Villages*, Ahmedabad 1952.

108. Fleure, H. J. — *Some problems of Society and Environment*, I. B. G. publications, No. 12, 1947, p. 37.

RAINFALL PATTERN AT NANJANAD AND ITS AGRICULTURAL SIGNIFICANCE

By

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INTRODUCTION:

At Nanjanad there is an Agricultural Research Station of the Madras Agricultural Department, functioning for the past forty-two years from 1917. This station is situated on the slope of a valley, lying just over ten miles south-west of Ootacamund. Consequently, it is well exposed to the south-west monsoon.

In view of the agricultural significance of the pattern of rainfall at Nanjanad and also, in consideration of the influence of rainfall pattern on frost formation, which in certain years is rather early in onset and prolonged in duration, with the result that it adversely affects both the irrigated and the second crops of potato, a detailed examination of the pattern of rainfall has been taken up on monthly and seasonal basis.

MATERIAL AND METHODS:

MATERIAL:—The daily data collected on rainfall for a period of thirty-one years from 1927 have been made use of in this study. Data on frost formation were compiled for a period of twenty-six years from 1932. Incidentally, thirty-one years' data on the performance of the different seasonal potato crops were also compiled and made use of in this paper.

METHODS: (A) **RAINFALL PATTERN:** The dates of onset and cessation of the south-west and retreating monsoons were compiled together with the intensity and distribution of rainfall in these two monsoon periods. The duration of activity of each monsoon was also assessed year-wise. The break period between the two monsoons and its range of variation were worked out. Range of variation was also established for the duration, intensity and distribution of rains in these two main monsoonal periods.

In addition, the rainfall data were compiled on monthly and seasonal basis. Standard Deviations and Coefficients of Variation were worked out for the twelve monthly means of rainfall and number of rainy days, and also for the four main seasons, namely, Dry Weather Period (January and February), Hot Weather Period (March to May), South-West monsoon period (June to September) and Retreating monsoon period (October to December). The nature of importance of the rainfall and number of rainy days in the different monthly and seasonal periods with reference to the annual rainfall and number of rainy days was also worked out.

Sixty-six intermonthly and ten interseasonal correlations were worked out for rainfall only.

The onset diagram for the two monsoons was prepared. To bring out the quantity of monthly rainfall and its nature of distribution, a pattern diagram was drawn.

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(B) *Influence of Rainfall on Frost Formation*:—The frost data collected for 26 years from 1932 were subjected to a similar study as the data on rainfall. Incidentally the study of relationship existing between the rainfall pattern and severity or otherwise of frost formation was also attempted.

(C) *Influence of Rainfall Pattern on Potato crop*:—An attempt has been made to assess the influence of the pattern of rainfall on the performance of the different seasonal potato crops, and also on the incidence of major pests and diseases.

DISCUSSION :

A. *Rainfall Pattern*: (i) In Table I, all particulars about the pattern of rainfall are given separately for the South-west and retreating monsoon periods. As already pointed out in the Introduction that the Agricultural Research Station at Nanjanad is exposed to the south-west monsoon, the rains and the number of rainy days in the south-west monsoon period constitute respectively 52.75% and 49.75% of the annual rainfall and number of rainy days. The similar figures for the retreating monsoon period are 24.29% and 23.35%. Further, it is evident from this table that the range of variation of the duration of activity of rainfall and number of rainy days is rather wide for each of these two monsoon periods. But it is to be noted that the range of break period between these monsoons is from 0 to 30, that is in certain years the retreating monsoon, is likely to follow the south-west monsoon immediately.

(ii) The Standard Deviation and Coefficient of Variation for the monthly, seasonal and annual rainfall and number of rainy days are given in Table II. The following tentative inferences from this table are drawn :—

(a) In the south-west monsoon period, the rains will be fairly uniform in the months of July, August and September, as indicated by the low values of Coefficient of Variation within the short range of variation of 33.59 to 46.65.

(b) Likewise, October and November are the rainiest months in the retreating monsoon period with low values of coefficient of variation for the particular season.

(c) Rains in the Dry Weather period of January and February are of rare occurrence as indicated by the high value of coefficient of variation, namely, 112.08.

(d) In the Hot Weather period of March to May, the rains are likely to occur in fair amount in the months of April and May. These rains go by the name of "Summer or Pre-monsoon Showers".

(iii) An examination of the sixty-six intermonthly correlations has indicated that there is not even one significant correlation between any two consecutive months. The interseasonal correlations given in table III indicate that there is no interseasonal relationship in regard to the total rain received during the four different seasons of the year. But the total rains received in each of the Hot Weather period of March to May, South-West monsoon period of June to September and Retreating monsoon period of October to December influence considerably the total annual rainfall. It is also explainable, since the total rains received in these three periods constitute respectively 19.76%, 52.75%, and 24.78% of the total annual rainfall.

TABLE I. DETAILS OF THE MONSOONS AT NANJANAD (26 Years' Data — 1932 to 1957)

S. No.	Details	South West Monsoon Period (June to September)	Retreating Monsoon Period (October to December)	Remarks
1.	Average Rainfall in inches	28.98	18.32	
2.	Percentage on Annual average rainfall	52.75	24.29	
3.	Range of variation of the monsoon rainfall in inches	10.41 to 44.19	5.08 to 23.94	
4.	Average number of rainy days *	49	23	* Rainy day - a day with ten cents and above of rainfall.
5.	Percentage on annual average number of rainy days	49.75	23.85	
6.	Range of variation of rainy days	25 to 78	11 to 38	
7.	Duration of activity of the monsoon in days	108	69	
8.	Range of variation of the duration	74 to 138	47 to 92	
9.	Heaviest rainfall in inches recorded during the monsoon periods with dates	5.15 on 21-6-1953	4.40 on 16-11-1939	
10.	The period of break between the two monsoons in days		11	
11.	Range of variation of the break period		Nil to 30	

TABLE III. INTERSEASONAL CORRELATIONS (Correct to two decimal points)
(31 Years — 1927 to 1957)

S. No.	Seasons	Dry Weather period	Hot Weather period	South West Monsoon period	North East Monsoon period	Annual	Remarks
1.	Dry Weather period	..	-0.16	-0.07	-0.12	-0.01	
2.	Hot Weather period	..	..	+0.10	+0.23	+0.64*	* Significant for P=0.001
3.	South West Monsoon period	..	..	..	-0.06	+0.65£	£ Significant for P=0.001
4.	Retreating Monsoon period	..	..	..	..	+0.46**	** Significant for P=0.01

(iv) The study of the Onset Diagram (Fig. 1) of the two monsoons shows that the onset period of the south-west monsoon is very wide, commencing from 15th May and extending upto 12th July. The probable period of onset of this monsoon seems to be between 31st May and 9th June, since in 18 out of 31 years, the monsoon has set within this period. In the case of the retreating monsoon, the period from 1st October to 14th October

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at on	Number of Days of Frost (1932-1957)					Re- marks
	Ave- rage	Range of variation	Percentage on annual number of frosty days	Standard Deviation	Coefficient of variation	
12	Nil to 25	38.78	6.27	50.64		
8	Nil to 24	20.46	5.86	78.13		
3	Nil to 13	8.30	3.28	107.88		
Nil	Nil to 3	0.41	0.61	406.67		
Nil	Nil	Nil	Nil	Nil		
Nil	Nil	Nil	Nil	Nil		
Nil	Nil	Nil	Nil	Nil		
Nil	Nil	Nil	Nil	Nil		
Nil	Nil to 1	0.11	0.20	500.00		
Nil	Nil to 1	0.11	0.20	500.00		
4	Nil to 11	9.14	3.83	114.33		
10	Nil to 20	27.69	5.39	53.10		
20	5 to 47	54.24	9.58	48.19		
8	Nil to 13	8.71	3.31	108.76		
Nil	Nil to 1	0.11	0.20	500.00		
14	1 to 27	36.94	6.79	50.22		
87	19 to 86	100.00	16.08	43.87		

* A day with 10 cents of rain and above is taken as a rainy day.

C. Influence of rainfall on Potato Crop: The potato yield data for the years 1926 - 27 to 1956 - 57 have been examined with reference to the pattern of rainfall in these periods, wherever possible with reference to the incidence of major pests and diseases. The tentative inference is that in regard to the main potato crop (April to August), heavy rains at the time of

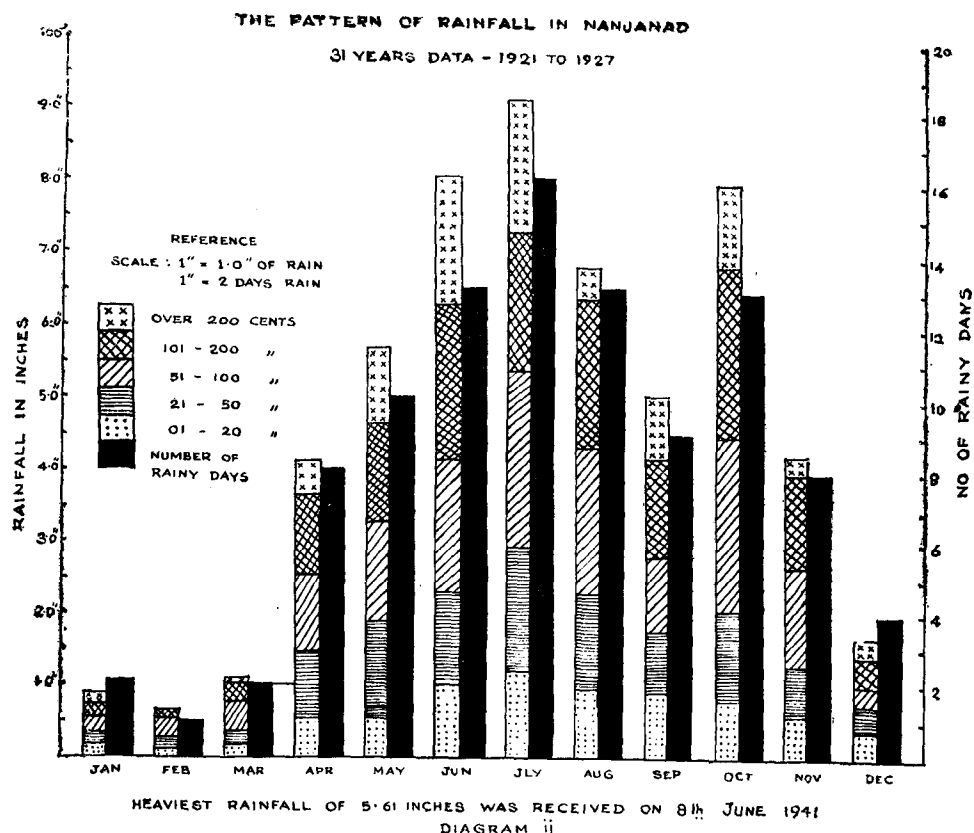


Fig. 2

harvest are likely to reduce the crop yield ($r = -0.3995 \pm 0.1871$). It is very probable that these rains interfere with and inhibit the final stages of starch formation in the tubers. Further, it is clear that the main crop is not benefited by the excessive rains in any stage of its growth.

With reference to the incidence of pests and diseases on potato crop, it is inferred that excessive rains favour the incidence of "Early Blight" disease.

SUMMARY AND CONCLUSION:

(i) South West monsoon is more important than the retreating monsoon for Nanjanad, since the former records more than twice the quantity of rains received in the latter period.

(ii) Rains will be fairly heavy and uniform in the months of June to October. Rains with intensity of over two inches per day are likely to occur in June, July and October. In May also, such heavy falls are probable.

(iii) The probable period of onset of the south-west monsoon seems to be between 31st May and 9th June. In regard to the onset of the retreating monsoon, the first fortnight in October seems to be the probable period.

(iv) If the rains in the retreating monsoon are above normal, the number of frosty days in the months of October to December is likely to be low.

(v) Regarding the influence of pattern of rainfall on potato crop, only the main crop (April to August) seems to be adversely affected by heavy rains at the time of harvest.

(vi) The incidence of "Early Blight" disease seems to be influenced by excessive rains during the life period of the potato crop.

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