

A survey was then started and the project worked out from the details of the survey submitted in 1876, but it failed to obtain sanction at that time. Representations made in 1891 favoured the Rohri Hyderabad canal and led to the appointment of the Sind Irrigation Commission which, however, decided finally on the Jamrao scheme and preparation of a revised plan and estimate was entrusted to Mr. J. Tate. These revised plans and estimates involved an expenditure of 72 lakhs of rupees and work was sanctioned in 1894.

The canal was opened in 1899. Since the opening of the Jamrao canal the largest work carried out was the remodelling of the Nasrat and Dad canals at a cost of 18 lakhs of rupees for the former and 27 lakhs of rupees for the latter, and also the remodelling of the Desert Canal. All these works were finished between 1902 and 1904, and between this time and the sanction of the Lloyd Barrage and Canals Construction Scheme no large mechanical work was carried out, and Sind was still without even one assured perennial canal. Many of the inundation canals worked well as such in years in which the Indus was favourable. But the success of these canals depended entirely on the height to which the river rose and on the period it remained sufficiently high. The demand, therefore, for perennial canals became stronger and stronger and with its sanction the Lloyd Barrage Construction Scheme gave considerable satisfaction to the cultivators in Sind. Until the nineteen twenties Sind lay at the mercy of the Indus, which played 'hide and seek' with it, changing its five hundred mile course at will, unleashing calamitous floods, ravaging the fields every now and then and leaving a trail of misery, pain and squalor behind the rivers' wrath. But with the coming of the Lloyd Barrage the river was made to surrender its power before the largest ever irrigation system of the world covering 1,028 miles of main canals 1,071 miles of canal distributaries and 5,196 miles of watercourses. Old and new watercourses run for over 50,000 miles, enough to circle the globe twice, with nearly 2,000 bridges and regulators and commanding some 7.5 million acres of land, 5.25 million acres cultivable as against 2 million acres in the pre-Barrage period.

Lloyd
Barrage 1932
new era of
irrigation.

The opening of the Lloyd Barrage in 1932 meant a complete revolution in irrigation in Sind. The Lloyd Barrage, however, could not cover the whole of the country. One considerable block in the north and another considerable block in the south were outside, the Barrage command, and this meant that a very large area of cultivation was supplied by inundation canals exactly as before the construction of the Barrage. Appendix IV of the Land Revenue Administration Report for the year 1945/46 shows the respective areas occupied by crops grown on Barrage water, on non-Barrage irrigation and on rainfall. This shows that after the Lloyd Barrage had been working for about twelve years, the area of unalienated

land cultivated on Barrage, water was 2,868,562 acres. The area cultivated on non-Barrage water was 1,629,891 and the area cultivated on rainfall was 825,428. Out of the total area of 55.55 lakhs of cultivation, roughly 28.7 lakhs were grown on Barrage water, 16.3 lakhs on non-Barrage water and 8.25 lakhs of acres on rainfall, that is to say, in 1944/45 the Barrage was supplying about 52 per cent of the cultivated area as against 28.6 per cent. Cultivated on inundation canals and 14 per cent. on rainfall. As regards the alienated land, the Barrage cultivation amounted to 117,019 acres, the non-Barrage area to 117,905. The cultivation on rainfall, 11,047 acres, was negligible. Thus in alienated lands cultivation was shared out equally between Barrage water and inundation canal water. These figures are exclusive of Khairpur, for which statistics for the year are not available. The chief Engineer in Sind for irrigation in this evidence before the Sind Agricultural Commission on the 10th and 11th November, 1953 stated that the total discharge of all the Sukkur Barrage canals, including those in the Khairpur State, was 46,583 cusecs in Kharif and 25,648 cusecs in Rabi and the area commanded was 6.75 million acres. The break-up of these figures canal wise was:

Canal.	Culturable areas In Lakhs of acres.	Discharge.	
		Kharif.	Rabi
North Western Canal	.. 9.33	5,042	3,639
Rice Canal	.. 4.81	10,215	..
Dadu Canal	.. 4.99	2,837	2,525
Khairpur Feeder West	.. 3.89	4,000	2,625
Rohri Canal	.. 25.35	10,887	9,900
Khairpur Feeder East	.. 3.36	4,000	2,625
Nara Canal	.. 18.33	13,602	6,959

The 1907 edition of the Gazetteer gives a fairly full account of the working of the inundation canals up to the year 1905. Since the position has been radically altered by the construction of the Lloyd Barrage, followed by that of the Kotri Barrage, to be further added to by the Gudu Barrage now under construction the information contained, with two exceptions in the 1907 edition Gazetteer

for the working of the inundation canals is now out-of-date and possesses merely some historical interest. Brief mention, however, should be made of the two large areas not covered by the Lloyd Barrage water.

Gudu
Barrage
command.

The first is the northern area to be incorporated in the Gudu Barrage command. The canals still operating in this area are on the right bank the Desert Canal, the Unhar wah with its branches, and the Begari Canal, and on the left bank the Sheher, the Mahare the Masu, the Mahro, the Lundhi, the Dengro, the Mahestro and the Korai, Janib and Garkano. All these canals will be affected when the Gudu Barrage comes into operation. The Gudu Barrage project provides for the construction of the following works, (a) a barrage across the river Indus at Gudu. (b) two feeders on the right bank, one of these will be called the Desert, Unhar feeder, to feed the Desert and Unhar Canal systems, and the other the Begari-Sind feeder, to feed the Begari Sind- Rajib and Chitti Canal systems (c) a feeder called Ghokti feeder on the left to feed all the canals on the left bank. The Desert-Unhar feeder is 50.66 miles long, the full supply discharge will be 12,945 cusecs. The existing canals out of the Desert-Unhar feeder have mostly been utilised and remodelled to suit their revised discharges. The commands have been adjusted wherever necessary, and the existing channels extended and new channels proposed so as to keep the length of watercourses within two to three miles. The Adiowah, Adio distributary and Soanwah have lift or hard flow areas under command. These channels are designed as dry kharif channels. Similarly Chandur, Thalho and Malhi distributaries are designed as dry kharif channels. The rest of the channels are designed as rice channels. The total length of the old canals to be remodelled is 473 miles and the length of the new channels to be constructed is, feeder 42 miles and other channels 105 miles. The Begari-Sind feeder will have total length of 83.9 miles all of which are new. The full supply discharge of the feeder at its head will be 15,494 cusecs. The feeder is in heavy cutting in its first 28 miles, in which no danger of breaches is expected. The existing canals from the feeder have mostly been utilised and remodelled to suit the revised discharges. A river bund has been proposed to enclose the high kacha area in front of the Kashmor bund from miles 20 to 42. Other high kacha areas in front of the Kashmor bund from mile 0 to 20 are already protected by frontal bunds, 74 miles of new channels are proposed for irrigation in this kacho area. The total length of the old canals to be remodelled is 391 miles, and the length of new channels to be constructed is feeder 89 miles, and other channels 232 miles. The Ghotki feeder is 83.6 miles long inclusive of the length of the L.M. feeder excavated in 1940/47. The full supply discharge of the feeder at its head is 8,490 cusecs. On the left bank there are large patches of undeveloped areas, the tails of existing canals, hence a good many new channels have been proposed

The total length of the old channels to be remodelled is 380 miles and the length of the new channels to be constructed is feeder 54 miles, and other channels 296 miles. The length of the new channels includes the intermediate links proposed to remove bad bends, and tortuous courses of channels and the extensions of old channels. The total gross area, including forests, in the command of the Gudu Barrage is 2,663,184 acres (4,161 square miles) out of which 198,767 (311 square miles) fall within the jurisdiction of Baluchistan. The cultivatable area commanded, excluding forests, works out at 2,144,590 acres out of which 1,93,459 acres pertain to Baluchistan. The forests commanded measure 1,150,320 acres lying wholly within the borders of Sind.

The second great area excluded from the command of the Lloyd Barrage is that in the south of Sind, a large triangular portion with the apex of the triangle at Kotri and the base extending along the lower fringes of the Indus delta and the Rann of Cutch. This area includes the greater part of the Fuleli Canal system and all the canals in the old Karachi or as it is now called Thatta Canals District. The canals in addition to the Fuleli itself are the Iman wah Janubi, the Nasir wah, the Imam wah Jagir, the Guni wah, the Hassanali wah within the limits of the Hyderabad district. Within the limits of the Thatta district the Mulchand wah, the Pinyari wah, the Gangro wah, the Sattar wah, Gharwah, the Baghar canal and the Kalri canal. All these canals are affected by the construction of the Ghulam Muhammad Barrage at Kotri. These canals will all be or have been remodelled, in the manner proposed for the Gudu Barrage described above. A brochure published by the Sind Government on the completion of the Ghulam Muhammad Barrage in 1955 says: "If the Lloyd Barrage of Sukkur in Upper Sind is a dream of the past realised in the present, the Ghulam Muhammad Barrage in Lower Sind is a hope of today, a hope immortalised in stone and concrete. The opening ceremony on the 15th March 1955 marked the concluding stage in the construction of a gigantic project of which the preliminary work was started in 1946 when the excavation of the Kalri-Baghar feeder was taken in hand. Work on the Barrage proper started in October 1949. On the 12th February 1950 Khawaja Nazim-Uddin, the Governor-General of Pakistan, performed the foundation ceremony characterising the project as a colossal undertaking of great national importance. The Barrage as originally designed in the year 1946 project was estimated to cost 701 lakhs, of this 680 were for works, 74 lakhs for establishment and 14 lakhs for tools and plant, while it was anticipated that a credit of 74 lakhs would be obtained from the sale of surplus plant after completion of the Barrage. In 1950, prior to the actual construction the Barrage was redesigned and the estimate revised. The cost was 510 lakhs on works, 74 lakhs on establishment and 8 lakhs on ordinary tools and plant, with a write-back of 48 lakhs on sale of heavy plant machinery. This, with

Kotri
(Ghulam
Muhammad)
Barrage
command.

minor other charges gave a total cost of 549 lakhs. The Barrage promises to control the Indus floods in the lower reaches of the Indus and command a total cultivable area of about 28 lakhs of acres in Hyderabad, Thatta and Dadu district, of which 17 lakhs of acres will comprise entirely virgin land and a considerable portion of it will come under peasant, proprietorship. Forests will cover 73,000 acres. Privately owned lands will extend over 1,17,4,000 acres and the government lands will comprise 1,57,4,000 acres. It is anticipated that the present crop out-turn, 179, 000 tons will rise to 7,50,000 tons once the project is fully developed. The canals which will be fed from the Barrage are themselves very large works. On the right bank the perennial Kalri canal of 9,100 cusecs will be constructed through difficult country. The alignment as revised after making an 8 miles traverse of the hills will enter a series of depressions which will be flooded to form a lake about 20 miles long and 45 square miles in extent. This lake will afford facilities for the production of hydro-electric power and be a valuable reserve for the water-supply of Karachi. Such lakes add greatly to the scenic amenities of a country and afford many facilities for recreation and fishery development.

The Kalri Canal will provide a water supply of 460 cusecs or approximately 230 million gallons a day for the growing needs of Karachi, the Capital City. Without the storage on Kalri Lake, it would be impossible to give this supply at certain times of the year without grave harm to irrigation.

On the left bank the Barrage will feed the existing Fuleli Canal which will be straightened and modernised. Its capacity will be increased from 11,000 cusecs as at present to about 13,800 cusecs. From Fuleli a new Guni Branch is being constructed to give non-perennial irrigation to a large block of new land outside the existing command.

Alongside the Fuleli Canal a new non-perennial canal known as the Pinyari Feeder of 14,350 cusecs is being constructed. This channel will take up and extend the existing inundation canals upto and including the present Pinyari Inundation Canal.

A third canal takes off on the left bank for the perennial irrigation of two blocks of land at present receiving non-perennial supplies from Fuleli. As this canal of 4100 cusecs capacity will flow perennially it is being lined with cement concrete to limit or obviate the dangers of waterlogging. The construction of a line channel 70 miles long and with a bed width of 44 feet and a depth of 15½ feet is a major operation and an innovation in Sind.

With the completion of the Barrage, it will be possible to give assured supplies to the left bank canals. It is hoped to give the Fuleli Feeder as much water as it needs, and to give 3/4 discharge

to the Pinyari Feeder, which will be adequate for the existing areas. The Guni will be given about 2000 cusecs which will suffice for existing areas thereon and provide some scope for extension. The Lined Channel will flow down to mile 22 to take up the irrigation of the upper block of perennial land on this bank.

Thereafter the Pinyari and Guni will be widened, new distributaries constructed and old channels remodelled to suit the speed of colonisation and the genuine as distinct from the speculative requirements of the land.

Unfortunately on the right bank the construction of the canal has been delayed partly from the difficulties of excavating a channel 40 to 50 feet deep through the 8 miles hilly reach and partly from lack of the necessary machinery which was received very late. It was hoped that this channel would flow during 1956.

Although in this part of Pakistan, the production of hydro electric power is not possible on the scale of Alpine or Himalyan countries the Project, as briefly indicated before, does afford the facility for an installation of 1000 KW to be developed from a fall of 20 feet at the lower end of the Kalri Lake. There are further possibilities for power development on a seasonal summer basis from a 10 foot fall on Pinyari Feeder. Also it may be possible to utilise a 40 feet fall on the escape channel of Kalri Lake during winter to increase power supplies. With the full functioning of these three Barrages in the Sind valley, the dream of Lieutenant J.G. Fife, R.E., in 1855 will at last be realised and two-thirds of the whole cultivable area of Sind will be provided with water capable of raising crop both in the kharif and the rabi seasons, irrespective of the amount of rainfall or the increased draw-off of water from the canals in the Punjab.

Before the further account of the inundation canals is completed readers may like to know what they achieved during their days of predominance. It is not possible to trace from the old records the cultivation and canals earlier than in 1873-74, but the revenue from them is traceable. This shows that for the ten year period ending 1863-64 the average annual area for which revenue was collected was about 14 lakhs of acres, and that for the ten year period ending 1873-74 the figure was about 15 lakhs of acres.

Cultivation on Inundation Canals from 1873-74 till opening of Lloyd Barrage.

These figures are very approximate. Statistics from 1873-74 up to 1931-32 show the gradual and continuous increase of cultivation on the inundation canals. The attached table shows for every year

the canal cultivation in Kharif and Rabi and Jagirs. Students of meteorology may be interested to notice that at ten-and eleven-year intervals there occurred years of bumper production. These, bumper years are seen to be 1878-79, 1889-90, 1900-1901, 1910-11 1919-20, and 1929-30. If these actually correspond with the maximum periods of sun-spot activity, some valuable evidence will be forthcoming there as showing the connection between sun-spot activity and years of good and abundant rainfall. The table as a whole shows that the amount of cultivation on canals rose from 14.19 lakhs of acres in 1873-74 to 30.6 lakhs of acres in 1931-32. The progress is continuous and steady with very few realset-backs. It is probable that the drop from 31.6 lakhs of acres in 1917-18 to 24.17 lakhs of acres in 1918-19 was a result of the influenza epidemic in the last months of 1918, which greatly reduced the amount of land under cultivation and caused the deaths of very large numbers of cultivators.

CANAL CULTIVATION (in lakhs of acres).						
Year.						
	Kharif.	Rabi.	Total.	Jagir.	Total.	
1873-74	.. 11.96	2.23	14.19	} Included in Kharif and Rabi figures.		14.19
1874-75	.. 12.24	3.73	15.97			15.97
1875-76	.. 11.39	2.51	13.90	1.91		15.81
1876-77	.. 12.91	4.19	17.10	1.36		18.46
1877-78	.. 10.94	2.02	12.96	1.23		14.19
1878-79	.. 13.33	5.52	18.85	1.31		20.16
1879-80	.. 11.15	2.28	13.43	1.11		14.54
1880-81	.. 11.73	1.56	13.29	1.64		14.93
1881-82	.. 12.60	1.59	14.19	1.83		16.02
1882-83	.. 12.82	2.26	15.08	1.65		16.73
1883-84	.. 11.97	1.65	13.62	1.79		15.41

CANAL CULTIVATION (in lakhs of acres).

Year.		Kharif.	Rabi.	Total.	Jagir.	Total.
1884-85	..	13.54	2.32	15.86	1.97	17.83
1885-86	..	12.89	2.44	15.33	2.07	17.40
1886-87	..	14.08	1.86	15.94	2.21	18.15
1887-88	..	14.38	2.15	16.53	2.18	18.71
1888-89	..	16.49	2.39	18.88	2.31	21.19
1889-90	..	17.22	3.88	21.10	2.40	23.50
1890-91	..	15.97	3.85	19.55	2.48	22.03
1891-92	..	15.14	4.36	19.50	2.16	21.66
1892-93	..	16.33	5.35	21.68	2.31	23.86
1893-94	..	16.68	4.72	21.40	2.46	23.86
1894-95	..	16.21	7.72	23.93	2.43	26.36
1895-96	..	15.22	3.19	18.41	2.56	20.97
1896-97	..	18.79	3.65	22.44	2.53	24.97
1897-98	..	19.95	5.30	25.25	2.81	28.06
1898-99	..	18.03	3.73	21.76	2.80	24.56
1899-1900	..	19.45	3.42	22.87	2.82	25.69
1900-01	..	21.68	5.45	27.13	3.31	30.44
1901-02	..	19.83	5.26	25.09	2.99	28.08
1902-03	..	19.39	3.85	23.24	3.02	26.26
1903-04	..	21.98	6.11	28.09	3.43	31.52
1904-05	..	20.90	5.24	26.14	3.10	29.24

CANAL CULTIVATION (in lakhs of acres).

Year.	Kharif	Rabi.	Total	Kharif.	Total.
1905-06	.. 23.80	6.31	30.11	3.37	33.84
1906-07	.. 23.77	7.85	31.62	3.24	34.86
1907-08	.. 20.82	4.34	25.16	2.56	27.72
1908-09	.. 23.61	6.68	30.29	3.16	33.45
1909-10	.. 21.61	4.83	26.44	2.83	29.27
1910-11	.. 22.87	5.45	28.32	2.90	31.22
1911-12	.. 21.02	3.93	25.00	2.33	27.33
1912-13	.. 23.34	4.40	27.74	2.65	30.39
1913-14	.. 23.58	5.12	28.70	2.77	31.47
1914-15	.. 23.02	7.32	30.34	3.15	33.49
1915-16	.. 21.31	6.20	27.51	2.81	30.32
1916-17	.. 21.19	5.86	27.05	3.13	34.28
1917-18	.. 21.68	7.16	29.04	2.56	31.60
1918-19	.. 18.85	3.34	22.19	1.98	24.17
1919-20	.. 23.08	5.88	28.96	2.59	31.55
1920-21	.. 22.21	3.05	25.26	2.37	27.63
1921-22	.. 20.96	5.87	26.83	2.56	29.39
1922-23	.. 22.75	6.56	29.31	2.94	32.25
1923-24	.. 22.53	5.19	27.72	2.88	30.60
1924-25	.. 23.85	6.35	30.20	2.92	33.12

CANAL CULTIVATION (in lakhs of acres).

Year.		Kharif.	Rabi.	Total.	Jagir.	Total.
1925-26	..	23.16	5.99	27.15	2.83	29.98
1926-27	..	23.02	5.87	28.89	2.68	31.57
1927-28	..	23.16	4.62	27.78	2.55	29.73
1928-29	..	23.95	5.07	29.02	2.69	31.71
1929-30	..	25.60	5.29	30.89	2.73	33.62
1930-31	..	23.67	6.18	29.85	2.62	32.47
1931-32	..	22.06	5.96	28.02	2.58	30.60

All government canals are in charge of canal officers appointed under Section IV of Act. VII of 1879. These are, for administrative purposes, the superintending and executive engineers and their subordinates. They are charged, not only with the construction, maintenance and repair of the canals, but with the issue of water from them and such supervision over the use of it as is necessary to prevent waste, provide for drainage and secure the best results from the supply available. The Collector, or Deputy Collector, of the district and his Assistant and Deputy Collectors in charge of sub-divisions are also canal officers for various purposes under the Act. As the authority to grant land on any canal is vested in the Land Revenue Department, the officers of the two departments are required to co-operate under orders issued by the Commission in Sind from time to time. If the supply in a Government canal is deficient, it is placed under restriction as to land grants. Otherwise the Collector ordinarily grants land already settled on any canal if it is to be watered from a supply which the applicant already enjoys. But if a new, or materially increased supply of water is required, he consults the engineers in charge of the canal. Such was the general position in respect of the grant of land and the provision of water for it during the days when only inundation canals existed. But on the Jamrao and some other recently constructed canals delivery of water is strictly controlled by rules designed to secure impartial distribution, economy, proper drainage and the maximum aggregate result from the supply. But on many of the old canals such ideals were unattainable and no attempt was made

Canal Administration.

to attain them. Applications from landholders for permission to construct watercourses to their fields are made to the Executive and Assistant Engineers and granted by them. The applicant constructs the watercourse at his own expense and thereafter becomes responsible for keeping it in proper repair. Only the sluice opening into it is constructed by the Public Works Department. No price is recovered for the water separately, that being an integral part of the assessment on the field. Water is let on to the fields by flow (mok), if it stands at a sufficient level ; otherwise by lift (charkhi) which means that it is raised by "nar", or "charkho", a wheel turned by two bullocks, or a camel, or a hurlo, a wheel turned by one bullock. One method not infrequently has to give place to the other as the river rises or falls. The old canals are designed to flow during the inundation only and supply kharif cultivation, the water arriving at the fields about the beginning of June and ceasing to flow in September or some time later. But by flooding the fields just before the water subsides rabi crops can be grown to some extent on such canals. This is known as bosi cultivation. In many low-lying parts similar rabi cultivation is carried on in lands which are annually submerged by floods, and this, which is called sailabi, has nothing to do with the irrigational system. The recent scientifically designed canals afford a perennial supply and irrigate both kharif and rabi crops. There is little irrigation by wells in Sind, except in regions like the Labdaria Taluka in the Larkana district, and a belt of land not far from the river banks where water is found very near the surface, and on the margins of dhandhs. This does not differ materially from irrigation by lift on canals. Vegetables, gardens and orchards, however, are very commonly watered from wells. The coming of the Lloyd Barrage necessitated considerable change and adaptation in the administration dealing with the distribution of water for the giving out of land for cultivation. The important changes which were brought about by the size of the Barrage project, and the fact that its operation extended over several districts at the same time, led to the creation of a special organisation under an officer called the Revenue Officer, Barrage, to deal with the problems which before had been dealt with individually by Collectors and Deputy Commissioners of districts in consultation with the local Executive Engineers. Some details of the new arrangement will be given in the account of the Lloyd Barrage project which follows. The creation of the Lloyd Barrage and its canals was so epoch-making an event in the history of Sind that suitable notice must be taken in this Gazetteer, which is the first to be published since the construction of the Barrage system.

**Lloyd
Barrage.**
**Description
and details.**

The complete account of this great public work appears in the Report of the Lloyd Barrage and Canals Construction Scheme, Sind, 1934. This report is an immense work consisting of six volumes, the full perusal of which is the business of specialists.

The six volumes of the report are: (1) General History, a description of the scheme, administration and construction with a supplementary volume of provincial forecasts and schedules ; (2) The Lloyd Barrage and Head Regulators of the Canals ; (3) The Design and Construction of the Canals in general ; (4) The Right Bank Canals the Manchhar Drainage Scheme and the Flood Protection Bund Scheme ; (5) The Rohri Canal and Khairpur Feeders ; (6) The Eastern Nara System.

In the short description, which is all that space at the disposal of this Gazetteer will allow, an attempt will be made to deal briefly with the origin of the scheme, the construction of the Barrage and its canals, the results of its working and the irrigational problems which were faced during the period of construction and subsequently during the operation of the Barrage during its first few years.

The gestation of the Lloyd Barrage was long and painful with more than one incident of miscarriage. There is a long and rather pathetic story relating to the work. In this story one can find an amazing mixture of wisdom and foresight and utter ineptitude. When in 1869 Captain Le Mesurier had proposed and, estimated for a canal costing 2 crores of rupees, he said, "I believe myself that a canal on the scale proposed will do an incalculable amount of good to the country and will turn out in the end a very profitable undertaking, and as such I send it up with a strong recommendation for the favourable consideration of Government." The Commissioner in Sind was Sir William Merryweather and his views on irrigation when forwarding the proposal were extraordinary, to say the least. He remarked "I consider mok (flow) cultivation the least advantageous of all, but it is true it is cheap, carried out with a minimum amount of labour, but it is most uncertain ; there is either too much or too little water. It is, therefore little better than gambling, and instead of improving the condition of the people it really does much mischief. It fosters their natural improvidence and almost invariably involves them deeper and deeper in the hands of the bania, money-lender. The charkhi (lift) system, when the water has to be raised, is infinitely preferable as being much more certain. With a fair supply of water in the main feeder, so as to keep water in the zamindar's karios and enough to work the wheel-pots in till the end of September, there will always be excellent crops with no uncertainty."

In 1872, when the Bombay Government had called in the Superintending Engineer in Sind for alternative plans for the head works at Rohri, these were not prepared as the project for the Rohri canal was abandoned by the order of the Viceroy, Lord Northbrook, who, from the information laid before him during his recent visit to Sind, decided that it was not at all a promising scheme. In 1877 the then Secretary of State for India, Lord Salisbury, called for an investigation into the general system of irrigation

in Sind and drew the attention of the Government of Bombay to the unsatisfactory state of Sind irrigation, which he requested might be considered in consultation with the Government of India. Nothing, however, was done towards carrying out any extensive works. After eight years the Rohri Hyderabad project was again brought forward by Lord Reay, the Governor of Bombay, who doubted the wisdom of the whole policy of inundation canals, and proposed an enquiry to show the feasibility of the great project, by a Rohri-Hyderabad canal or some other scheme affording a permanent supply at a high level to the cultivable areas now irrigated by lift from canals at a great depth below the country, "the supply in which is at all times precarious by reasons of the fluctuations of the inundation and the instability of the river bank in which their heads are located."

In 1891 Mr. Joyner pointed out in forcible language the lamentable state of the Sind canals and again urged, as General Fife had done, that the great area, 4,000 square miles, of cultivable land between Rohri and Hyderabad should be irrigated by a perennial canal. Subsequent proceedings seem incredible today. An influential committee, presided over by Sir Charles Pritchard, C.S.I., K.C.I.E., Member of Council, was appointed in November, 1891 to consider the Rohri project and other questions connected with irrigation in Sind. After examining a large number of witnesses this committee came to the conclusion that the project for a perennial supply of water from a canal taking off the Indus at Rohri would be financially unsound and virtually impracticable. Accordingly they unanimously recommended that it should be finally abandoned. The Government of Bombay, however, was not quite so short-sighted. While agreeing with the committee that Mr. Joyner's scheme was financially unsound, they pointed out that they were not prepared to advise such a total abandonment of the perennial principle as the committee were prepared to recommend, nor to commit themselves to the opinion that the project of a paying scheme for a perennial canal with a permanent head at Rohri was hopelessly impracticable. The final result was that the Rohri-Hyderabad canal project was laid aside for another period of thirty years, and considerable expenditure was incurred in improving old canals. In 1893 General Fife again urged the crying need for the Rohri-Hyderabad canal and pointed out the necessity for the appointment of a Chief Engineer, especially for irrigation, to advise Government on all questions connected with the department, to inspect and to consult with Superintending Engineers. But in March 1894 Mr. Thompson, the Superintending Engineer in Sind, commenting on General Fife's report, stated that the financial impracticability of the Rohri-Hyderabad canal had been fully demonstrated in the Sind Irrigation Committee's Report and gave some further reasons why he considered it impracticable on engineering grounds. Thus in 1894 the prospect of the construction of the Rohri-Hyderabad canal seemed further off than ever.

In 1903 there was published a report of the Indian Irrigation Commission which gave some encouragement to those with far-sighted views. For the Commission referred to the Sind triple project, that is to say, the scheme for a Barrage, the right and left bank canals, and stated that a vast scheme of this kind appeared to be feasible ; but there were many practical considerations which would perhaps render it desirable to reduce its scope. In 1904 Dr. Summers, the Superintending Engineer in Sind, asked Government for permission to make a survey for a canal from Rohri across Khairpur territory. The Doctor, pointing out its immense advantages, said "The continuous increase of irrigation in the Punjab will eventually force a weir upon us, but the canal now suggested would answer for many years to come, and when the weir becomes necessary it could be made to combine with this canal and one on the right bank." Dr. Summers' proposal, which isolated the Rohri canal from the construction of a Barrage, proved to be one of the most fertile sources of delay to a full consideration of the scheme during the next twenty years. But Dr. Summers was the first to call attention to the serious effect likely to be felt in Sind from the enormous development of irrigation canals in the Punjab. This point was taken up by the Government of India, which suggested to the Government of Bombay that the increasing cold-weather withdrawals in the Punjab would very likely diminish the supplies entering the inundation canals in Sind and they pointed out the unsatisfactory condition of Sind as regards the low percentage of irrigation to cultivable areas and the high proportion of lift to flow.

In 1910 Dr. Summers submitted the Rohri canal project (1909). In this report Dr. Summers showed the complete triple project, including the cost of the Barrage which he took to be 324 lakhs. He considered the triple project was not remunerative, but he was convinced that it could be made remunerative by constructing the Rohri canal first. For years arguments ranged, what should be done? Should the Rohri canal be constructed and the Barrage left, or should the Barrage be an integral part of a comprehensive project for perennial water? The Government of Bombay in December 1910 recommended the construction of the Barrage only, the cost of which they estimated at 215 lakhs of rupees and the Rohri canal at 438 lakhs of rupees. The right bank canals and the Eastern Nara were not then proposed for consideration. As these proposals were complicated, the Secretary of State for India appointed a committee in London in 1912 to report on the project for a Barrage and the Rohri canal. They issued their report in 1913 and their recommendations were surprising and their arguments so bizarre as to be an occasion for incredible wonder. They said that the project was not necessary as a protective measure. There was no evidence of Sind having suffered in the past owing to withdrawals in the Punjab and that it would not suffer in the

future. In the inundation season the withdrawals certainly had no prejudicial effect on Sind. In the cold season the supply in the river may have been affected, but the Sind canals had never had a cold weather supply, and had therefore not been adversely affected. The future effect could be minimised by considering Sind an inundation canal country. They further stated that to construct the Rohri canal without a Barrage would mean that this canal would be a source of supply to an enormous area at present irrigated by a number of small canals. The latter would never fail simultaneously and the failure of one would be unimportant, but the failure of the Rohri canal would mean disaster to the whole area. The committee considered also that the project was not Productive. Though the scheme was unproductive and premature, the committee none the less recommended that a complete scheme should be prepared and kept in readiness. "Sind", they said, "had not suffered in the past, but it might be a fact in the future and in that case remedial measures, though unproductive, might be justified. One useful suggestion was that the effect of the Punjab withdrawals should be carefully watched and an alternative site for the Barrage below the gorge and founded on sand should be investigated. In 1914 the Government of Bombay took a very realistic view of the situation. The Government of Bombay was not in agreement with the committee's report and, in addressing the Government of India, said that with unfavourable conditions of the river the Punjab withdrawals might have an appreciable effect on lowering the level at Sukkur during the critical months of June and September and, although it was not possible to say exactly what the effect would be, there were many good reasons for saying that Sind ought to be protected by the construction of a Barrage. The present conditions of cultivation and irrigation were not suitable, and Sind was calling loudly for improvements and benefits which the Punjab and the United Provinces had long been able to enjoy. To regard Sind as inundation country pure and simple would be adopting a policy of stagnation. The Government of Bombay further stated that they would put forward a scheme which would differ from the former in these two points : (1) that the right bank canals should be included and (2) the Barrage would, as suggested by the London Committee, be located below the gorge instead of above it. The Government of Bombay estimated the rough cost of the Barrage on the right and left bank canals at 1,120 lakhs and that the ultimate revenue was likely nearly to cover the accumulated interest by the tenth year after completion. On these grounds they requested the approval of the Government of India for the preparation of detailed plans and estimates. Victory was then in sight.

In October, 1915 Mr. A.A. Musto (now Sir Arnold Musto Kt., C.I.E.), Executive Engineer, was put on special duty under the Chief Engineer in Sind to take up the revision of the Sukkur project, as it was then called, and on the 1st September, 1916 he

opened the newly sanctioned temporary Sukkur Barrage Project district. In 1917 it was decided to place an officer in each of the Revenue and Public Works Department on special duty to investigate the area and quality of Government land available in the Barrage area, and also to propose intensities and duties for the proposed new canals. Mr. C.M. Baker, I.C.S., and Mr. C.M. Lane, of the Public Works Department, were accordingly placed on this special duty from January, 1918. On the suggestion of the Inspector General of Irrigation it was decided that, in addition to redesigning the Barrage, the redesign of all the canal systems, namely, the Rohri canal, the Eastern Nara system, the right bank canal system and the Khairpur canals, should be placed in the charge of Mr. Musto, Executive Engineer, who was recalled from military duties in January, 1918 for the purpose of taking charge of the district. The plans and estimates for the Barrage were completed by the Executive Engineer, Sukkur Project Division, in October, 1919, and those for the canals in July, 1920. The proposals were finally accepted by the Secretary of State for India, the Government of India and the Government of Bombay, and the important resolution of the Government of Bombay giving orders for the sanction for the construction of the Sukkur Barrage and Canals Project is given here as an historic document inaugurating the new era of irrigation in Sind. Orders were issued for the work of construction to start from 1st July, 1923. Since the submission of the project to the Government of India a new circle of superintendence had been created and on 1st February, 1921 Mr. C.S.C. Harrison, later Sir Charlton Harrison, C.I.E., was appointed to this post and designated Superintending Engineer, Sukkur Barrage Project. In July, 1923 the Government of Bombay, acting on the unanimous resolution of the district local board at Larkana, issued orders that the Barrage should be named after Sir George Lloyd, the Governor of Bombay, to whose energy the rapid implementing of the resolution is almost wholly due. From this time onwards, therefore, the project was known as the Lloyd Barrage and Canals Construction Scheme. The Lloyd Barrage and Canals (1923 to 1932) were opened by His Excellency the Earl of Willingdon, G.M.S.I., G.C.S.I., G.M.I.E., G.B.E., the Viceroy and Governor-General of India, to commemorate the completion of the Barrage and the opening of the seven canals systems designed to irrigate five and a half million acres of land annually in Sind, Baluchistan and Khairpur state. The project, which was prepared by Mr. A.A. Musto, C.I.E., Indian Service of Engineers, was sanctioned by the Secretary of State for India in April, 1923 and was approved by the Bombay Legislative Council in June, 1923, when funds were voted and the work was immediately started. The construction organisation was inaugurated on the 1st July, 1923 with Mr. C.S.C. Harrison, C.I.E., Indian Service of Engineers, as Chief Engineer. The actual construction of the canals was

started in January, 1925 and of the head works in October, 1926. The date of the opening of these, the greatest irrigation system in the whole world was the 13th January, 1932.

Description. Briefly the scheme is comprised of :

- (i) the construction of a Barrage across the Indus about three miles below the Lansdowne Bridge at Sukkur, and
- (ii) the excavation of seven main canals with their branches, distributaries, minors and water-courses.

The Barrage designed by Mr. Musto is a huge river regulator consisting of 66 spans each 60 feet wide. The regulation of these openings is by means of steel gates, each weighing about 50 tons, which will ordinarily be operated by electric power but they can also be worked by hand. "Over this regulator there are two bridges, the higher of which, called the "gate bridge", will be used for manipulating the steel gates and the other, called the "road bridge", will be used for traffic and will connect the main road on the right bank of the river with that on the left bank.

"The Barrage is nearly a mile long, that is, about five times the length of London Bridge. It has been built of a creamy white limestone, the arches alone being of a different material, viz., reinforced cement concrete. Its sill level is at R.L. 177.0 and it will be used to head up water to R.L. 194.5 which is the level at which all the new canals can obtain their required full supply.

"The end five spans on the right bank and seven on the left bank will be used as scouring sluices. Two long divide walls have been built, one on the right bank measuring 1,690 feet and the other on the left bank measuring 1,975 feet. These divide the river longitudinally into three compartments, the two flank ones being capable of carefully controlled water velocities and levels, to suit the required conditions of entry of water into the canals.

The Canals.—Seven canals have been excavated, three on the right bank and four on the left bank. The following are a few details in connection with these:—

Items.		North- Western canal	Rice canal	Dadu canal	Eastern Nara	Rohri Canal	Khairpur Feeder West	Khairpur Feeder East
Area commanded	..	1,037,395	543,614	6,67,534	2,326,591	2,831,024	..	..
Cultivable area	..	939,235	476,498	5,82,035	2,195,384	2,545,609	..	..
Final area of annual Cultivation	..	563,000	357,000	4,12,000	1,627,000	2,043,000	298,000	..
Maximum discharge at head	..	5,152	10,215	2,837	13,649	10,883	1,936	2,094
Bed width at head	..	165	243	92.5	346	247	79	82
Full supply level at head	..	193.90	194.00	194.04	194.20	192.50	193.50	192.50
Length of the Main Canal	..	36	82	131	525	208	45	13
Length of branches	..	171	5	52	215	277	..	..
Length of distributaries and minors	..	678	65	441	1,212	1,937	..	..
Length of Escapes..	..	..	..	29	9	35	..	..
Length of water-courses	..	3,300	258	2,486	5,000	20,000	..	..
Spans 25 feet each in the head regulator	..	6	13	4	16	12	2	2
R.L. cill of head regulator.	..	183.75	183.13	184.32	181.54	188.30	185.48	187.48

Does not include 305 miles of old channel to be remodelled.

Method of
Construction.
The Barrage
and Regu-
lators.

“The most difficult part of the work was naturally that which had to be done under water. This was done by constructing coffer-dams round each year’s area of operations and de-watering this area by means of pumps.

The coffer-dams consisted of a line of interlocking steel piles which were driven into the river bed by means of pile drivers mounted on pontoons.

This steel piling was supported on the inner side by a backing of sand which was deposited by dredgers to a little above the water level in the river. To expedite work, earth for these banks was, on occasions, also brought from outside by donkeys.

The foundations were excavated by dredgers working within the coffer-dams in which gaps were always left for taking them out when the bulk of the excavation work was completed.

After this was done, the gaps in the coffer-dams were closed and pumps employed to de-water the enclosed compartments.

As soon as the bed was exposed labour was put on to complete the excavation and the upstream and downstream protection was laid and the masonry work for the pavement and the piers was built.

The necessary materials, such as stone and mortar, which were previously kept ready in the required quantities, were conveyed to the site by means of broad and narrow gauge railways taken right into the coffer-dam.

In all forty-two miles of broad-gauge rail and twenty-four miles of 2 feet gauge rail were laid and the necessary locomotives and trucks installed for this purpose.

A number of country boats was also employed for the carriage of materials.

“The masonry work was carried on day and night, the whole field of operations being lighted at night by electricity obtained from the special electric plant.

Sheet piled sumps were provided and kept open within the coffer-dam area for collecting all seepage water during the course of construction and batteries of electric pumps on Pontoons pumped out all this seepage water over the coffer-dam.

The Canals.—The excavation of the Canals was carried out by mechanical excavators and by hand labour. It was decided to make use of mechanical excavators for the following reasons :—

(1) Because the labour, some 135,000 men, would not easily be available;

(2) The output of the machines would be continuous and not affected by seasonal considerations ;

(3) The machines would work at rates which would control cost of excavation by manual labour.

(4) Any excessive demand for local labour would have adversely affected agricultural operations in Sind. The result fully justified the employment of the machines.

The total amount of earthwork completed was about 569 crores cu. ft. of which as much as 312 crores cu. ft., i.e. over 54 per cent., was done by the machines.

A fleet of 46 machines was assembled costing in all about one crore of rupees. Of these machines, nine were of the largest type, seven medium and thirty small. An idea of what each class of machine was capable of turning out may be obtained from the following figures which represent the record monthly output by a machine of each class :—

Large size	.. 56.6 lakhs (5,660,000 cu. ft.)
Medium size	.. 32.2 lakhs (3,220,000 cu. ft.)
Small size	... 16.1 lakhs (1,610,000 cu. ft.)

These figures represent the labour of 3,800, 2,100 and 1,100 men respectively working daily for the whole month.

The total capacity of all the machines working together was roughly 74 tons of earthwork excavated and dumped per minute or 1.23 tons per second night and day for $5\frac{1}{2}$ days in the week and 250 days in the year. This represents the labour of nearly 32 thousand men working all the year round or about 77 thousand men working for seasonal period of 5 months of the year.

In some parts, excavation was carried out by keens, a primitive way of scraping up and depositing the earth, outside the canal bed, by means of pairs of bullocks drawing a metal edged board scoop.

**Cultivation
and
produce.**

The ultimate annual area of cultivation in British territory was expected to be 50.13 lakhs acres which was expected to be under various crops :—

Wheat	..	2,440,000 acres.
Cotton	..	790,000 „
Rice	..	625,000 „
Jowari, Bajri, etc.	..	695,000 „
Pulses	..	53,000 „
Oil seeds	..	410,000 „

This denoted in produce would mean the following approximate quantities :—

Wheat	..	1,133,000 Tons.
Cotton	..	500,000 Bales.
Rice	..	447,000 Tons.
Jowari, Bajri, etc.	..	298,000 „
Pulses	..	15,000 „
Oil seeds	..	117,000 „

**Rectangula-
tion.**

Along with the works proper was carried out a process of rectangulating the area to be served by the new canals.

The sub-division into acre blocks is desirable from the point of view of improved husbandry in that it encourages the levelling up of lands, the better control of water into each plot, and the more scientific and economical alignment of water-courses.

It further benefits the land owner by reducing the unit of assessment of land and water rates to one acre.

All the main rectangulation work, *i.e.* down to 320 acres rectangles, was carried out through the agency of the Survey of India. Further rectangulation down to the one acre plots is being done by the staff of the Revenue Officer.

1. Total latest revised estimated cost of the whole Scheme ..			£ 15,000,000	A few important Facts and Figures in connection with Construction of the Lloyd Barrage and canals.
			Rs. 20,03,00,000	
2. Total estimated cost of Barrage and Head works ..			£ 4,300,000	
			Rs. 5,58,97,000	
3. Total length of canals of all sizes to be excavated ..			6,166 mile.	
4. Total quantity of earthwork to be excavated in the whole scheme for canals, branches, distributaries and minors ..			5,900 million cu. ft.	
5. Total cost of 46 dragline machines employed for excavation work ..			£ 800,000	
			Rs. 1,06,66,000	
6. Total cost of all machinery employed inclusive of draglines ..			£ 3,400,000	
			Rs. 4,53,33,000	
7. Total number of bridges and regulators to be constructed ..			1,970	Gul Hayat Institute
8. Gross area commanded by the scheme (in British Territory) ..			7.4 million acres.	
9. Annual cultivation when area is fully developed (in British Territory) ..			5.01 „	
10. New area of virgin soil brought under command ..			1.95 „	
11. The Barrage across the River Indus has 66 spans of 60 feet each with 2 extra land spans to the “gate” bridge.—				
Sill level of Barrage ..	R.L.	177.0		
Full Supply Level ..	R.L.	194.5		
R.L. of springing of gate bridge arches ..	R.L.	219.0		
R.L. of springing of road bridge arches ..	R.L.	201.0		

The “gate” bridge is for manipulating the gates in the openings of the Barrage, and the “road” bridge is for traffic.

12. Work commenced in July 1923.
13. (a) All work expected to be finally completed and accounts closed in 1934-35.
(b) Canals to flow in 1932.
14. Government land that will come under command—

A Class land	..	1,058,928 acres.
B Class land	..	6,02,205 „
C Class land	..	289,400 „

Note—

A Class denotes good quality land.

B Class denotes fairly good quality land.

C Class denotes poor land fit for rice and then only after washing.

The Design
of the
Barrage.
General
description
of the
Barrage.
Leading
features.

It is desirable to give some details of the design of the Barrage. These details are obtained from Chapter II in the second volume of the project.

The Barrage proper consists of a wide masonry floor founded on the sand of the river bed. The floor is protected on its upstream side by an apron of stone pitching and on its downstream side by an apron of concrete blocks as well as by stone pitching. Below the floor there are curtains of steel sheet piling, the top of the piling being embedded in the masonry of the floor. Masonry piers 10 feet in width are constructed on the floor 60 feet clear apart. The piers support two separate bridges, that on the upstream end of the piers, *i.e.*, the gate bridge is at a higher level than that on the downstream and consists of two separate reinforced cement concrete arches, one 8 feet wide and the other 5 feet wide, with a gap of 13 feet between them in which the gates of the Barrage and their counterweights work. The operating gears, &c., are carried on this bridge which is not suitable for traffic or use by the public. The bridge on the downstream end of the piers, *i.e.*, the road bridge, is also constructed on reinforced cement concrete arches. They are 25 feet in width and their springing level is slightly above the highest estimated flood level of the river, *i.e.*, R.L. 201. These arches carry a 16 foot roadway for vehicular traffic while on either side of the roadway there is a footpath 3 feet 6 inches wide.

The height of the river gates is $18\frac{1}{2}$ feet while that of the scouring sluice gates is $22\frac{1}{2}$ feet and it is possible to head up water to R.L. 195.5 though the full supply levels and discharges in the canals are designed for a pond level, upstream of the Barrage gates, of R.L. 194.5. Height of gates.

The Barrage is built on a straight line normal to the centre line of the river. Owing to the banks of the river not being parallel, the abutments of the Barrage were constructed in the river bed about 400 feet from the bank on either side. The full length of the Barrage between the regulator faces is 4,725 feet while the overall length of the gate bridge which has land spans and terminal towers at either end is 4,925 feet. Length of Barrage.

The Barrage comprises 66 spans, each 60 feet clear, and is divided into three sections by the two divide walls which form approach channels for the head regulators. In two of these three sections are the right and left bank scouring sluices while in the third, i.e., the central section, are the river sluices. There are seven scouring sluice spans on the left bank and five on the right bank while between the last scouring sluice and the first river sluice on each bank there is an abutment pier 25 feet in width. The central section of the Barrage consists of 6 bays of 9 spans each, the end piers of each of these bays being abutment piers of 25 feet width. Scouring Sluices, Sill level of floor.

The floor of the river spans has a raised sill 1 foot wide, the level of the top of which is R.L. 177.0. From the top of this sill the floor slopes down to R.L. 171.0, the upstream and downstream slopes being 1 in 5 and 1 in 10, respectively. The section of the floor through the scouring sluices is different from that through the river spans, the transition from the one to the other being made by sloping the floor up in the width of one pier.

The Barrage has been designed in certain main features after the Esna Barrage on the Nile." Interesting features of design.

Cost of Barrage and Head Regulators .. 4.04 crores.

Interesting facts.

Cost of whole scheme including works to be carried out of the estimates 1933 (including all charges except interest on capital) .. 20. crores approx.

Interest on capital, to 30th September, 1933 .. 4.5 crores approx.

Total length of channels of all sizes (excluding waterways but including Khairpur feeders).. 6,473 miles.

Total length of watercourses.

(a) New .. 30,000 miles.

(b) Old .. 17,800 miles.

47,800 miles.

Total quantity of earth work in the whole scheme.

(a) In canals and all works connected and therewith, .. 628 crores cu. ft.

(b) In watercourses .. 124 crores cu. ft.

752 crores cu. ft.

=279 Million cubic yards

Total number of bridges, regulators, etc. all sizes .. 1,889

Maximum amount of labour employed at one time in addition to 46 draglines employed on the scheme; had no draglines been employed double the labour would have been required .. 60,000

Important factors of the scheme and canals.

	<i>E. Nara.</i>	<i>Kohri</i>
Discharge	.. 13,002 cusecs.	10,887 cusecs.
Bed width	.. 346 feet.	347 feet.
Top width	.. 369 feet.	274 feet.
Depth	.. 11½ feet.	12 feet.
Length	.. 226 miles.	208 miles.

Total discharge of all canals including Khairpur feeders .. 46,617 cusecs.

Gross area commanded by Scheme .. 7½ million acres.

Cultivable area commanded by Scheme .. 61/8 million acres.

Area cultivated annually when whole area is
fully developed .. 5½ Million acres.

Government land in the Scheme and available
for sale.

A class (good land) .. 10,59,000 acres.

B class (fairly good land) .. 6,02,000 acres.

C class land (poor land suitable for rice only). 2,89,000 acres.

Annual production of :— .. 1000's of acres. 1000's of mds

Wheat	} Where whole area is fully developed.	2440	1.133
Cotton		850	.96
Rice		625	447.
Milletts		635	271.
Oil seeds		410	117.

Year of sanction of Scheme .. 1923.

Year of commencing work .. 1923.

Year of opening canals. .. 1932.

Approximate percentage of expenditure on
canals under different heads :—

Earth work .. 49 per cent.

Establishment .. 15 per cent.

Bridges, regulators .. 10 per cent.

Land .. 6 per cent.

Buildings .. 4 per cent.

Preliminary surveys .. 1 per cent.

Tools and plant .. 1 per cent.

Various minor and miscellaneous items and
smaller than those of above, 14 per cent

The area covered by the Scheme is about one quarter of the area of England.

Maximum discharge of Thames at London Bridge is 15,000 cusecs. The Eastern Nara discharge is 13,602 cusecs.

Width of Suez Canal at surface is 200 feet and that of Eastern Nara is 370 feet.

The watercourses, old and new, utilized under the scheme would come nearly twice round the world.

Before the account of the Lloyd Barrage and Canals can be considered complete, certain subsidiary matters deserve some notice in this Gazetteer. These are (1) the reasons why the Barrage was sited below the Sukkur gorge (2) the survey and rectangulation of land within the Barrage command (3) the method of distribution of water from the Barrage canals and the duties for crops (4) the land acquisition policy, the sale of land and the work of the Revenue Officer, Barrage (5) the treatement of the Khairpur canal system under the Barrage (6) the position of the Eastern Nara system under the Barrage (7) difficulties caused by the existence of large numbers of jagirs, (8) the supply of water from the Barrage canals to forest areas.

Subsidiary matters :—

(1) *Reasons for the selection of the Barrage site below the Sukkur gorge.* For many years there was great argument as to the most suitable location for a Barrage across the Indus near Sukkur. The reasons why the site actually chosen was considered the most suitable of all are given officially in the completion report as follow:—

“The reasons leading to the selection of this site were :—

- (a) The stretch of river between this site and the Sukkur gorge has maintained its banks, practically unaltered for as many years as surveys are available. A survey made in 1876 shows the banks of the river in this section to be practically the same as at present.
- (b) The width of the river at the site selected was sufficient to enable the requisite waterway to be given through the Barrage, without having to go to an extensive depth for the floor.
- (c) A Barrage at this site would have no tendency to obstruct or alter the natural conditions of the river above the gorge during floods, and hence would introduce no danger of an avulsion above the gorge.

- (d) At any point higher upstream the width was insufficient for a Barrage, and below the site the river begins to swing from side to side through less clearly defined banks and would necessitate much heavier training works.
- (e) The position of the heads of the right and left bank canals at the site was about 3 miles nearer their commanded areas while the heads of the Rohri and Khairpur Canals avoided the heavy rock cutting through Rohri

Similarly the new head for the Eastern Nara Supply Channel, although longer by 4 miles than the existing head, would be entirely through earth, and would avoid the difficult and expensive widening through rock up to the 4th miles of the existing head where the new head would meet it. The existing supply channel below this junction point was all in earth, and there would be no rock cutting whatever in the widening.

- (f) The site was sufficiently far from the gorge for the water of the river to have assumed a steady flow, so that surface water would not be surcharged with an abnormal quantity of silt.
- (g) No rock is met with anywhere on the site for a great depth, so that the Barrage and regulators could be designed throughout to be founded on sand (or silt) on principles well understood, thereby eliminating the uncertainty of foundations in rock of doubtful quality.
- (h) The Barrage could have a straight alignment normal to the centre line of the river which flows towards it on a gentle curve for a distance of $2\frac{1}{2}$ miles.

(2) *Rectangulation of land for supply of water from Barrage canals.* The scientific system of irrigation, such as that prevalent under the Lloyd Barrage and its canals, requires that the unit for which water is supplied should be as far as possible of uniform size and shape. This was accomplished over most of the area by a separate survey and rectangulation of open land and of fields. The advantages of rectangulation can be summarised as under:—

- (1) The system provides a definite and reasonable unit of irrigation and assessment of regular shape and size instead of the present unit, the survey number, of indefinite shape and size. Under the Sind land revenue system, full assessment is chargeable on a unit whether it is wholly or only partially cultivated.

- (2) It simplifies the distribution of land among haris for cultivation, and also facilitates the distribution of takavi among them.
- (3) It provides a ready means of detecting encroachments and thereby prevents boundary disputes.
- (4) It enables engineers to design an efficient and economical system of watercourses, and thereby promotes the equitable distribution of water.
- (5) It facilitates the inspection of irrigation and crops by all concerned, by the owner himself as well as by Government officials.
- (6) It simplifies the calculation of assessment.
- (7) It saves the khatedar recurring expenditure on repairs to boundary marks.

In Sind with its old inundation canals and winding kairas, the problems of the rectangulating or squaring lands first arose in the nineties of the last century when the Jamrao and Nasraet Canals were designed for the irrigation of large tracts of waste land. In the case of the former canal, all the unoccupied lands under command, as well as a small proportion of the occupied lands, were divided into 16-acre squares, each such square being further sub-divided into 16 petty numbers of one acre each.

The Nasrat tract was similarly squared, but the 16 acre squares were sub-divided only down to 4-acre plots instead of 1-acre plots.

(3) *Methods of distributing water from the Barrage Canals and duties on crops.*

The definitions of a main canal, branch, distributary and minor are given below :—

Definitions and Nomenclature.

- (a) The main canals are the principal channels which take off from above the Barrage. There are other main canals, e.g., the Khipro, the Jamrao and the Mithrao Canals which take off the Eastern Nara, which itself takes off from above the barrage at Sukkur.
- (b) A branch is a channel, other than a main canal, carrying more than 200 cusecs. It may take off from a main canal or another branch. In the latter case it may be called a minor branch or sub-branch.

- (c) A distributary is a channel carrying from 50 to 200 cusecs. It can take off from a main canal or a branch or from another distributary.
- (d) A minor is a channel carrying a discharge of less than 50 cusecs. It can take off from a main canal, a branch, a distributary, or another minor. In the latter case, it may be called a sub-minor.

During the first few years of construction, the distributaries and minors were generally numbered serially on each bank commencing from the head regulator of the parent channel, e.g., MIR/D7L Warah Branch was the nomenclature adopted for the first minor on the right bank of distributary No. 7 on the left bank of Warah Branch. This nomenclature, though convenient during the construction period, was abandoned when the distribution system was finally settled. All such channels were given names which were generally chosen from the names of the Dehs irrigated by the distributaries or minors.

Provision for rice areas on the Lloyd Barrage perennial canals.

The presence of large areas of rice cultivation on a perennial canal complicates the design in that it does not lend itself easily and satisfactorily to the equalization of kharif and rabi discharges, a condition on which the easy and economical working of canals largely depends. For the left bank, Messrs. Baker and Lane in their report gave the actual survey numbers which they considered as established rice survey numbers. Probably the reason why they went to the trouble of giving the actual survey numbers was that rice was cultivated year after year in those numbers more or less continuously, and very little rice cultivation was done outside those actual numbers, it thus being not too laborious a task to extract the figures from the revenue records. For the right bank perennial canals, however, they gave statements made out by dehs of the aggregate area of rice to be provided in the designs. It was not possible to ascertain how these areas had been arrived at, but whatever the basis, as soon as detailed design work was started it was at once realized that rice was far more extensively grown in this tract than was indicated by the Baker-Lane figures. There was a considerable increase in the area of rice grown on the left bank also as compared to the period prior to the investigation of Messrs. Baker and Lane, but there was no doubt that, on the left bank, the extension of the rice area was not due to the land in which it was grown being unfit for dry kharif and rabi cultivation (as was often the case on the right bank), but because conditions in the inundation canal system in recent years had been favourable to

the cultivation of rice. Breaches in the banks of canals with uncontrolled heads, brought about frequent floods and gave the zamindars opportunities for growing rice in lands favourably situated and in a few cases rendered it difficult to grow anything else. Moreover, rice crops are much less liable to damage by floods and disease than dry crops. In order to obtain economical designs for the perennial channels, it was decided that in the Rohri Canal System, provision for rice should be omitted when such cultivation was concentrated at the tails of channels or was scattered over the command, due regard being given to the nature of the soil as far as possible. Thus on the Rohri Canals, though 21,320 acres were provided in the original project with water for rice yet in the designs of channels as actually constructed only 8,800 acres were so provided. Similarly in the designs of the channels in the Eastern Nara System, it was decided that water should be provided for rice in only such land which by reason of its being bad kalar or by reason of its being low-lying is habitually liable to flooding from rain, e.c., and could therefore grow nothing else but rice. The area provided with a rice supply on the perennial canal of the Eastern Nara System was 26,600 acres. All other land was, in designs, considered as dry crop land. In the financial forecast the rice area has been assumed to be 12,000 acres only for the Eastern Nara System as recent experience proves that much of the rice will be replaced by dry crops.

In his evidence before the Sind Agricultural Commission the Chief Engineer in Sind for Irrigation informed the Commission that the duties at outlet heads from the Barrage canals were :—

(a) Rice crop	50
(b) Dry crop	100
(c) Gardens	00
(d) (i) Forests taking water in abkharani only	67
(ii) Forests taking perennial water ..	116
(e) Rabi crops	200

Duty for sugarcane is 75.

The same officer informed the Agricultural Commission that the total discharge of the Sukkur Barrage canals, including Khairpur State, is 46,583 cusecs in kharif and 25,648 cusecs in rabi and the area commanded is 6.75 million acres. The break-up of these figures canal wise is :—

Canal.		Cultivable areas in lacs of acres.	Discharge.	
			Kharif.	Rabi.
North Western Canal	..	9.33	5,042	3,639
Rice Canal	..	4.81	10,215	..
Dadu Canal	..	4.99	2,837	2,525
Khairpur Feeder West	..	3.89	4,000	2,625
Rohri Canal	..	25.35	10,887	9,900
Khairpur Feeder East	..	3.36	4,000	2,625
Nara Canal	..	18.33	13,602	6,959

(4) The work of the Revenue Officer, Barrage.

1. A scheme of the magnitude of the Lloyd Barrage and Canals Construction, spreading over all, except two, of the revenue districts of Sind, involved a great deal of miscellaneous revenue work. At an early stage, it was found necessary, both in the interests of the Barrage engineers and of the ordinary revenue administration to concentrate this work in the hands of a single officer of the Revenue Department who was known as the Revenue Officer, Lloyd Barrage and Canals Scheme.

A Revenue Officer for the Lloyd Barrage and Canals Scheme

To the Barrage engineers, this brought the advantage of having to deal in all revenue matters with only one officer, instead of with half a dozen Collectors, with the assurance that the same matter would be dealt with on uniform principles in all districts. The Collectors at the same time were relieved of all responsibility in matters affecting the Barrage, as they were dealt with by the Revenue Officer through the medium of his own staff.

2. The names of the officers, who held the post of Revenue Officer, are given below :—

Officers who held the Post of Revenue Officers.

Name	From	Period
Mr. N. H. Hey	17th Dec. 1923.	12th Jan. 1925.
Mr. C.M. Baker	13th Jan. 1925.	23rd Nov. 1926.
Mr. A.C. Green	24th Nov. 1926.	2nd Jan. 1927.
Mr. H. Dow	3rd Jan. 1927.	3rd Nov. 1933.
Mr. A.C. Green	4th Nov. 1933.	5th Dec. 1933.
Mr. A.D. Gorwala	6th Dec. 1933.	Date not recorded
Mr. A.C. Green	worked as Revenue Officer during the periods Mr. Dow was on leave.	

Sales to end
of 1932-33

The following table shows the areas of each class of land actually disposed of year by year till the end of 1932-33, and the prices obtained:—

Year.	Concessionary sales.		Sales at full market rates.		Leases.	
	Area.	Sale price.	Area.	Sale price.	Area.	Lease-money per annum.
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
1928-29	13,336	2,00,040	1,580	1,76,234	108	800
1929-30	25,468	3,82,020	658	93,174	234	2,068
1930-31	56,407	8,46,105	5,411	6,29,726	..	..
1931-32	39,850	5,97,750	62,826	60,62,275	26,881	1,35,990
1932-33	11,954	1,79,310	1,33,258	1,15,06,610	99,312	6,06,424
Total ..	1,47,015	22,05,225	2,03,733	1,84,68,019	1,26,535	7,45,282

The following table shows the sales of land for the years from 1938/39 and from 1941/42 to 1957/58. Sales subsequent to 1932-33

Prior to	1938/39	..	..	..	810,539	acres.
	1941/42	..	..	..	112,689	„
	1942/43	..	..	..	130,863	„
	1949/50	..	..	..	20,188	„
	1950/51	..	..	..	53,722	„
	1952/53	..	..	..	30,829	„
	1953/54	..	..	..	22,058	„
	1954/55	..	..	..	22,922	„
	1955/56	..	..	..	125,604	„
	1956/57	..	..	..	39,842	„
	1957/58	..	..	..	33,716	„

(5) The Treatment of the Khairpur Canal System under the Lloyd Barrage.

The Khairpur State covers an area of about 6,200 square miles, the greatest length and breadth being 120 miles and 70 miles, respectively. Within its limits are three small enclaves comprising the tapas of Kingri and Manghawari. The south-eastern half of the State is a desert supporting only scrub, while the western and northern parts of the territory are very fertile where irrigated. The principal canal in the State is the Mirwah (maximum discharge 2,100 cusecs) on which the town of Khairpur stands. The Sathiwah (maximum discharge 1,850 cusecs) taking off from the Indus close to the Mirwah is the second largest canal in the State. These canals irrigate a narrow strip of land to the west of the railway line and the Rohri Canal but east of the railway and the Rohri Canal they are the channels which, with their branches, supply all the water used for irrigation in the State. The Abulwah (maximum discharge 1,400 cusecs) and a large number of smaller canals taking directly off the Indus irrigate the western and south-western portion of the Khairpur State. The Abulwah system of canals has always had a precarious water-supply which was chiefly lift and the State had already investigated a proposal for improving it by giving the Abulwah a new head higher up the Indus.

Pre-Barrage
irrigation in
Khairpur
State.

Works
necessary
for remodel-
ling the
severances

The construction of the Rohri Canal severed the State into two parts. The Sathiowah, the Mirwarh and its branch, the Faizwah, were intersected and a feeder to the east of the Rohri Canal called the Khairpur Feeder East was proposed taking off the Barrage at Sukkur and tailing into the Mirwah, thus maintaining the irrigation therefrom with an assured and controlled supply from the Barrage. The Faizwah was intersected and its tail and the Sanhrowah, a branch of the Mirwah, was proposed to be extended and enlarged for irrigating this portion. None of the other irrigation channels on the west bank of the Rohri Canal were intersected, except the Abulwah. The Sathiowah and the Mirwah with its branch the Faizwah were capable of doing all that was required of them (with slight remodelling) for the irrigation of the portion of their area cut off by the Rohri Canal and lying to the west of it. It was therefore proposed in the 1909 project that a Feeder to be called the Khairpur Feeder West should be constructed, taking off above the Barrage and tailing into the Mirwah a mile and a half lower down. The areas severed west of the Rohri Canal and dependent of the Mirwah, Faizwah and Sathiowah would thus get an assured high level supply from the Barrage. If the State was anxious to improve its very unsatisfactory system of irrigation in the area in the south, *i.e.*, on the Abulwah and smaller canals, it was assumed that it would construct a channel connecting all the inundation canals in this area to the West Feeder. It was considered that improvement of irrigation in the State was not the responsibility of the Bombay Government, and for this reason the only works that were provided in the 1909-10 Project were those described above. When the 1919-20 Project was under preparation, exactly the same works were included for State as had been included in the 1909-10 Project. No objections had been raised against what was provided for the State in the 1909-10 Project and it was natural to presume that the State held the same opinion as when the latter Project was under preparation.

The ques-
tion of
extending
Khairpur
Feeder
West
beyond the
length of
1.6 mile
already
proposed.

A year or two after the construction of the Barrage works had started, a Council was appointed to manage the affairs of the State. In 1928 the Public Works Member of this Council reported that it would be absolutely necessary to have the West Feeder extended so as to feed the southern most canals of the State. He explained that the construction of the Khairpur Feeder West for a length of about 44 miles (not of merely 1.6 mile) was an obligation which the Bombay Government must fulfil if, by the construction of the Barrage and the Rohri Canal, they desired not to impede the progress of cultivation in the State. He argued that a West Feeder only 1.6 mile long would be of no use to the State as all the water it carried (which was meant for supplying all the State channels on the west of the Rohri Canal) would be passed into the Mirwah which could at the most feed only a small portion of the area cut off. Further, the construction of the Barrage would very likely

have an adverse effect on the working of the mouths of canals close to it, in that the fair irrigating level of the inundation system would be attained late on the rising river, and it would be lost early when falling. The question of what works should be carried out for the state at the cost of the Government of Bombay was thus reopened.

After exhaustive enquiry, it was accepted by the Government of Bombay that the West Feeder with the necessary regulators and bridges, should be constructed at their cost in a length of 44 miles. This decision was arrived at late in 1931, but prior to this, it was agreed that the work should be carried out by the Lloyd Barrage and Canals Administration, pending a final decision as to who was to bear the liability for its cost.

The West Feeder was eventually opened in April, 1932 for irrigation.

The Treatment of the Eastern Nara System under the Barrage.

The Eastern Nara has received considerable attention already in this Gazetteer. It seems originally to have been a spill-water channel naturally formed, but was developed by extensive irrigation works into a perennial canal and became an important item in the Sind irrigational scheme.

The Indus, from time immemorial, has always overtopped its left bank in low places between Reti and Rohri during the inundation season, the flood water eventually finding its way to the Eastern Nara, a natural drainage channel of Eastern Sind, on which there was a certain amount of cultivation. The channel was fairly well defined from near Rohri southwards, and prior to the conquest of Sind by the British in 1843, the floods from the Indus formed its only source of supply. Due to changes in the course of the river and also due to the yearly inundations gradually raising the banks of the Indus, the floods from the latter or the "Ghotki floods", as they were called, diminished in volume, frequency and duration. The supply to the Eastern Nara had become precarious and the Government of India, on the recommendation of Lieutenant Fife, sanctioned in 1852 a project for the excavation of a supply channel for the Nara from the Indus near Rohri. The channel, the first four miles of which were in rock, was 12 miles long and was excavated in 1858-59. The Nara was thus able to get, during the inundation months, a supply of water which it previously received only in years in which Indus was higher than usual.

The
Excavation
of the
Eastern
Nara Supply
Channel in
1858.

The water-supply of the Eastern Nara considerably improved after the construction of the supply channel but there was nothing to stop the Ghotki floods from entering the Nara in years in which

The Kassim-
pore and
Flood
Diversion
Bunds.

the Indus was high and when this occurred, the regime of the Nara was upset by silting. Measures to exclude the flood water were adopted, but only to a slight degree. The Kassimpore Bund constructed in 1875, helped to keep out a certain amount of flood water near Rohri. This was abandoned in favour of the Flood Diversion Bund, constructed in 1917 with the object of diverting the main floods into the sand hills on the left bank of the Nara. This object, however, for various reasons, was not achieved and further measures had to be adopted in conjunction with the Barrage project.

Course of
the Eastern
Nara up to
Jamrao and
losses in
water supply

Much of the water carried down the Eastern Nara was, however, wasted on the way in depressions which fringe the Nara on either side. For the first 52 miles, the Nara passed through British territory and after flowing about 74 miles through the Khairpur State, emerged again into British territory 3 miles above Jamrao. The Nara in this reach flows through an inhospitable valley of alluvial soil on either side of which are broken sand hills. Before the works in connection with the Barrage scheme were carried out, the Nara in this length used to spread out into wide sheets of water in the inundation season, while in the cold weather these became merely sluggish pools. The numerous depressions along the channel gradually filled up by the water overflowing the natural banks where they were low. These depressions sustained from their reservoir capacity a little kharif cultivation, and in the rabi season the beds of these depressions or sangs as they are called, after they had dried up, supported a certain amount of rabi cultivation, but most of the water which used to find its way into the depressions was wasted.

The Nara
below
Jamrao.

The sand hills on either side of the Nara extend for about 20 miles below Jamrao where they come to an end and where the Nara enters a wide alluvial plain extending up to the Indus on the east and the Rann of Cutch in the south. After traversing a distance of 320 miles from Rohri, the Nara discharged its waters into the Rann of Cutch meeting and utilizing the Dhoro Puran, an old river bed on its way. For many years past, the discharge of the Nara has become less and less and practically no water has flowed below miles 226 (Thar Weir) for many years.

The Jamrao
Canal.

The first main canal taking off the Eastern Nara is the Jamrao Canal. It was completed in 1899-1900 and was designed as a perennial canal. Part of the area lying on the west of the main canal up to mile 17 and that on the west of the West Branch which was irrigated from this canal, has, under the Barrage Scheme, been transferred to the command of the Rohri Canal. The areas to the east of the main canal which were supplied with water from inundation canals *i.e.*, the Shahu, Sanghro and Mir wahs have been transferred to the Jamrao Canal. The cultivable command of the Jamrao

Canal has, on account of these changes, been increased to 8,36,600 acres. The whole system has been remodelled to the Barrage duties of 100 acres per cusec for dry kharif, and 200 acres per cusec for rabi, and also for Barrage intensities. The discharge of the main canal based on these duties and intensities is 3,400 cusecs at the head as against 3,200 under pre-Barrage conditions.

The areas formerly commanded by the three inundation canals, the Shahu, Sanghro and Mir Wahs and now transferred to the Jamrao Canal, have been rectangulated and provided with new water course systems. The existing channels of the Jamrao Canal needed very little remodelling to pass the revised discharge, but in order to convert lift land into flow, a considerable amount of raising of F.S.L. was necessary. This is now in progress and will be finished in 1934-35.

The Mithrao Canal is the second canal taking off the Eastern Nara. It was a kharif canal in the pre-Barrage period and under the Barrage Scheme has been remodelled to provide perennial water to the lands already commanded by it under pre-Barrage conditions, as well as to the lands which have been brought within its command under the Barrage Scheme. The additional cultivable area brought under its command is 2,23,600 acres, and the total cultivable area commanded by the Mithrao Canal System is 5,21,200 acres.

The alignment of the main canal has not been changed, except, in the case of a severe bend between miles 63 and 72 (old mileage), which has been removed and has shortened the length of the main canal by 12,600 feet. The Naokot Branch takes off from the Mithrao Canal at mile 83·7. The existing length of the main canal below this point has been abandoned as the area which used to be watered from it could be better served from the Nabisar and Naokot Branches. The abandoned length will, however, serve as a drainage channel to the surrounding country. The total length of the canal before remodelling was 89·3 canal miles. It is now 83·7 miles.

According to the 1919-20 Project, the Mithrao Canal was to command a gross area of 5,59,000 acres. Actually it commands a gross area of 5,22,700 acres and 5,21,200 acres of cultivable area. The F.S.L. upstream and downstream of the head regulator is R.L. 77·0 and R.L. 73·50, respectively, while the bed width and depth are 60 feet and 9·5 feet, respectively. The F.S.L. downstream of the head regulators in the pre-Barrage period was R.L. 70·0. The Mithrao Canal now tails at the off-take point of the Naokot Branch where in pre-Barrage years, the depth of water was 2·5 feet and the

bed width 12 feet. The Mithrao Canal now has 6 feet depth of water and a bed width of 30 feet at this point in order to supply the Naokot Branch. To accommodate the higher F.S.L., the banks of the Mithrao Canal have been raised from head to tail, for the same reason many of the existing masonry works had to be remodelled. The sanctioned project provided for 90,000 acres of rice cultivation annually. It was not considered necessary to provide for so large an area of rice, as it was clear that much of the land in which it had been the custom to grow rice, could produce good dry kharif crops. Consequently only 1,100 acres of rice were provided for, and this is the area of land which is either low-lying or kalar and which can certainly grow nothing else but rice. Due to the change in the area of rice allowed for the discharge of 3,025 cusecs in the original sanctioned project has been reduced to 2,024 cusecs in the final designs.

The Khipro Canal.
Alignment and details of design.

The Khipro Canal is the third and the last perennial canal of the Eastern Nara Canal System. It takes off from the right bank of the Nara just above the Makhi Weir, close to and downstream of the Mithrao Canal. The canal was, in the sanctioned project, to take off from the Mithrao Canal above the Bakhoro Regulator, but in the final designs it was thought better that a channel having nearly the same discharge as the parent channel, should have an independent head directly from the Nara. It involved an extension of the Khipro Canal for a length of 3.0 miles, but secured independent control for both the canals. This change involved an extra expenditure of about Rs. 80,000. There was no other deviation in the alignment of the Khipro Canal as proposed in the sanctioned project. It runs nearly north-south and parallel to the adjacent Mithrao Canal in its first 11 miles. It then follows an easterly course up to mile 18, the Samarjo Branch taking off from the canal in this length (at mile 14.2). The canal from mile 18 takes a south easterly course up to mile 39, whence it runs southwards to mile 49.6 where it ends.

The Thar Canal and Sufi Distributary.

The Thar and the Hiral Canals are the last and most southerly canals of the Eastern Nara System. The Thar Canal is the only canal which takes off from the Nara on the left bank throughout its whole length of 217 miles. It has been in existence as a kharif canal growing almost entirely rice for many years and in the 1919-20 Project it was proposed to remodel it with a view to increasing the intensity of cultivation. As, however, there were good lands in this area (on the left bank of the Nara) which could not be commanded by the existing Thar Canal, but which were eminently suitable for perennial irrigation, a new channel (Sufi Distributary) has been constructed which supplies perennial water to these lands on the left bank which could not be commanded by the Thar Canal.

Jagir Lands within the Lloyd Barrage Scheme.

Great trouble was caused in the planning of the large canals under the Lloyd Barrage by the existence of great areas of jagir land situated in no uniform or regular pattern throughout the country.

The lands commanded by the Barrage Canals may be either occupied or unoccupied. The occupied lands may be either the property of jagirdars or may be in the hands of zamindars or rayots. The zamindar is really an occupier of Government land with more or less limited proprietary rights. The jagirdar is a rent-free owner of the land and has acquired his title to his lands generally by grants dating prior to the conquest of Sind by the British. These grants were given either by favour or in consideration of meritorious services to the State. After the battle of Maini in 1842, Sir Charles Napier issued a proclamation intimating that all jagirdars who proffered their allegiance to the British Government within a specified time, would be confirmed in the possession of their estates. About 2,000 grantees presented themselves in accordance with this order and their jagirs were confirmed. The area of jagir lands commanded by the new Barrage Canals is about, 3,30,000 acres, i.e. about 5 per cent. of the total cultivatable area.

The definition of a jagir.

The internal management of a jagirs is entirely in the jagirdar's hands. When watercourse construction was started, it was not possible to put pressure on the jagirdar to have his lands sub-rectangulated. As the jagirdars, with a few exceptions, did not agree to the sub-rectangulation of their lands, the continuity of watercourse construction was somewhat affected. Jagir lands were, therefore, classified for purposes of water-course construction as Class III lands, i. e. lands in which existing water courses and the boundaries of internal survey numbers were to be kept to as far as possible.

Watercourse construction in jagir lands.

The Irrigation Act and the Sind Canals Rules, however, apply to jagir lands in exactly the same way as to Zamindari lands, and watercourses serving such land or vacant Government lands were taken through intervening unrectangulated jagir lands and the lands was acquired from jagirdars for this purpose in the same way as from zamindars. The existence of jagir lands, though theoretically not affecting adversely the interests of Government, has in actual practice done so in the past. Some jagir lands are unsurveyed and the records of areas are, therefore, imperfect. In consequence, the amount of water to which they are entitled and the amount of hakabo (water-rate) which they should pay, is somewhat vague.

Hakabo (i.e. water-rate) Payable by jagirdars.

The jagirdar cultivates his land either by means of ordinary haris taking a share of the crop or the haris may be maurusi, i.e. hereditary haris who have zamindari rights as against the jagirdars. The jagirdar pays to Government a toll called hakabo, intended to defray his share of the expenses incurred by Government in supplying him with water. The maximum rate which can be levied is that which it costs Government to supply the water or half the rate payable by a zamindar, whichever be greater. On the advent of the British in Sind, payment of hakabo was made in kind and a jagirdar had to pay one-fifth of the entire produce of his jagir to Government. When, later on, the payment of assessment in cash was enforced hakabo was fixed at a very low figures and upto 1924-25 it was only annas 8 and annas 10 per acre for dry kharif and rice respectively. The cost of supplying water was much more than this and the rate could reasonably have been raised many years previously. In the year 1924-25 it was raised to annas 12 and Rs. 1-8-0 per acre for dry kharif and rice respectively, but this is not sufficient to cover the proportionate share of the working expenses of the inundation canals. Jagirdars in the past have gained much advantage from these low hakabo rates, coupled with the fact that improvements to the canals have greatly increased their water-course supply and the value of their lands. The case of a jagirdar in the Larkana district may be cited. When the jagir was originally granted, most of it was barani land, i.e. cultivated on rain only as canal-water was not available. For many years past much of the jagir has been receiving water from the inundation canals, while for the past twenty years rice has been freely grown. The value of the land has risen from about Rs. 5 per acre as barani land to Rs. 200 or more per acre as rice land. There would, therefore, appear to be a strong case, with the provision of assured water-supply guaranteed by the constructing of the Barrage and new canals, for an increase in the water-rates or hakabo paid by such land owner.

The situation as it stood in August 1933.

The Lloyd Barrage Standing Committee, in considering the question of increasing the rates recommended that an enquiry into the circumstances of each jagirdar should be made and that section 83 of the Land Revenue Code should be so amended as to enable the jagirdar to pass on some of the increased hakabo to their tenants. An officer to enquire into the circumstances of each jagir for the purpose of fixing the hakabo rate has now been appointed. In March 1944 Government adopted a suggestion of the Revenue Officer that until the new hakabo rates are settled an amount equal to the difference in each deh between the pre-Barrage and post-Barrage rates of assessment for rayoti lands should be added to the present hakabo rates. Very roughly, this means that the present rate of annas 12 and Rs. 1-8-0 per acre for dry kharif and

rice will be doubled. Assuming that hakabo is eventually raised to an average rate of Rs. 4 per acre (the actual cost to Government of supply water for irrigation with interest on capital at 5 per cent) for jagirs in the Barrage command, the difference between the 1933 rates of hakabo paid by jagirdars and the average rate of Rs. 4 per acre, will amount to about Rs. 5 lakhs per year, assuming an intensity of 60 per cent. only, and this will be a loss to canal receipts. For developments on the question of jagirs see Chapter XVIII in this Gazetteer.

The Supply of Water to Forest Areas from the Barrage Canals.

The forests of Sind are mostly riverain and cover an area of, about 6 million acres. The yearly inundations of the river, flood the river rain forest to varying depths and for varying periods depending upon the level of the land under the forests and the height and duration of the floods. Exposed to the action for the river, the riverain forest are liable to be partly or wholly eroded away at one place, while new land is being formed by the river at another. Where the forests are situated on high ground, the floodings are less frequent and of a shorter duration. Due to these reasons, the riverain forest can only produce timber such as is used for fuel, etc., e. g., babul, kandi, bhan, etc. The watering of these riverain forests under post-Barrage conditions will continue to be of the same nature as at present, as the withdrawal of the Barrage canals will not appreciably affect the yearly inundation as far as they are concerned. Besides the riverain forests there are some inland forests which were originally formed by the floods overtopping the banks of the Indus at low places and flooding certain portions of the low-lying tracts of country. Prior to the construction of the existing continuous chain of river embankments along the Indus, these inland floodings were frequent and heavy, but for the past fifty years or so as the bunds along the river have been extended and strengthened, the water received by these inland forests has become less and less, and to-day they receive practically no water at all. A few hundred acres of inland forest have for some years been given a water-supply from the inundation canals, but generally speaking all the inland forests have greatly deteriorated and when the Sukkur Barrage Project was being prepared in 1920, the Forest Department asked for a water-supply from the new canals for some of the inland forests. The area for which such a supply was required was changed several times, but the final demand was for 55,000 acres on the perennial canals on the right bank of the river and 17,000 acres on the Robri Canal on the left Bank.

Riverain and
inland
forests.
Areas
requiring
water-
supply.

In his evidence before the Sind Agricultural Commission in September, 1953 the Chief Conservator of forests in Sind stated that the total forest area under the Sukkur Barrage irri-

gation is 50,000 acres, out of which 30,000 acres have already been brought under plantation, and the area proposed for afforestation under the Kotri and the Gudu Barrage is 150,000 acres in each. The Conservator stated that as a result of the construction of the Sukkur Barrage and the lower Sind Barrage, now under construction, and the projected upper Sind Barrage for the first time an assured and controlled water supply would be available to the Forest Department to remedy the present lop-sided forest economy, with its emphasis on fuel and charcoal, by the introduction of economically important species in Sind forests. In the irrigated plantations to be established in the lower Sind Barrage zone an area of 20,000 acres in the perennial water supply zone is earmarked for the introduction of such species. The lower Sind, or Kotri Barrage, was officially opened on the 15th March 1955 by his Excellency Mr. Ghulam Muhammad, the Governor-General of Pakistan. The necessity for this Barrage and its feeder canals had been felt for some time as there was no doubt that the Punjab canals were making a greater draw-off of water than had first been thought of. The Lower Sind Barrage has been officially named "the Ghulam Mohammad Barrage" and it plans to do for the Lower Sind area and part of the deltaic region what has been done for the area under its command by the Lloyd Barrage.

Kotri
(Ghulam
Muhammad)
Barrage.

The project, of which the Barrage only forms a part, is being constructed by Pakistani Engineers and staff with the exception of the Chief Engineer and a few British Engineers, never more than five and for most of the time considerably less, who were chiefly required in the mechanical side. The Barrage itself was constructed departmentally partly by labour directly employed and partly by very small contractors. With one partial exception, all the canal works are being executed either directly or by Pakistani contractors, while this system has put great strain on the key construction Engineers at all grades, it has on the whole resulted in considerable economy. The system has the advantage of flexibility in that timely improvements in design or execution, the possibilities of which become apparent after the commencement of the work, can be incorporated more easily.

The Barrage itself is 3,000 feet long and is designed to pass a maximum flood of 8,75,000 cusecs. It consists of 44 bays of 60 feet span each provided with gates 21 feet deep which hold up water 20 feet above the crest of the Barrage. The maximum head between the upstream and downstream sides in the cold weather will be about 31 feet.

The Barrage is provided with a lock channel to facilitate river traffic. That portion of the road bridge over the lock channel is designed to lift, to enable the boats to pass. A lock will also be provided into the Fuleli canal which will be navigable in part of its length.

Two divide walls, one in each side, enclose the pockets containing the head regulators of the canals. These form desilting devices enabling the canals to draw water free from the heavier grades of silt, which deposits in the pockets. When a sufficiency of silt is thus deposited, the pocket gates are lifted and the silt transferred into the river downstream of the Barrage.

Situated in each of the divide walls are two fish ladders or passes. These consist of a series of pools with one foot difference in level between each pool. The pools are connected. The fish ladders will enable the valuable 'palla' fish to pass without difficulty.

Besides the two divide walls, two other piers have been built wider than normal. The purpose is that, if in the future it is desired to pass a very high tension electrical transmission line across the Indus, this can be accommodated cheaply and without difficulty.

Hyderabad at present obtains an inadequate and unsatisfactory supply of water by pumping from the Indus downstream of the Barrage. The Government have plans to give a greatly augmented and improved supply from above the Barrage by flow for part of the year and by pumping during the winter. Facilities have been provided on the left bank for doing so.

Similarly, on the right bank, facilities have been provided for the water supply to the proposed 15,000 K.W. Steam Station for generating electricity for the lower Sind Thermal Grid. The implementation of this project has so far been blocked by the lack of foreign exchange, but it is hoped that this very necessary project will shortly go forward.

A recent development has been the discovery of Sui Gas. The pipeline from the North to Karachi passes over the Kotri Barrage. It has been found possible to accommodate this pipeline on the Barrage, although not part of the original design. This has meant much saving as otherwise an expensive river crossing would have been necessary.

The Barrage is provided with a road bridge 20 feet wide with footpaths 4 feet wide on each side. This additional means of communication will be exceedingly valuable in normal times and particularly so whenever it is necessary to repair the existing Kotri road bridge which is integrated with the railway bridge. The Barrage road bridge is carried on pre-stressed pre-cast beams. This is the first occasion on which this new method of construction has been used in Pakistan.

A steel overbridge carried on steel trestles has been provided for the operation of the gates. While of adequate height and strength to carry the gates and their counterbalances, it is yet light enough to put no undue strain on the masonry of the piers and the floor below. The trestles, gates and gearing have been erected departmentally.

The Barrage is made of concrete, the piers and abutments being faced with stone. The stone both for the facing and concrete was brought by the North Western Railway from Jungshahi about 70 miles distant where first-class stone was available.

While no money has been wasted on purely ornamental or decorative features every thought has been given to the appearance of the Barrage so that it may have the natural good looks of a structure, soundly built, and with all its parts severely designed to carry out their functions without waste or grandioseness.

Owing to the shortage of labour and its increasing cost, the construction of the Barrage was mechanised to a far greater degree than was the practice in the immediate past.

The canals which take off above the Barrage and will be fed from it, are themselves very large works. On the right bank the perennial Kalri Canal of 9,100 cusecs will be constructed through difficult country. The alignment as revised after making an 8-mile traverse of the hills will enter a series of depressions which will be flooded to form a lake about 20 miles and 45 square miles in extent. This lake will afford facilities for the production of hydro-electric power and will be a valuable reserve for the water-supply of Karachi. Such lakes add greatly to the scenic amenities of a country and afford many facilities for recreation and fishery development.

The Kalri Canal will provide a water supply of 460 cusecs or approximately 230 million gallons a day for the growing needs of the Karachi the Capital City. Without the storage on Kalri Lake, it would be impossible to give this supply at certain times of the year without grave harm to irrigation.

On the left Bank the Barrage will feed the existing Fuleli Canal which will be straightened and modernised. Its capacity will be increased from 11,000 cusecs as at present to about 13,800 cusecs. From Fuleli a new Guni Branch is being constructed to give non-perennial irrigation to a large block of new land outside the existing command.

Alongside the Fuleli Canal a new non-perennial canal known as the Pinyari Feeder of 14,350 cusecs is being constructed. This channel will take up and extend the existing inundation canals upto and including the present Pinyari Inundation Canal.

A third canal takes off on the left bank for the perennial irrigation on two blocks of land at present receiving non-perennial supplies from Fuleli. As this canal of 4,100 cusecs capacity will flow perennially it is being lined with cement concrete to limit or obviate the dangers of waterlogging. The construction of a lined channel 70 miles long with a bed width of 44 feet and a depth of $15\frac{1}{2}$ feet is a major operation and an innovation in Sind.

The cost of the whole project will exceed Rs. 24 crores. This is a very large sum and the Engineers are straining every nerve to complete the work within the estimate. Their success in this respect will depend partly on factors outside their control, such as world trends, modified by local conditions and the competition of other agencies both Governmental and private, which are striving to meet the tremendous pent-up demand in Pakistan for construction and expansion. But this huge expenditure at the inflated levels of postwar constructional costs is none-the-less necessary both for the protection of this part of the Province against upstream withdrawals, and in order to increase its general level of prosperity.

With the completion of the Barrage it will be possible to give assured supplies to the left bank canals during 1955. It is hoped to give the Fuleli Feeder as much water as it needs, and to give $\frac{3}{4}$ discharge to the Pinyari Feeder, which will be adequate for the existing areas. The Guni will be given about 2,000 cusecs which will suffice for existing areas thereon and provide some scope for extension. The Lined Channel will flow down to mile 22 to take up the irrigation of the upper block of perennial land on this bank.

Thereafter the Pinyari and Guni will be widened, new distributaries constructed and old channels remodelled to suit the speed of colonisation and the genuine, as distinct from the speculative requirements for land.

Unfortunately on the right bank the construction of the canal has been delayed partly from the difficulties of excavating a channel 40 to 50 feet deep through the 8-miles hilly reach and partly from lack of the necessary machinery, which was received very late. It is hoped that this channel will flow during 1956.

Although in this part of Pakistan, the production of hydro-electric power is not possible on the scale of Alpine or Himalayan

countries the Project as briefly indicated before does afford the facility for an installation of 10,000 K.W. to be developed from a fall of 20 feet at the lower end of the Kalri Lake. There are further possibilities for power development on a seasonal summer basis from a 10-foot fall on the Pinyari Feeder. Also it may be possible to utilise a 40-foot fall on the escape channel of Kalri Lake during the winter to increase power supplies.

These hydro-electric power schemes have not been designed due to uncertainty of development in the upper part of the Indus Basin. Lately they have been shelved in favour of development from Sui Gas. But welcome as the discovery of this gas has been its possibilities, as at present proved, are not limitless. There is no doubt that in the not too distant future it will be necessary to develop all these power possibilities, developments which will form a welcome relief to the resources of Pakistan.

The salient details of the Ghulam Muhammad Barrage Project are shown in the table which follows.—

Areas and Canals.

Gross area commanded	.. 3.2 million acres approximately.
Culturable area commanded	.. 2. 3/4 million acres approximately.
Area designed to be cultivated annually ..	.. 1.91 million acres.
Area cultivated under the present system ..	.. 6,35,000 acres.
New area of virgin soil brought under command	.. 1.5 million acres.
Maximum discharge of the Thames at London Bridge	.. 15,000 cusecs.
Maximum designed full supply discharge of Pinyari Feeder	.. 14,350 cusecs.
Maximum designed full supply discharge of Fuleli Feeder	.. 13,420 cusecs.
Width of Suez Canal at the surface ..	.. 200 ft.
Width of the Pinyari Feeder at the surface ..	285 ft.
Width of the Fuleli Feeder at the surface ..	.. 300 ft. nearly.

Salient Features of the Headworks.

Situation	.. ..	..4 $\frac{1}{2}$ miles upstream of Kotri near the tiny village of Jamshoro.
Length of Barrage between abutments	..	..2,984 ft.
Over-all length of gate bridge	..	..2,984 ft.
Total No. of spans, each 60 ft.	..	..44.
Lock Channel	.. ..	..270 ft. long and 60 ft. wide.
Fish Ladders	.. ..	..2 numbers, each 5 ft. wide.
Full supply discharge at Canal Head Regulators:—		
(a) Pinyari	.. 14,350 cusecs.	58.6 miles long canal.
(b) Fuleli	.. 13,420 cusecs.	56 miles long canal.
(c) Kalri Baghar	.. 8,473 cusecs.	42 miles long canal.
(d) Lined Channel	.. 4,100 cusecs.	70 miles long canal.
Width of ordinary piers of the Barrage	..	7 feet.
Width of abutment piers of the Barrage	..	10 feet.
Height of the river gate of the Barrage	..	21 feet.
Height of the lock gate of the Barrage	..	34 feet x 50 feet wide on downstream side.
Crest Level	.. 48.0	
Pond Level	.. 68.0	
Downstream Bed Level	.. 35.0	
Maximum Flood Level up-stream (expected)	.. 80.1	
Maximum recorded discharge passed at Kotri	.. ..	..7,10,000 cusecs (1948)
Maximum flood discharge for which the Barrage is designed	.. ..	..8.75 lacs cusecs.
Width of road bridge	.. ..	..20 feet with 2 footpaths 4 feet each.

Work done on Headworks.

Foundation stone laid on the 12th February,
1950.

Diversion completed on Friday, 1st October,
1954.

Excavation of foundations	..	.. 5,21,91,682 cubic feet.
Permanent Piling	... ..	.. 2,28,859 square feet.
Concrete work	... ..	.. 86,83,000 cubic feet.
(a) Jungshahi Stone	.. ..	.. 140 lacs cubic feet.
(b) Bricks	.. ..	.. 74 lacs cubic feet.
Reinforced cement concrete work..		.. 1,33,000 cubic feet.
Estimated cost	... ..	.. About 55 million rupees.

Work done on Canals.

Total miles of feeders excavated 92 miles nearly done
Over 1,200 million cubic feet of earth-work excavated.

Total miles lined 7.5 miles.

Total miles that remain to be done .. 60 miles.

Time during which the remaining work is
expected to be finished Left Bank Feeders expected to open in April, 1955.

Right Bank Feeder expected
to open in April, 1956.

About two dozen major Road Bridges in hand, of which more than half the number have been completed.

Other Features.

1. Super-passage on Baran Nai-A huge cross-drainage works 1500 feet long; consisting of 7 large barrels 14 ft. x17 ft. deep at a cost of approximately 5 million rupees, almost completed.

2. 8-mile length of Kalri Baghar passes through rock; blasting varying from 25 feet to 50 feet in depth.

3. Fuleli required long lengths to be pitched-Particularly near Hyderabad Town-Already completed.

The third great Barrage in Sind is now under construction. This is the Upper Sind Barrage, called the Gudu Barrage, from the Gudu dhandh, at which part of the Indus the Barrage is being constructed. It is about 60 miles up the course of the Indus from Sukkur. The Gudu Barrage Project provides for an assured water supply to the Sind and Baluchistan area to the north of Sukkur and Rohri, an area that at present is irrigated by inundation canals. The area on the right bank is irrigated by the Desert, the Unhar, the Begari, the Sind and the Rajib canals, and that on the left bank by the Shehar, Mahar, Masu, Mahro, Lundi, Dengro, Mahesteo, Korai Janib and Garkano Canals. A part of the commanded area on the right bank immediately above Sukkur will continue to be irrigated by the Sukkur and Garang Canals as these canals are expected to function satisfactorily due to the heading-up effect of the Sukkur Barrage situated 10 miles below the Garang head and 2 miles below the Sukkur head. The area which will receive water from the Gudu Barrage comprises the following revenue districts and talukas :—

**Gudu
Barrage.**

(2) Right Bank Area :—

(i) Baluchistan :—

Tehsil Nasirabad (part).

(ii) Upper Sind Frontier District (Sind).

Taluka Jacobabad.

Taluka Kashmore.

Taluka Kandhkot.

Taluka Thul.

Taluka Garhi Khairo (part).

(iii) Larkana District (Sind).

Taluka Shahdadkot (part).

(iv) Sukkur District (Sind).

Taluka Sukkur (part).

Taluka Shikarpur.

Taluka Garhiyasin (part).

(b) Left Bank Area :—

(i) Sukkur District (Sind).

Taluka Ubauro.

Taluka Mirpur Mathelo.

Taluka Ghotki.

Taluka Panoakil.

Taluka Rohri (part).

The total gross area commanded by Gudu Barrage is 4161 square miles, including 311 square miles of Baluchistan area. The area lying on the right bank of the River Indus is bounded by hills on the north-western side and by the River Indus on the South-East. The ground sloping from the hills in the North towards the South has a very steep slope up to the Desert Canal, after which it flattens and forms a valley line of which the other ridge is the River Indus itself.

The area on the right bank is subject to floods by hill torrents which have their catchment areas in the hills to the North. Once in 10 years the rainfall of these hills is intense bringing down heavy discharges through the naifs which strike against Adio Wah, Sonewah Frontier Rajwah, Uch Rajwah and the Desert Canal in different reaches causing breaches in these and, at time, in the Desert Canal and finally spreads and floods the low-lying areas to the south of the Desert Canal. The damage to cultivation and property is considerable when the Desert Canal breaches, as in the year 1929.

It has been proposed to strengthen the right bank of the Desert Canal to the flood protection bund section to safeguard against these floods and to provide sluices of the right bank of the Desert canal to drain off flood water.

The average rainfall in the tract is very small and is of the order varying between 0 to 5 inches in a year. This small rainfall is sufficient to grow any crops and the country has to depend entirely in on canal irrigation for its agriculture.

The tract undergoes extremes of temperature. In summer the temperatures in the shade go sometimes as high as 125°F., and in winter a few frosty nights are experienced.

In common with the rest of Sind and Northern Pakistan this tract has two crop seasons, the hot weather or kharif season and the cold weather or rabi season. The kharif season roughly begins from the 15th of April and extends up to the 14th of October. The hottest period of about 40 days called "Chaliho", during which hot winds blow, is roughly the whole of May and half of June. Duration of rabi season is from 15th of October to 14th of April. Half of December and the whole of January is usually the coldest period.

On the right bank side, rice is the principal crop grown wherever flow irrigation is possible and water supply is adequate. Where the command is difficult, flow or lift or the water supply inadequate, dry kharif crops such as Jowar and Bajri are grown. On the Desert, and Unhar canals, intensity of rice cultivation is comparatively lower than on the Begari, Sind, Rajib and Chitti Canals. Rice is the favourite crop of the people, as it is the most paying and requires least manure and the lands being slightly kalarish are more suited to rice than dry crop. Thus a gradual increase in rice cultivation is accompanied by a corresponding decrease in dry crops. As there is no perennial supply, rabi cultivation is of "Bosi" type, i.e. matured in the moisture retained in the soil after getting one heavy initial flooding. These floodings are usually given in the months of September and October, when demand of water supply for kharif crops is reduced considerably.

Dubari Rabi, which is a follow-on-crop for rice, is grown in the rice fields on residual moisture after the rice crop is harvested. The percentage of Dubari area to rice area is almost 80. It is sound agricultural practice to grow dubari crops after rice is harvested. The usual dubari crops are Matar and Chana (Pulses) which being of leguminous variety add to the fertility of the soil, and afford good fodder for the cattle.

There are large compact areas on the Begari canal measuring about 75,000 acres, where the existing intensity of rice cultivation varies from 60 to 100 percent. The effect of rise on the subsoil table due to the increase in rice cultivation in this area was studied and it was found that, in spite of heavy intensity of rice cultivation, the water table has remained within 6 to 8 ft. from the ground surface in April.

Under this project, it is intended to give water supply for growing rice at 75 per cent. intensity with a F.S.F. of 45 to all the culturable area on the right bank side except the high patches and lift lands which are provided with water supply for growing dry kharif crops at 60 per cent. intensity and a F.S.D. of 90. Forest areas are provided with water supply at 100 per cent. intensity and 66 F. S. F.

F. S. F. for forest area at 66 per cent. will have to be reconsidered in view of the demand of the Forest Department that a lower factor of 50 for Lower Sind area and 45 for Upper Sind area may be accepted.

It is expected that with the increase in the intensity of rice as proposed, there will be no rise in subsoil water table.

On the left bank side the soil is mostly sand loam, and is eminently suitable for dry crops. The subsoil water table is generally 15 to 30 feet below the ground surface.

It is proposed under this project to give water-supply for growing dry kharif crops at 60 per cent. intensity with F.S.F. of 90 to the entire command on the left bank side, except for some scattered established rice areas where rice is already grown, and for one-fourth of Y-Class (Kalarish) unsurveyed lands which are proposed to be cultivated with rice by rotation for the purpose of reclamation. The established rice area has been taken as the highest yearly rice cultivation in each Deh during the period 1938-1942, and provided with water supply at 100 per cent. intensity and 45 F.S.F. One fourth Y-Na-class lands will be provided with water supply at 75 per cent. intensity and 45 F.S.F. Forest areas are provided at 100 per cent. intensity and 66 F.S.F., as on the right bank side. There is no danger of a rise in the water table on this side due to a negligible area being under rice cultivation.

The Gudu Barrage Project provides for the construction of a Barrage across the river Indus at Gudu, two feeders on the right bank—one called the Desert-Unhar feeder and the other the Begari-Sind feeder—and a feeder called the Ghotki feeder on the left.

Desert-Unhar Feeder.—This feeder is 50.66 miles long. The full supply discharge of the feeder is 12,945 cusecs. The existing canals Ex. the Desert-Unhar feeder have mostly been utilized and remodelled to suit the revised discharges. The commands have been adjusted wherever necessary, and the existing channels extended or new channels proposed so as to keep the length of water-courses within 2 to 3 miles.

Adiowah, Adio distributary and Sonewah have lift or hard flow areas under command. These channels are designed as dry Kharif channels. Similarly Chandur, Thalho and Malhi distributaries are designed as dry kharif channels. The rest of the channels are designed as Rice Channels. The total length of old canals to be remodelled is 473 miles, and the length of new channels to be constructed is feeder 42 miles and other channels 105 miles.

Begari-Sind Feeder.—The total length of the feeder is 83.9 miles, which is all new. The F.S. Discharge of the feeder at head is 15494 cusecs. The feeder is in a heavy cutting in the first 28 miles, in which no danger of breaches is expected. The existing canals ex. the feeder have mostly been utilized and remodelled to suit the revised discharges. Other high katcha areas in front of Kashmore bund, mile 0 to 20, are already protected by front bunds. 74 miles of new channels are proposed for irrigation in this katcha area. The total length of old canals to be remodelled is 391 miles, and the length of new channels to be constructed is, feeder, 89 miles and other channels, 232 miles.

Ghotki Feeder.—The feeder is 83.6 miles long inclusive of the length of L.M. Feeder excavated in 1940 and 1947. The F.S. discharge of the feeder at head is 8490 cusecs. On the left bank side, there are large patches of undeveloped area at the tails of existing canals. Hence a good many new channels have been proposed.

The total length of old channels to be remodelled is 380 miles, and the length of new channels to be constructed is, feeder, 54 miles and other channels, 296 miles. The length of new channels includes the intermediate links proposed to remove bad bends and tortuous courses of channels and extensions of old channels.

The total gross area including forests in the command of the Gudu Barrage is 26,63,184 acres (4,161 square miles), out of which 1,98,767 acres (311 square miles) fall within the jurisdiction of Baluchistan. The cultivable commanded area excluding forests works out at 21,44,590 acres, out of which 1,93,459 pertain to Baluchistan. The forest area is 1,50,320 acres and this lies in Sind only.

When the Gudu Barrage Project is, in the course of the next few years completed, Sind will have in the Lloyd Barrage and canals, the Ghulam Muhammad Barrage and canals and the Gudu Barrage and canals; one immense irrigational system covering almost the whole of the easily cultivable area of the Lower Sind Valley. The cultivable area commanded by the Lloyd Barrage

canals amounts to 6.125 million acres, the cultivable area commanded by the Ghulam Muhammad Barrage canals amounts to 2.75 million acres, and the cultivable area commanded by the Gudu-Barrage canals amounts to 2.14 million acres; a total for the Sind/Khairpur area of 11.015 million acres, the largest single irrigation project in the whole world.

Water-logging in Sind and Khairpur.

The great increase in the area under irrigation which came with the Lloyd Barrage canals early directed attention towards the question of water-logging, which the Punjab experience had shown to be a formidable difficulty accompanying the large scale use of perennial canals.

Early in the period of construction of the Lloyd Barrage and Canals project, the question of water-logging was brought very prominently to notice by the experience of the Punjab Irrigation Department. In the Punjab, water-logging has on some older canal systems become a very serious problem indeed, and it has been necessary for the Punjab Government to set up a special organization for the investigation of water-logging problems, and to undertake many expensive drainage schemes, with a view to the reclamation of water-logged or damaged lands and the prevention of further extensions of the trouble. The canal systems in the Bombay-Deccan, which are fed from storage reservoirs have also experienced a certain amount of trouble due to the damaging, or water-logging, of lands as a consequence of irrigation from the canal systems. The experiences of the Punjab and Bombay indicated that similar trouble might be expected in Sind and led to the investigation of conditions in the areas commanded by the Lloyd Barrage Canals, with a view to ascertaining the likelihood of water-logging following the commencement of Barrage irrigation. It was found, as a result of preliminary investigations, that a very large area on the right bank (approximately 3,500 square miles) in which the predominant crop was rice, had a high sub-soil water table. The water-table was found to vary yearly from 3 feet to 12 or 13 feet below the surface of the ground, the water-table being nearest the surface at the end of the irrigation season in October and lowest at the commencement of the irrigation season in June. In the other areas commanded by the Barrage, notably those on the left bank of the river sub-soil water-table was found to be situated at much lower levels and the problems of possible water-logging was, therefore, considered to be most urgent on the right bank.

The rice area of pre-Barrage days, which averaged some 360,000 acres per year, will be increased eventually up to 560,000 acres when full development is attained under post-Barrage conditions and this area of rice cultivation will, in addition, be surrounded on the north, north-west, south and east by the perennial cultivation

from the new canal systems. Since the periodical lowering of the sub-soil water level in the rice area was presumably due, in part at least, to the movement of water through the sub-soil from areas, in which the level is high to areas in which it is low, it appeared possible that the new perennial irrigation which surrounds the rice area would affect adversely the drainage capacity of the soils and therefore cause a gradual, but persistent, upward trend in the level of sub-soil water, resulting eventually in water-logging. The danger of water-logging in this area of rice cultivation within a fairly short period of years after the commencement of Barrage irrigation was thus apparent and, in order that as much knowledge as possible should be available for the study of the question, it was decided to carry out investigations first of the sub-surface conditions in the right bank area.

A special organization, called the Research Division, was created for this purpose and the investigation of the sub-soil conditions on the right bank area was done in the working season of 1930-31 during the course of which it was decided to extend the investigation to the whole of the Barrage command.

Formation
of the
Research
Division.

The classification of the samples was done by their appearance and their feel to the fingers into the five types, viz., clay, clay-silt, silt, sandy-silt and sand. Soil samples were collected from the surface by scraping the soil to a depth of about 1 inch and from the first 6 feet of each borehole by each individual foot. Samples were also taken from each of the various strata passed through, below 6 feet depth from the surface. These samples were all carefully labelled and have been collected at a central depot for analysis in the laboratory. The number of samples collected was very large indeed, and it has been found necessary to discard many of them, since it will not be possible either to store them or to carry out detailed mechanical and chemical analyses on them. Samples have been retained from boreholes in which kalar exists at present on the surface of the soil, and from all clay layers recorded, whether from boreholes showing kalar at the surface or not. These samples will be dealt with gradually as time permits in the laboratory. Whenever water was met with in a borehole, it was necessary to use a casing pipe and a sand pump as soon as sand was entered, as it was only by this means that the borehole could be carried to 30 feet depth.

A study of the maps prepared for the main investigation work showed that there were large areas of land in which kalar appeared to be predominant and, in order that the effect of irrigation on these areas might be watched, it was decided to carry out a detailed classification in approximately 1,50,000 acres situated in three

Detailed
investigation
of the Kalar
Areas.

blocks; a large one of 97,000 acres on the right bank near Shahdadkot and two smaller ones situated near Shadipali and Mitho Machi on the left bank. This detailed classification work involved the boring, on the same grid system as was used for the main investigation, of a considerable number of additional boreholes and the recording of the surface appearance of each survey number and of the names of the various flora growing on the land. The additional borings were made in order that a closer picture of sub-surface conditions might be obtained, and the recording of surface indications and flora was undertaken in order that these conditions might be investigated in connection with the different kinds of soluble salts forming the kalar in the soil.

As a result of much work on sub soil water samples it has been found that the dominant salt in the sub-soil water in Sind is sodium chloride and an abridged method of analysis has accordingly been adopted in place of the ordinary routine method.

In the abridged method the conductivity of the water samples is measured by means of a Dionic Water Tester, and the total percentage of soluble salts present in the sample is read from a graph which has been plotted from a large number of detailed estimations made by evaporating selected samples. After its conductivity has been measured the sample is tested for alkalinity and for sulphate and chloride ions by titration. The chloride ions is taken wholly to represent sodium chloride.

In his evidence before the Sind Agricultural Commission the Executive Engineer of the Research Division gave important information on the work done by the Research Division into the investigation of kalar soils and the rise of the sub-soil water level in irrigational areas. It is very necessary to carry out "kalar" reclamation experiments on small and large scales but this cannot be done without the right type of staff. This needs a trained reclamation officer with wide experience of the practical problems and the solutions as found in other parts of the world, such as America, Egypt, the Continent and in the Punjab also. This would need a complete separate division to tackle both the drainage, water-logging and "kalar" problems of the province.

**Kalar areas
in Sind and
proposals
for reclama-
tion.**

Kalar lands are very common in Sind. They exist as small or big patches of land among cultivated fields and also as vast stretches of barren land extending over several thousands of acres covered with salt encrustations. The attention of predominant kalar patches was drawn at the time the sub-soil level pipes were being fixed in the Barrage zone in the years 1930-32. After the pipes had been fixed, detailed investigation of these patches was undertaken and completed in 1937.

The object of the investigation was to know the surface appearance of the soil with respect to different kinds of kalar and the nature of the substrata underlying it, and to ascertain the causes of the formation of the various kinds of kalar in the surface, and thus ultimately to consider remedial measures against the detrimental effect of kalar in order to make the soil fit for cultivation.

Another object of the investigation was to determine the co-relationship of various flora growing on to soil with the surface appearance of the soil, the substrata and the water-table underlying it.

The main classification of the soil was made as under :—

<i>Serial No.</i>	<i>Classifications.</i>	<i>Symbol used</i>
1.	Black kalar	B.K.
2. (a)	Dark Brown kalar	B.I
(b)	Light Brown kalar	B.II
3. (a)	White kalar with traces of white efflorescence.	W.I.
(b)	White kalar with thick white efflorescence ..	W.II.

In addition, the nature of soil as to whether it is hard, cracked powdery or puffy was also noted.

The flora with special reference to intensity of growth was noted.

The detailed investigation for the field was divided into two main parts :—

- (i) Taking boreholes each five furlongs apart East to West and $6\frac{1}{4}$ furlongs apart North to South, the temporary bores being 30 feet and intermediate bores being sunk upto 2 feet below the tapped water level.
- (ii) A detailed classification of substrata was done generally of every survey number by means of 3 ft. bores.
- (iii) Detailed classification of the growth of flora on the soil (i) trees and shrubs and (ii) herbs and grasses was done.

From the work done on the field the following plans were prepared :—

- (1) Index Plan of the area.
- (2) Plan showing ground contours.
- (3) Plan showing cross section of boreholes taken.
- (4) Plan showing sand and clay belts.
- (5) Plan showing detailed surface classification.
- (6) Plan showing Hydro-Iso-Bath of the area.
- (7) Plan showing salinity (salt contents) contours of the water table.

After the first classification of the kalar patches had been done between the years 1933 to 1937, in accordance with the recommendation made by the sub-committee of the Central Board of Irrigation appointed to report on Water-logging in Sind in 1936, it was decided that a complete soil survey should be made where salt lands are prevalent to see if there is any increase in the area which is unfit for cultivation and reclassification of the areas was started in 1937.

No kalar reclamation has yet been attempted by the Public Works Department, though with the opening of the Drainage and Research Circle which had a reclamation officer on deputation from the Agriculture Department, proposals and preliminary schemes were drawn up. It was considered that the immediate problem for Sind was to take strict measures for controlling further deterioration of the soil, rather than to start on scattered schemes to reclaim kalar affected areas to bring more areas under cultivation. As a first step in this connection, collection figures of rice cultivation in Barrage and Non-Barrage areas for 1932 and 1945 or 1946 for purposes of comparison with established and permissible rice areas and re-presentation of this information on plans was decided on. The figures were not collected till about Partition in 1947 and therefore no further work was done beyond drawing the conclusion from a study of the water table, with reference to the rice and dry crop cultivation, the rice is not the sole factor which contributes to a rise of the ground water.

The Executive Engineer of the Research Division stated that in November 1947 a detailed programme for reclamation work was proposed to be carried out by the Reclamation Officer under the supervision of the Executive Engineer, Drainage Division. The systems of reclamation which were proposed were to open two experimental and reclamation farms, one in an area of high water-table and another in an area of low water-table. The sites selected were to contain soil mixtures, textures of all the three types, light, medium and heavy. No further work, however, was done beyond drawing up the schemes, owing to the closure of the Drainage Circle and Drainage Division in 1947. The position of the water-table, in the commands of the Begari and Shikarpur investigated areas and the whole of the Barrage command for April 1950 and 1951, gives a description of the Hydro-Iso-Baths' contours showing equal depth of water below ground for 1950 and 1951. The note deals with this Begari and Shikarpur investigated area and in the Barrage command, the North-Western Canal, the Rice Canal and the Dadu Canal on the right bank; and on the left bank the Rohri Canal and the Eastern Nara system. A few extracts from this note are reproduced here.

As regards the Begari and Shikarpur investigated area, the water-table in the command of the Begari Canal is round about 8 feet below ground level in April, 1950 and as well as in 1951, excepting in the lower reaches of the canal and in a small area at the head and along the Nurwah, where the water-table during both the years is between 4 to 8 feet. The average depth of the water-table in the above tract in April, 1951 has been 8 feet against 7 feet in April, 1950. The two averages suggest that there should be a fall in 1951; but this is not so and the discrepancy is mainly due to an abnormal heavy rise in 1950 in the case of some individual pipes.

Begari and
Shikarpur
investiga-
ted Area.

As regards the North-Western Canal under the Barrage command, in the area between Warah and Ratodero Branches there has been a fall in the water-table over 1949 observations. The plan of Hydro-Iso Baths drawn for April, 1949 shows that the sub-soil water levels were between 4 to 8 feet from the surface whereas similar Plans drawn for 1950 and 1951 show for the same area that the water-table is mostly between 4 to 8 and 12 feet.

North-
Western
Canal.

The plans of Hydro-Iso Baths for both the years show that the water-table is mostly between 4 to 8 feet, except in some local patches which record a water-table, either between 0 to 4 feet or 8 to 12 feet below ground level. On comparing the two plans it will, however, be noticed that the local areas showing a water-table within 4 feet appearing in the plan of 1950 have in the plan of 1951 become less in dimensions and size. Also the plan of 1951 shows some local areas recording water levels between 8 to 12 feet which recorded a higher water-table in 1950. Such patches are particularly between the Ghar Branch and the Rice Canal. These indicate a slight tendency for all between 1950 and 1951.

Rice Canal.

The sub-soil water-table in the command of the Dadu Canal is low as compared with those of other commands on the right bank of the River Indus. Below Ruk in 1950 from the head to Naudero the water-table was about 12 feet below ground level. For 1951 there are no observations up to Ruk, but below Ruk the water-table is from 8 to 12 feet below ground level. On the right of the Dadu Canal between Naudero and the head of Johi Branch the water-table in April, 1950 and 1951 is mostly between 4 to 8 feet.

Dadu
Canal.

The two plans of Hydro-Iso Baths drawn for April, 1950 and 1951 show that the water-table continues to be high in the vicinity of the Rohri Canal from the head of the canal upto the Tando Masti Khan Fall. The 1951 plan shows that in the above are the water-table is mostly between 4 to 18 feet with some local patches recording within 4 feet from the ground. These local patches when compared with the similar plan of the previous year show that there has been some improvement in 1951, as would be

LEFT
BANK
Rohri
Canal

evident from the size of these local areas recording 0 to 4 feet in the plan of 1950.

Eastern
Nara
System.

From Mehrabpur to Padidan, which area comes in the commands of Sehra Branch, Nasrat Branch and Mehrabpur Branch, the water-table continues to remain between 16 to 24 feet below ground level. Below Padidan upto Nawabshah the water-table is mostly lower than 30 feet as the pipes are reported dry up to that depth, excepting at the tail of Dad Branch and in an area to the North East of Nawabshah, where the water-table fluctuates between 16 to 24 feet. Below Nawabshah in the commands of Rohri Canal and its branches, viz., Hala Branch, Ali Bahar Branch, Shadadpur Branch, Tando Adam Branch, Nasir Branch, Sarfaraz Branch and Hyderabad Branch, the water-table continues to be low, as most of the pipes spread over the entire area are found dry upto the depth of 30 feet excepting at the head of Ali Bahar Branch, in the command of Hala branch, and at the tail of Nasir and Hyderabad Branches, where it is mostly between 16 to 24 feet from the ground level.

In April 1949 the plan of Hydro-Iso Baths showed that most of the data in the commands of the Jamrao, Khipro and Mithrao canals were missing, as a very large number pipes were found either choked or missing. It is unfortunate that the same state of affairs prevailed during 1950 and 1951, by not refixing and cleaning the missing and choked up pipes.

From the meagre data available it is, however, found that, excepting some local patches recording water-table within 8 feet, the water-table is low. In the commands of Hiral, Sufi and Thar tract between Hiral and Sufi branches where it is 4 feet from canals the water-table continues to be high, particularly in the the ground surface in some local patches. The water-table in the command of the Eastern Nara system in the area to the east of Mithrao Canal and below the Pithoro and Chor Railway line is high, and appears mainly due to rice cultivation.

When the Chief Engineer in Sind, Irrigation, gave evidence before the Sind Agricultural Commission on the 10th and 11th November, 1953, he was asked three important questions: (1) Are the Barrage canals working all the time on full level. If not, what is the total decrease in the discharge of canals during the last three years, (2) Has the intensity of cultivation proposed at the start been achieved in all the canals in the Barrage zone. If not, to what extent has it been achieved and what are the reasons for that drawback? Is there any possibility of measuring the discharge in the Barrage canals? If so, to what extent, and what would be the approximate expenditure on it? To these three questions the Chief Engineer in Sind, Irrigation, replied "(1) The Barrage Canals do not work all the time on full level as the water supply in the canals depends on the crop requirements. But there are periods when the

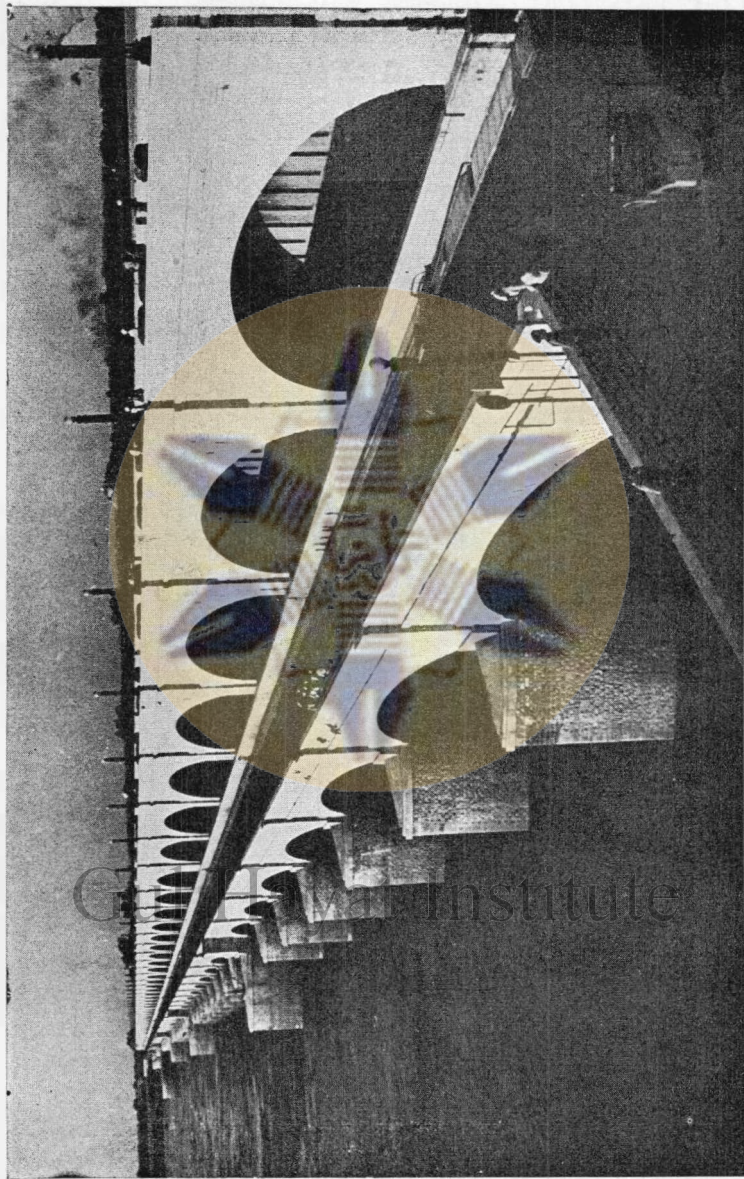
supply is short specially in the winter when the river supply falls short of the allocations. If the last three years are considered, the supply fell short of the allocations for the number of days as shown below:—

<i>Period</i>		<i>January</i>	<i>February</i>	<i>March</i>	<i>Total</i>
1950-51	..	4	20	21	45
1951-52	..	3	14	23	40
1952-53	..	20	26	31	77

Decrease in discharge in 1952-53 in winter was 25 per cent. to 30 per cent.

(2) The kharif intensity of 27 per cent. has mostly been achieved and even exceeded. Effort now is to raise it from 30 to 35 per cent. and later on to 40 per cent. So far as the rabi intensity of 54 per cent. is concerned, this has not been achieved and that higher figure is not likely to be achieved. This rabi intensity varies now between 25 per cent. to 35 per cent. At places where Dry Kharif is grown late even a higher percentage of the order of 40 per cent. is achieved. Time will improve figures as more economic use is made of water. The reason for the low intensity for rabi is the shorter period for sowing wheat after kharif waterings for cotton are over. It is expected these figures will improve gradually and we should expect kharif intensity to go up to 40 per cent. and rabi to a similar figure. (3) The discharges of the Barrage Canals are already being measured by the Barrage Division and the river discharges by the Research Division. This is done as a matter of regular routine. The question of approximate expenditure, therefore, does not arise. There is, however, always an error of ± 3 per cent. to -3 per cent., even with these measurements, and more accurate measurements need not be expected”.

PRESENT-DAY SIND

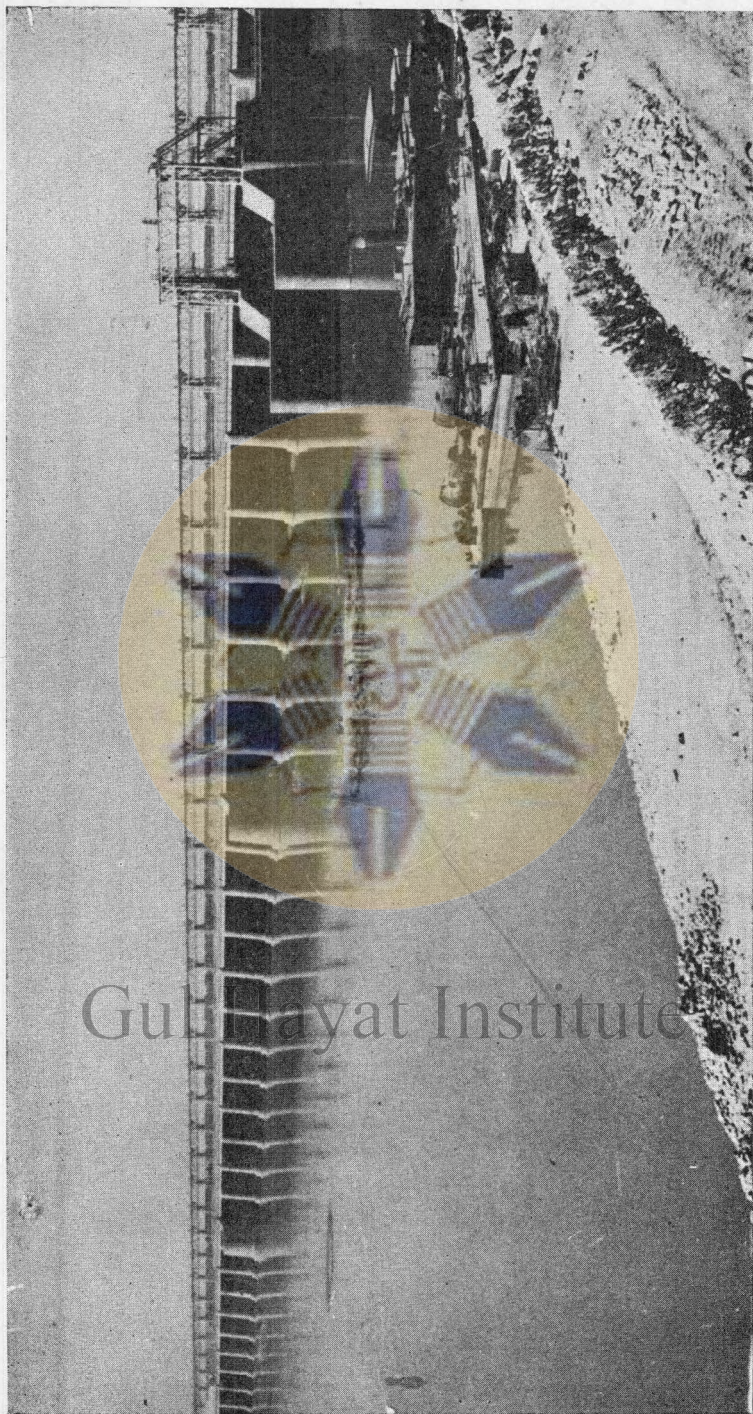


Sukkur Barrage looking across river towards Sukkur

CHAPTER XIV
ECONOMY

Gul Hayat Institute

PRESENT DAY SIND



Ghulam Muhammad Barrage at Kotri.

TABLE OF CONTENTS

	Page
The Predominantly Agricultural Economy of Sind and Khairpur.	525
The Occupational Scheme.	530
Features of the Agricultural Economy.	537
The state of Industrialisation in Sind and Khairpur.	553
Trade, Commerce and Communications	568
Fisheries.	594
Forests.	611
Minerals and Mining Development.	626
Salt and Excise.	631

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CHAPTER XIV

ECONOMY

Economy comprises the following sections : (1) The Predominantly Agricultural Economy of Sind and Khairpur, (2) The Occupational Scheme, (3) Features of the Agricultural Economy, (4) The Extent of Industrialisation, (5) Trade, Commerce and Communications.

I.

The Predominantly Agricultural Economy of Sind and Khairpur

It is an understatement to say that the economy of Sind and Khairpur is predominantly agricultural. The true statement would be to say that it is overwhelmingly agricultural, as will be shown in the second section of this chapter where the Occupational Scheme of the country is commented upon. At this stage it is sufficient to say that there has been very little industrialisation and that urbanisation is also a minor problem in Sind and Khairpur, and this condition remains despite the efforts that have been made since 1947 to enlarge the scope of industry in Sind and Khairpur and notwithstanding the fact that a large number of refugees from India belong to the artisan class resident in towns and not taking kindly to country life. The land system was Predominantly feudal in character until the introduction of Land Reforms. Sind is, in fact, typical of the general condition of affairs in Pakistan. In the economic survey which accompanied the budget of the Government of Pakistan for the year ending the 31st March 1958 it is stated, of the country as a whole, that the agrarian character of the economy is underlined by the fact that agriculture accounts for 60 to 61 per cent. of the total national income and supports over 80 per cent. of the population. One of the features of Pakistan since 1947 has been a shortage of food stuffs and it is in this matter that Sind and Khairpur can play a most important part because, not only is there a large potential of cultivable land not at present cultivated, but water in abundance will be provided with the full functioning of the two new barrages, the Ghulam Muhammad Barrage at Kotri and the Gudu Barrage north of Sukkur. Meeting the shortage of food stuffs in Pakistan is a long term problem because of the steady increase in the population, which is estimated annually at nearly 1.4 per cent. between 1951 and 1956. The food position of the country is delicately balanced, and slight variations in the food grain production caused by vagaries of weather greatly upset the supply position. In the past few years Pakistan has experienced a considerable shortage of food-grains, and has had to rely on imports which have been a drain on foreign exchange earnings. Deficits have been declared from time to time which have been covered by arranging for supplies of wheat and rice from external sources.

As regards Sind and Khairpur in particular, the rent of agricultural land is generally paid in produce, cash rents being taken only on land in which mahsuli crops are grown, that is, those which are not susceptible of easy division, such as sugarcane, tobacco, cotton and vegetables. The produce rents fixed by custom vary with the character of the irrigation which the situation of the land allows or requires. Where the land lies much above the level of the water irrigation is costly and the rent paid by the cultivator is low. But when the land can be watered without the labour of lifting, rents are higher. It is the landlord's duty to pay the assessment and to clear the channel by which water comes to his lands from a Government canal, or distributary. The prevailing rent for land cultivated by lift is one-third of the produce, the tenants supplying the seed-corn and manure. But sometimes the zamindar supplies one or both and gets one-half, or at least two-fifths. These are matters of accommodation and make it difficult to compare the rents obtained in different districts. Other disturbing elements are the condition of the land, whether it is ready for cultivation or requires clearance, and in the latter case whether the zamindar or the hari is to clear it. So far as comparison is possible, it appears that the rents are highest in the more fertile parts of the Larkana, Sukkur and Upper Sind Frontier districts, where the zamindar's share is two-fifths or even one-half, though the hari provides the seed and manure, and lowest in the talukas about Hyderabad. But such deviations in the general rate are uncommon. Even the tempting advantage offered by some of the new canals and the fact that there is more land waiting for labour than labour waiting for land do not appear to have diminished materially the regard paid by both sides to the time honoured rules of batai. Almost equally uniform is the rent of land irrigated without labour, whether moki, bosi, or sailabi. It is one-half of the produce when the tenants supply seed and manure. But there are considerable variations in the Thatta district, where the conditions are sometimes peculiar. In the Bhal lands of the Shah Bunder and Ghorabari Talukas, for example, on which luxuriant groups of rice are raised without even the trouble of ploughing, the landlord's share is four-fifths or even five-sixths; but he supplies the seed. The land on which mahsuli crops are to be grown is, as has been said, often let for a fixed cash rent. The amount demanded will naturally be based on the estimated value of the landlord's share of the crop if it were divided according to the custom of batai. Consequently it is as variable as the productiveness of lands, much more so indeed where other conditions come in, such as proximity to markets. In his notes on "Agricultural Development in Sind" Sir Roger Thomas, C.I.E., Adviser to the Government on Agriculture and Post-war Reconstruction, has made the following comments on the position of agricultural labour and the importance of agriculture in the economy of Sind and Khairpur. He says "the shortage of agricultural labour in Sind is acute. It is one of the major factors

limiting productivity. The activities of the Sind cultivator are dictated by the conditions under which he lives. He has no incentive to improve the land he cultivates or to maintain it in good heart. He pays no rent, water-rates, taxes, cesses or other Government dues. He manages to plough and sow about eight acres of cotton and about eight acres of wheat each year, in addition to a few acres of cattle fodder and subsidiary crops. As an alternative to these he may grow twelve acres or more of rice on rice canals. It is physically impossible for one ploughman with one pair of bullocks to attain the maximum productivity on such extensive areas. With the expansion of irrigation contemplated under the two new irrigation projects, the agricultural labour problem will become increasingly acute. The rural population resident in the irrigated areas is inadequate to meet the demands of agriculture, and especially so at times of crop harvests. Seasonal immigrant labour from the adjoining unirrigated areas serves to solve the labour problem in part. This labour arrives immediately after it has harvested its monsoon crops in the late autumn each year. It comes in time to help with cotton picking and the rice harvest. Most of it remains until the wheat harvest from March to May, when it returns to its desert home, to prepare lands for the next monsoon season. The grain and cash earned by these people in the irrigated areas goes to supplement their meagre livelihood dependent on precarious rains and subject to occasional severe famines in the desert areas. They provide their own temporary shelter and carry their household goods on donkeys and camels. On the perennial canals agricultural labour is fully occupied throughout the year because of the quick succession of seasonal crops, each of which demands preparatory tillage, periodic irrigation and inter-cultivation in harvest operations. In non-perennial canals the position is different in that rice, which is considered to be a lazy man's crop, demands much less attention and the winter crops which may follow it are not irrigated. The effective labour on non-perennial canals is used only in small part and these are the tracts in the irrigated areas where cottage home industries should be encouraged. Cattle-breeding is an important source of income to agricultural labour in rice tracts, and no charge is made to them by the land owner for the upkeep of the cattle which subsist largely on the rough grazing. Most of the lands in Sind are comprised of large estates. Lands owned by peasant proprietors constitute a small minority. Most of the farming is done by share croppers, haris, who are tenants-at-will. They supply their own labour and that of their plough bullocks in return, for half the produce of the crops grown. This is the batai system. The cost of the seed for sowing is met by the hari. The cost of harvesting, threshing and winnowing is shared equally. Haris demand substantial cash advances each year before they engage in cultivation. These are recovered from their share of the crops. Some unscrupulous landowners and leaseholders take advantage of the illiteracy of their haris to withhold from them part of their legitimate dues and to keep them in perpetual debt. The farm

accounts are often maintained in a manner and in a script both of which are unintelligible to anyone except the writer."

In his evidence in 1954 before the Sind Agricultural Commission, Sir Sidney Ridley, Revenue Commissioner and Revenue Secretary to the Government of Sind, was asked whether he had any suggestions for the economic conditions of the masses and ways to increase the production of land. He replied that the basis of Government policy was to improve the condition of the masses. It was largely a matter of batai, which was fifty-fifty at present. In reply to the question "Do you suggest that, in order to improve the conditions of the masses, we raise the batai from fifty-fifty to a higher percentage to the tenant and lower to the owner?" he replied "It would upset the Government taxation for some time because then the zamindar will also claim that the hari should pay part of the land revenue, as is being done in the Punjab, and the ultimate benefit to the haris might be nil." Sir Sidney Ridley gave it as his opinion that "there is no cash rent system in Sind; the only place where I found it is in Malir", which incidentally is a market garden area largely employed in supplying the vegetable needs of Karachi city. When he was asked whether he was in favour of the batai system, or a rent system between zamindars and tenants, Sir Sidney Ridley, replied that he was in favour of retaining the batai system generally because then the owner of the land takes an interest in it. "If" he said, "you encourage the rent system, it will encourage the absentee owner system. We must keep the owner interested."

A study of prices and wages over the last fifty years is not a very rewarding occupation, since it would show chiefly the rise and fall in the value of money. As one of the features of the last generation of British rule in India was the increasing extent to which the Indian economy became linked up with world supply of commodities, variations in the general price level and wage level do nothing more than record the vicissitudes to which the Indian economy was subjected during a period which included two world wars. On the whole between 1907 and the present day wages and prices kept more or less in step. Certainly from 1900 to 1939 there was no great change in the standard of living of all classes. Hindus continued to improve, but Muslims remained mostly stationary. The reason for this to be found probably in the difference of outlook the capacity for work. From 1907 to 1930 or so prices were fairly steady on the whole, and generally not unfavourable to agriculturists. From 1930 to 1939, and especially in the middle of that period, there was a long spell of acute agricultural depression, and prices were very low for agricultural produce. During this period those engaged in agriculture, namely, the zamindar and his cultivating tenant, the hari, suffered grave strain. But from 1939 and the outbreak of the Second World War a great improvement took place in agricultural prices, owing to the demand for foodstuffs during the years of hostilities. The higher prices brought great prosperity to agriculturists, and

the high prices enabled Sind, not only to pay off its Barrage debt, but to make a profit from which various public buildings could be provided. From 1945 to 1947 was a period when planning was predominant. A vast number of new schemes for improvement, mostly in the social sphere, were worked out. This was perhaps part of the general outlook of the world at that time, namely, that now that a destructive war was over, vigorous steps should be taken to improve the material conditions of living for the worse off sections of the population. The money available for these ambitious schemes was to come from the savings which had accrued during the period of the Second World War when it was impracticable to undertake the ordinary programmes of development and maintenance and repair of existing institutions. From 1947 to 1955 was a period of partition and post-partition confusion. It was also a period when help from abroad began to be available to develop the state on the latest modern lines. During all this time the Sind Government was very ambitious and launched many projects.

Despite the rather fragmentary conclusions which can be drawn from a study of price levels, the reader might be interested to compare the price of a maund of wheat at various years since the time when, from the commencement of British rule, statistics about the price of grain began to be recorded.

Prices of Wheat and Rice per-maund Locally.

Year.	Wheat.	Rice.
1844-50	1—0—7	0—15—7 Sind (average).
1896-1906	3—11—3	4—3—4 Sind (average).
1915	5—10—0	7—8—0 Hyderabad.
1951 (September)	9—8—0	11—0—0 Dadu.
1953 (January)	15—8—0	13—0—0 Dadu.
1956 (March)	11—12—0	14—0—0 Dadu.

The study of the price levels, of which these are only capriciously selected items, is one for professional economists and sociologists to undertake, since one of the main questions involved is the fall

in the value of money caused by social events, not only in Sind, but over the world generally, and the extent to which Sind prices have been affected by world trends is an indication of the extent to which world economy has been unified commercially since the days in 1843, when Sir Charles Napier won the Battle of Miani.

Such general conclusions as may be drawn from the table above are that for the fifty years after the Battle of Miani the rise in the prices of wheat and rice may be taken as showing the cost of general development and the increase of amenities of all kinds during the last half of the nineteenth century. The 1915 figures belong to a period when the First World War was in a critical state and scarcity of supplies was almost as urgent as it became in the critical days of the Second World War. As regards the last three figures for 1951, 1953 and 1956, the year 1953 should be regarded as governed by unusual influences, for that year was one in which there occurred great scarcity of foodgrains in East Pakistan and procurement took place in Sind in order to ensure that the provinces with a surplus should contribute to a pool for the relief of stricken areas in Pakistan. The 1956 figures indicate the level at which prices are now more or less stable, and they indicate also the extent to which inflation has occurred and payment is being made for the great increase in amenities which the modern state considers necessary and inevitable.

II

The Occupational Scheme.

In the 1951 Census certain new categories were used for the description of the occupational Scheme of the country. The population was divided into two broad categories of economic status : (1) the self-supporting and (2) dependents. The self-supporting section was divided into : (1) agricultural labour force, (2) non-agricultural civilian labour force, and (3) persons not in the civilian labour force. The civilian labour force excluded the armed services and included all other economically active persons, all persons who work for their own account other than in the employ of others; salaried employees, wage earners and the unpaid family workers engaged directly in family business enterprises are covered by the term civilian labour. In other words the civilian labour force includes all persons engaged in remunerative activities of economic value and also those unemployed persons who are not working but are seeking work and able to take a job. The term excluded inactive persons, such as students, those who have retired from work, inmates of prisons, asylums and beggars. Persons who are self-supporting, or are partially self-supporting, or are not seeking work were classed as dependents. All children under

twelve years were assumed to be dependents. On this basis the following statement shows the persons according to economic status per cent. of the population.

Districts.	Total Population.	Self-supporting Civilian Labour Force.			Dependent.	
		Agri-cultural.	Non-Agricultural.	Not in Civilian Labour Force inactive.	Under 12 years.	12 years and over.
Sind including Khairpur State	49,25,342	24.1	9.3	0.6	34.4	31.6
Sind	46,05,934	24.0	9.5	0.7	34.2	31.6
Khairpur State	3,19,408	25.1	6.9	0.7	37.1	30.2

From this statement it will appear that in Sind and Khairpur together dependents constituted 66 per cent. of the total population, leaving only 34 per cent. to carry on the productive activities of the country. Of this 34 per cent. 24.1 per cent. were engaged in agricultural activity, 9.3 in non-agricultural activity and 0.6 per cent. were engaged in the category which was not in the civilian labour force and was inactive. The percentage of workers in the economic divisions of Sind and Khairpur is set out in the statement which follows.

(%s in lower lines are females).

Main Economic Divisions.					Sind and Khairpur.	Sind.	Khairpur
TOTAL	..	..	..	..	1.00	1.00	1.00
					2.2	2.3	0.5
Cultivation	..	..	..	..	68.1	67.8	73.2
					1.7	1.8	0.4
Animal Husbandry	..	..	..	..	2.0	2.0	2.0
					0.004	0.004	0.005
Other Agriculture	..	..	..	..	0.3	0.3	0.3
					0.001	0.001	..
Forestry	..	..	..	..	0.006	0.01	..
Fishery	..	..	..	..	0.6	0.6	0.4
					0.01	0.01	0.001
Mining	..	..	..	..	0.03	0.03	0.005
Manufacturing	..	..	..	..	4.9	5.0	4.0
					0.0	0.7	0.04
Building Construction and Utilities	..	..	..	..	0.5	0.5	0.5
					0.002	0.002	..
Trade and Commerce	..	..	..	..	7.1	7.1	6.2
					0.07	0.07	0.01

Main Economic Division.	Sind and Khairpur.	Sind.	Khairpur.
Transport and Shipping	1.1 0.003	1.2 0.003	0.7 0.001
Post and Telecommunication	0.05	0.05	0.03
Education	0.5 0.01	0.5 0.01	0.7 0.01
Medical	0.2 0.03	0.2 0.03	0.2 0.02
Governmental, Municipal etc. services	2.6 0.01	2.6 0.01	2.1 0.004
Domestic and Personal Services	3.1 0.1	3.1 0.1	3.2 0.02
Religion, Art, Public Information etc.	0.2 0.02	0.2 0.03	0.2 0.2
Other and Unclassified including unemployment.. .. .	6.54 0.21	6.7 0.2	3.2 0.0
Unemployment N.A.L.F.	0.3	0.4	0.1
Unemployment A.L.F.	1.7 0.03	1.6 0.03	3.0 0.001

The above statement shows that in Sind and Khairpur 68.1 per cent. of the working population was engaged in cultivation, 7.1 per cent. in trade and commerce, 4.9 per cent. in manufacture, 2.6 per cent. in Government and in municipal services and 6.5 per cent. in unclassified categories, including unemployed. Out of 16.44 lakhs of the total civilian labour force 11.48 lakhs were engaged in cultivation, and the other 3 lakhs were distributed, 33.3 thousand in animal husbandry, 10.3 thousand in fisheries, 81.1 thousand in manufacturing, 8.2 thousand in building and construction, 1.16 lakhs in trade and commerce, 18.7 thousand in transport and shipping, 8.2 thousand in education, 4.0 thousand in medical service, 42.4 thousand in Government and Municipal services etc., 51.4 thousand in domestic and personal service, 3.3 thousand in religion, art and public information. But 1.13 lakhs, including nearly all the unskilled labourers, are unclassified.

Agricultural Statistics per cent. of Cultivators.

Districts and States,	Cultivators.	Owning		Renting		Agricultural labourers.
		All land tilled	Part and Renting part land tilled	All land tilled	And also working on hire	
Sind and Khairpur	11,47,705	15.6	7.9	72.6	1.2	2.7
Sind	10,69,826	14.5	7.4	74.1	1.2	2.8
Khairpur	77,879	31.3	14.3	52.4	0.8	1.2

The majority of workers in Sind, as well as in Khairpur State are cultivators. Next to them a larger number of persons are working in trade and commerce than in manufacturing, Government

and Municipal services and domestic and personal services. In important towns the majority of workers are employed in trade, and commerce. When the information as to the agricultural status of cultivators is broken up, it is found that in Sind and Khairpur together, of the total number of cultivators, 11,47,705, 15.6 per cent. were owners tilling all the land they held, 7.9 were owners-part cultivating and part renting out the land tilled, 72.6 per cent. were persons renting all the land they tilled, and 1.2 were renting and also working on hire, and agricultural labourers were 2.7 per cent. For Khairpur alone from a total of 77,879 cultivators, cultivating owners were 31.3 per cent., cultivating all the land they held, and 14.3 per cent. part cultivated and part rented the land they tilled, and the renting cultivators were 52.4 per cent. renting all the land they tilled and 0.8 per cent. rented land and also worked for hire, and the proportion of agricultural labourers was 1.2. The conclusion to be drawn from this table is that cultivating owners constituted in Sind and Khairpur together 23.5 per cent. of all cultivators; 73.8 per cent. were persons who rented land and did not own it, that is to say roughly, that of all cultivators one in four were cultivating owners and three out of four were agriculturists renting the land which they tilled. In the Census Report for 1951 it is stated that the total number of agricultural workers in Sind, including Khairpur State, was 1,186,247 and the total cultivable area was 14,168,443 acres, of which, on an average for the three years ending 1949-50, an area of 5,956,620 acres was actually cultivated every year. The cultivated area per agricultural worker, therefore, worked out at about five acres, which in itself is not an economic holding. This bare arithmetical average, however, possesses very little value, except as a basis for calculating what should be done in case any time hereafter it were decided to split up the land amongst cultivating agriculturists. It cannot be deduced from this figure of five acres that the majority of agriculturists in Sind must be living in abject and complete poverty. In the Census it is stated, while summing up on the economic condition of agriculturists, that in the desert, in hilly portions of Dadu and other areas cultivated on rains, their condition is miserable; and that of those in the areas outside the Sukkur Barrage it is much below average; and that of those in the Sukkur Barrage zone it is generally a bare living. "As a rule," says the Census Superintendent, "Sind people are economical in their dress, food and generally lead a simple life. The standard of living, however, varies in different parts of the province; in the desert people generally live in kutchas huts and their usual food is simple bread with milk or curd twice a day. Ordinarily every agriculturist has a few animals which, not only give him milk, butter and curd to be taken with bread, but also produce bullocks for his field work. In the Sukkur Barrage area the people generally have houses of mud walls and their dress, though simple, is decent. Their usual diet

is milk, butter, vegetables, pulses, mutton and rice; but at every meal they usually have only one course. In the other areas the living of the people, though not very much different from what has been shown above, is even more austere and the houses they live in are mostly kutcha. Sind cultivators are, used to a hard life. If their crops fail they go to the nearest town, and do any sort of hard work they can find."

While this statement is true enough generally, it depicts too gloomy a picture of conditions in the rural areas of Sind and Khairpur. These conditions must be understood in connection with the standard of living which the cultivator is accustomed to and which in many cases he desires to maintain unchanged. The nature of the houses and habitations which cultivators use is largely a matter of convenience, determined in extensive areas by the climatic conditions of the countryside. Moreover, it is not true to suggest that the best way of improving the condition of the rural population is by some sort of increase in material comforts, especially if in the rush to obtain increased comforts settled and established institutions and ways of living are too rapidly disturbed or disrupted. This is a danger which has happened in many parts of the world where too great emphasis has been laid upon material gains, and not sufficient consideration has been devoted to the break-up of old established economies.

Sind and Khairpur are agricultural areas but there are no industrial establishments of any size for the processing or manufacture of agricultural produce, except for rice-husking factories in the rice-growing areas of Dadu, Larkana, Jacobabad, Sukkur and Tharparkar districts, and cotton-ginning factories in the cotton-growing areas of Nawabshah, Tharparkar and Hyderabad districts. There are textile mills at Khairpur Mirs and at Hyderabad, and flour-mills in all towns. These constitute the extent to which industrialisation has invaded a purely agricultural economy in the agricultural field.

When the occupations of the non-agricultural labour force are examined, it will be seen that the following table displays the all-over position in Sind and Khairpur. The figures which follow are taken from Table 11-A of the Sind and Khairpur Census Report of 1951, and are to the nearest thousand, showing occupation as it was in January, 1951.

NON-AGRICULTURAL LABOUR FORCE

Sind and Khairpur (to nearest 1,000).

Occupational Groups.	Total No. of Persons.
NON-AGRICULTURAL LABOUR FORCE ..	458
<i>Professional and Technical</i>	18
Engineers, Architects, etc.	..
Transport Managers, Pilots, etc.	..
Professors and Teachers	8
Religious Workers	2
Physicians and Workers	3
Nurses and other Health Workers	1
Authors-Editors and Journalists	..
Judges, Lawyers, etc.	..
Chemists and Metallurgists	..
Other Professions	3
<i>Administrative</i>	41
Business Executives	5
Government etc.	..
Office Workers	36
Sales workers and Shop keepers	100
Forestry Workers	..
Fishermen	10
Mine and Quarry Workers	..
Transport Operatives	13
Road	8
Railway	4
Sea and River Craft Crews	1
Air Transport	..
<i>Manufacturing Workers (Skilled)</i>	76
Metal Workers	15
Textile Workers	20
Wood Workers	11

Occupational Groups,	Total No. of Persons.
Coke, Cement, Brick etc. Workers	1
Glass and Ceramic Workers	7
Chemical Paints, Oil Mill Workers	1
Leather Workers	13
Paper Mill Workers	..
Printing trade operatives	..
Building trade operatives	6
Electrical Workers	1
Other skilled production workers	1
Food, Drink and Tobacco Processing Workers	9
Unskilled Labourers	130
Domestic Servants	31
Other Service Workers	17
Police, Fire etc. Services	12
Unclassified	..

The total non-agricultural labour force, male and female, amounted to 458,000. In this total the main classes were:—professional and technical occupations 18,000, administration 41,000, sales workers and shopkeepers 100,000; fishermen 10,000, transport operatives 13,000, manufacturing workers 76,000. Manufacturing is broken up into the following showing the main categories:—metal workers 15,000, textile workers 20,000, wood workers 11,000, leather workers 13,000, building workers 6,000, glass and ceramics 7,000, food, drink and tobacco 9,000, unskilled labourers 130,000, domestic servants 31,000, other service workers 17,000, police force, fire services etc. 12,000. The number of females enumerated in these categories was in the total only 9,000 for the whole of Sind and Khairpur, which seems to be a gross understatement. The only categories which return substantial numbers of female workers were professional and technical with 1,000, sales workers and shopkeepers 1,000, textile workers 1,000, unskilled labourers 3,000 and domestic servants 1,000. When the non-agricultural labour force in respect of the employment of females is compared with the agricultural labour force in the same respect, it is found that in the agricultural labour force there are enumerated 28,000 females, of whom 27.5 thousand are cultivators and agricultural labourers and 448 are shown as unemployed. Cultivators shown as unemployed in the census tabulation are

generally cultivators who were without work at the time of the census. Most of them might be owning or renting land which depended for its irrigation on rain water or river floods, or on some canals with deficient water supply, and it might not have been cultivated for the want of irrigation, and for that reason the cultivators may have shown themselves as unemployed at the time of the census. Those unemployed persons were spread over all districts and Khairpur State but the largest number, 7,065, was in the Tharparkar district, in which the entire desert area is cultivated only on rainwater. Of the working population in the non-agricultural civilian labour force the 1951 Census showed that roughly about 25 per cent. were engaged in trade and commerce, about 25 per cent. were in unclassified occupations or unemployed, about 18 per cent. were engaged in manufacture, about 11 per cent. were in domestic and personal service and about 9 per cent. were in government and municipal and other public or semi-public services. All other categories together formed about 12 per cent. of the total, and included those engaged in forestry, in fishery, in mining, in building and construction, in utilities, in transport and shipping, in port services, in post and telecommunications, in education, in medical services, in religion, art and public information. Taking Sind and Khairpur as a whole, nearly three times as many persons are employed in cultivation as in all other forms of occupation together. The 1951 Census, therefore, demonstrates incontestably that the economy of Sind and Khairpur is overwhelmingly agricultural. Sir Sidney Ridley stated before the Sind Agricultural Commission in 1954 that the percentage of the agricultural population in Sind was nearly 80 per cent., in which were included children and women, as well as village artisans, dependent upon agriculture. In this, Sind and Khairpur are typical of Pakistan as a whole. In West Pakistan as a whole each agricultural worker is cultivating about 4.4 acres of land; in Sind and Khairpur the figure is about 5 acres.

III

Features of the Agricultural Economy.

The agricultural economy of Sind and Khairpur is characterised and dominated by the zamindar-hari relationship. The relationship is largely feudal still, with many strong loyalties existing today between the zamindar, the holder of the land, and the hari, the cultivating tenant-at-will. The relationship is both a system of life and a co-operation for agricultural production, and it provides a personal credit system without which agriculture would not thrive. The zamindari system is very largely the result of historical influences, since in the past large areas of land were given into the possession of influential men who have cultivated

extensive tracts of land with the help of their followers and servants. It has still to be shewn that any other system will work better in the conditions prevalent in Sind and Khairpur. It would be folly to abolish this system, even were that possible today, without first putting in its place something equally simple and equally capable of providing credit without the intricacies and formalities of a banking system. In his evidence before the Sind Agricultural Commission in 1954 Sir Sidney Ridley said: "I do not think it desirable to alter the set-up or to eliminate the big holdings. I do not think it would have any material effect on the economic position of the people in the lower grade. The hari is very often much better off than the smallholder, who has 20 to 25 acres of land and cultivates himself. If his crop is ruined by locusts or other calamity, he has to look after his own interests, whereas the hari will usually get his maintenance from his zamindar. The hari is often better off than the smallholder. Besides the above the government have set apart 275,000 acres of land in the Lloyd Barrage area for grant to haris on the basis of 20 acres per family. The land is there, though it has not all been taken up by the haris. They are not coming to take it up; they prefer to continue to be haris rather than hold 20 acres of land as smallholders".

The zamindari system in Sind and Khairpur has great merits which advanced social thought today either does not recognise or which it tends to disparage. The burden of the criticism which the system faces is based upon distaste that the hari should be so poorly off in money and should be continually in debt. But the position is not nearly so bad as modern egalitarian and socialist thinking is ready to believe. Living on an income free from debt is an aim or ideal of the comfortable upper and middle-classes in advanced countries, persons with a bank balance and a surplus to spend on cultural and other interests. This happy state of affairs has never been true in industry, which lives on credit and overdrafts. In the West the working-classes have always had to borrow in the past through pawnbrokers and in other direct ways, and even now in Britain hire-purchase, which continually mortgages the future for the present, is in substance the same system as the agricultural credit system in Sind worked for generations by zamindar and hari. The financing of the hari, permanently indebted to his zamindar or a money-lender, is in substance not different from the practice of most modern governments permanently bound to pay loans in the service of the national debt. In the same way the hari is always having to pay for money advances by surrendering part of his income annually.

There is no way out of the main problem of indebtedness in agriculture, which is not really much of a social evil. Curing the landlessness of the cultivating tenant is no answer because there

is not nearly enough land to form an economic unit to provide for all the cultivators in Sind and Khairpur and co-operative farms are probably no answer either, if individualism is to be retained, as it is likely always to remain under Islamic thinking.

The main objection to the indebtedness of the past vanished with the disappearance of the Hindu money-lender and landowner in 1947. The 1907 Edition of the Gazetteer says "that the great majority of the cultivating classes are in debt goes without saying, and does not necessarily imply that they are not well-off, for people so constituted that they cannot keep money or so situated that it is not safe for them to keep it, the best practical arrangement may be to live always on the anticipated earnings of the future and to possess nothing in the present". This was the modus vivendi adopted by the humbler classes throughout India. In Sind they were fortunate in being, as a rule, attached to a landlord who was debarred by his religion from taking any interest for the advances which his principles and his advantage alike prompted him to give them, and those who served well-to-do zamindars enjoy that advantage still. It is a very general practice for the zamindar to maintain his haris during the working season and to recoup himself at the batai. The position of the zamindar has not improved under British rule. That he should retain his feudal power and patriarchal authority was not to be expected, and the British policy was from the beginning directed to encouraging the humbler tillers of the soil to aspire to independence. But it was no part of that policy to reduce the natural leaders of the people to insolvency and force them to part with their ancestral estates. This, nevertheless, was the almost immediate effect of the introduction of regular British administration. At the time of the conquest the whole of the land in Sind, exclusive of jagirs, was either in the possession or under the protection of the large zamindars. Smaller landlords, and even peasant proprietors, existed but acknowledged the rights of the chief lord by the payment of lapo. This was almost the only arrangement possible under such a government as then was in a country in which cultivation depended absolutely on large works of irrigation involving capital and organised labour. The land-holders, large and small, were Muslim, like the cultivators under them. The Hindus of Sind were not of an agricultural class nor would the position of a Hindu land-holder have been tolerable under the Mirs. Therefore, while the zamindar and the cultivator alike looked to the bania for money when he needed it and he fleeced them of as much of the produce of the land as he could, he had no desire for the land itself. But the introduction of the civil courts in 1866 changed all that. In works of Mr. Mountford, writing in his pamphlet on the relations between debtor and creditor, published more than fifty years ago. "The facilities offered by the civil courts for re-

covery of debt, the enforced sale of land in execution of a decree, the value land had acquired owing to the scarcity of security of tenure, the admirable opportunities that the civil law afforded to the stronger intellect for cheating and deluding the weaker intellect stimulated the money-lender to advance far in excess of what had been his former unit, namely the surplus of the zamindar's crop. The introduction of the British Civil Courts in 1866, following rapidly on the unsuitable First Settlement of 1865, opened the eyes of the banias to the wide vista of prosperity which was now unfolded before them. Land was now a marketable commodity; they could hold it themselves and take therefrom, not the surplus produce, but the whole produce after allowing the haris the barest subsistence and ousting the zamindar and keeping him on as a cultivator. They could now enjoy his share as well as the surplus. They were not slow to take advantage of their unique opportunities and enrich themselves, now that under the security of the British Government society had been subversed. This sudden subversion was too much for a race whose generosity was proverbial, and who had crude notions of the advantages of thrift and learning. Within eleven years of the opening of the first Civil Court it was found necessary to start the first Sind Encumbered Estates Act. The banias had done their work so well with the admirable material that lay at their hand under the fostering influence of British law, but the zamindar was heavily involved in debt and the stability of the newly acquired little province was shaken to its foundations. In 1864 the early settlements showed that the Hindu land-holders were rare, but the introduction of the Civil Courts in 1866 rendered land liable for debt and afforded every facility for the recovery of debt, while the security of life and property and the lightness of the assessment, no longer one-third of the gross or even more as under the Talpurs, rendered land a valuable commodity. In these circumstances the bania soon developed a taste for land and became an ardent land grabber. Both he and the zamindar competed for the possession, the zamindar to retain what he had and the bania to procure the best available land that had been rendered fit for cultivation by the zamindar's and his ancestors' efforts. With the facilities given them under the Civil Procedure Code of recovering debts by sale of land, the moneylenders soon began to foreclose and the heavily indebted zamindar, oppressed by a new system which he could not even faintly comprehend, saw in bewilderment his best land passing into the hands of the despised bania. Under the rayatwari settlement, which was open to hereditary cultivator and moneylender alike, the bania was able to extend his holding, until in 1892 1,771 Hindus were holding properties over 200 acres in extent against 7,620 Muslims. This process continued with ever-gathering force until the end of the days of British rule, when in the thirties of the present century the bania discovered his heyday

as an acquirer of land which had been cultivated by others and had to be disposed of in settlement of debt. The great evil of the system which enabled Hindus to come into possession of cultivated land in this way was that it encouraged enormously the creation of a class of absentee landlords who took little interest in the cultivation of the land, and were concerned merely in collecting the profits of it. But the whole of this particular evil was undone in 1947, when with partition caste Hindus deserted the country en masse with their debts uncollected. Mr. A. R. Arain, Professor of Agricultural Economics, K.G.V. Institute of Agriculture Sakrand, in his evidence before the Sind Agricultural Commission in 1953, when asked as to the extent of agricultural indebtedness in the province said: "Hardly 13 per cent. of the families in Sind were free from the burden of debt in 1936. The debts consisted of mainly private loans taken from moneylenders, mostly for unproductive purposes. Revenue arrears and takavi loans and loans from the co-operative societies also formed a good part of the debt owing by the khatedars. Most of the private debt," he added, "was liquidated by the exodus of the Hindus, who formed the moneylending class". "At present," he said, "the rural debt consists mainly of the money required by tenants to meet their ordinary running expenditure. The extent of debt may be put on an average at 100 rupees per family in the case of about 50 per cent. of agricultural families." Professor Arain states that there are no data available from which it is possible to estimate the income of the agriculturists without knowing the details of the livestock owned. Income will differ with different types of livestock, such as camels, horses, buffaloes, cows, sheep and goats, as also with the number of animals he possesses. The income will also vary with the prices of livestock products, such as milk, ghee, butter, wool, hair, etc. The price of meat will determine the price of animals for meat. It is the absence of these details, constituting an important part of the agriculturist's livelihood, which renders very vulnerable the money estimates of agriculturists' income which have been collected by statistical departments. Professor Arain stated that he considered the per capita income in Sind would be about 215 rupees per annum, and the average income of a hari family in the dry crop area was approximately 700 rupees per year; but he may earn from other sources 200 rupees, thus bringing the total to 900 rupees per annum. A permanently employed labourer in agriculture would earn about 450 rupees per year, at 1 rupee 4 annas per day on an average.

In dealing with this matter we must not forget that still in large parts of rural Sind and Khairpur there is not a great deal of need for money and that concentration on money incomes gives an incomplete picture of the economic position of the agricultural worker, whether he is the owner of the land or a cultivating

tenant. The tenancy legislation of 1947, which was meant to give security to the cultivating tenant, was excellent in intention but its provisions proved easy to evade. It is doubtful whether the security it gives offers much improvement over the system where the good zamindar held control, and most zamindars did not wish to antagonise their haris and drive them away, as there was a growing shortage of agricultural labour of a permanent kind throughout the last thirty years of British rule. The tendency has been accentuated since independence under Pakistan. Income remains low, but this does not prove that the system is bad; it is workable and generally acceptable. It is only as a result of the socialistic agitation of the last fifteen years or so that there has been any kind of semi-organised opposition against the abuses of the system. Very likely most haris are just not interested, provided they obtain the occupation and the modest means with which they seek to lead their traditional life. The rent system under batai remains more or less unchanged; but with the shortage of agricultural labour, especially when more land becomes available under the new Barrages and with the drift to the towns as a result of the drive to make Pakistan more industrial, the zamindar is being forced economically into a weaker position vis-a-vis the haris. Just as under British rule, the general result was a diminution in the political power of the zamindar as democratic institutions became part of official policy towards the ultimate goal of self-government for the country. Emphasis has been placed far too much on purely material progress inspired by the planning of the future, which is almost entirely economic in aim concerned with the ways of spending huge foreign subventions in order to carry out enormous schemes aimed at increasing production, productivity per worker and raising the standard of life which, being analysed, means converting everything into money terms and enabling the poor man to afford more luxuries than he ever knew before. This, of course, is completely at variance with the feudal idea that has hitherto ruled agricultural Sind and Khairpur. The movement, if carried out, is likely to increase vastly the bureaucratic control over the minutiae of village life as schools, hospitals, welfare centres, travelling clinics and village libraries are multiplied all over the countryside and supervised by a new class of government official. Whether this is good or bad the future will decide, but for the present it can be said that the trend of this movement is inevitable. Nothing has been fully thought, out; and in the Pakistan Plan 1955-1960 it appears that many excellent things in themselves have been planned. No one can doubt that present-day thinking is too materialistic and that far too much emphasis has been laid upon the increase of creature comforts for everybody as the greatest ideal at which the state should aim. In the meantime the zamindar continues to think more or less as he did, and the hari has no conception of any great social change in his

relation to the zamindar and in his relationship to the state as a fully privileged citizen. With the great increase in agricultural prices, which is characteristic of the last twenty years, it is true to say that never has the zamindar or the hari had so much money in his hands as he has today. Some of the results of this are evident enough. Many zamindars now run expensive motorcars and some of them have tractors; and in the wattle hut of the hari can be seen manufactured china cups and saucers taking the place of the old village earthenware. Both zamindar and hari now travel much more than they used to do, which is a sign that they have money to spend on travel, and it is no uncommon thing now for the poorest agriculturist to be seen drinking some of the sweet mineral waters so freely advertised all over the countryside. In these circumstances the view expressed in paragraph 231 of the Agricultural Commission's Report paints an over-gloomy view of what is happening. The report says "the agriculturists in Sind are well-known for their extravagant expenditure in everyday life, especially on all ceremonial occasions. As we have pointed out above, agriculturists in Sind could be divided into two classes, zamindars and haris. This extravagance of expenditure is rampant in both classes barring a few exceptions which are so rare among them. The majority of zamindars and haris, as we have said above, do not keep any account of their income and expenditure and few of them have acquired the habit of saving for a rainy day. Even some of the largest landholders in Sind are found in debt and the hari, whose income is very much less, is generally heavily in debt. After the enactment of the Tenancy Act, however, since the provision of the Act prevents the zamindars from recovering their dues directly from the produce at the time of batai and gives the option to haris to get an equal quantity of grain in lieu of the seed, or pay its value, whichever is suitable to him, zamindars have begun to refrain from giving takavi or other loans to the haris. The hari has, therefore, necessarily to go to some small trader for his needs. While the zamindars generally never charge any interest from the hari, the small trader on the contrary recovers his pound of flesh like the proverbial Shylock in the nature of extremely heavy interest. When the hari needs, he takes his grain to the trader, who gives him credit for it at very much less than the current rate, and instead of paying him cash gives him in exchange some other commodity required by the hari. On the other hand, extreme expenditure on all ceremonial occasions is a common disease of both zamindars and haris. They even go to the extent of incurring heavy debts for feeding the whole raj, which may consist of about one thousand persons. Nazrana for pirs and rasai for officials are another source of expenditure. The cost of rasai generally has to be faced by the zamindars and not by the haris, excepting of course in the case of the tapedar, who now enters his permanent rights. The pir muridi

system, which is rampant in Sind, is developing into a curse for the common man, and the visit of a pir, followed by his khalifas and a score of murids and friends, forces the hari to incur expenses for their stay and entertainment which are a drain upon his income. Besides this he has to pay a yearly subscription to the pir."

As against this view the opinion of Professor Arain, of the Sakrand Institute, deserves to be studied. "It is generally admitted that the peasantry of Sind appear to lead a happy and easy, not to say, a rather indolent life. Their condition is worse in the coast talukas and in the hilly and desert tracts. In the first of these a malarious climate and the uncertainties of agriculture dependent on floods continually depress them. In the hilly and desert tracts both climate and terrain make a fully comfortable life impossible for most of the year. But on the whole there is little doubt that the position of the indigenous farm labourer has improved much. The style of living has changed little, except that he eats rather better food and wears more warm clothing. But his earning and means of livelihood are less precarious and a greatly increased demand for labour not only in agriculture with the throwing open of large areas of land under the new Barrages, but also in other directions, has made him more independent. The extension of present proprietorship which resulted from the last settlement has also opened a door to ambition, of which the industrious and frugal are freely taking advantage. Reverting to the poverty of the agriculturist again, the questions which arise today are: "How is credit obtained after the disappearance of the Hindu moneylender in 1947, and how is the productivity of agriculture to be increased, which is what all the planning schemes contemplated for the future of Pakistan are demanding." Some little attention must be paid to these matters. First, as regards the provision of credit, the problem has altered enormously with the disappearance of the Hindu and village moneylender. He, with the zamindar himself, was the chief source of credit for the cultivator. It is likely that zamindars are still providing the bulk of the short-term credit required by the cultivating tenant, though it may be unlikely that they are all anxious to do so in order to give three years' tenancy occupation to their cultivators, which would provide these with security under the tenancy legislation of 1947. It is quite natural that zamindars should be unwilling to grant facilities to their tenants to establish permanent rights against themselves. The petty trader who deals in money, of course, still exist; but it is not known to what extent he is financing agriculture in the way in which the Hindu moneylender and shopkeeper used to do. Usury is frowned on by Islam but it does not mean that there are no Muslim usurers. Zamindars with more money in their hands are of

course, in a better position to offer takavi to their tenants, and it is very probable that many are doing so. No statistics, however, exist to show conclusively what exactly is happening in the agricultural credit field today. Professor Arain says that agriculturists require short-term credit, medium term credit and long-term credit. In these three classes he places for short-term; seasonal agricultural operation, implements and seeds, personal expenses; for medium-term credit; purchase of cattle and bullocks, expenses of ceremonials and improvement of land; and for long-term credit; the payment of old debts, the purchase of costly machinery the purchase of land and improvements involving heavy outlay. The most important need is the supply of short-term credit, and this can best be met through co-operative banks on the security of the standard crops and livestock. Professor Arain thinks that such co-operative banks should be backed by government and the co-operative banks should be provincial, district and taluka. Under this plan all banks would be guaranteed by government and all loans would be recoverable as arrears of land revenue. However, it is unlikely that the government will accept this plan.

Much thought has been given in Pakistan to the problem of providing agricultural credit, and in the White paper on the Budget of the Government of Pakistan for the financial year ending 31st, March, 1958, it is stated that the Agricultural Development Finance Corporation entered the fourth year of its life when its sanctioned loans amounted to 90.87 lakhs up to end of December 1956. The explanation for this modest figure lies largely in the fact that the Corporation has been working under handicaps. Certain provisions of the provincial land debt laws, the evacuee law and conditions attached to reclaimed land have the effect of placing restrictions on the mortgaging of agricultural land, and this has stood in the way of the Corporation granting loans. The an agricultural bank has been completed and a bill for the constitutive societies for the reason that these societies have no assets of their own to offer as security. Provincial governments have been requested to provide guarantees to co-operative societies to enable them to take loans from the Corporation. In order to increase the facilities for rural credit, the scheme for the establishment of an agricultural bank has been completed and a bill for the constitution of the bank has already been introduced in the National Assembly*. In addition to providing credit facilities to agriculturists, co-operative societies and other bodies, the bank will offer technical assistance to co-operatives and provide facilities for warehousing, storage and marketing agricultural products. The initial paid-up capital of the bank will be 3 crores, of which 2

*The scheme is now a reality.

crores will be subscribed by the Central Government and 1 crore will be offered for subscription to the Provincial Governments and co-operative bodies. This represents an approach to the rural credit problem, which is new and which could not have been contemplated without the initiative of the Government of Pakistan. In addition there is the possibility of the mobilisation of internal savings, facilities for the investment of which exist in the Post Office Savings Bank, in the Post Office Savings Certificates and in Postal Life Insurance. A small saving scheme which aims at popularising the sale of National Savings Certificates is being administered by the Provincial Governments under the supervision of the Central Government. The scheme is stated to be making satisfactory progress. By these various means it is hoped to overcome the difficulties which were created by the collapse of the bania money-lending system in 1947.

In his reply to the questions of the Sind Agricultural Commission Mr. A. G. M. Kazi, Secretary to the Government of Sind, Finance Department, stated in 1954 that the savings of the people were too insignificant to give rise to capital formation of the magnitude required to finance large scale industrialisation. He stated "Capital formation has been actually slowest in the province. Unfortunately accurate statistical data are not available. However, it is obvious that the total income of the people of the province is itself of the order of 100 to 150 crores. This indicates that the savings, which even in advanced countries are of the order of 5 to 10 per cent. cannot possibly give rise to the capital formation required for absorbing all this population in industry as envisaged by the Commission. In the meantime, the financing of agricultural operations is continuing as best it can with the means at disposal. As long as prices for agricultural commodities rule sufficiently high and there is every chance that they will continue to do so, in view of the growth of population and the need for meeting a constantly rising demand for foodgrains and cotton goods, it is likely that the zamindar class will continue to have a fairly satisfactory income from which to advance loans to cultivating tenants." This is probably all that can be said at the present moment. Official opinion on the value of co-operative societies and the provision of rural credit is not very favourable. The Registrar of Co-Operative Societies in Sind in his evidence before the Sind Agricultural Commission in 1953 stated that there were 331 co-operative societies working in the Province of Sind. Of these 187 were agricultural credit societies in the following classes: 6 zamindari banks, 16 taluka agricultural banks, 2 multi-purposes societies, 33 re-organised central societies 3 Farming societies and 127 primary agricultural societies, unlimited. In addition there was one agricultural non-credit society, namely the Shikarpur Grain Sale Society, Ltd. The Registrar says that much attention was paid in the beginning of the movement towards the development of the

agricultural co-operative credit side of the movement. The primary agricultural co-operative societies formed in various parts of Sind in the early stages could not achieve their objectives. Experience of the working of co-operative societies during the first four decades of the twentieth century show that in their peculiar conditions the primary village societies have not proved suitable. Some of the reasons for their lack of success are that there are no organised villages and means of communication and a prepondering influence of the headman of the village exerts control over the institution by him and his relatives; the stark illiteracy of the masses, and, in consequence lack of democratic spirit, the rather remote chance of development owing to the low percentage of literacy which is only 10 per cent., the lack of trained persons to work as secretaries; the incapacity of the societies to cover head charges owing to small capital; the lack of adequate supervision and the inadequate arrangement for the stay of inspectors and staff in the villages independently of the village zamindars; and the misuse and misapplication of the funds of the society by the Chairman and Committee Members and the raising of fictitious loans in the names of others. In view of these difficulties, the Registrar says, "It was not possible to develop primary agricultural societies in villages on sound lines in a developed democracy which is the sheet anchor of development of the institutions of these types. The co-operative movement came into active existence in the year 1918 when the Province of Sind was part of the Bombay Presidency. The co-operative movement became independent only in the year 1936, when the province was separated from Bombay. Since then 656 new societies of all types have been registered and 750 societies went into liquidation. It seems, therefore, for the present that the help of co-operative societies in the provision of rural credit constitutes a rather shaky prop.

As regards measure to increase productivity of agriculture as a whole and of the individual agricultural worker, per unit of capital and labour employed, various matters demand consideration, such as the optimum holding, the division of land by the breaking-up of large holdings, improved methods of cultivation, the effect of the growth of population, which seems to be at the rate of about 1.4 per cent. annually with the consequent pressure on the food supplies of the country and the effect on agricultural prices of the competition for markets which are now international and where outside factors contribute greatly to the rise in the cost of living. Asked what he considered an economic holding, Professor Arain gave his opinion that for a peasant proprietor the figure was 64 acres in the Barrage dry crop area and 32 acres in the Barrage rice area. He considered the minimum holding for the zamindar, which would enable him to maintain a fair standard of living and educate his children at college, would be 320 acres in the Barrage dry crop area and 160 acres in the Barrage rice

crop area. Obviously with holdings of this size, the sub-division between cultivating tenants of all the land in Sind would not suffice to provide for anything like the number of cultivators at present in employment. Actually the Government of Sind was working on the assumption that the minimum economic holding for a peasant proprietor would be about 20 acres. Even on this reduced average figure, the available land in Sind would not go nearly far enough to accommodate all the persons to be provided for. It seems, therefore, that whatever the future may have in store, there is no likelihood that any scheme which involved the splitting up of present holdings would be more beneficial to the national economy than the existing system which has both large estates, medium estates small estates and a great number of cultivating tenants. Nor is there any likelihood that any practical system better than the zamindari-hari relationship in the providing of agricultural short term credit can produce better results than the system which exists today. Apart from improvements in the technique of cultivation, which is probably the most important of all, mechanisation of agriculture and co-operative farming have been considered as the main ways in which to raise the productivity of agriculture. The Finance Secretary, Mr. Kazi, however, is of opinion that mechanisation on a large scale is not desirable. He stated before the Sind Agricultural Commission: "We shall have to reconcile ourselves to the fact that for years to come the economy of the country will be largely agricultural, and the major portion of the population will have to depend on agriculture. It appears to be undesirable to make an all-out effort for mechanisation of agricultural processes, as this would give rise to a surplus unemployed agricultural population which could not be absorbed in industry for a long time to come." The Sind Agricultural Commission made a cautious recommendation in favour of extension of mechanisation to agriculture in Sind. The Commission said "There are extensive tracts of land still remaining in undeveloped condition in the Barrage area and there would be large tracts of virgin undeveloped land commanded by the remaining two Barrages. On account of the scarcity of agricultural labour we apprehend it would not be possible to develop these tracts without the assistance of machinery. By the introduction of mechanisation in the field of agriculture more land could be easily cultivated and looked after by a farmer with a consequent reduction in his working hours, which is bound to afford sufficient time and opportunity to him for following cultural and social pursuits." The Commission also drew attention to the fact that in certain tracts, on account of continuous and intensive cultivation, the soil had become very hard and clayey, which is extremely difficult to plough with the help of bullocks and the obsolete plough. In the circumstances when there is a great decrease in the number of bullocks available in the province, because of slaughter, and

horses are not being used for ploughing, machinery would obviously be necessary to surmount these difficulties. The Director of Agriculture in his evidence before the Commission said: "The Agricultural Engineering Section maintains a large number of tractors of high horse-power for lending to zamindars and farmers on a no-profit-and-loss basis. The demand is increasing and the department is not able to meet the requirements due to the limited number of tractors. As regards small khatodars, they are not interested. A few big zamindars have started partial mechanisation of their lands for cultivation. The programme to be adopted on a large scale is very difficult as, on the one hand, it will replace agricultural labour for which there is no alternative profession and, on the other, there is no arrangement for repairs and service and for supplying spare parts, which creates enormous difficulties for growers and therefore, the progress in that direction is very slow. However, a scheme has been prepared to purchase high-powered tractors costing 26 lakhs of rupees, the project being spread over 5 years, and the material required during the first year was purchased in 1951-52 and the approval for the rest of the materials was pending with the government." When asked his opinion on the mechanisation of agriculture in Sind and Khairpur, Sir Roger Thomas stated "I am opposed to mechanisation of agriculture in Pakistan on the intensive scale adopted in some western countries. I favour partial mechanisation which will take care only of the heavier operations, thereby enabling the existing farm labour to be engaged in intensive, as distinguished from the present extensive, forms of agriculture. The advantages of partial mechanisation would be the higher productivity of the land resulting from the better preparation of the land, effective control of weeds, improved tillage, saving in cattle labour, and consequent release of fodder areas for food and cash crops, and savings in the cost of transport of farm produce. This limited form of farm mechanisation has the additional important advantage of not disrupting rural economy in that it would not only unduly displace the existing agricultural labour. The needs of small holdings can be met by fostering the joint use of tractors and tractor-driven machinery. In areas commanded by the lower Sind Barrage project there is a grave danger of much of the water being misused and of its doing permanent and irreparable damage to large tracts of land during the initial years of the operation of the project, unless measures are adopted by government to avoid this calamity. Excessive farm mechanisation on most of these lands is not only desirable but indispensable to supplement the available agricultural labour. Government should make provisions in its terms for temporary leases on state lands that they should be adequately mechanised on a prescribed scale."

It seems, therefore, that the prospects of increasing mechanisation in Sind and Khairpur are good provided the new system is introduced on a gradual scale and that an adequate servicing and maintenance depot is available for the proper care of the tractors and other mechanical implements employed. The other main method suggested for the increase of productivity of cultivation in Sind and Khairpur relates to co-operative farming. The views of Sir Roger Thomas on this point are: "The only system," he says, "of co-operative farming which in my opinion holds any possibility of succeeding under present conditions in Sind is that in which government on its state lands collaborates with the cultivators of the soil in crop production, and engages its agent in the form of a board, or otherwise for the management of the land in all its aspects. It has achieved remarkable success in the Sudan. No proprietary rights of the land would be given to the peasants but they would be given here cultivating rights on economic family holdings. The government would engage in the farm management of the land through a statutory board whose duties and responsibilities would need to be defined. No direct land taxes or water rates would be collected in cash. Government revenues from the land would be in the form of a share of the crops grown. The revenues would include the cost of farm management entailed by the activities of the board." He concludes "I strongly recommend the adoption of this form of co-operative farming on an extensive scale on government owned lands located in the tracts to be commanded by the Lower Sind and Upper Sind Barrage Projects. Experience gained by government in this form of enterprise would point the way to desirable land tenure reforms on zamindari lands." The Sind Agricultural Commission agreed with Sir Roger Thomas in this matter and made a recommendation agreeing to his suggestion that 50,000 acres in the Lower Sind Barrage and 50,000 acres in the Upper Sind Barrage should be reserved for experimenting with the co-operative system of farming. The recommendations of the Sind Agricultural Commission were made to the Sind Government and, as that government has now been absorbed in West Pakistan, any recommendations in respect of co-operative farming in Sind and Khairpur must be left for the decision of the West Pakistan Government.

In concluding this account of the main features of the agricultural economy of Sind and Khairpur, a word must be said on the legislative enactments by which government has attempted during the last seventy years to deal with the indebtedness of zamindars. The pieces of legislation in question are: the Sind Encumbered Estates Act and its various amendments, and the Court of Wards Act which were designed for the benefit of the land-owning class, and the Deccan Agriculturists Relief Act which was brought into force in Sind in 1901, with the object of improving the financial position of the agriculturist. In addition the Agriculturists and Land Improvement Loans Acts of 1884 and 1883 respectively have greatly assisted landholders, especially since the Deccan Agriculturists Relief Act was brought into force. The effect of the last act was actually to destroy the credit of the agriculturist and curiously enough of the money-lender too, for the latter generally owned land and was ready to take advantage of his position as an agriculturist against the larger capitalist from whom he borrowed to carry on his business. The subsequent difficulty of obtaining money was said by some to have done much injury to agriculture, and it might well have had this effect without the loans Acts. But the combined effect of them in restraining both extortion and extravagance and relieving the difficulties of the poorer zamindars was beyond question. The object of the Sind Encumbered Estates Act is to provide relief to jagirdars and zamindars by liquidating their debts and liabilities through the management of their immovable property. The object of the Court of Wards Act is to take under superintendence the property and persons, male or female, who by reason of their age and physical infirmity, mental or otherwise, are disqualified from managing their own property, so as to save it from being wasted. The table which follows shows the operation of the Sind Encumbered Estates Act and the Court of Wards Act in Sind since 1947,

**WORKING OF THE SIND ENCUMBERED ESTATES ACT AND THE COURT OF WARDS ACT FOR THE RELIEF
AND PROTECTION OF ZAMINDARS' ESTATES**

Encumbered Estates Act,						Court of Wards Act.					
1947-48 1948-49 1949-50 1950-51 1951-52						1947-48 1948-49 1949-50 1950-51 1951-52					
Estates under management.	89	88	77	63	48	Estates under management	354	356	359	337	342
Estates departmentally managed preparation 61	Year 1952-53					12					
Estates leased partly to outsiders preparation 19 and partly to women.	Year 1952-53					129					
Estates leased partly by department preparation 26 and partly by owners or lessees.	Year 1952-53					14					
Income of Department	1946-47	1952-53				1946-47	1952-53				
	Rs. 10,59,021	Rs. 2,55,086				Rs. 17,47,080	Rs. 13,48,817				
Expenditure of Department	1946-47	1952-53				1946-47	1952-53				
	Rs. 4,39,540	Rs. 78,969				Rs. 17,56,102	Rs. 10,54,005				
Arrears outstanding against lessees.	1952-53					1952-3					
	Rs. 99,184					Rs. 4,07,374					
Aggregate indebtedness of Estates under management of proved debt	1946-47					1952-53	1952-53				
	Rs. 18,38,097	Rs. 50,248				Rs. 5,15,788	Rs. 2,80,203				
private loan	Rs. 1,03,682	Rs. 73,471				Rs. 7,46,644	Rs. 7,13,403				
Total area under management.	18,401 acres 24 gunthas.					1,22,143 acres-2 gunthas.					

The State of Industrialisation in Sind and Khairpur.

How far Sind is from industrialisation and urbanisation is shown by the 1951 Census. According to that enumeration, of the employed population engaged in pursuits other than agriculture, barely one in twenty was employed in industry, and the proportion which the urban population bore to the total population in Sind in 1951 was 14.7, or a little over one in seven. In Khairpur the urban population was 6.8 of the total population. A very large part of the urban population is accounted for by Hyderabad itself, which in 1951 had a population of 241,000. Hyderabad is in fact the only considerable city in the whole region and its growth to nearly a quarter of a million in 1951 is mostly the result of the great influx of town-dwelling refugees whose numbers more than made up for the disappearance of the very large population of advanced Hindus belonging to the trading and commercial classes. When the compiler of this Gazetteer was Collector of Hyderabad over thirty years ago, the town had no more than 80,000 persons living within its boundaries. As urbanisation and industrialisation usually go together, it can be inferred that Sind is still very far from being typical of industrial conditions as they prevail in the advanced countries of the West. The 1951 Census shows that of the non-agricultural labour force of 458,000 in Sind and Khairpur manufacturing workers in the skilled category amounted to only 76,000, while sales workers and shop keepers, who constitute those engaged in trade and commerce, numbered only 100,000. Manufactures and trade and commerce together employed only 12 per cent. of the working population outside agriculture. The break-up of the economic groups of the non-agricultural civilian labour force for Sind and Khairpur is shown in the following table.

(Figures in the lower lines denote the number of Females included in the figures immediately above them).

Main Economic Divisions.						Total Workers. *
Total All Divisions	..	..	..	..	..	4,57,942 8,505
Foetry	..	..	..	..	..	101
Fisherry	..	..	..	..	..	10,314 222
Mining	..	..	..	..	..	514
Manufacturing	..	..	..	..	..	81,139 1,184

*Excluding (a) Defence Services (b) Economically inactive persons.

Main Economic Divisions					Total Workers.
Building, Construction and Utilities	..	..	..	..	8,159 25
Trade and Commerce	..	..	..	..	1,16,271 1,153
Transport, Shipping and Port Services	..	..	..	..	18,717 52
Post and Telecommunications	..	..	..	..	751
Education	..	..	..	..	8,177 227
Medical Services	..	..	..	..	4,022 482
Governmental, Municipal etc. Services	..	..	..	..	42,449 135
Domestic and Personal Services	..	..	..	..	51,380 1,684
Religion, Art, Public information etc.	..	..	..	..	3,347 387
Other and Unclassified (including unemployed)	..	..	..	..	1,12,601 2,954

Note:— Excluding (a) Defence Services (b) Economically in active Persons.

The classification of industries is given in the following statements.

SIND PROVINCE

NUMBER OF MANUFACTURING ESTABLISHMENTS IN THE BEGINNING OF THE YEAR 1948, 1949 AND 1950 IN SIND FALLING UNDER 29 GROUPS

Name of Industry.					1948	1949	1950
1.	Wheat Flour	..	..	..	5	5	6
2.	Rice Milling	..	..	..	96	95	93
3.	Biscuit Making	..	..	..	6	6	6
4.	Distilleries and Breweries	..	..	..	1	1	1
5.	Vegetable Oil, Oil seed and crushing and extraction and processing vegetable oils	..	..	..	3	3	3
6.	Cement	..	..	..	1	1	1
7.	Glass and Glassware	..	..	..	1	1	1
8.	General Engineering and Electrical Engineering	..	..	..	5	5	7

NUMBER OF MANUFACTURING ESTABLISHMENTS (FALLING UNDER 63 GROUPS) IN THE BEGINNING OF THE YEARS 1951-53.

				1951	1952	1953
	TOTAL	..	..	263	261	258
1.	Wheat Flour	..	..	6	6	5
2.	Rice Milling	..	..	94	94	9
3.	Biscuit Making	..	..	6	6	0
4.	Distilleries and Breweries	..	..	1	1	5
5.	Vegetable oil, oilseeds, crushing and extraction and processing vegetable oils	..	..	4	4	3
6.	Tanning	..	..	1	1	
7.	Cement	..	..	1	1	3
8.	Glass and Glassware	..	..	1	1	2
9.	Cotton Textiles-Spinning and Weaving	..	..	..	1	3
10.	General Engineering and Electrical Engineering	..	..	6	6	5
11.	Footwear and Leather manufacturing	..	..	1	1	1
12.	Hosiery and other knitted goods	..	..	..	..	1
13.	Cotton Ginning and pressing	..	..	130	127	125
14.	Silk and Artificial Silk	..	..	1	1	1
15.	Electricity Generating and transmission	..	..	3	3	4
16.	Railway's Workshops, repair shops and locomotive shops	..	..	5	5	5
17.	Railway wagons manufacturing	..	..	1	1	1
18.	Unspecified Industries	..	..	2	2	4

The marked manner in which the occupational distribution of the muhajirs differs from the occupational distribution of the indigenous Sind population is made manifest by these figures. Of the total muhajir population of 550,000 no fewer than 358,000 were dependents and in the non-agricultural labour force it numbered 130,000 with merely 6,000 in the agricultural labour force. In detail there were 56,100 muhajirs in agriculture, 37,700 in trade and commerce, 24,200 in manufactures, 10,700 in Government Service, 9,900 in domestic and personal service, and 6,520 in transport. There were 3,600 technical and professional persons, 1,500 administrative and managerial, 1,120 clerical workers, 35,100 sales workers, 31,700 skilled operatives, 32,700 unskilled labourers

and 14,000 service workers. From this general picture the conclusion can be drawn that, while in Sind and Khairpur seven out of every ten persons are engaged in agriculture and its subsidiary occupations, only one person out of twenty is engaged in industries, and only one person out of fourteen in trade and commerce. It is this very pronounced tilt in favour of agriculture that has made the Government of Pakistan and the Sind Provincial Government ever since independence most anxious to encourage the growth of industry, since with the prospective increase in population, even with the opening up of more land cultivation and improved methods of tilling the soil, it would be impossible for an agricultural economy like Sind's to provide an adequate livelihood for all the persons who are likely to be living there in the next and oncoming decades.

The Director of Industries, Sind in his evidence before the Sind Agricultural Commission in 1953 considered that handloom weaving, tanning, shoe manufacturing, pottery, lacquer work, fibre ware, soap making and embroidery work were the most suitable small industries for Sind as raw materials for them were available in plenty and not much capital was required for development and operation. As will be gathered from the statements set out before in this chapter, large scale industry on modern lines hardly exists in Sind. Sir Roger Thomas's view was that there is large scope in Sind for a profitable industrialisation but priorities should be given to those industries which process agricultural produce and which manufacture unfinished articles therefrom. The cotton ginning and pressing factories, which are the most numerous manufacturing establishments in Sind, are seasonal in operation and cannot provide full employment for twelve months in the year. Factories dealing with the processing of agricultural products already exist in the shape of wheat flour-mills, which numbered 5 in 1953, rice-mills which numbered 90 in the same year and biscuit making factories, which numbered 5 in that year too. Heavy industry has, however, since independence obtained a footing in Sind. At Rohri private enterprise has established a large cement works with the help of the Pakistan Industrial Development Corporation. It is controlled by the Pakistan Government. The Zeal-Pak Cement Factory at Hyderabad, the largest in the country, was formally declared open in January 1956. This factory has an annual production capacity of 2.4 lakhs tons, and together with the Maple Leaf Cement Factory being set up at Daudkhel with a production capacity of 1.6 lakhs tons, will go a long way to meeting the country's growing requirements of cement. The other big industrial enterprise in Sind and Khairpur was the completion of the 350 mile long pipeline from Sui in Baluchistan to Karachi. This pipeline conveys natural gas for the use of factories. The entire work, in which

the Pakistan Industrial Development Corporation collaborated with the Burmah Oil Company and the Commonwealth Development Finance Corporation, was completed in eighteen months. Several industrial consumers in Karachi switched on to natural gas in September 1955, and stops are being taken to extend the supply to gas to consumers in Hyderabad and Sukkur. A large new textile mill in Khairpur Mirs is already using Sui gas for its fuel. The Sui-Karachi gas pipeline cost 8.4 crores and is now supplying natural gas to several big industrial consumers. The internal distribution of gas has been entrusted to two separate public limited companies, namely the Karachi Gas Company Ltd, Karachi, and the Indus Gas Company Ltd., Hyderabad. The pipeline crosses the Indus twice, once by the Lloyd Barrage Bridge at Sukkur and once by the bridge of the Ghulam Mohammiad Barrage at Kotri. Sind and Khairpur are, therefore, in a favourable position for drawing upon this wonderful supply of natural fuel, a deposit of natural gas at Sui of sufficient quantity to last more than a hundred years. This should simplify the problem of cheap fuel for any large and medium scale industry which may start in Sind and Khairpur in the next thirty or forty years. Sind and Khairpur are indeed fortunate to have this wonderful natural facility on their doorstep. In a speech which she delivered in 1956 before the Pakistan Society in London Begum Ikramullah, the wife of Pakistan's then High Commissioner to the United Kingdom said: "Pakistan is very fortunate in being the home of many types of cottage industry and handicraft. There is a rich and varied heritage of handicrafts, not only in every province of Pakistan, but nearly every district has its own distinctive type of craft Sind can be said to be the home of creamics. Five thousand years ago unglazed pottery was being baked and made in the valleys. Today that type of pottery is still to be seen and many other types besides. We have three types of pottery in Pakistan. There is a glazed pottery that was introduced in about the ninth or tenth century soon after the advent of Muslim rule. The centre of that is Hala. It is generally of dark brown or mustard yellow background with contrasting colours painted on it with bold strokes. This is a heavy type of pottery, nice to the feel and touch, twice baked with a very fine glaze. It will be interesting for you to know that it was from Hala that the artisans went and opened up the Gujarat School of Art in India. The second most popular type of handicraft to be found in Pakistan are the varied types of embroidery. There is a famous Sind embroidery with its distinctive feature of mirrors. These are embroidered with the button-hole stitch, chain stitch and interlacing stitch and, as you can see, they are in bright colours and bold designs and look very attractive. Even more attractive than Sindhi embroidery is the Baluch embroidery which is still richer

and finer in execution. The most interesting thing about these types of embroidery is that they are done by peasant women without any samples, without any design, just in their own head. The threads are dyed with vegetable dye, the designs are evolved as they go along, and they are done in the coarsest of materials by the poorest people in the Baluchi hills." Begum Ikramullah said it was very necessary that cottage industries should be produced, preserved and developed. "They serve," she said, "a three-fold purpose: first and foremost is the aesthetic one; they supply an innate need of our nature, not only of those who use it but of those who make it. You have only to watch the faces of artisans and craftsmen at work know that it is satisfying as a very basic need of human beings. Secondly, Begum Ikramullah said "It is absolutely necessary to have these hand made goods providing part-time employment for our men to supplement their agricultural employment. In the village you have your potter and your handloom weaver and they supply the village need, and it is very necessary that this should continue; otherwise the dislocation and upheaval would be terrible. Then comes the therapeutic use of these; for modern science has shown hand work as very healing. Wounded soldiers, shell-shock cases are made to do handwork for healing purposes. Under the stress and strain of modern life it is very necessary to have these healing powers amongst us. Highly mechanised industrialised countries, like the United Kingdom, Canada and America, are encouraging their handicrafts as a therapeutic necessity and are paying fantastic sums for pottery work. We should at least try to preserve ours before it gets into the realm of antiques. The third purpose is that the cottage industry has an economic value also. I know it is much earlier and much simpler to provide bales of cotton and bales of jute. You just order it and there it is but to provide handicrafts takes a lot of organisation and is difficult. But if properly organised and properly advertised and publicised, it will be a source of income to Pakistan. This is something in which we can compete with the others. We can never compete with industrialised countries in machine-made things, but we can complete in these wonderful handmade things."

There is little doubt that cottage industries are facing difficult problems today and this fact has drawn considerable attention in the Government of Pakistan's First Five-Year Plan 1955-1960, in which the difficulties are analysed and possible ways of improving cottage industry are considered as part of the economic policy of the country. The likely threat to cottage industry from the advancing tide of manufactured goods of all kinds was noted by Mr. Aitken in the 1907 Edition of the Gazetteer, when he said "There are workers in fine arts of which Sind, or particular towns in Sind, had at one time a great reputation; but these arts have,

without an exception, unless it be lacquer ware, decayed and the workers have diminished in skill as much as in numbers." The cottage industries of which Mr. Aitken took particular notice in the 1907 Edition of the Gazetteer are shoe-making, tanning, cotton-weaving, woollen textiles, rugs and carpets, silk-weaving, dyeing boat-building, embroidery lacquer ware, glazed pottery, stucco work, enamelled metal, ivory carving and brasswork. There is no space in this gazetteer for the full descriptions of some of the processes which Mr. Aitken gave. But as a commentary on the figures of the 1951 Census enquiry which follow, some of these remarks may be of value. Of shoe-making, one of the most important of the cottage industries, Mr. Aitken remarks that it is chiefly in the hands of Sochis and Mochis. The former word indicates Hindu shoemakers of Sind, Marwar and Cutch, while the latter in Sind usually indicates Mussulmans of the Menghwar caste. The Marwaris devote themselves more particularly to the manufacture of leather covers for camel saddles (nat) and this involves the art of embroidering leather with silk. The elaborately embroidered 'nat' represents the highest degree of excellence attained in artistic leather working in the Presidency. Tanning is closely associated with shoemaking but is the province of distinct castes. Hides of cattle are tanned by Jattris, Menghwaris and sometimes Mekranis and skins of goats and sheep by Kalals. The process is very simple. The leather of Sind is considered better than most Pakistan leather and is exported to Europe. Camel hides are tanned in the same way as cow hides and the leather is used for the same purposes, but it is considered inferior. Raw camel hides are much employed in making dabbas for storing ghee and oil. An additional use which meets present-day taste is for the manufacture of ornamental electric light shades. Cotton-weaving still supports a very large number of persons in Sind. The articles manufactured as trouser material, bedcovers, towels, scarves and tape. The production of trouser material, known as susi, occupies a large number of looms in Nasarpur, Hala and Thatta. Bedcovers (khes) generally consist of two fold interwoven so that the pattern appears on both sides. The better quality, made of Bombay and Madras yarn, exhibits neat and varied, though simple designs. For the cheapest kind, made of locally spun yarn, blue and white are the only colours employed. A coarse cloth called jori and used for towels is made of local yarn either plain white or with a red or blue check on a white ground. Scarves, lungis used as turbans or waist-bands, are woven in pieces from six to twelve yards by eighteen inches. Coloured tape (agath) used for trouser strings made by the women and children of the susi and khes weavers who employ a simple contrivance in lieu of a loom. The woollen textiles of local manufacture consist of carpets, rugs, blankets and sacking. The weaving of rugs or floor mats of wool and cotton employs the leisure of Jat and Baluch women in scores of

small villages. The textiles are made of wool (un), or of goats' hair (das), or of both, and in some the woof is of cotton. They are used for sleeping on and for kneeling on at prayers. The better quality made of wool, or of wool and cotton, is called farasi. A cheaper and coarser rug made of goats' hair is termed "Kharir". The wool is coloured locally with vegetable dyes. Farasis are usually six feet long and four feet wide. Kharirs of the same size are about half the price of farasis. Very durable rugs of this kind are made in the Tharparkar district of undyed camels' and goats' hair. Rugs are also made of saddle-cloth (tapar) for riding camels. They are made in two pieces which are stitched together at the ends, leaving an aperture for the camels hump. Sacking (boro) is made of goats' hair and is used for horses' nosebags (tobro)' saddlebags (khurzin) and grain bags and double sacks for pack camels and bullocks. It is usually black or dull brown and is extremely strong. Another industry of the Thar Parkar district is the weaving of blankets (khatho) similar to the kambli of the Deccan, but white and finer in texture, the wool of which it is made being superior. Woollen pile carpets are made in Bubak town for sale and in the Upper Sind Frontier for domestic use. In Bubak the number of weavers is now very much reduced. But carpets are still being woven to order and the compiler of this gazetteer in 1952 had four carpets made to order by a man of middle-age who carried out intricate designs according to a plan which he knew by memory. The Bubak carpet-makers, now reduced to a few families only, are thought to have been originally members of a large family derived from slaves from Persia and in this way they account for the so-called Irani pattern of the carpets they make. Designs are obviously basically Persian but have taken a character of their own from being long practised in Sind. The carpets made in the Upper Frontier are the work of Baluchi women. They are quite different in character and very substantial. They are not easily obtainable as they are not intended for sale but are given with marriage dowries of daughters and are kept as heirlooms. Spinning, dyeing and weaving silk was at one time the industry for which Sind was more celebrated than any other. In the palmier days of Thatta its looms for the weaving of shawls and lungis were said to number five thousand, and up to the time of the British conquest, when Thatta had utterly decayed, silk still held an important place in the trade and industry of the country, a fact of which there is abundant evidence in the reports of several officers. Lungis, the rich scarves which are mentioned by early travellers in Sind as the most distinctive article in the dress of the Mirs, which were at that time worn by every man of position, are now going out of fashion, while other silk fabrics can now be imported cheaper and better than any handloom weaver can make them. Nevertheless, silk-weaving still goes on in Karachi, Thatta, Rohri, Jacobabad

and other places. In place of raw silk, yarn is obtained from Bombay and Multan, and chemical dyes have to some extent displaced the rodung, musagh and safflower of Kandahar. The fabrics now made consist of garbi, mashru and lungis; garbi and mashru are fabrics of silk and cotton, strong and rather rough in texture like most Pakistani silks. They are made in lengths of about 30 yards with a width of about three-quarters of a yard. Of the cotton-dyers of the Bombay Province three-quarters were said to be found in Sind, which contains both Hindu and Muslim. One of the principal dyeing castes, the Khattris, or Khatis, is supposed to have immigrated into Bombay from Sind. The industry has three branches: cotton-dyeing, silk-dyeing, calico-printing. Wool is also used for their own purposes by the carpet weavers of Bubak. Cotton-dyers are found in all districts. Hindus do not dye with indigo. Excepting indigo, the dyes used are mostly imported. Silk is dyed in the Hyderabad and Thar Parkar districts by Patolis, a small caste which includes both Hindus and Muslim. The silk yarn is brought from Bombay and Multan and dyed here with indigo and imported colours. Calico-printing is practised everywhere in the Bombay Province but the prints of Sind surpass all others. The printing is effected by means of small wooden blocks or dies with handles attached which are first pressed on a folded cloth soaked with the desired dye and then stamped on the cloth like an office seal. The cloth is previously prepared by dipping in a mordant of alum gum and fuller's earth (met) and, if it is intended to have a ground colour, it is printed immediately after the stamping process with powdered cow-dung. This adheres to the damp pattern and protects it when it is afterwards dipped in a dye of a different colour. Native dyes are used for calico-printing and the colours are fast. These printed cloths are used by the Sindhi people as shawls and sheets, but they make pretty and very inexpensive table-covers and wall-curtains, the designs being often very pleasing.

There are many other common industries that support hundreds of persons but present no point of special interest, such as the making of brass cooking pots, grinding stones, mats and baskets of palm leaves and grasses. Special arts for which Sind was famous in times past, besides the weaving of lungis and the printing of calico, were embroidery in silk and gold and silver thread, inlaid gold and silverware, lacquerware and glazed pottery. The Lohana of Hyderabad have travelled far afield in marketing these products of the Sind cottage industries and are today, even after Hyderabad has been completely deserted by them, to be found strongly entrenched in Bombay. There are probably thousands of these Sind merchants in different parts of the world today. Anyone who has visited the main street of

Gibraltar and can exchange a few words in Sindhi there with the sellers of shawls and bedcovers will be greeted with smiles of pleasure. In Hyderabad there are workers doing beautiful embroidery in gold and silver, thread and silk, upon silk cloth or velvet, known as chikindosi. The men who inlaid swords and daggers and scabbards with gold and silver have disappeared, and of those who inlaid gold and silver ornaments for the wrists and ankles of ladies with red and blue and green, only a few shops remained at the time of the 1907 Gazetteer. The arts still exist but are languishing. Embroidery in silk and gold and silver thread was in great demand at one time for the decoration of shawls, coats, caps, ladies' shirts and children's trousers. The professional embroiderers were all Muslims and some of them still survive in Hyderabad, Shikarpur and other towns. Persons who wish a garment embroidered take it to them and pay for the material and the labour. Whether the professional embroiderer can be saved is very doubtful, but the art has now taken root in domestic soil, and employs the leisure of hundreds of women in the best Muslim families. This kind of work in the form of slippers, cushions and table-covers is too well-known to require description. It exhibits the variety and elegance of design which is characteristic of all Sind work. Another interesting variety of the embroiderers craft is found where one would not look for it, namely in the desert of Thar Parkar. The women of these parts greatly affect petticoats of chuni, which is the coarsest cotton parts dyed red and deeply embroidered with silk in many colours with little bits of looking-glass set in. This is in widths of about eighteen inches, so it takes three widths, one above the other, to make a petticoat, but the uppermost need not be embroidered. This material is made, not only for local use, but exported in some quantity to Marwar. The art of lacquering wood is one that does not appear to have deteriorated, though some of the colours used in the production of lacquer wood ware are crude and over-bright. Much is done that is highly artistic and beautiful. A description of the process of lacquering has already been given in the chapter of this Gazetteer dealing with culture as the lacquer work can easily be regarded as a form of artistic creation. As regards glazed pottery, the art of making bricks and tiles like those on the tombs on the Makli hill, or in the mosques at Thatta, has been lost. After two centuries these ring like metal and show edges as clean as the wooden bricks in a child's box while the enamel remains as transparent as in the day when they were made. But the Sind pottery of the present-day is difficult to carry without breaking and flakes or chips when exposed to the weather. The designs are very various and almost always artistic and beautiful, but the materials is mere earthenware, fit only for flower-pots. The clay now used is the silt of the Indus and undergoes little sifting and preparation of any kind. There

was a fine blue colour the recipe for which has been lost. Hala is the chief seat of this craft. It is carried on in other places like Nasarpur and the Guni taluka of the Hyderabad district. With the influx into Sind of refugees from the former United Provinces of India after partition, some new cottage industries are likely to be established, and amongst these, the products of which can be seen, are artificial flowers made most skilfully from paper, so realistic that they look like the actual flowers they imitate, and the carving of ivory and alabaster and marble, such as could be seen round entrances to the mosques of Delhi and Agra. There has also been an influx of stone carvers bringing with them the traditions of carving found in Rajputana, from places like Ajmer. An enquiry into the nature and location of cottage industries was made while the population census staff of 1951 was surveying the enumeration areas and preparing the household lists. This work was spread over the period from mid-September 1950 to mid-January 1951. The Census enumerators were at the time making a list of all the households in their areas and were painting numbers on the buildings to agree with the serial numbers on the list. While the men were on the ground for this purpose they were required to ask whether any home manufacture was carried on by the household. If so, particulars were to be recorded on a special form. The enquiry was carried out more or less satisfactorily throughout most of the country, and provides what is perhaps a more widespread detailed survey of cottage industries than has generally been possible by other means. But it is far from adequate and cannot be regarded as complete. All that can be deduced from the tables, therefore, is that at the time of the investigation the enterprises shown in the tables actually existed; but that many more would have been disclosed by a more careful and thorough enquiry. The 1951 Census has provided two supplementary tables, 1 and 2, dealing with cottage industry. The first table shows the location of cottage industry and the second table the number of each class of cottage industry and the number of workers employed therein. A general view of the state of cottage industry in Sind and Khairpur as revealed by the Census enquiry is given in the table below.

	Sind.		Khairpur.	
	Enter-prises.	Workers	Enter-prises.	Workers
	5,138	15,615	894	1,656
Yarn and Textiles.	2,423	Looms (4,126) 7,965	419	Looms (454) 840
Carpets, rugs, ropes, bags and mats.	443	1,146	83	135

	Sind.		Khaitpur.	
	Enter- prises.	Workers	Enter- prises.	Workers
	5,138	15,615	894	1,656
Wearing apparel and textile fabrics.	365	669	101	160
Jewellery and ornaments. ..	75	181		
Glass and Ceramics. ..	512	1,880		
Fine and applied art ..	11	42		
Paper and Stationery. ..	5	24		
Wood-work, cane and bamboo work ..	351	842	75	191
Leather processing etc. ..	531	1,643	84	137
Metal work ..	253	655	18	20
Other manufactures. ..	23	78		
Food, drink, tobacco ..	146	490	2	2

A break-up of individual industries under the main heads in respect of those kinds of work employing the greatest number of workers is instructive. Thus under the production of yarns and textile fabrics the following specific industries are enumerated: cotton-ginning, spinning cotton and wool, cotton muslin weaving, of other cotton fabrics, weaving of woollen fabrics, weaving of silk fabrics, weaving of shawls and khathas, zari, thread and gota making, thread-ball making, tape and newar making, cloth dyeing and printing. Under the head of carpets, rugs, rope, bags and nets are found woven carpets and rug-making, pile carpets and rug-making, durri making, fibre mat making, rope making of coir, rope making of other materials, sack and bag making and other fabrics; and under wearing apparel and work on textile fabrics occur cap and kulha making, sola hat making, ready-made clothing, hosiery, zari, gota and other embroidery, knitting and needlework, cotton and silk embroidery. Under wood work occur boat-building, tonga and rickshaw making, wood furniture, bobbin making, cart wheel making, cane furniture and cane weaving, bamboo furniture, matting of split bamboo reed, murta, pati etc., woodcarved articles, agricultural implements and other wood, cane or basket work. In leather processing are found curing of hides, tanning and leather processing, leather boots and shoes, leather-soled chappals and sandals, saddlery and leather work; and under metal work are the following categories: agricultural blacksmithy, brass and bell-metal casting and processing, sheet steel and tin work, cutlery, electro-plating and making of E.P.N.S. work, locks and padlock-making, hardware, cooking utensils mak-

ing, gold heating and silver film making, steel trunks, safes and boxes other than metalwork of various descriptions. In the section devoted to food, drink and tobacco processing can be found confectionary and biscuits, gur making, extraction of vegetable oil, other food processing, bidi making, aerated water making, other beverage making, food and drink and tobacco processing. In a mixed category under other manufactures there occur brushware, button making, toys, polishes, soaps and cosmetics, lac and shellac and other miscellaneous manufactures. The census enumeration, inadequate as it undoubtedly is, shows the scope of employment afforded by cottage industry in Sind. In Sind under enumeration were 5,138 enterprises giving employing to 15,615 workers and the use of 4,186 looms. In Khairpur there were enumerated 894 enterprises giving employment to 1,656 workers and employing 454 looms. In the brochure "Sind People and Progress" published by the Directorate of Information, Sind, in 1954 recording some of the achievements of the Sind Government in its latest, and as it proved nearly its last, days cottage industries received considerable attention. The brochure details various measures taken to help cottage industry. Of the handloom industry it says "this is the most popular industry in Sind, and there are least twelve thousand handlooms at present actively working. So far the handloom industry has been dying, mainly because of the difficulty in getting yarn at reasonable rates. After the Central Government enacted the Yarn and Cotton Order of 1953, the Sind Government at once availed itself of this opportunity to organise the weavers into weavers' co-operative societies, so as to make raw materials available to them at the lowest possible prices. At present over one-third of the entire handloom weavers in Sind have already been organised into co-operative societies and they are all getting yarn direct from the mills at ex-mill rates, saving 15 per cent., the margin of profit allowed under the Yarn Control Order. As a result of this efficient distribution system for yarn, by which the handloom weavers get their regular monthly quota of yarn on their ration cards, the number of handlooms has been increasing, and the handloom industry is flourishing." The brochure records that cottage industry institutes are being set up at Hyderabad, Sukkur, Larkana and Nawabshah. The object of these institutes is to carry out reasearch into methods and to develop techniques and also to introduce the use of small equipment and machinery wherever possible. At these institutes there will be sections for the existing cottage industries, like handloom, pottery, fibreware, Muradabad brassware and also sections for new ones to be introduced, like mechanical toy-making, bone button-making, paper machines, Japanese lacquerware, newar-making on Japanese automatics looms. The brochure mentions the two centres at Sehwan and Hala concerned with ceramics in artistic

and coloured pottery, comprising flower-vases, teapots, toys, ashtrays and other small articles. In order to modernise the working of the potteries, the Government decided to set up a modern pottery plant at Hala where the use of machinery would be introduced. The scheme was likely to cost 3 lakhs and an expert would be invited from Japan to establish the centre and train workers. For improvements in the methods of tanning a mobile demonstration party was working under the Industries Department helping tanners in mofussil areas by showing them correct ways of small scale tanning. There are also two wool-weaving centres at Mithi and Chachro being run by the Government. Demonstrators were training weavers in the weaving of woollen blankets, embroidered articles like woollen tea-cosies, mirror and embroidered work like cushions and table-covers, which are in great demand. Another speciality at these centres were khathas made of wool and cotton in beautiful and intricate designs conforming to the modern trend of fashion yet retaining the oriental touch. Of shoe manufacture the brochure says that Hyderabad is the main centre for the manufacture of shoes, boots and sandals. Apart from thousands of workmen engaged in shoe manufacture by hand, there is a very large fully mechanised Hyderabad Shoe Manufacturing Company which makes army boots and chappals. An industrial home for widows at Hyderabad recently opened admitted destitute widow and taught them the popular handicrafts, like sewing, embroidery and knitting. The use of various types of small machinery for knitting, sewing and embroidery is taught at this industrial home, so that these women can buy similar equipment for themselves and start working at their homes if they so desire. Three handicraft schools for girls are working at Hyderabad and Tando Mohammad Khan. There, training in the various handicrafts of sewing, knitting and embroidery of all sorts is being imparted to the girls and the full course extends over two years. Another successful and popular cottage industry providing work for a large number of workers is bangle-making. The raw material is supplied by the Indus Glass Works. The workers take the unfinished rings of glass to their homes and work there to produce a variety of finished designs in various artistic colours and patterns. The Sind Agricultural Commission in its report speaks of lungi-making, susi-making, khes-making, khatha-making and towel-making as cottage industries that are dying out in Sind, especially in Thar Parkar and, it is similarly said that this is the fate of ajrak and chadar making, dyeing and printing industries. These old industries are still in existence in Tatta, Nasarpur, Matiari, Hala, Mithi, Chachro, Lakki, Pirjo Goth and Sayidpur. The Commission recommended that they should be given better marketing facilities and also facilities for the supply of raw materials. Amongst textile products, the Commission recommended that the cottage industry should manufacture on handlooms and paddlelooms

tapestry cloth, bed-sheets, pillow-cases and table-covers, towels of all sorts and saris, and that the textile mills should be prohibited from producing these articles, and that marketing centres should be opened to facilitate the disposal of the products of the hand-loom industries.

An analysis of the condition of the cottage industry in Sind today discloses that its nature is two-fold. First, it is producing cheap articles that satisfy the simple needs of the peasantry which is still not much affected by modern taste, and secondly it is making articles of a luxury nature with a limited market only. The first class of article has an assured market at present in the rural areas everywhere, since such goods as trouser cloth, blankets, rugs, bed-sheets and bed-covers, reed and coir mats, shoes and sandals constitute goods which are in constant demand and which so far, owing to the conservative nature of the peasantry, have resisted the invasion of factory goods. The second class of article, of which the ornamental pottery of Hala and the artistic lacquer work like vases and table ornaments are typical, is not in nearly so strong a position to resist the kind of competition which it is likely to face. In fact, this type of article is really a luxury and outside the local areas. Scope for development is little and most peasants have a specimen or two of a luxury article in their poorly furnished habitations, and there will always be a demand in Sind for the ornamental lacquer bedsteads and swinging cots which are the pride of the better class agriculturist and well-to-do zamindar. Luxury articles, however, are subject to violent changes in fashion and perhaps the best hope for maintaining the healthiness of the Sind cottage industries supplying such articles is by way of encouraging their purchase in sale centres in large towns, where they are likely to appeal to tourists and to the curio trade. Whether cottage industries supplying articles of this kind can expect to survive depends upon the existence of the curio and luxury trade outside the local areas. Scope for development is little and most of the industry will be lost unless the object aimed at is art and not merely craftsmanship. Subject to these remarks observers can agree with the view expressed in the First Five-Year Plan 1955-60 of the Government of Pakistan National Planning Board that "small industry has specific contributions to make to economic development; first it can contribute to the output of needed goods without requiring the organisation of large new enterprises and the use of much foreign exchange to finance the import of new equipment; secondly to provide opportunities for employment beyond the narrow boundaries of urban centres; finally as history shows, it can perform an important function in promoting growth, providing a training ground for management and labour and spreading industrial knowledge over wide areas. Small industries are not to be thought of as archaic institutions requiring coddling and

protection lest they disappear. There is permanent place for efficient and progressive small scale industries in modern industrial societies, as is shown by the existence of thousands upon thousands of small units alongside the giant firms found in advanced countries, such as the United Kingdom, Germany and the United States". This is true of the Sind cottage industries, but the difficulties which they face are those that have been commented upon above, namely in respect of necessary articles in common use, in the competition of mill made and manufactured articles, they have to be guarded against, and in respect of luxury articles, constant watch will be needed to ensure that some kind of limited market is not allowed to disappear. Perhaps the final comment should be that Sind cottage industry is lucky in that it still has a very large and conservative agricultural population in its five thousand villages demanding the same kind of simple and cheap goods, to which they have been accustomed for generations and a liking for which they show few signs of wishing to relinquish.

V

Trade, Commerce and Communications.

According to the 1951 Census the number of persons engaged in trade and commerce amounted to only 116,271, or 7.1 per cent. of the population of Sind and Khairpur. Transport, shipping and port services employed 18,717 persons equal to 1.1 per cent. of the population. Of the persons employed in transport 8,224 were employed in road transport, 3,618 on railways, 1,105 in sea and river traffic and 23 only in air transport. In posts and communications the number employed was 751 only, equivalent to 0.05 per cent. of the non-agricultural labour force. Until the partition of India in 1947 the Hindu trading and commercial classes, except in a few types of enterprise, monopolised the trade and commerce of Sind, and comprised almost all the entrepreneurs and business managers, all the wholesale and retail traders and almost all the petty shopkeepers, both urban and rural. It is only in the Thar Parkar district that the small trading and commercial community has not been much affected by partition because in that area trade, which is mostly on a small scale, was in the hands, not of the caste Hindus, but of the lower class of Hindus similar to those engaged in petty trade outside the Sind borders in Cutch, Gujarat, Marwar and Rajputana. In that area, therefore, no great change has occurred, but there the volume of trade and commerce is very negligible.

Who have taken the place of the Hindu trading and commercial classes who deserted Sind and Khairpur in 1947. Most likely Khojas, Borahs and Memons, who were by nature Muslim traders and business men but who confined their interests to special lines, are now occupying the chief managerial posts and constitute the entrepreneurs and business managers of the country. In addition to these there must be refugee recruits occupying some of the chief business posts and many petty traders and shop-keepers. The amount of business that is done inside the country and even the country's external business is not ascertainable as statistics are not kept by revenue divisions now that Sind and Khairpur are in the set-up of West Pakistan. Even up to 1936, when Sind still formed a part of the Bombay Presidency, and after 1936. When Sind became a Governor's province in British India, trade and commerce statistics were not compiled so as to isolate the portion that belonged to Sind and Khairpur alone. Since 1947 with the creation of Pakistan under the Federal Government of Pakistan established in Karachi, trade, exports and imports and coastal trade, railways and posts and telegraphs and means of communication are all in the hands of the Central Government and, though Sind from 1947 to 1955 was a Governor's province within the State of Pakistan, its position as regards trade, railways and communications remained in the control of the Central Government and statistics have not been maintained so as to isolate the trade of Sind and Khairpur, both external and internal, from the general figures maintained by the statistical offices. It is not, therefore, possible to portray completely the nature and amount of trade and commerce in Sind and Khairpur. As far as internal trade is concerned no statistics are maintained, and it is only possible to guess from the figures of octroi and other dues collected by municipalities and local authorities what the amount can be. A very large portion of internal trade is conducted without the use of money and so does not enter into any recorded statistics. Another complication now is that since 1947 Karachi has ceased to be politically in Sind, and even in the days of British rule statistics of Karachi Port did not separate out for Sind alone either the import or export trade by land and sea, so that, unless a fair and reasonable estimate of the share of Sind in such trade can be made from the statistics as now maintained, any calculations of the amount of this trade in Sind and Khairpur are mere matters of guess. Similarly, the railway statistics of the North Western Railway, which monopolises all railway traffic in Western Pakistan, are not such that Sind's share in the many operations of traffic movement can be satisfactorily isolated. In any case statistics are not available for this Gazetteer. For these reasons the treatment of trade which was attempted in the 1907 edition of the Gazetteer cannot be repeated. Though politically Karachi is not part of Sind it

is economically so linked up with Sind and Khairpur that some account must be given of the place which Karachi occupies in the Sind and Khairpur economy, for not only it is the main depot for goods entering West Pakistan and destined for Sind and Khairpur, but it is also a place in which many inhabitants of Sind and Khairpur look to find lucrative employment.

Since the beginning of the nineteenth century the Port of Karachi has been the gate of foreign commerce, not only for Sind, but for a large area of North-West India, Baluchistan and Afghanistan. It belonged for a time to the Khan of Kalat. It was taken from him in 1795 by the Mirs of Sind, who recognised its importance and built a fort on the headland of Manora to protect the entrance to the harbour. They also extended a tolerance and even favour to the Hindu merchants on whom the prosperity of the port depended. In the report of the administration of the Customs Department in Sind for the year 1863-64 it is stated: "It is now upwards of twenty years since the Province of Sind became an integral portion of the British Empire in the East. At that period the value of its trade was 12,21,600 rupees in 1847-48. Five years thereafter it rose to 44,26,000 rupees and in five years more to 80,00,000 rupees, in the succeeding five years to 215,92,000 rupees, and in the five years ending with the official year just closed it has reached the enormous total of 666,28,106 rupees". This is all very ancient history now. The progress of Karachi as a port under British rule was phenomenal, and since the creation of Pakistan, Karachi as a port has become even bigger and more important than it ever was. In fact it is now one of the great ports of the world and dealing with an enormous miscellaneous trade in all kinds of goods. The following tables have been taken from the Pakistan Statistical Year Book 1952 published by the Ministry of Economic Affairs in the Central Statistical Office of the Government of Pakistan. They show the extent of Karachi's trade and commerce, and perhaps from a perusal of them it may be possible to gauge the amount of trade and commerce in what are now merely administrative divisions, namely Hyderabad and Khairpur, in the political unit of West Pakistan.

Coastal shipping-entered and cleared : 1949-50 to 1951-52, by fiscal years and April-December 1952.

Thousand tons (except for number of vessels).

		Vessels entered.			Vessels cleared.		
		Net registered tonnage.			Net registered tonnage.		
	Number of vessels.			Number of vessels.			
		In ballast.	With cargoes.		In ballast.	With cargoes.	
KARACHI PORT							
1949-50	118	0.7	126.0	139	9.4	237.6	
1950-51 ..	146	5.1	183.9	212	41.5	216.1	
1951-52 ..	140	5.3	152.9	252	12.9	322.5	
April-December, 1952 ..	103	0.3	137.5	177	8.6	171.4	

January to March, 1951 only.

International sea-borne shipping-entered and cleared : 1949-50 to 1951-52, *by fiscal years and April-December, 1952.

Thousand tons (except for number of vessels).

Period.	Vessels entered.				Vessels cleared.		
	Number of vessels.	Net registered tonn- age.		Number of vessels.	Net registered tonn- age.		
		In ballast.	With cargoes.		In ballast.	With cargoes.	
KARACHI PORT							
1949-50 ...	1,485	53.8	3,381.0	1,464	1,043.2	2,219.0	
1950-51 ..	1,455	220.2	3,365.0	1,545	844.8	2,709.4	
1951-52 ..	1,757	208.0	3,555.0	1,571	985.0	2 533.9	
April-De- cember. 1952. _	935	101.5	2,947.9	900	642.3	2,196.9	

*Includes data relating to both steam and sailing vessels.

Cargo handled at Karachi Port *1950-51 and 1951-52, by fiscal years and April-December, 1952.

Thousand tons.

Period.	A—IMPORTS					
1950-51	..	..	..	..	..	2,391
1951-52	..	..	..	..	..	2,622
April-December, 1952.						2,308
	B—EXPORTS					
1950-51	..	..	..	..	..	1,081
1951-52	..	..	..	..	..	1,156
April-December, 1952.	..	..	..	..	..	659

* Separate figures for foreign and coastal are not available.

Arrivals of pressed cotton at Karachi by the North Western Railway :
1948 to 1952 by years.

Thousand maunds.

Period.	Arrivals from					
	Sind and Baluchistan.					
1948	..	..	..	..	..	1,825.6
1949	..	..	..	..	..	1,905.1
1950	..	..	..	..	..	2,509.2
1951	..	..	..	..	..	2,281.7
1952	..	..	..	..	..	2,352.6

Movement of cotton textile goods from Karachi to Sind and Baluchistan
by North-Western Railway : 1949 to 1952 by years.

Thousand maunds.

Period.				Cotton twist and yarn.		Cotton piecegoods yarn.	
				Sind.	Baluchistan.	Sind.	Baluchistan.
1949	..	..	..	12.7	1.1	14.3	77.3
1950	..	..	..	23.2	0.8	7.3	84.8
1951	..	..	..	7.5	..	5.3	78.6
1952	..	..	..	5.3	0.5	5.0	74.7

Coastal Trade: Value of imports into the port of Karachi: 1948-49 to 1951-52
by trade years.

Million rupees.

Period.	Total.				Pakistan Mer- chandise.	Foreign Merchan- dise.
1948-49	19.8	18.8	1.0			
1949-50	50.5	32.3	18.2			
1950-51	62.9	46.0	16.9			
1951-52	66.3	36.4	29.9			

Coastal Trade : Total imports into the port of Karachi : 1948-49 to 1951-52
by trade years.

Thousand rupees.

Period.	Pakistan Merchandise.				Foreign Merchandise.		
	Total.	From Chitta- gong.	From Balu- chistan	From Minor Ports of Sind.	Total.	From Chitta- gong.	From Balu- chistan ports.
1948-49 ..	18,820	18,185	610	25	937	917	20
1949-50 ..	32,284	31,457	808	19	18,183	18,120	63
1950-51 ..	46,023	44,999	781	243	16,845	16,792	53
1951-52 ..	36,381	35,965*	384	32	29,915	29,907*	8

* Includes 33 thousand from Chalna.

† Includes 21 thousand from Chalna.

COASTAL TRADE : Quantity and value of principal commodities imported into the port of Karachi from East Pakistan during 1948-49 to 1951-52 by trade years.

PAKISTAN MERCHANDISE.

Thousand rupees.		PAKISTAN MERCHANDISE.							
		1948-49.		1949-50.		1950-51.		1951-52.	
Unit.		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
GRAND TOTAL ..	..	..	19,102	..	49,577	..	61,791	..	65,872
Pakistan Merchandise-Total ..	..	..	18,185	..	31,457	..	44,999	..	35,965
1. Drugs and medicines ..	..	..	16	..	..	..	27	..	61
2. Dyeing & tanning substances	Cwt.	400	41	1,270	117	337	73	753	21
3. Fruits and vegetables dried, salted or preserved.	Tons.	39	27	515	195	290	101	45	13
4. Fresh Fruits ..	..	..	..	..	62	..	6	..	2
5. Fresh vegetables ..	..	..	..	..	20	..	1	..	27
6. Pulse ..	Ton.	..	..	..	..	13	6	422	241
7. Hides and skins raw ..	Ton.	1	1	6	18	24	142	138	789
8. Leather (hides dressed or tanned).	Ton.	41	75	17	62	26	250	537	1,486

WEST PAKISTAN GAZETTEER
SIND REGION

(DESCRIPTIVE)
CHAPTER XIV

9. Mats and matting	.. Sq. Yds.	..	4,500	1	..	9,655	6
10. Matches	.. Gross of boxes	11,460	69	..	26,600	63,000	334
11. Coconut oil	.. Gls.	2,096	16	..	..	..	..
12. Ground nut oil	.. Gls.	1,45,848	1,027	..	..	..	..
13. Provisions and oilman's stores	.. Cwt.	106	4	8	434	2,184	21
14. Seeds essential	.. Ton.	26	20	9	435	70	75
15. Seeds non-essential	.. Ton.	1,828	1,198	9	6	131	62
16. Soap	.. Cwt.	..	..	4	18	1,128	117
17. Betelnuts	.. Cwt.	29	2	2,667	61,563	87,620	4,686
18. Chillies	.. Cwt.	54,368	3,018	1,782	469	5,267	295
19. Ginger	.. Cwt.	105	3	53	1,957	1,001	35
20. Turmeric	.. Cwt.	119	9	..	11,871	808	38
21. Tea	.. Lb.	81,50,327	10,573	25,394	2,49,38,488	38,727	1,71,36,539
22. Cotton piece goods	.. Yds.	11,24,688	1,393	164	4,930	..	..
23. Rope and twine	.. Ton.	..	..	..	100	905	1,085
24. Gunny bags	.. Nos.	2,74,950	237	12	..	6,87,447	992
25. Wool raw	.. Lb.	..	..	..	..	1,732	5
26. Tobacco manufactured including cigarettes.	Lb.	660	2	1	20,860	2,650	24

COASTAL TRADE : Quantity and value of principal commodities imported into the port of Karachi from East Pakistan during 1948-49 to 1951-52 by trade years.

PAKISTAN MERCHANDISE.

Thousand rupees.

		1948-49.		1949-50.		1950-51.		1951-52.	
Unit.		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
27. Tobacco un-manufactured	Lb.	1,88,300	201	3,49,508	177	2,85,136	227	8,60,297	897
28. All other articles	..	..	253	..	702	..	630	..	925
FOREIGN MERCHANDISE									
Foreign Merchandise-Total	..	..	917	..	18,120	..	16,792	..	29,907
1. Apparel	..	..	8	..	19	..	78	..	101
2. Carriages and carts	..	..	230	..	417	..	465	..	494
3. Chemicals	..	..	..	..	36	..	28	..	116
4. Drugs and medicines	..	..	26	..	300	..	216	..	304
5. Dyeing and tanning substances	Cwt.	..	..	142	71	4	7	204	68
6. Fruits and Vegetables, dried, salted or preserved	Ton.	..	..	..	..	2	10	..	..
7 Glass and glassware	..	..	..	..	3	..	14	..	29

8. Hardware	..	..	33	..	739	..	964	..	1,491
9. Instruments	..	..	1	..	30	..	156	..	335
10. Liquors	..	Gls.	105	41,884	333	17,726	108	60,973	409
11. Machinery	..	..	27	..	392	..	463	..	250
12. Matches	..	Gross of boxes.	15	..	..	1,09,500	578	6,77,318	3,567
13. Metals and ores	..	Cwt.	..	1,700	45	1,387	68	1,472	91
14. Oil mineral	..	Gls.	1	..	..	..	..	7,425	22
15. Paints and colours	..	..	..	..	1	..	8	..	204
16. Paper and pasteboard	..	..	..	..	402	..	164	..	117
17. Provisions and oilman's stores..	Cwt.	48	15	282	52	8,814	1,075	2,772	222
18. Soap	..	Cwt.	..	..	..	3	2	1,219	104
19. Spices	..	Cwt.	20	5	184	57	374	1,082	150
20. Stationery	..	..	2	..	13	..	2	..	88
21. Cotton twist and yarn	..	Lb.	..	3,41,908	1,086	4,46,786	1,014	1,53,330	567
22. Cotton piecegoods	..	Yds.	76	1,00,78,747	11,908	40,41,991	5,868	27,65,047	3,934
23. Other textiles	..	..	51	..	1,923	..	4,305	..	15,971
24. Tobacco manufactured	..	Lb.	..	1,453	44	1,74,326	137	22,824	43
25. All other articles	..	..	322	..	249	..	1,005	..	1,230

COASTAL TRADE : Quantity and value of principal commodities imported into the port of Chittagong from West Pakistan during 1948-49 to 1951-52 by trade years.

PAKISTAN MERCHANDISE

Thousand rupees.

		1948-49		1949-50		1950-51		1951-52	
Unit.		Quantity.	Value	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Grand Total	.. ..	..	1,39,233	..	2,35,078	..	2,70,675	..	2,08,228
Pakistan Merchandise-Total	.. ..	..	1,36,490	..	2,28,646	..	2,08,936	..	1,15,693
1. Apparel	.. ..	..	50	..	80	..	152	..	15
2. Boots and shoes	 Pair	4,572	40	53,847	234	4,71,960	1,878	4,80,849	2,917
3. Chemicals	.. ..	..	1,657	..	1,029	..	4,297	..	1,444
4. Drugs and medicines	.. ..	..	3,078	..	1,277	..	1,141	..	92
5. Dyeing and tanning substances	.. Cwt.	502	582	11,753	3,018	11,176	2,317	4,767	72
6. Fruits and vegetables dried, salted or preserved.	Ton	1,292	1,046	1,366	1,313	1,566	964	1,218	1,290
7. Rice	 Ton	86,360	38,986	1,19,627	64,615	28,876	16,644	..	..
8. Wheat and wheat flour	 Ton	3,251	885	1,03,126	55,079	12,114	8,959	12,764	6,520
9. Pulses	 Ton	2,519	742	4,522	2,228	6,073	3,453	3,374	1,851

WEST PAKISTAN GAZETTEER
SIND REGION

(DESCRIPTIVE)
CHAPTER XIV

10. Gram	..	..	..	6,254	2,889	5,986	2,197	5,298	1,412
11. Grain other sorts	..	..	Ton	..	127	115	1,306	3,270	719
12. Gums and resins	..	..	Cwt.	988	49	1,292	31	5,620	128
13. Hardware	..	..	..	..	1,406	898	882	..	836
14. Liquors	..	..	Gls.	8,235	60	..	54	..	..
15. Matches	..	..	..	..	3,108	..	2,798	..	..
16. Metals and ores	..	..	..	..	1,550	1,299	2,601	..	4
17. Rape and mustard seed oil	..	..	Gls.	9,82,991	5,282	9,80,851	1,5525	1,92,232	10,924
18. Other vegetable non-essential oil..	..	..	Gls.	1,89,480	2,322	6,03,083	9,774	9,76,753	9,590
19. Paper and pasteboard	..	..	Cwt.	20,213	723	1,992	1,243	915	47
20. Ghee	..	..	Cwt.	477	98	8,351	1,099	4,428	597
21. Other provisions	..	..	Cwt.	37,632	2,839	24,523	1,088	13,647	480
22. Salt	..	..	Ton.	82,758	8,185	87,729	8,871	40,344	3,847
23. Rape and mustard seeds	..	..	Ton.	30,838	18,695	47,149	41,800	54,836	37,790
24. Seed non-essential other sorts	..	..	Ton.	12,918	714	1,897	4,111	3,121	3,404
25. Soap	..	..	Cwt.	1,647	52	1,448	56	174	9
26. Chillies	..	..	Cwt.	328	26	12,003	493	60,783	4,611
27. Other spices	..	..	Cwt.	20,960	1,924	45,697	831	757	161
28. Cotton raw	..	..	Ton.	..	6,585	2,091	13,562	6,579	18,205

COASTAL TRADE : Quantity and value of principal commodities imported into the port of Chittagong from West Pakistan during 1948-49 to 1951-52 by trade years.

PAKISTAN MERCHANDISE

Thousand rupees.

			1948-49	1949-50	1950-51	1951-52				
	Unit.		Quantity.	Value	Quantity	Value.	Quantity.	Value.		
29.	Cotton twist and yarn ..	Lb.	44 71,787	8,941	24,52,865	4,583	54,28,481	13,848	..	..
30.	Cotton piecegoods ..	Yds.	17,39,064	3,204	7,33,571	1,345	1,36,99,564	19,226	34,692	51
31.	Other textile ..	..	..	437	..	785	..	996	..	399
32.	Tobacco manufactured	Lb.	..	67	72,930	253	..	5,994	..	5,823
33.	Tobacco un-manufactured	Lb.	..	..	748	2	27,417	41	..	..
34.	Others ..	Lb.	..	23,157	..	16,043	..	20,704	..	2,455
FOREIGN MERCHANDISE										
	Foreign Merchandise-Total	..	..	2,743	..	6,432	..	61,739	..	92,535
1.	Chemicals and chemical preparation.	..	..	13	..	157	..	276	..	3,784
2.	Drugs and medicines ..	..	..	80	..	152	..	592	..	1,571
3.	Dyeing and tanning substances ..	Cwt.	..	..	3,113	382	497	99	2,502	673

WEST PAKISTAN GAZETTEER
SIND REGION

(DESCRIPTIVE)
CHAPTER XIV

4. Hardware and cutlery ..	..	36	36	154	..	183	..	1,045
5. Instruments ..	..	15	..	58	..	25	..	855
6. Machinery ..	..	5	..	99	..	148	..	4,419
7. Metals, and ores ..	..	77	..	244	..	997	..	1,353
8. Coconut oil ..	Gls.	..	56,548	715	32,525	298	3,16,487	3,108
9. Paints and colours ..	Cwt.	..	122	54	595	225	5,429	1,728
10. Paper and pasteboard ..	Cwt.	481	38	843	6,538	449	30,788	2,381
11. Provision and oilman's stores ..	Cwt.	49	8	2,100	2,644	92	4,084	338
12. Rubber manufactures ..	..	..	..	..	..	12	..	532
13. Stationery ..	..	3	..	5	..	..	..	1,385
14. Cotton twist and yarn ..	Lb.	1,15,159	346	6,44,770	2,017	33,183	53,66,227	20,243
15. Cotton piecegoods ..	Yds.	1,297,214	1,754	5,50,039	658	16,075	26,786,760	36,516
16. Other textiles ..	..	..	13	..	22	495	..	2,088
17. Tobacco manufactured ..	Lb.	..	..	1,120	6,695	1,702	21,988	67
18. Other articles ..	..	..	355	1,356	..	6,888	..	10,449

Subject to the qualifications which have been enumerated above as to the validity of the statistics for the Sind and Khairpur areas, these tables may give some idea of what the trade and commerce in Sind and Khairpur mean today, so far as recorded statistics are readily available. The chief exports of Sind and Khairpur are cotton, oil seeds, wool, hides and skins and animal bones. Foodstuffs, which particularly in the case of wheat used to be the main item of the export trade, have ceased to be an export owing to the fact that West Pakistan and East Pakistan together have in recent years proved insufficient for the supply of foodgrains to their own population. This result is due partly to a series of unfortunate agricultural years, partly to the great increase in population and partly to the failure of agriculture to keep pace with the need for greater production. The cotton which is mostly the produce of the Nawabshah, Hyderabad and Thar Parkar districts is bought from growers and taken first to ginning factories whence, after ginning, it is despatched by rail to Karachi in unpressed bales of about 440 lb. weight. In Karachi it is prepared for shipment in hydraulic cotton presses. Oil seeds are grown principally in Hyderabad, Larkana and Upper Sind Frontier districts. No recorded quantity of any of them comes into Sind by road, though a good deal comes by rail and the greater part of rape seed, til, sesame and Gingelly, which is annually exported from Karachi, is grown in Sind. Wool takes a high place among the exports of Sind and is classified under two heads: Foreign and Indian.

Fairs are almost as numerous in Sind as holy places. Every departed saint has his day, on which the devout come together to worship and buy and sell in his honour.—Some of these religious fairs being together forty or fifty thousand people; some only a few hundreds. Some last a week, some for only a day. The following are the most important.

Where held.	When held.	Length of time.	Average attendance.	Nature of goods annually sold.
Days				
Shah Yakik in Shah bandar.	First Sun-day of Chet	3 or 4	14,000 to 15,000	Gold and silver articles to wearing apparel, meat, vessels, fancy articles sweetmeats and fruit.
Mughulbhin in Jati	23rd Phagun	6	10,000	Goods of all sorts. No animals.
Uderolal in Hala	First day of Chet.		50,000	Provisions, sundries, fancy articles, susi cloths and camels.
Badin.	5th Rabi-al-sani.	15	10,000	Sundries, brass trinkets, silk, Cutch silverware and camels.
Bulri in Guni.	Ist Zilkad.	7	10,000	Sundries, brass trinkets silk, Cutch silverware and camels.
Sehwan.	18 Shahban	3	30,000 to 40,000	Carpets, utensils, cloths toys, articles of food No animals.
Pithoro.	Ist Bado.	4	20,000 to 30,000	Silver and brassware, silk linen goods (khes and susis) embroidered work harness and nats, toys and fancy articles, sweetmeats, grains and cloth.

The unit of weight is always a man (maund) of 40 sers each ser weighing 80 tolas. For common purposes a ser is considered the equivalent of 2 lbs., but it is actually about $\frac{4}{5}$ of an oz. more and the official equivalent of a standard maund is $82\frac{2}{7}$ lbs. This maund is used in the whole Province and does not vary with the commodities. The common divisions of the ser in use are:—

Duka.	.. 1 Tola.	(The weight of a rupee).
Chatang.	.. 5 Tolas.	
Adh-Pau.	.. 10 Tolas.	
Pau.	.. 20 Tolas.	
Adh-Ser.	40 Tolas.	This is called a Kacha Ser in Lower Sind).

In Karachi the Khandi (Candy) is also a unit of weight equal to 8 maunds.

Gold and silver are weighed by tolas, masas and ratis, 8 ratis being equal to a masa and 12 masas to a tola. Precious stones are weighted with ratis, which are the same as those used in weighing gold. Each rati is an equivalent of 4 mung. The weight of precious stones is not expressed in masas or tolas but in ratis by any number. There is a distinct and complicated system of weights for pearls.

Milk is sold by measurement. Vessels containing a Ser and a Pau ($\frac{1}{4}$) are used as the units. The liquid ser contains 27 oz. of water and is equal to 1.35 pints English measure. Cotton and other raw material, foodstuffs, oil-seeds, vegetables, fruit, metals, ghi, country oil, etc. are sold by weight.

Grain and seeds are also sold by measure, the table of which is as follows:—

4 Chothais.	= 1 Pati.
4 Patis.	= 1 Toya.
4 Toyas.	= 1 Kasa.
60 Kasas.	= 1 Kharar.

A Kharar is equal to $29\frac{1}{2}$ bushels, English measure.

(There are exceptions.)

In the case of Jurai, bajri, wheat, rice, mung, gram and peas a Kharar is considered to be equivalent to 24 maunds by weight. In the case of til seed, oil seeds and paddy (rice in husk) a Kharar is considered to be equivalent to 20 maunds.

Cloth is measured by Gaz (ramrod) and Hath (cubit). A Gaz is equal to a yard of 36 inches, but the Hath varies in different parts of the Province from 18 to 27 inches according to local usage.

Carpets, matting and glass are sold by superficial measure.

Stones, masonry-work and timber are sold by cubic measurement.

Land for building sites is sold by superficial measure. In the case of agricultural land the unit is an acre or a jireb, 2 jirebs being equal to one acre.

Canal clearance is estimated by cubic measurement, the unit being a Gaz of 4 feet, which means 64 cubic feet.

The Weights and Measures Act is now in force in Sind and Khairpur. Administration of the Act was in the first instance entrusted to local bodies; but from the 1st April 1940 the entire

work in connection with weights and measures was taken over by the Department of Industries. Before the change there were eleven local body inspectors and eleven government inspectors, but as only some of the local body inspectors were taken over as government inspectors, the total strength of inspectors became fifteen. The change-over resulted in the better enforcement of the Weights and Measures Act which is now definitely self-supporting. In 1940-41 receipts were 77,479 rupees and expenditure 68,235 rupees and in 1941-42 receipts 79,963 rupees and expenditure 56,909 rupees inclusive of 18,816 rupees for taking over the equipment from local expenditure 56,909 rupees inclusive of 18,816 rupees for taking over the equipment from local bodies. During 1940-41 twenty-six prosecutions were sanctioned against traders and dealers for non-compliance with the Act and twenty-five persons were convicted. In 1941-42 there were forty-three prosecutions, thirty-four ending in conviction, while several cases were left pending at the end of the year. In 1940-41 eighty-nine concerns were registered with the Department of Industries as dealers and manufactures of weights and measures, and this number increased to ninety-nine in 1941-42. Although the Act provides that for all transactions and dealings one of the standard weights and measures and multiples thereof should be used, practices such as taking one or two sers extra for each maund of goods purchased continues to be in vogue in certain grain markets. These customs are called badano, naman, darmau, run and pachaino. Action cannot be taken under any of the sections of the Weights and Measures Act. Agriculturists were, however, advised that such customs operated to their disadvantage. A Press note was issued drawing the attention of the trading public and inspectors were asked to carry on propaganda during the course of their tours to induce the trading public to discontinue these practices. But that these irregular practices still continue to the disadvantage of the ignorant peasantry seems clear from the mention of the fact by the Sind Agricultural Commission in its report of 1953.

Communications in Sind today are by road, by rail, by water and, to a very small extent and recently, by air. Taking roads first, the First Five-Year Plan 1955-60 for Pakistan emphasises the need for considerable development of the road system in Sind and, as the plan is put into effect, the road mileage in Sind will be added to considerably. In 1851 Sir Bartle Frere found in all Sind not a mile of bridged or of metalled road, not a masonry bridge of any kind; in fact, not five miles of any cleared road. Roads in truth are not a Sindhi institution. The sandy plain lies before the camel to go whither he wishes. When the inundation came and the camel could not go, it created over all the land waterways for boats or floats of weeds and grass; but there were recognised routes by which the traffic between the large towns was

carried on in the dry season avoiding insuperable obstacles. Such were the routes from Karachi to Shikarpur, from Karachi to Kotri and by ferry to Hyderabad, from Hyderabad to Thatta, Lakhpat, Jodhpur and Multan. Road-making began in earnest with Sir Bartle Frere. Now a network of roads has overspread the length and breadth of the country. But many of them are merely tracks still. In the Upper Sind Frontier they are commonly covered with river-grass, so that feet and wheels may not sink too deep in the soft dust. In the south they are merely banks of earth raised above the level of the rice fields. But whatever the character of the track may be, bridges are essential in a country which is reticulated with canals and these have been built by the hundred. Road-making in Sind is indeed not a very easy task because of the vast stretches of sand in certain areas and the absence of stone in the greater part of the alluvial plain. For this reason road-making was not taken up seriously for a long time, and until thirty years ago the number of metalled roads with a tolerable surface in the country was very small. This has been greatly altered in the last two decades since the motor vehicle has asserted its right to travel wherever wheels can go. Since the motor vehicle arrived on the scene, it was inevitable that buses would need a suitable surface for conveying passengers in all directions to the larger villages. Excluding roads maintained by municipalities, district boards and the M.E.S., at the end of 1952 Sind possessed 758 high type roads and 1,436 low type roads. Of the high type roads 258 were black-top, 145 cement concrete and 355 macadam. Of the low type roads 100 were granular, 947 natural surface, 292 black paved and 97 trackways. In 1953 the Chief Engineer, Roads and Buildings, Public Works Department, Sind, stated that the total mileage in charge of the P.W.D was 2,376 miles, out of which 1,082.5 miles were pukka roads and 1,293.5 miles were kacha roads. The mileage of metalled roads in Sind was 869. The total expenditure on the maintenance of roads in charge of the local boards is very much inferior to that of the roads in charge of the Public Works Department. The exact mileage of the roads in charge of the local boards is not known; but general opinion in Sind is that all roads should eventually be placed in charge of the Public Works Department for proper construction and maintenance.

After partition the Sind Government "nationalised" certain roads for passenger traffic. The General Manager of the Sind Government Transport at Karachi stated in 1953 that the routes nationalised for passenger traffic were then Karachi-Thatta-Hyderabad; Karachi-Bohara; Hyderabad Station-City Hyderabad-Kotri; Hyderabad-Matiari; Hyderabad-Hala; Hyderabad-Halani; Jungshahi Thatta Ferry; Halani-Sukkur; Sukkur-Shikarpur; and Sukkur-Jacobabad. He stated that the policy was to nationalise impor-

tant highways and the more busy routes in Sind, in order to provide better travelling facilities to the public at the cheapest possible rates. Sind Road Transport provided for the transport of passengers only; but the nationalisation of goods traffic only was also within its programme. The transport organisation owned seventy-nine buses, of which about forty were in working order, the rest, being off the road for want of spare parts, were not readily available. The Transport Board had also placed an order for thirty-six new vehicles. The working of this transport system on these roads showed a considerable profit, the figures for the years 1950-51, 1951-52 and 1952-53 being as shown in the statement on page 411 of the report of the Sind Agricultural Commission.

Year.			Earnings.	Expenditure.	Net Profit.
1950-51	..	..	26,94,835	22,18,975	4,75,860
1951-52	..	..	36,91,808	29,62,288	7,29,520
1952-53	..	..	36,49,237	31,11,784	5,37,453

The Mechanical Engineer, Lower Sind Mechanical Division, Hyderabad, Sind, stated in 1954 that the earthwork for the construction of roads was done by means of tractors and graders, the cost being from 8 to 9 rupees per 1,000 cubic feet. The work comprised jungle-cutting, levelling, making embankments and providing diversions for traffic. Consolidating and surfacing was done by means of road-rollers, tar-boilers and asphalt mixers in the case of asphalt roads, but by means of concrete mixers in the case of concrete roads. A number of roads have been constructed in Lower Sind during recent years, the Hyderabad/Mirpurkhas Road; the Mirpurkhas/Sindri Road; the Hyderabad/Tando Mohammad Khan Road; the Tando Mohammad Khan/Jhok Road; the Tando Mohammad Khan/Matli Road; the Matli/Tando Ghulam Ali Road; the Gharo/Mirpur Sakro Road; the Mirpur Sakro/Bulara Road; the Hala/Shahdadpur Road; the Shahdadpur/Tando Adam Road; the Nawabshah/Sakrand Road; the Sakrand/Makhidhandh Road; the Sakrand/Nawabshah Road; It is thus clear that Sind and Khairpur have progressed a long way towards the motor age and that the mileage of roads suitable for internal combustion engines is growing rapidly. In this connection the following figures are interesting showing the number of motor vehicles in use in Sind in the years 1951 and 1952 as follows: 1951—private cars 2,290; taxis 80; trucks 1,010, buses 430; motor-cycles 302; and in 1952—private cars number not available; taxis 89; trucks 1,009; buses 626 and motor-cycles 396. There are, of

course, still large areas of the Sind countryside and Khairpur territory which are without adequate roads. In the sandy tracts this perhaps does not matter so much because these areas are lightly populated, and the camel and the horse are the most convenient means of carriage and transport. But in areas at present uncultivated and likely to come under intensive cultivation when the three Barrages are all working to full power, a big road-building programme will be needed to cope with the rise in population. Road-making in these areas will not be easy owing to the multiplicity of canals, majors, minors, distributaries, and watercourses which will require bridging. But doubtless this is part of the problem that will be tackled when the First Five-Year Plan is put into operation as far as road-building schemes needed for Sind and Khairpur are concerned.

Sind and Khairpur are well provided with railways. The North Western Railway has a monopoly of all railway traffic within the territory. It is a Government concern and financed by the Central Government. There is no need to repeat in this Gazetteer the detailed history of the construction of the railway system in Sind. It is sufficient to say that through Sind run the two vital railway lines supplying Lahore and the Punjab on the one hand and Baluchistan and Quetta on the other, and that a main line connection runs from Sind through Hyderabad and Mirpurkhas to the Indian frontier at Khokhrapar in the Thar Parkar district, and that doubtless when conditions return to normal and the relationship between Pakistan and the Republic of India is on a better footing this main line through Marwar will be an important additional source of traffic and communication between the two countries of the sub-continent today. After partition this line was cut at Khokhrapar, so that there was no train running through from Sind into India. When the 1907 edition of the Gazetteer came out the railway construction stage had for all practical purposes been completed. The only additions to the railway system were in the thirties when additional lines were laid down to cope with the great increase in cultivation and population in those areas of middle Sind where the Rohri canal was giving water for the cultivation of vast areas of new land. These new additions to the railway system constructed in connection with the Sukkur Barrage agricultural development programme are: the metre gauge from Mirpurkhas Junction to Nawabshah Junction, a distance of 83 miles; the metre gauge loop-line from Mirpurkhas Junction and Jamrao Junction to Pithoro a distance of 119 miles; the broad gauge line from Pad-Idan Junction to Tando Adam Junction via Sakrand Junction, a distance of 125 miles; the broad gauge connection from Sakrand Junction to Nawabshah Junction, a distance of 15 miles; and the broad gauge line from Mehrabpur via Tharushah Junction to Pad-Idan Junction, a distance of 46

miles. Apart from these extensions, the only other notable achievement has been the construction of a broad gauge line between Jacobabad and Kashmore, this replacing the previous narrow gauge system. This extension was completed in 1955, so that Kashmore is now via Jacobabad linked up with a broad gauge line to Larkana via Shahdadt. At Larkana the main line to Quetta by the right bank of the Indus is joined. During the First World War the line between Hyderabad and Badin was taken up in order that the permanent way might be used for the campaign in Mesopotamia against Turkey. The line was restored after the end of World War I and, during the period when there was no railway line between Hyderabad and Badin, a rather inefficient service of steamboats plied in the Fuleli Canal between Hyderabad and Badin. It is not necessary in this Gazetteer to describe in detail the working of the railways in Sind. Persons who are interested can find what they want in a perusal of the report on the working of the Pakistan Railways and in the Fare and Timetables published by the North Western Railway. It remains merely to say that all trains running through Sind carry enormous traffic, both of passengers and goods. In fact they constitute an example which many more advanced countries are unable to attain at least according to the experience of the last ten years. Whether Pakistan in the Sind and Khairpur area has reached that stage of railway development where further expansion is not called for, but where instead some sort of co-operation will be necessary between rail and road traffic is a matter for the urgent consideration of the authorities whose business it is to ensure an adequate supply of modern up-to-date transport of the kind which the present-day world demands. With the transfer of the Federal Capital area from Sind and with the removal of the railway workshop from Sukkur to Lahore, the two big railway workshops in Sind have gone. This has meant a considerable reduction in the number of persons employed on railway work in the country. In fact according to the 1951 Census railway transport employed no more than 7,500 persons in Sind and Khairpur. Some description of the two imposing railway bridges over the Indus in Sind is given in the district volumes. The description of the beautiful Lansdowne Bridge which carries the North-Western Railway across the Bukkur Gorge from Rohri to Bukkur Island will be found in the District Gazetteer of the Sukkur District and a description of the sturdy Kotri Bridge which takes the North-Western Railway over the river from Kotri to Hyderabad is in the District Volume of the Hyderabad District. The Lansdowne Bridge, which was opened in 1889, has proved not up to the weight of modern trains, and the budget of Pakistan for the year 1958 has made a provision of 5 lakhs of rupees for preliminary expenses on measures to replace the existing bridge over the Indus river.

Waterways.

The river Indus has fallen greatly from its high estate as a means of communication through Sind. In the days of Napier it was regarded as the easiest solution of the problem of transporting goods from one end of the country to the other. But the river has proved itself quite incapable of providing a convenient and useful waterway for the bulk of traffic that the country now demands. For five years before the British occupation the navigation of the Indus engaged the serious attention of the Bombay Government, in consequence of the necessity for using the river for the passage of troops to Multan and Afghanistan, and several officers were deputed to survey it. Their reports have much interest. The cargo boats (dhundhis) on the river then appear to have been of the same construction as those in use now. They were of bad materials because the poor Muhanas could not afford the cost of the teak timber that came from Cutch. The first steamer seen on the river is said to have been "The Indus" in 1835. In 1843 two steamers, "The Planet" and "Satellite", took part in the operations connected with the annexation of Sind and after the occupation of the province had been completed a small flotilla was maintained under the command of an officer of the Indian Navy, with headquarters at Kotri. From 1852 it appears that something like a fortnightly mail service between Karachi and Multan was maintained with the help of this fleet. In 1859, however, another flotilla was organised to co-operate with the railway then in course of construction between Karachi and Kotri, and to this steamers of the Indus Navy were handed over on its abolition in 1862, or thereabouts. This flotilla was amalgamated with the railway in 1870, and its management transferred to Lahore. A company called The Oriental Inland Steam Company, which has been started with a capital of £250,000 for the purpose of navigating the principal rivers of India with steam trains, consisting of trains and barges drawn by powerful steamers, began operations on the Indus in 1858, receiving an annual subsidy from the Government of £5,000. But it collapsed through mismanagement and its fleet was sold off in 1869. After the connection of Karachi with the Punjab by rail in 1878 the river lost its importance as a means of communication. It is still used, however, for the transport of timber, firewood, hay and all sorts of agriculture produce, as are the Fuleli, the Western Nara and other navigable canals. No account is kept anywhere of the volume of this traffic. It is feared, however, that the Indus river traffic has still further declined because of the construction of the Sukkur Barrage. This certainly had much to do with the shutting down of the prosperous timber trade in Sukkur Bundar, and with it went the ship building which took place on the banks of the river there. Presumably the Ghulam

Muhammad Barrage Bridge at Kotri and the Gudu Barrage Bridge at Gudu, when that is completed, will still further lessen the importance of the river as a facility for comparatively long-distance traffic. The Census of 1951 shows that the total number of persons employed in sea and rivercraft crews was only 1,105, of whom 1,086 were males and 19 were females. This is an indication of the extent to which the use of the river as a means of transport today has declined. The dhundhis still ply in considerable numbers on the Indus, but it is feared that they will gradually disappear. In actual fact the river Indus in the fair season is so obstructed by shifting sandbanks and so impeded by snags that navigation on it is, at the best, somewhat precarious and always painfully slow. For the most part, when going up-stream the dhundhis have to be pulled from the bank by men leaning heavily on tug ropes. It is doubtful if more than 1 mile an hour is possible by this means of locomotion. As these Indus boats are likely soon to become museum pieces, the description of them in the 1907 Gazetteer is reproduced here.

"The hull, or body of the boat, is formed by the junction of three detached pieces, namely two sides and a bottom; at variance with our ideas of naval architecture the three parts are first separately completed, and then brought together, as a cabinet-maker does the sides of a box. The junction is thus effected: when each of the three parts that are to form the whole is complete in itself, the sides are carried to the bottom of the boat, and at once secured, by crooked pieces of timber, to the flat future bottom of the doondee. To bring the bow and stern up to the corresponding parts of the sides is more difficult, and to effect this many days are necessary. Where the bow and the stern are to rise, the planks are lubricated with a certain composition, which gives them a tendency to curve upwards, and this is further increased by the application of force. The extremes thus risen, a tackle is stretched between them, and by a constant application of the heating mixture, and a daily pull upon the purchase, they rise to the required angle, and are secured to the side, while an advantageous curve is imparted by this process to the planks in the boat's bottom. The bow of the doondee is a broad inclined plane, making an angle of about 200 with the surface of the water: the stern is of the same figure, but subtends double the angle."

"The masts are poised upon strong beams resting athwart the gunwales: moving on this fulcrum, their management is easy, and the masts can be lowered down or placed upright at pleasure. The sail is hoisted behind in preference to before the mast."

The dhundhi nevertheless, with its square ends, its high stern and low and its great curved steering car, is a quaint and picturesque object. The dhondho is merely a smaller version of the dhundhis used by fishermen. The man and wife manage while the children and a few tame herons or cormorants, or perhaps a pelican, behave as steerage passengers. The kauntal is of similar construction, but has a greater breadth of beam and is used at the ferries for transporting men, cattle and camels. The zohrak, with its variety the bagochri, is a Punjab craft, which differs from the dhundhi a good deal in appearance owing to its bow and stern being rounded instead of forming an angle with the bottom; but there is little essential difference in the plan of construction. They run to a larger size. There are several other names, which may indicate distinctions known to nautical men, but they are lazily and contradictorily used. The commonest of them is the batelo, which in its proper application belongs to the largest type of sea-going vessel in India except the Cutch kotia. Under sail none of these boats will lie within 8 or 9 points of the wind. Consequently it commonly happens that the only way of going up-stream is by 'tracking', that is, by the crew getting out and towing the boat. They get along at about 2 miles an hour, with luck. The boats on the Indus are unfitted in every respect for the navigation of the sea, and the cargoes, if intended for export are transferred to sea-going vessels at Ketī or Sirganda. These two ports are visited by native craft from Karachi, Cutch and even Zanzibar, but are inaccessible to square-rigged ships and steamers, for which Karachi is the only port in Sind.

Ferries in Sind are numerous, not only over the Indus, but over the larger of the branches of that river and the bigger canals. The proceeds of public ferries are credited to the local fund of the district in which they are situated. When a public ferry plies between two districts the proceeds are divided in the proportion determined by the Commissioner. Before the Indus was bridged at Sukkur and Kotri there were public steam ferries at both places. There is only one now, which plies across the river from Machis village in the Sijawal taluka to the mouth of the Bhagar in the Thatta taluka. The boat ferries over the Indus and its canals number in all more than a hundred, besides some of a temporary character. A list of these ferries will be found in the district volumes enumerated according to the district in which they exist. Before the subject of the Indus river is completed, a word should be said about the Indus River Commission. This is a body comprising the Chief Engineer and Superintending Engineers, the Honourable Minister of the Public Works Department being the President. It formulates the policy regarding river control and deals with all problems connected with the river. A survey of the river Indus is an annual feature of the Research Division and

this record is regularly maintained to watch the vagaries and to see how the heads of canals should take off to avoid failure as far as possible, and how to keep the river floods out by constructing bunds and loops. The survey of the river Indus has been helpful to the agriculturists in this respect, that the study of the vagaries of the river as surveyed and plotted show to the experienced eye the behaviour of the river. The agriculturists have benefited by the providing of new heads to the inundation canals at suitable points, which can be done only with the help of the surveys of the river Indus by an experienced engineer. Not only that, but the whole cultivated area on both banks is protected from floods by providing a series of bunds and timely construction of loops by the aid of these surveys. The Executive Engineer of the Research Division stated in his evidence before the Sind Agricultural Commission that its functions are to carry out the annual survey of the river Indus from Rojhan to the sea. The object of the survey is to know the river course, so that timely precaution may be taken at points of erosion by building loop bunds where the front bunds are subject to the attack of the river. It also records the water-table in the Sukkur Barrage and other investigated areas. It maintains and records the river gauges and the observation of the discharges at various points of the river. The Executive Engineer of the Research Division said: "The survey of the river Indus had provided the basic data on which the further behaviour of the river survey could be predicted, and without the yearly collection of the basic river survey prediction would have been impossible. To this extent the annual survey of the river Indus is very fruitful. "But if the point is," he said "that there should be a check on the vagaries of the Indus, so that there may be control of it, it may be stated that even in countries like the U.S.A., which are highly advanced in dealing with problems of river control, these countries have not succeeded in controlling the vagaries of the river Mississippi".

Posts and telegraphs are now under the Federal Government and details of the working of the Postal Department can be found in the annual reports published by that department. Sind is now exceedingly well provided with Post Offices and Telegraph Offices, and the telephone system is now widely in use, and the demand for telephones from private subscribers grows yearly. Air services at present are in their infancy in Sind, where perhaps the distances are too short for anything but small planes and local flights. Aviation is another of the departments under Federal control. Persons interested should consult the publications of the Federal department dealing with aviation. A subsidiary aerodrome to Karachi has been constructed at Nawabshah, but it is only a standby. The near future is likely to see considerable development in the use of flying-machines, whether aeroplanes or helicopters over Sind and Khairpur.

Fisheries.

There are probably few shores to which fish resort in greater number and variety than the coast of Sind. The Indus, one of the few rivers in Pakistan which flow all the year round attracts those species, like the palla, which breed in fresh water, while the food which its many mouths pour into the sea brings together countless small fry, which are food in turn to many predacious species. Others, like the sardine, of migratory habit, pass by periodically in countless shoals. For these reasons the fisher's craft has been carried on at and about Karachi from time immemorial on a scale so much in excess of local requirements that the salting of fish for export has also become a great trade. The Amirs raised a revenue of from Rs. 4,000 to 7,000 by farming out the right to fish, with the results that the fishermen became virtually slaves of the Bania contractors. The farmer could levy his dues in either money or kind according to a tariff truly oriental in its complexity and much too long for reproduction here. The fishermen were also subject to about ten different cesses of a miscellaneous nature, the collection of which must have maintained a host of harpies. The British Government, abolished the contracts in 1846 and adopted a system of licenses, but this proving very unremunerative, the fisheries were again sold by auction in 1851. In 1858 this system was again condemned and licenses were issued to fishing boats on fees which ranged from Rs. 3 for a toney to Rs. 5 per ton on larger craft. Having paid this fee the owner of the boat was free to fish where and as he pleased. This system continued until 1884, when fishermen were relieved of all special taxes in view of the deplorable condition into which their trade had sunk since the abolition in 1867 of the import duty of $7\frac{1}{2}$ per cent. on salted fish. This had exposed them to a ruinous competition from the Makran coasts, where there was no duty on salt. To meet this an import duty of 12 annas a cwt. was imposed by the Tariff Act of 1875 on salted fish imported into any part of the Bombay Presidency excepting Sind, which gave the Sindhi in his turn an unfair advantage over the fishermen of the Bombay coast, whom he could undersell in their own markets, for the duty on salt was only 8 annas a maund in Sind, but Rs. 1-13-0 in the rest of the Presidency. Three years later however the Bombay salt duty, which had in the meantime been raised to Rs. 2-8-0 a maund, was extended to Sind, and the Tariff of 1882 repealed the import duty on salted fish from Makran and elsewhere, with the speedy result that the Government of India was moved, in view of "the virtual destruction of the fish-salting industry in Sind," to insist on an experiment being made with yards in which salt should be issued to curers at cost price. By Bombay G. R. No. 8895, dated 11th November, 1884, the opening of four such yards was sanctioned. Three of them proved impracticable, but one was started on the

1st of May following at Shamspir, within the limits of Karachi harbour, and has been maintained successfully to the present day, the average issue of salt per annum being 860 maunds and the out-turn of fish 5,235 maunds. In May 1904 another yard was opened at Khadda, close to the fish market on the west of Karachi City, at which, in the eleven remaining months of that official year, 959 maunds of salt were issued and 14,672 maunds of fish cured. Measures are also taken to encourage curing with duty-paid salt, which is carried on extensively at Rehri in the creek east of Ghizri Bandar and at Kund in the Mutni channel, not far from Ketri Bandar, and on board fishing boats. Permits to store salt at the two places mentioned are granted by the Collector of Karachi, under Section 38 (2) of the Bombay Salt Act, and a by whom, as well as by the Collector of Customs, similar permits Customs Munshi is appointed to control the traffic at each place, are issued to fishermen desirous of curing fish on their boats. The aggregate quantity of salt for which permits were issued to fishing boats in 1904-05 was 838 maunds.

The effect of all these oscillations of the fiscal pendulum on the fishing industry may be fairly gauged by the following figures showing the value of exports of salted fish from Karachi:—

1855-60	Rs. 1,04,508
1860-65	Rs. 1,69,418
1880-85	Rs. 2,47,379
1900-05	Rs. 6,26,610

Allowance must be made for the inclusion in these figures of an uncertain proportion of fish from Makran re-exported.

It must not be supposed that the advance in the fishing and fish-curing industries evidenced by the above figures indicates a proportionate advance in the prosperity of the fishermen. When Dr. Day wrote his great Report on the Sea Fish and Fisheries of India, 1873, he was informed that the fishermen in Sind all borrowed money to purchase boats and nets, entering into a bond with the creditor to deliver their captures to him at half the ruling market rates; and their condition is very much the same at the present day. Their boats, if not actually owned by Khojas and Banias, are mortgaged to them on terms which usually include a right to the produce of all the fishermen's labours at a fraction of its value. The salting at the Government yards is entirely, or almost entirely, in the hands of a few wealthy men, who have the mass of the fishermen in their grasp and derive more benefit from the benevolent intentions of Government than the objects of them do. Nevertheless the condition of the fishermen as a whole appears to

be fairly prosperous and very different from the picture drawn of it sixty years ago. They are all Muhanas and are divided into Karachi, Lara, Vangura and Bandri. These appear to be merely topical names, but probably indicated at one time differences of occupation wider than exist now. Even now the Bandri fish more with hook and line, the others more with nets. The Karachia and Lara are said to inter-marry freely, but not the others. There is a Wadero, or Headman, of each village, not each division, as Dr. Day reported to be the case about ninety-three years ago, and of perquisites and privileges he has retained none save the right to a marriage fee of a gangi when a marriage is celebrated in his village. The number of self-supporting persons aged twelve and over engaged in fishing was according to the 1951 Census 10,314, of which 222 were females. For the whole of Sind and Khairpur the figures appear to be a gross underestimate, especially as regards numbers of women. It is not possible to state the number of Muhanas as was done in the 1901 Census owing to the stoppage of the classification of castes after the 1931 Census. There is no doubt that the majority of working fishermen are still in the seaward talukas of Sujawal, Jati, Mirpur Bathoro and Shahbandar as described in the 1907 Gazetteer. There are, of course, many Muhanas fishing on the inland waters of Sind and Khairpur, but no estimate of their numbers can be given. Then, as now, Muhanas were not only fishermen but lascars, and also found employment in cutting and disposing of mangrove jungle and other produce of the creeks.

Dr. Day enumerates 160 species of marine fishes obtained by him on the Sind coast and there are many which he did not obtain. Only those which have some economic importance can be noted here. Of the kinds which are thought worthy of a table the following are the best known: of some the bazaar, names are more familiar than the Sindhi.

Stromateus cinereus (Sindhi-Pithun)-the Gray, or Silver, and *S. niger*, the Black Pomfret—"Paplit" of the bazaar. These are to be had only occasionally.

Drepane punctata (Sindhi, Phano: Dr. Day says "Punnur") This is passed off for a Pomfret.

Cybium guttatum (Sindhi, Gor), the "Surmai." Also *C. interruptum* (Sindhi Kakan) and *C. commersoni* (Sindhi Karghan), which is very highly esteemed.

Clupea ilisha, the famous Pallo or "Pulla" of the Indus. Large numbers are netted off Karachi harbour in March and April when they congregate before ascending the river to breed.

Polynemus indicus, *sextarius*, *plebeius* and *tetradactylus*, all known as "Seer" (Sindhi, Siari), or Salmon Fish, in the bazar. *P. sextarius* is the Bombay Rawas and *P. tetradactylus*, the "Bahmin" of anglers. *P. indicus*, distinguished in Sindhi as Sir Photai, is specially esteemed and yields the best maws.

Mugil waigiensis (Sindhi, Mori) and another species of *Mugil* (Sindhi, Phar) known in the bazaar as Mullet, or Bhoi.

Crenidens indicus and *forskalli* (Sindhi, or Baluchi, Kisi) *Sargus noct*, *Chrysophrys sarba*, *bifasciata* and *berda* (Sindhi, Dandio). These and some other *Sparidae* and also *Diagramma nigrum*, or *cinctum* (Sindhi Mui), are known as Rock Fish, Stone Fish and "Istone Fish." Some of them are very good.

Synaptura orientalis (Sindhi, Phani), the Sole. *Plagusia bilineata* (Sindhi, Chhail) and *Pseudorhombus* sp. (Sindhi, Hajam) inferior kinds of sole.

Harpodon nehereus, the Bummaloh, or "Bombay Duck." Only plentiful on occasions.

The following and many other species are also sold in the markets.

Clupea longiceps (Sindhi, Luar, Marathi, Tarli) the Oil Sardine. It visits the coast periodically in vast shoals. Several inferior species of herrings, such as *C. fimbriata* and *lile* and *Engraulis malabarica*, (Sindhi Kareri, Padan) are also sold as Sardines. *Scomber microlepidotus* (best known by its Marathi name Bangda). This mackerel is abundant and cheap and most excellent.

Lates calcarifer (Sindhi Dhangro). A grand fish, growing to 5 feet in length. It frequents the mouths of the river and is esteemed excellent eating.

Serranus lanceolatus (Sindhi, Gissir), *S. diacanthus* (Sindhi Dambo) and several other species of the genus.

Pristipoma hasta (Sindhi, Dothar) and others of the genus *Scicena sina* and perhaps *S. miles* (Sindhi, Sua) salted in greater number than any other fish. Also *S. axillaris* (Sindhi Gol) *S. coitor*, *S. glauca* and others.

Chorinemus sancti-petri (Sindhi, A'1). one of the chief species salted.

Mugil dussumieri (Sindhi chhodi), plentiful and cheap.

Bellone strongylura, (Sindhi Kango), the "Ghar Fish."

Less esteemed but freely eaten by Muhanas, Makranis and Negroes, are "Cat fishes" Arius thalassinus and others (Sindhi, Khago), and Sharks (Sindhi, Mangro) of several species and the Sawfish (Sindhi Mor-Mangar). The flesh of the sharks is considered to be very strengthening and they are salted for export in great numbers.

Almost any of the above mentioned species may be salted when caught in larger number than can be disposed of at once; but the export trade is dependent mainly on a few species, such as the Sua, A'l, and Dothar, which visit the coast in vast shoals from March to May and again after the monsoon. Of the first named as many as 25,000 are said to have been brought to the Khadda yard in one day, all large fish. Cat fishes (Khaga) and Sharks (Mangra) are also cured in large quantities. The method of curing is different from that followed on the Makran coast. Each fish is deftly slit up, the sound, or "maw", removed salt sprinkled on it. After lying for a night it is laid out in the sun to dry. Sharks are differently treated, being cut up into small strips. The quantity of salt used varies with the species and condition of the fish. One maund of salt to five of fish is considered a fair proportion, but much less is often made to suffice. Of the fish cured at Karachi very little is consumed in the Province. Roughly speaking 20 per cent. of it goes to East Africa, as much or more to Burma, rather less to Colombo and the balance to Bombay, or elsewhere via Bombay.

Other products of the Sea Fisheries are Shark-fins, Fish-maws & Liver Oil. The fins of Sharks, Skates and Saw-fishes are cut off, rubbed with salt and dried in the sun for export to China, where, being rich in gelatine, they are said to be convertible, like bird's nests, into a luxury for the table. They are divided into "White" and "Black." Maws are the sounds, or air vessels, of certain fishes, from which isinglass is prepared, and are exported to the United Kingdom as well as China. The principal fishes which yield this product are those of the genera, Serranus, Sciaena and Polynemus mentioned above, the best being those of Polynemus indicus. The Siluridae also yield maws and are sometimes killed in the creeks for these alone, the bodies being thrown away. The maws, cut out with as little delay as possible after the fish is caught, and split, are flattened, and dried. The oil extracted from the livers of Sharks, Skates, Rays and Saw-fishes is a valuable

product, but in Karachi it is all used up locally for the curious purpose of greasing the bottoms of fishing boats. Therefore no attempt is made to purify it. The livers are cut up, slightly salted and boiled down and strained.

The capture of prawns forms an important branch of the fisherman's trade in the creeks to the east. The Sindhi name is Sano, different species known as Kalri Sano, Jero Sano, etc. Kikut Sano is the large dark green kind which does duty for the Lobster. Prawns are caught in nets and at once boiled, dried, and sent to the godowns of contractors at Karachi. Here they are beaten with sticks to remove their shells and packed in sacks for export. The powdered shells are not lost, but carefully swept up for export to Cochin, or Malabar, where they are valued as a manure.

Classification of Nets.

The chief nets have been classified in the following various categories according to the methods of use:—

1—Fixed or Stationery Nets.

SIND AREA.

Dora:—Length—1,000' to 2,000'

Breadth—2 to 5 fthms.

Make—Cotton twine.

Catch—Smaller kinds of fish are caught. The net is attached to stakes driven in the mud in the inshore waters.

Rachh net:—This is known as “Jar,” “Thukri.”

Length—20 to 40 fthms.

Breadth—15' to 20'.

Size of mesh—2" to 4".

Make—Cotton twine.

Darbando:—Length—60 to 70 fthms.

Breadth—2 to 3 Choge.

Prawns are caught in this net. Barking of the nets is done with the decoction prepared from the bark of Karel wood imported from Zanzibar.

II—Seine Nets.

Pakhi, Rabi and Dak are different kinds of prawn nets.

Their length and breadth vary from 3' to 8' and 2' to 4' respectively.

The size of mesh ranges between 1" and 1½".

III—Drift Nets.

Rachh net:—Length varies from 40 fathoms to 100 fathoms.
Height varies from 6 to 8 fathoms.

This is a surface fishing net.

It is allowed to drift with the current, one end of the net being held in a boat.

IV—Inshore Drag Nets.

The prawn nets called Dak, Luyen and Jar are all inshore drag nets. The length varies from 15' to 30' and the breadth from 20' to 25'.

The size of the mesh ranges from ½" to 1½".
Made of cotton twine.

V—Cast Nets.

Jari net:—Length 5' to 10'.

Height—15' to 16'.

Size of mesh 1".

Catch—small sardines, prawns, etc.

VI—Long Lines.

Three different types of lines used. Single hook line, double hook line, line with over hundred hooks. Each boat

carries two lines. These are for fishing in the deep sea, a distance of 10 miles from the shore. The hooks are attached to the line 6 feet apart. The line is attached to floating pieces of wood marked with flags. When fishing with line the boats are anchored. Prawns and small sardines are used as bait. All kinds of deep water fish are caught by line and hooks.

VII—Hooks and Lines.

Hooks and lines are rarely used.

The boats used in fishing have finer lines than cargo boats generally and average ten tons burden. If the stern is pointed like the stem, they are known as Kelsi, but if the stern is square, as Batel. The cost of a large fishing boat complete may be Rs. Tonies, called in Sindhi Hora, are very much used in the creeks, of all sizes from a tonnage of about 1 3/4 down to tiny craft with scarcely sitting accommodation for one. The best come from Cochin and are hewn out of a single trunk, but after arrival the sides are often built upon to increase their carrying capacity.

Sindhis do not eat shell-fish, but they collect Oysters (Kado) for the market, and the Oysters of Karachi once had a great reputation, if they ever deserved it. They must have been well nigh exterminated by the reckless way in which the banks were cleared, for more than 90 per cent. of the oysters sold in Karachi now come from the coast of Cutch and Kathiawar. The quantity thus imported in 1902-03 was 21,600 dozen. Each boat carries from 1,000 to 2,000 dozen, which are kept in water at Khadda till disposed of. As the voyage takes three or four days, the freshness of the Karachi oyster is no longer above suspicion. Recently efforts have been made to protect the native from extermination. In 1896 a notification was issued closing the beds from Ghizri to the Habb for two seasons. Since then a close season has been observed from 15th April to 1st October and the removal of shells less than two inches or more than six inches in diameter has been forbidden. Since 1903 the expedient was tried of closing the eastern and western sections of the coast from Ghizri Bandar alternatively for periods of two years, so as to give the oysters that period for growth and reproduction.

In Sind, oysters are collected from the Brairi Hain Rocks. Dubba, Pitiani, Maurpur, Phity, Khajar, Karanji, Kudi, and the Hub river. The Sind oyster-beds produce by far the best oysters. The oysters found in the Presidency proper are small and often undersized. Mr. Rai has fully described the present-day condition of the oyster-beds and has arrived at the conclusion that

overfishing is resulting in their destruction. A similar conclusion, as far as the Sind oyster fisheries are concerned, was very definitely reached by Mr. James Hornell in 1910 as a result of a special investigation which he conducted in 1909 in Sind. He has published the results of his enquiry in "The Present Depletion of the Oyster Bed of Sind" and is it impossible not to agree with his conclusions. At present the Sind oyster-beds are under the control of the Collector of Customs, Karachi, who exercises over them a system of supervision which is preventing a too rapid deterioration of the beds as they exist to-day. The figures of production are as follows:—

	Dozen.	Royalty receipts.	Expendi- ture.
		Rs. as. p.	Rs. as. p.
1926-27	4,998½	924—2—0	786—11—0
1927-28	983	172—6—0	172—6—0
1928-29	5,049 5/6	1,115—8—6	989—10—0
1929-30	3,887	857—9—6	86—14—0
1930-31	3,842 11/12	797—7—9	98—14—0

These figures show that the financial results are trifling. This however would not matter provided there were some assurance that the most was being made of the natural resources. It cannot be said however for certain that this is so. There is admittedly no scientific supervision by experts of the oyster supply and the present system aims at little more than maintaining the supply in a position of stabilisation and preventing further spoliation. Whether it would be financially profitable to Government to attempt to develop the Sind oyster supply on the present basis is a matter for consideration. It seems likely that, at least for some time, there would be no financial gains commensurate with expenditure incurred and unless there were some reasonable certainty that the oyster-beds would regain something like their excellence in the days when they had not been ruined by over fishing it would possibly not be worth while taking the matter up. Of the various measures suggested by Mr. Rai to improve the oyster fisheries some are impracticable, and several of the restrictions which he would like to see imposed would be very difficult indeed to enforce. Little doubt however remains that the Sind oyster-beds could with scientific care and some expenditure be made to yield a much bigger crop of good oysters, for which the demand

much exceeds the supply. But the extent to which Government might be prepared to develop the oyster-beds in Sind must depend largely on what policy Government is willing to follow in respect of fishery development generally. The Sind oyster fisheries do seem capable of very considerable improvement by scientific treatment and proper regulation though it is more than doubtful whether they can ever be restored to the condition they enjoyed before they were ruined by over fishing and uneconomic exploitation.

The true pearl oyster (*Meleagrina*) is not found on the Sind coast, but the "Window Oyster" (*Placuna Placenta*), so called because its thin, translucent, flat shells, was extensively used as a substitute for window glass in the days when that commodity was scarce and costly in Bombay and is so used in Goa to this day. It is very plentiful in Karachi harbour and the creeks to the east, lying flat on the bottom in shallow water. In nearly 5 per cent. of the mature shells of this species pearls may be found, which, though small and often ill-shapen, are worth 15 rupees a tola by weight all round. Only the best are fit for the purposes of the jeweller, but the rest are used in native medicine and are also calcined to make the precious powder with which native ladies beautify their eyelids and those of their children. The Mirs are said to have discovered the existence of these oysters by about 1836, when they sold the right to collect them in the creeks east of Ghizri for Rs. 500. Next year a much larger sum was offered, but the lesses could not make the business pay, so the Mirs tried it themselves, but eventually abandoned it on the same ground. Under the British Government the banks have been leased periodically for very variable amounts. Pearling is of no practical importance now. The pearl beds are in Karachi harbour. What pearls are found are of poor quality and in small quantity. There is no scope for development as in the Madras province where there are extensive valuable pearl fisheries which have been made a source of profit. In 1872 Dr. Day found the banks very much impoverished. He recommended that they should be let once in three years and then under strict conditions of a protective nature. But these remedies suppose a supervising establishment which it would not pay to maintain. Without such an establishment to leave the banks unlet is to abandon them to the local fishermen, who are possibly worse than a contractor and pay nothing to Government. Upon the whole the best policy appears to be to give the contract for long periods and so make it the contractor's interest to save the goose that lays his golden eggs.

The Freshwater Fisheries of Sind are extensive and rich and have three claims on the care of Government, first as an almost

indispensable source of food for poor and rich*, secondly, as a means of livelihood to a large section of the people, and thirdly, as a source of revenue. The last offers a measure of the importance of the other two. The right to fish in the river Indus, and in all Government canals and dhandhs, is sold by the Government, as it was by the Mirs and the British. The arrangement made by the farmer, who purchases the right with the fishermen who catch the fish, is usually that he is to receive a third of all the latter catch, so the market value of the fish taken annually must be three times the abovementioned sum, plus three times the profits of all the farmers; and the income derived by the fishermen must be at least twice the amount of the revenue. It is obvious that freshwater fisheries are much more under the control of man than those of the sea and may be conserved and improved by wise care, or ruined by carelessness and avarice, as indeed they have been too often throughout India. The attention of the Government of Madras was first directed to this subject by the Secretary of State for India in 1867, and Surgeon Major Francis Day, one of the most distinguished naturalists that India has produced, was deputed to report on the fisheries of that Presidency. His inquiries were afterwards extended to all India, including Sind, which he visited in 1872-73. He found that there was no undue and preventible destruction of small fish in Upper and Central Sind, owing, first, to the paucity of the population, secondly, to the rapidity of the current of the river and the constant variation of its channel, and thirdly, to the security that the immature fish obtain during the inundation season. He might have added that the Sarkar's right in the fish had protected them from destruction by poison and other methods adopted too commonly by villagers in other parts of India. He made a few suggestions, however, and he earnestly opposed the efforts of the Public Works Department to have fishing altogether prohibited in many places on account of the damage which fisherment were alleged, or suspected, to do to the bunds. As his reports were printed and circulated by Government, they doubtless had their influence on the conditions on which the farms have since been sold.

Dr. Day enumerated 64 species of fishes which found in the fresh waters of Sind, and there are a good many more which he did not find. They are almost all eaten by some class and have vernacular names; but these are known to few except fishermen and are sometimes local: so identification is difficult. Only the most prominent need be mentioned here. From every point of

*So great is the importance fish to the enjoyment of the rich and the necessities of the poor, that man might, with less inconvenience, give up the whole class of birds, and many of the mammalia, than be deprived of the finny tribes, Linnaeus.

view the most important is the palla (*Clupea ilisha*), known as the Hilsa in Bengal, a sea-fish of the same genus as the herring, which in February and March ascends the Indus in enormous numbers for the purpose of spawning. At this season it is caught in the sea at Karachi and in the Indus at every favourable spot. It is esteemed as the very best fish for the table in Sind, if not in all India; and this would scarcely be disputed if the disposition of its countless bi-and trifurcate bones were within average human comprehension. There are "Palla cooks," however, who are said to be able to put it on the table in a boneless form. Fancy prices are given for it at Hyderabad and Sukkur at the beginning of the season. They do not keep well and should be eaten very fresh; but large quantities are salted. The commonest method of catching the palla is one of the original things which the Sindhi does. The instrument used is a bag-net attached to the end of a very long pole forked at one end. The limbs of the fork are about 5 feet in length and keep the net open, like a huge butterfly-net, as long as a double cord which runs along them is kept taut. As soon as this is relaxed the net collapses. The fisherman launches a very wide and flat chatty, or earthen pot, with a small mouth, and laying himself on it, so that his belly forms a close-fitting stopper to its mouth, he floats gaily down-stream, guiding himself by kicking the water with his feet like a somewhat paralytic turtle. The net is now let down perpendicularly like an inverted Y, the cord being drawn tight with the right hand. As soon as a fish, driving against the strong and muddy current, strikes the bag, the man lets the cord go, the net collapses and is folded and rolled by the current. It only remains to draw up the net, stab the fish with an iron spike carried in the girdle and introduce it into the chatty. How this is achieved without collapsing and foundering is a mystery of acrobatics. Sometimes the fisherman floats by means of a kind of life-belt made of gourds instead of the chatty; but this is unsportsmanlike. When he has reached the bottom of his beat he comes to the bank, shoulders his chatty and net and trudges up the bank to begin again. It should be mentioned that the mesh of the palla net about $7\frac{1}{2}$ inches in circumference, so that only fish of fair size are caught in it. Another species of herring, *Clupea chapra*, which grows to only 9 inches in length, is found in the Indus and believed by the fishermen to be the young of the palla. When the spawning time is over the palla return down the river to the sea, but they are then out of condition and not worth catching. The construction of the Sukkur Barrage, although it was provided with a fish ladder, in effect prevented the palla fish from going up beyond the Barrage below Sukkur, so that catching of palla which used to be a profitable undertaking at Rohri and in the Bukkur Gorge ceased to exist,

but one result favourable for the fishermen was that the palla congregated in large numbers just below the Barrage where they were caught with considerable ease. Since the construction of the Ghulam Muhammad Barrage a little above Kotri, the ascent of the palla is probably still further impeded, although the Barrage has been provided with a fish ladder. There are, however, no official statistics showing what has been the result of the construction of this Barrage in impeding the upper trek of the palla fish in the Indus. Very likely it will result in a great diminution in the number of palla found in the Indus between Kotri and Sukkur, and very likely the palla will be held up at Kotri to the advantage of the fishermen there if the fish congregate below the Ghulam Muhammad Barrage in the way in which they congregate below the Sukkur Barrage when there was free access thereto from the ocean.

After the palla the most important fish in Sind is the dambhro (*labeo rohita*), known in Punjab as the rohu, a noble carp, which may grow to a length of 3 feet. Three other species of the same genus, *L. gonius*, *calbasu* and *dyochilus*, all fish of large size, are known in Sindhi as siriho, dahi and nugari, or nigari. The carp family supplies several other fishes for the table, e.g., morakhi or morakho (*cirrhina mrigale*) and thelhi (*catla buechanani*) the latter of which is said to grow to a length of 6 feet. These all inhabit the Indus, but spread over the country during the inundation and breed in weedy and reedy dhandhs. When the dhandhs are isolated and contracted by the drying up of the water, much mischief may be done by the wholesale destruction of the fry in them. Myriads of fry perish annually without man's malice by following the distributing channels of the canals and being unable to return. On the other hand, stocking tanks with some of these species and preserving them has proved a profitable enterprise in other parts of the country and might in Sind.

There is another class of fishes which, though considered by us coarse and unsavoury is preferred perhaps to the more delicate kinds by the common people and at any rate constitutes a much larger proportion of their food. These are the "cat-fishes" and other siluridae, which include a number of species of enormous size that contribute much to the value of the fisheries in the Manchhar Lake and large dhandhs, and also in the canals that lead to them. Of these may be mentioned khago (*rita buechanani*), lohar (*saccobranchus fossilis*), singari (*macrones aor*), muli, or poiki (*wallago attu*), and diman (*callichrous bimaculatus*). The last in particular is considered a good fish for the table. So are

the murels (Sindhi jarko, *ophiocephalus striatus*, &c.) which are found in weedy tanks. The goj, (*mostacemblus armatus*) a mud fish, and the gandan (*notopterus kaporat*) and phandan (*N. chitala*) may be added to this list.

Finally there are many species of small size, or poor flavour, which are pursued with hook, net, or basket, in very water from the Indus to the roadside ditch, and contribute a not unimportant item to the food of the poor.

The men who buy the right to fish are almost invariably Baniyas, or rich men of some other caste, who make terms with the fishermen. The latter belong to one or other of the sub-castes of the Muhanas, or Mirbahars. The conditions of the contract on which the farm is sold usually oblige the farmer to employ these men and forbid him to sublet. The arrangement made between him and them is usually based on a division of all spoils, the contractor's share being $\frac{1}{3}$ to $\frac{2}{5}$. He can improve upon this by buying their share also, which they will generally sell on the spot for less than a half of its market value.

There is comparatively little fishing in the Indus, except for palla. Its strong current and shifty banks are unfavourable: at any rate its backwaters and the canals and dhandhs feed by it are better. The means used vary of course with the kind of fish to be caught and the kind of water to be fished. The palla net has been described. The canals are fished with standing nets (*jari*) attached to stakes, and weirs made of stakes and bushes, with a bag net at the opening; and with long rectangular nets held by two men who walk up the canal, one on each side. Dambhro and other carps will leap over a standing net, so a second strong net, running like a pocket along and behind the first, is provided to receive them. This is a common device and is called *pathro*. In dhandhs and dhoros the main net sometimes takes a spiral form, guiding the fish into a narrow enclosure, which prompts them at once to leap into the fatal pocket. The fisherman has only to come and empty the pockets at intervals. On the Manchhar Lake a net of this kind is formed into an enclosure like an elephant "Kheddah," into which hundreds of fish are driven by boats filled with men, women and children, making a pandemonium with metal pots and boards and sticks. The following is an account of the manner in which fish are caught in the Manchhar Lake to-day. The description is from an account written by the compiler

of this Gazetteer in the course of a visit to the Manchhar Lake on the 9th April, 1951.

"The chief fish which are caught in the Manchhar seem to be dambhro which are lovely carp-like fish with silvery and sometimes with golden scales weighing anything from 1 lb. to 10 lbs. or more. Most of the fish I saw actually caught to-day were about 1 or 2 lbs. in weight and were about the size of an average small haddock. I managed to take an excellent photograph of a Mohana holding up a lovely specimen of this fish. The sun was shining on the silver of it till it seemed to be a vast piece of precious metal. It appeared to be regarded as of special value as there was some talk about it when it was caught. The Mohanas are very superstitious people and believe in luck and have their own way of propitiating luck. They did not regard it as auspicious that we should have a meal before they began their big beat, and that was the reason why we stayed for a long time being grilled and dazzled on the water while the preliminaries of the beat were being arranged. Their fishing dhundhis had about there or four Mohanas each on them but some of the bigger ones had more, and in these there were women and children. The women, not only engaged in punting the craft about as skilfully as the men, but some of them actually took headers into the water and used pyramidal nets on the bottom. There was one quite elderly woman with grey hair who was as lively as anyone could be, and there was one youngish girl, who would have been called a "flapper" in Europe, who seemed to be enjoying herself like a boy in the water. The two ways of fishing, phero and bano differ considerably. The first entails a drive on to a single line of net set on a slight curve and the fish are driven by beating boats towards this net, and when they are held up near it the fishermen dive into the latter and plunge their pyramidal nets violently into the water when they feel the fish about their feet or legs. The net is open at the bottom when it is plunged in but some kind of release rope near the apex closes it completely on the floor of the lake and shuts the fish in so they cannot escape. The beating is done by boats that have a man with a long pole which he smashes on the water to make a splash and the man, usually one of the older men, who keep up a rattling on a strange instrument called a joro consisting of a metal tray and a metal plate that he rattles against each other to produce the sound of clashing cymbals. This goes on without intermission till the dhundhi reaches the net and the fishermen have all plunged in and are using the pyramids. We watched a phero taking place. The catch was only moderate, that is to say about twenty men caught in this way about sixty or seventy fish, most of them of very good size. The bano is a much

more elaborate affair. The same method of beating is used and the joro clashes its way towards a very intricate net which is shaped like a spiral leading into a central circular enclosure, to which the beating boat gradually makes its way, the puntsman not only steering the boat with his pole, but also rocking it back and fore so as to terrify the fish still more and force them along the spiral towards the central net. The results are wonderful. The net has a sort of lower fringe opening outwards a little above the water level, and when the fish find that they are caught and that they cannot get out of the net which must be spread on the floor of the lake from some distance of the uprights, they leap into the air by themselves and get themselves entangled in the lower fringe; so the fish actually catch themselves in their panic to escape. They make enormous jumps and some of them able to clear more than six feet get away altogether. It is a wonderful sight seeing the fish jumping all around and being caught as they fall and then burrowing along the water level in dreadful efforts to get out. At this stage the Mohanas go into the water and somehow or other take up fish with their hands and toss them into the fringed net. The beat that we saw lasted about half-an-hour. There were about six boats engaged in it and the total catch amounted to six hundred good fish. I did not like the way in which the fish were taken back to the bank. The idea is that the fish may be as fresh as possible for the market. They are strung out on hooks to long bamboo poles about twenty feet in length, one fish every two inches on both sides of the bamboo poles and the poles are then linked in long lines and trailed behind the boats through the water. Each pole must hold about four hundred fish and the number of poles being towed ashore must be well over a score at least daily. While we were watching we must have seen at least a dozen of them all loaded with fish. There are fish auctions every afternoon and agents of the buyers come to the Bubak shore to bid. The lots are bamboo poles of fish and these are knocked down at from 30 to 80 rupees according to the number and quality of the catch. It is said that about two thousand maunds of fish are caught every day in this extraordinary place, and still there is not only no diminution in the number of fish caught but the fish population is actually growing. Fish are gutted and packed in great matting baskets. Ice is put on them. The baskets are about 3 feet high and 3 feet wide across the top. When a basket is full it is so heavy that it needs two men to lift it. There are very many of these baskets sent off to Bubak Station daily. But there is no refrigeration on the railway and the transport between the Manchhar and the station, a distance of about five miles, is primitive in the extreme."

The Palla Fisheries have undergone considerable changes since Aitken's Gazetteer was published in 1907. The Palla, an anadromous fish, used to migrate to the river Indus unchecked and was recorded as far up as Multan. The range of its migration was restricted to Sukkur following the erection of the Sukkur Barrage in 1930. The run of Palla has further been curtailed by the erection of the Ghulam Muhammad Barrage. Two fish ladders have been provided at this Barrage but both have proved quite ineffective as Palla cannot negotiate them. The effect of this Barrage on the economy of the region and the biology of the species is being studied. The value of the fishing contracts above the G.M. Barrage has been estimated to have fallen by Rs. 810/- per mile in the Nawabshah District, Rs. 540/- per mile in the Larkana District and Rs. 3,664/- per mile in the Sukkur District (below the Sukkur Barrage). The length of the river in these parts is 116 miles, 78 miles and 38 miles respectively. The value of the down-stream side has, however, risen by 11.5% approximately. There is an over-all increase in the revenue by 10% if the figures for the entire length of the river are considered. This rise should normally have been 30% as is the case in section above the Sukkur Barrage where the construction of Ghulam Muhammad Barrage has had no effect. Thus on the whole there is a loss of revenue to the extent of 20% of the average revenue for 1946 to 1953.

The disposal of the fisheries rights of the inland waters is controlled by the following Departments:—

- (a) District and local Boards control the leases of the Indus in their respective areas.
- (b) The Irrigation Department controls the fishing leases of canals and irrigation dhandhs.
- (c) The Forest Department auctions the fishing leases of dhandhs falling within their own jurisdiction.
- (d) The Haleji Lake is controlled by the Karachi Development Authority.
- (e) Government waters those mentioned above are classed as revenue dhandhs and are auctioned by the Revenue Authorities.

FORESTS.

The forests of Sind, as reported in 1953, occupied an area of 722,800 acres, or about 1,135 square miles. Of this area inland forests comprise 246,129 acres and riverain forests 476,671 acres. The total forest area under irrigation is 52,944 acres and the total area of forests under the Sukkur Barrage irrigation is 50,000 acres, of which about 30,000 acres have already been brought under tree cultivation. The area proposed for afforestation under the Kotri and Gudu Barrages is 150,000 acres in each. These figures are taken from the evidence of the Chief Conservator of Forests Sind, before the Sind Agricultural Commission on the 5th and 8th September 1953. The latest official figures of the forest area in the two civil divisions of Hyderabad and Khairpur are: reserved forest 643,656 acres or 1,005.3 square miles and protected forest 140,860 acres or 218.5 square miles, giving a total of 784,516 acres or 1,223.8 square miles. The difficulties which face afforestation in a country like Sind are obvious from the character of the terrain, which has been described in the section on Botany in this Gazetteer.

The forests of Sind generally follow the course of the river Indus and all its boundaries from Punjab boundary on the north to the sea in the south. They in no place depart from that course, except in the north where the flat country as far west as Jacobabad and nearly as far east on the other side had formerly offered facilities for the waters of the annual inundations to spread. The greater number of the forests is strictly riverain, the remainder being inland, situated in the northern districts of Sukkur and the Upper Sind Frontier. A small area to the south of Hyderabad town and a larger extent of country on the Eastern Nara in the Thar Parkar district form detached groups or patches. Some of the riverain blocks have latterly been converted into inland, forests owing to the construction of canals and bunds by the Irrigation Department for the purpose of cultivation and protection from disastrous floods. Prior to the British conquest the annual inundations were unchecked in their flow practically throughout the province. Cultivation was not half of what it is now. The population was probably not a quarter of that existing at the present day, and the forest growth covered all the land which the water reached. People cut down the timber and made temporary settlements and tilled the soil wherever they chose, and were thus responsible for the separation of the wooded area into the patches and blocks which characterise the country today. Certain riverain forests were reserved by the Mirs for the purposes

of the chase, were walled in with mud walls, existing in many places at the present time, and strictly protected by severe laws from interference and trespass on the part of the people. The tree growth was carefully fostered. Traces of canals and dykes testify even now to the thorough manner in which this was done. After 1843 these game preserves, or shikargahs as they were called, became the nuclei of the present forests of Sind. There is nothing to show when they were first determined and demarcated as forests. But in the year 1847 Major Scott was appointed the first Forest Ranger in Sind. He was followed by Captain Crawford, Dr. Stocks, the botanist, and Captain Dalzell, another celebrated botanist. These last two rangers demarcated all the shikargahs by erecting boundary walls. During the last forty years of the nineteenth century, a Forest Department was gradually built up until it formed a regular part of the administration of the country's resources. The 1907 Edition of the Gazetteer gives some idea of the course of progress made during this time. The first Conservator of Forests, Dr. Schlick, was appointed in 1871 when he organised the Department and divided the then Sind Circle into three divisions. During the year 1876, the Circle was reconstituted and divided into four divisions, namely Sukkur, Nawabshah, Hyderabad and Jherruck, with fifteen ranges.

One Working Plan was created from 1st July, 1912. Nawabshah division was renamed as Larkana division and its headquarters shifted to Larkana. From 1st August, 1917, Larkana and Sukkur divisions were split into three divisions, namely Sukkur, Shikarpur and Larkana, and the name of Jherruck was changed to Karachi division during the year 1918.

At the end of the Second World War it was considered necessary that the existing depleted stocks should be replenished and new development should be planned for the Forest Department. Accordingly during the year 1944 a post of special Conservator, Development, was created to prepare schemes for the development of Sind Forests and posts of Silviculturist and Utilization Officer were also created during this year to carry on the work of research and utilization side by side with the development of the forest wealth. After independence however, due to innumerable difficulties, nothing substantial could be done for a number of years. As a first step the existing Working Plan Division was split into two divisions and a Canal and Farm Plantation Division was created during the year 1947. This division was subsequently abolished and on account of the financial stringency, the posts of Second Working Plan and Utilization Officer were also retrenched. After the improvement

in the financial position the Ghulam Mohammad Barrage Afforestation division was created in the end of 1954. A Sub-Divisional Forest Officer was put in charge of the Second Working Plan Division which was also revived during 1955. By the end of the same year one more Sub-Divisional Forest Officer was appointed and put in charge of the Lac Cultivation Scheme.

After the reorganization of the services due to the integration of all Provinces and States into one single Province of West Pakistan, during the year 1955, it was considered essential to split the existing forests circle into two. At present the former Province of Sind and Khairpur State form two Forest Circles. There are eleven Divisional Forest Officers and three Sub-Divisional Forest Officers in both the circles with 44 Forest Rangers, 46 Foresters, 384 Forest Guards, 5 Overseers and 21 Surveyors.

There are no authentic records showing the amount of revenue realized from these forests from the time when these were demarcated as such. There are reports to show that some revenue was collected during the year 1861 annually from the sale of firewood to the Indus Flotilla Company and later on to the North Western Railway also. It is estimated that the out-turn never exceeded ten million cft. during the nineteenth century. It seldom exceeded 15 million cft. before the war of 1914-18, but large areas were felled to provide fuel to the Military authorities before the years 1916 and 1919 and more than 20 million cft. of firewood was extracted annually. A large amount of fuel was supplied to Mesopotamia from the forests of lower Sind and to Quetta from the forests of Upper Sind. About 1,20,000 tons of firewood were supplied from the forests of Lower Sind annually as compared with 11,000 tons supplied to Quetta from forests of Upper Sind.

After the First World War fellings were again restricted to annual possibility. But during the Second World War more over-cutting was done and as much as 40 million cft. of firewood was removed from these forests as compared with the maximum of 19 million cft. before the war. On account of the increasing demand for charcoal in Karachi and its high price, contractors were made to accept the condition that they should supply a stated quantity of charcoal from each lot to Karachi at the fixed rate.

After the Second World War existing stocks were again conserved to make up the over felling which had occurred during the war. It is now estimated that whatever was over-cut during the war has since been made good. The annual out-turn at present is very near the annual sustained yield. This annual possibility varies slightly because of unregulated fellings, but seldom exceeds 20 million cft.

There is no record of management prior to the year 1860. From that date Administration Reports are available showing that a certain revenue was realised from the sale of wood fuel to the Indus Flotilla Company. It does not appear that any attention was paid to conservation or protection between 1860 and 1870, though some lands were added to the Government forests and efforts were made to foster trading in their resources. Revenue seems, however, to have been the only object in view. The earliest scheme of systematic working was proposed by Mr. Campbell in the year 1875, and provided for exploitation of the area plan with a rotation of fifteen years and provision for reservations of standards for timber, as well as regulations for the grazing of cattle. The reason for this introduction of systematic working was that about this time the Indus Flotilla Company was supplanted by the North-Western Railway, which required a very large amount of wood fuel, which it was not certain the forests could produce for ever. In 1896 Mr. Dasai obtained the sanction of Government for the preparation of working plans under the provisions of the Forest Code. Work was immediately started and working plan reports were drawn up for the Sukkur Division and for Hyderabad, Jherruck and Naushahro. Working plans for these four divisions were brought into force in the years 1901, 1902, 1903 and 1906. These plans were based on the area system with a rotation of thirty years for the chief species and less for others. If the chief demand for wood was fuel, no place was given in the prescriptions of the plans to the production of large trees. The railway required nothing but firewood. But circumstances were different when the railway substituted coal for wood.

The Working Circle is the unit of management and its area has been fixed so as to allow one coupe, or cutting of manageable dimensions, to be exploited each year of the rotation prescribed; each such unit forms a beat in charge of a Guard. Coupes are prescribed for some years in advance, variable in number, and such number of years is called a period. There are difficulties connected with the systematic carrying out of working plan prescription in Sind. These are unavoidable owing to the annual liability of the riverain forests of erosion and to the wholesale changes which now and then take place in the river's course. It so happens that at times several years' coupes are washed away during the inundation, before the turn of their exploitation comes round. Occasionally even a whole forest disappears. While it is true that erosions are more or less counterbalanced by corresponding accretions, these constant changes are inimical to system and it is, therefore, impossible to forecast accurately the sequence of working or the out-turn of the forests for any length of time.

The exploitation of forest material is carried out by contract agency, the year's coupes being sold by public auction on departmental estimates of the outturn of fuel. The contractor supplies the local demands of the towns and factories and mills for timber, fuel and charcoal, and exports a small portion thereof to seaports down the coast, to the Persian Gulf, to Quetta and Baluchistan, but at present there is no such export as the internal needs of the country account for all production. The chief lines of transport are the river, its backwaters and arms and canals, which are connected with the forests by very indifferent roads and temporary tracks made by the contractors. The vehicles used are camels and donkeys by land and boats by water; rafting is never practised and bullock-carts are used only occasionally in Sukkur Division. Cutting work is done by Chawans, Brahuīs and Kachhis.

The Chief Conservator of Forests, Sind, in his evidence before the Sind Agricultural Commission was of the opinion that, as the result of the Sukkur Barrage and the Lower Sind Barrage and the Projecte Upper Sind Barrage, assured and controlled water for the first time will be available to the Forest Department, which will remedy the present lop-sided forest economy, with its emphasis on fuel and charcoal, by the introduction of commercially important species in Sind forests. The total amount of grazing fees and fines realised on the Sind forests for the year 1950-51, 51-52, 52-53 was Rs. 99,038, Rs. 91,099 and Rs. 94,372, respectively. There are two grazing periods in a year in the Sind forests, from the 1st February to the 31st July and from the 1st August to 31st January. The annual grazing rates throughout Sind were camels Rs. 2.8.0 each, buffaloes 8 annas each, cows 4 annas each, goats 2 annas each, sheep 1 anna each, horses 6 annas each and donkey 4 annas each. But the Department is in favour of increasing the grazing rates for camels and goats to 8 rupees as against the present rate of 5 rupees and to 1 rupee as against the present rate of 4 annas in the case of goats, as these animals are very destructive to forests. The following statement shows the revenue and expenditure of the Forest Department from 1946-47 to 1955-56:—

Year Out-turn.	Million cft.	Revenue.	Expenditure.
1946-47	18.5	19,98,382	8,87,671
1947-48	9.9	15,26,638	9,99,301
1948-49	16.4	23,67,051	9,32,577

Year Out-turn.	Million cft.	Revenue.	Expenditure.
1949-50	15.0	20,27,064	8,67,918
1950-51	24.0	22,49,595	8,64,460
1951-52	13.0	23,57,433	8,55,829
1952-53	17.5	27,19,008	10,53,550
1953-54	16.2	29,19,441	10,87,012
1954-55	16.2	39,62,818	11,44,843
1955-56	11.9	38,05,095	13,31,527

Wood which is the main produce of the forests provides 84 per cent. of the total revenue, minor forests produce 4 per cent and miscellaneous 12 per cent. On the expenditure side establishment claims 78 per cent. and the remaining 22 per cent. is spent on improvement and the exploitation of the forests. The separate revenue from erosion strips is collected by the Divisional Forest Officers. Approximately 35 per cent. is taken from erosion strips and 65 per cent. from wood contractors for coupes and other fellings. The revenue from forest lands cultivated by lease for the three years was approximately 1951-52, Rs. 4,02,399, 1952-53, Rs. 4,07,070, 1953-54, Rs. 4,62,242.

The Chief Conservator of Forests stated in his evidence before the Sind Agricultural Commission that the Sind Forest Department has been neglected in the past and is at present in a state of rapid development. The settlement work of the Sind forests was completed as far back as 1895. A few areas which are added year after year are settled in due course. The total area is divided into compartments of half a mile square and they are demarcated by lines 20 ft. in width, which also serve as inspection paths. The boundary of the forest blocks is demarcated by earthen mounds with central wooden stacks, placed at stated intervals along cut lines 20 ft. in width. It is now proposed that all the inland forests should be demarcated by masonry pillars. There is a large number of development schemes waiting to be put into practice. The developments of the Lower Sind Barrage zone alone with fifteen irrigated plantations will need three additional divisions besides the Kohistan and Registan areas which are to be developed. The area under reserved and protected forests is reserved forests 643,656 acres, protected forests

140,860 acres, and the main sources of forest revenue were lease money from the erosion strips to be auctioned, annual yield from the utilisation of dead and dying trees and burnt-out wood areas, the revenue from the economically important species of trees being introduced and increase in the irrigated plantation area as a result of the construction of the new Barrages.

Forest growth consists of four chief sorts of trees, namely *Acacia arabica* or babul; *Prosopis spicigera* or kandi; *Populus euphratica* or bahan; and two species of tamarisk, *Tamarix gallica* and *dioica*, called lai and jhao respectively. Of these babul is the most useful and occurs chiefly in the two southern Divisions of Hyderabad and Jherruck, although it is met with also fairly plentifully in Naushahro and Sukkur. It yields an excellent timber used extensively for wheels, agricultural implements, building purposes and fuel; a gum which is only slightly inferior to true gum-arabic; an astringent bark which is used for dyeing and tanning; and pods affording an excellent food for cattle of all kinds. It grows when young in dense, unmixed crops, forming a covering to the ground through which very little sunlight can penetrate, but becomes thinner naturally as it reaches maturity. It comes up readily from seed and is best regenerated by artificial sowings and has a maximum height of 60 to 80 feet, with a girth when full grown of from 9 to 12 feet at breast height in favourable circumstances. Kandi is next in importance and characteristic of the lands furthest removed from the river, and is the chief tree of the Sukkur Division; it yields a good fuel, but is of little use for building or other purposes; the pods are used as fodder for cattle, goats and camels in the same way as those of babul. Bahan is most plentiful in Sukkur Division also, growing in the immediate area of the inundations, and yields wood for building and lacquer-work. Tamarisk exists chiefly in the new lands thrown up by the Indus and is equally distributed throughout the Province, giving a good fuel and wood for agricultural implements and turnery. Tamarisk and bahan both come up thickly in the kacha lands, from naturally sown seed washed down by the river, more resembling cereal crops in density than anything else in the first year. The former suffers little as it grows from natural thinning; the latter becomes fairly open in mid-life and quite open as it nears its term of existence. Tamarisk hardly ever reaches a large size; bahan, on the other hand, becomes a tree of good diameter and respectable height. Kandi is, when cut, immediately attacked by insects and does not last. Tamarisk is liable to attacks of the same sort even when green, and it is difficult to find a sound tree of the species in the forests. The forests of Sind might be said to be divided into

three bands according to their distance from the river; the first the Bahan-tamarisk band, the second bearing babul, the third characterised by kandi growing always in very open order, frequenting the highest and driest parts and occupying on the whole, the largest area of the three.

Another tree occurring occasionally in the forests is *Dalbergia aissoo* or "tali", but it is not indigenous to Sind. It is found near villages and wells in the revenue lands, especially in Sukkur, and has presumably been planted there by the people because of its valuable timber. It is especially plentiful in the Khairpur State. The Forest Department established a few small plantations twenty or thirty years back in Sukkur, which have in several cases flourished, notwithstanding subsequent neglect, and now contain large trees which are said to be worth Rs. 20 and Rs. 30 each. During the last four years the area of plantation has been extended and very promising results have been obtained so far. The timber is very durable and commands a high price in the market and is known as "rose-wood".

Acacia senegal, or khor, yields the true gum-arabic and is found on the edge of the most western forests in Hyderabad Division and in the small valleys and nalas of the hill ranges of Sind, as also all around Malir in the Thatta District. No notice seems to have been taken of the existence of the tree hitherto, except in a botanical way.

Other trees met within forest limits, including useful bushes, are: *Zizyphus jujuba* or ber, yielding fodder for goats and camels; *Azadirachta indica* or nim, yielding timber; *Albizia lebbek* or siras; *Ficus bengalensis*, banyan or wad, and *F. religiosa*, pipal; *Tamarindus indica*, tamarind; *Acacia Farnesiana*, Vilayati Babul; *Cordia Myxa*, lesuri, and *C. Rothii*, liar; *Parkinsonia aculeata*, vilayati kikar; *Casuarina equisetifolia*, planted only; *Thespesia populnea*, bhendi, near villages and scarce; *Capparis aphylla*, kirir; *Salvadora persica*, khabar, the mustard-tree of Scripture.

The last two are bushes, but grow large enough to supply small rafters for building purposes; the former yields fruit and shoots which have a marketable value for table purposes; the fruits of the latter are eaten in years of scarcity. Both these bushes are characteristic of dry or waterless lands, the latter more special of "kalar" or salt lands, where it abounds.

It is open to question whether lac ought not to be classed as an animal product, being secreted by an insect, but as it is an item of Forest Produce, it may be mentioned here. The lac insect, *Carteria lacca*, is a small, gregarious member of the lowly organised family Coccidae, which lives, like Green Fly, Thrip, Cuckoo-spit and other garden pests, upon the juices of plants: and lac is a hard, cellular, reddish substance which the female secretes as a protection to herself and her eggs. When she dies her body is full of a red substance which forms the "Lac Dye" of commerce. This is intended for the first nourishment of her young, which, having consumed it, break through the crust of Lac which envelopes them and settle on the nearest tender shoots and begin secreting on their own account. They are at this time very minute, about 1/40th of an inch in length, and so numerous that they look like a red powder dusted thick on the tender twigs. The young issue in July and again in January; accordingly there are two seasons for gathering the lac, just before they have spoiled it and consumed the Lac Dye. The insect feeds in this Province on the Babul, Kandi, Ber, Siras, Banyan and Tamarisk, but lac is collected mostly from the first. For some reason not yet discovered it flourishes only in very limited areas, being absent from regions which seem equally suitable, or occurring too sporadically to repay collection. The great source of supply is the Babul forests on the Indus and the Fuleli Canal within a radius of 20 or 25 miles from Hyderabad. It is also found along the canals in the Eastern Nara Irrigation Division, in some other parts of the Thar Parkar District and in the Kotri Taluka of the Thatta District.

Lac is collected by lopping off the incrustated twigs. These, cut into short lengths, are known in the trade as "Stick Lac". After scraping the crust off and carefully washing out and preserving the dye, the lac is melted into the thin leaves known as "Shell Lac". Both these forms enter largely into the returns of export trade from Bengal; but Sind Lac, which is inferior, is mostly used in the Province or in the Punjab, by lacquer workers. In its crude state, as scraped from the twigs, it sells in Hyderabad. The dye does not appear to be preserved in Sind. The lac is long and patiently winnowed and sifted to separate bark and dirt, then pulverised with a grinding stone and again sifted, after which it is put into tubs with water and trodden and washed until all dirt and colouring matter (the precious dye) have been worked out of it. It is then ready for use. Lac is one of the secondary products of the forests and is chiefly found on Babul and Ber. Experiments were conducted on its artificial propagation during the years 1919, 1922 and 1923. Due to one reason or the other, the trials were not successful. Either the brood lac was defective or too little to propagate or the host trees were not prepared for

the cultivation before hand. Whatever may be the cause the experiments failed and then were dropped. Casual experiments were conducted during 1924 and 1925 also, but the results were not encouraging. The question of artificial cultivation of lac was again taken up during 1954 and a few experiments were conducted by the Silviculturist in Khathar Forest of the Hyderabad Division. A Sub-Silviculturist Forest Officer, Lac, was appointed during 1954 to continue the work and to carry out the experimental scheme of lac cultivation sanctioned by the Government during the year. Results from these experiments have been found encouraging, and a scheme of lac cultivation on a commercial basis has been sanctioned by the Government during the current year. It is hoped that the scheme will be successful and the lac cultivation will increase in Hyderabad circle.

Lac is a very valuable forest product which is used in the manufacture of shellac, lac dye, varnishes, polishes, sealing wax, ammunition, electrical apparatus, lithographic ink, gramophone records, lacquer, lac toys etc.

It is a resinous encrustation produced by the females of a scale insect (*Laccifer Lacca* or *Laxadia Sindica*). The insect starts its life as a minute red coloured larva, which, when introduced to succulent branches of the host tree during July and November (that is in two seasons), crawls over it, comes to a rest and forces its proboscis through the thin bark to suck the juice of the branch. It secretes lac as it grows. The larvae settle down in large numbers and look like a red-powder dusted thickly on the twigs. When they start to secrete lac, the secretion from one larva meets and coalesces with that of its neighbour and then an almost continuous coat of lac is formed. The insects are both male and female. The latter predominate. The male forms round itself at thin cigar-shaped cell and the female a thick oval cell; the male matures earlier and emerges. The female keeps its place firm in its cell, where it is fertilized. The female continues to grow by sucking the juice of trees, secreting lac and laying eggs. The eggs, towards maturity display an orange yellow spot in the cell. The ripe ones are pushed by the insect into the incubating chamber whence they later on emerge. Emergence and swarming take place together. Thus two life cycles are completed in a year.

Lac is indigenous in the southern part of Sind. The principal host trees of lac insect are babul (*Acacia Arabica*). Lac is also known to do well on: Ber (*Zezypheous jujuba*), Siris (*Albizia lebbak*), Pipal (*Ficus religiosa*), Phulari (*Acacia Modesta*), Devi (*Prosopis glandulosa*), Lai (*Tamarix gallica*), Bahan (*Populus eupharatica*), Kandi (*Prosopis spicigera*).

Revenue from lac was as shown below for the years specified:—

Year.	Revenue.
	Rs.
1928-29	12,223
1929-30	2,732
1930-31	137
1931-32	409
1932-33	385
1947-48	Nil.
1948-49	400
1949-50	2,586
1950-51	2,125
1951-52	2,390
1952-53	2,400
1953-54	2,400
1954-55	1,000

An experimental lac cultivation scheme, costing 1.05 lakhs was sanctioned by the Food and Agricultural Council of the Government of Pakistan for a period of 4 years. It was financed by the Provincial and Central Governments on fifty-fifty share. During the period of experiment the following technical data were collected.

I. Young growth preferably from 8 to 10 years is best suited for lac propagation.

2. Pre-treatment of host trees is necessary, which includes lopping or pollarding of host trees and cleaning of boles and branches to a reasonable height.

3. The swarming of lac larvae commences in this locality during the second week of July and in the first week of November.

4. The first fortnight after the commencement of larval swarming is the best period for artificial inoculation.

5. Lac insect is considered to be fond of light and therefore favourable conditions have to be created in the crop in this respect.

6. Lac extraction should not be allowed before the fourth week of July and second week of December.

7. Lac larvae crawl upwards only.

Another scheme on a larger scale, named Commercial Production of Lac in Khathar Forest of Hyderabad Division, costing Rs. 7.04 lakh from the year 1958-59 was sanctioned by the Planning Board which is still in operation. The revenue realized by the Forest department from the year 1955-56 upto date is as under:—

Year.	Revenue.
1955-56	8,924
1956-57	1,035
1957-58	20,660
1958-59	1,900
1959-60	Expected to be Rs. 16,000 (213 Mds. Lac not yet sold).

For some reason not yet properly known, lac flourishes in very limited areas, being absent from adjoining areas which seem equally suitable.

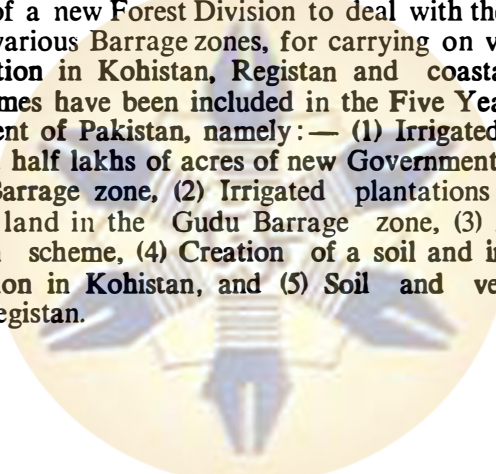
Other minor produce from the forests are reeds from Sar and Kank grasses (*Saccharum spontaneum* and *Arundiacum*). Reeds are used for blinds, shades and walls for huts and duck boards and Sar grass for baskets, chairs and ropes. Other grasses are used as fodder for animals. Fishery contracts in the forest dhandhs also give a good profit. The grazing of animals on passes is also responsible for a large revenue, and resident "Maldars" or graziers, occupy more or less permant "bhans" (settlements) in every forests where there is anything to feed their cows, buffaloes, goats, and camels. Most of these "Maldars" are originally hill-men. In years when the rain fails in the hills many beasts are brought down to the inundated country to tide over the interval of scarcity, and at such times herds of goats, sheep and cows may be seen constantly on the move between the mountains and the valley of the Indus.

The chief causes of damage to forests are lopping and fires, the graziers being responsible for most of it. Continuous attention is paid to the suppression of both these nuisances but it is difficult to make any impression on them, for fires bring up early grass and lopping of branches is one of the easiest ways of feeding animals. The river, as has been mentioned above, erodes considerable portions of tree-bearing land in some years, and causes losses which it is not always possible to prevent by the system in force of cutting strips along the banks. Amongst the minor causes of damage may be mentioned beetles of the family of *Cerambycidae*, whose larvae riddle green tamarisk trees and even attack hard babul wood: moth larvae, belonging to the family of *Cossidae*, attack chiefly the tamarisk and in the same manner as the beetles. *Buprestid* and *scolytid* beetles make short work of kandi, tamarisk and bahan wood once it is dying or dead, and locusts destroy the pod crops over large areas in certain years. Finally severe frosts render whole years of sowing useless by killing all the young seedlings in the coupes under regeneration.

The Forest Settlement of Sind was finished in the year 1895. Areas are added from year to year as occasions for extension offer and their settlement is effected in due course. Demarcation of boundary marks has been done throughout the province. These marks consist of earthen mounds with central wooden stakes placed at stated intervals along cut lines of 30 feet in width on outside boundaries, as well as on the internal boundaries of compartments of a square mile each, into which each forest is divided for purposes of easy management. After the end of World War II many ambitious post-war development schemes were drawn up by the Sind Government. These, of course, have been interrupted by the political troubles and the unsettlement consequent on the partition of India in 1947. In these post war development schemes very considerable thought was given to improving the condition

of the Sind forests. A plan was drawn up, though not carried out as intended, on sound lines and will doubtlessly be incorporated in part in the carrying out of the Forestry Development plans contemplated under the Five-Year Plan for Pakistan 1955-60. The 1947/1948 Post-war Development Plan makes the following remarks about the development of Sind forests: "In the past" it says "with a low density population the whole province was self-sufficient in its needs for wood, particularly firewood and charcoal, though not for high quality constructional timbers. Rural areas relied mainly on natural production from extensive waste lands, while the Government forests, though totalling only 1,100 square miles, supplied the needs of the larger towns and also sufficed for a small, but regular, export trade beyond the borders of the province. These Government forests are all located in a narrow strip down both banks of the Indus and have relied for water supplies, requisite for their growth, almost entirely on annual inundation, when the river rises in flood. Extensions of canal irrigation and control of floods by the erection of protective embankments have reduced both the extent of waste land producing natural tree crops and also cut off about one-third of the Government forest lands from annual inundations. Increases in cultivation and consequently of industries and population have been specially rapid since the construction of the Sukkur Barrage. The projects for further Barrages will lead to further increases. The demands for firewood and charcoal have already considerably exceeded available supplies, and during the war years were met only by drastic depletion of the capital resources of wood on the Government forest estates. Shortages in the Indus Valley led to tremendous pressure on the meagre resources of Registan and Kohistan. These regions, because of their soils and topography, are liable to disastrous erosion by wind and water denuded of their vegetation by means of which alone their soils can be stabilised. This vegetation, much of which is of herbaceous or shrub habit, is also valuable as a source of fodder and forage, while the trees, though of slow growth, also are capable of supplying the local needs for fuel and timber. In consequence of difficulties in the natural conditions for growth and for intensive management, tree crops in the Government forest estates along the banks of the Indus have never achieved a high acreage rate of production. Though they cover only about one-third of the total area between the protective embankments on both sides of the river, their expansion alone could not suffice to meet even the present needs of the province for fuel. Lands under permanent irrigation capable of high acreage rates of production under intensive management had to be set aside for tree crops to avoid a famine in fuel, which may be as disastrous as a famine in food, so as to ensure adequate supplies for urban and industrial requirements. In the wide valley

lands of the Indus rural needs, besides fuel and timber, include protection against desiccation and surface erosion of soil by strong and hot winds. For this, farm woodlands in the form of wind-breaks and shelter belts are of great importance. Plantations can also serve to check excessive rises of the subsoil water. Organised planting on Government land along all canal banks and distributaries can also help toward these objectives. Among the projects envisaged in the Forest Department schemes in the post-war development plan attention was directed towards contour survey, soil classification and determination of the forest boundaries, to irrigated plantation research, to utilisation research, to soil and vegetation conservation in Kohistan, Registan and coastal areas, and the creation of a new Forest Division to deal with the raising of plantations in various Barrage zones, for carrying on vegetation and soil conservation in Kohistan, Registan and coastal areas. Five of these schemes have been included in the Five Years' Plan for the Development of Pakistan, namely: — (1) Irrigated plantations of one and a half lakhs of acres of new Government land in the Lower Sind Barrage zone, (2) Irrigated plantations for one lakh acres of new land in the Gudu Barrage zone, (3) A forest utilisation research scheme, (4) Creation of a soil and irrigation conservation division in Kohistan, and (5) Soil and vegetation conservation in Registan.

A circular logo with a yellow background. In the center is a blue stylized pen nib pointing downwards. Radiating from the base of the pen are several blue lines, resembling a fountain pen's spray or a stylized sunburst.

Gul Hayat Institute

MINERALS AND MINING DEVELOPMENT
IN SIND AND KHAIRPUR.

Dr. M. H. Khan, Geologist to the Geological Survey of Pakistan, gave evidence before the Sind Agricultural Commission on the 14th December 1953 on the subject of Minerals being worked at Sind and Khairpur at present. He cited alkalies, building stones, fireclay, fuller's earth, gypsum, glass sand, lignite, limestone, red ochre and salt, and he mentioned also that there are possibilities under investigation for the mining of celestine and prospecting for oil. The alkalies are worked in the soda dhandhs of Khairpur and eastern Sind. Building stone is worked at Jungshahi, near Clifton and other places. It is of fair quality but is not regarded as good enough for major government buildings. Fireclay is worked in the Thatta-Jungshahi area on a very small scale. "How much", says Dr. Khan, "is present it is impossible to say. But probably much, if we could afford to go underground in search of it; so far only surface scratchings have been attempted."

Fuller's earth.—Large deposits occur in Khairpur; they are mined on a considerable scale. Samples have been sent to London for an opinion as to whether the quality could be improved. But the experimental work on it suggests that this would be difficult and probably uneconomic.

Glass sand.—Glass sands are worked near Jungshahi and also occur near Thano Bulu Khan, Meting and probably in other places. The quality is fairly good.

Gypsum.—Gypsum for the Dalmia Salt Works is dug in many places in the Sind Desert. It occurs as small veins in clay and is poor dirty stuff fit only for cement works. If there is any large extension of cement working in Sind then gypsum will probably have to come from Baluchistan.

Lignite.—Lignite occurs as a bed from 1 to 2½ feet thick near Meting. The extension below ground is quite unknown. The Geological Survey of Pakistan is putting pits down to 100 feet in depth to ascertain the quantity of lignite available. They have had some success but have not been able to get down to the lignite in the deeper pits owing to the poisonous gas encountered. Drilling will have to be undertaken to get complete results.

Limestone.—Limestone is worked for cement by the Associated Cement Company near Rohri and by Dalmia at Drigh Road. It is abundant and locally of excellent quality. Chemical investigation of limestone at Hyderabad showed it to be very suitable for cement making.

Red Ochre.—A small quantity is worked from time to time near Thatta.

Salt.—Salt is worked extensively around Karachi and less so near the Rann of Cutch. The possibilities of increasing production in Karachi are unknown. Large production in the vicinity of the Rann is said to be possible but costly owing to transport difficulties.

Celestine.—Some good veins of almost pure strontium sulphate occur at Kalu Kohar and near Thano Bulu Khan. It is found useful as a filler in paints. It was tried in drilling muds but without much success. Its real use is for fireworks but there seems no demand for it at present in Pakistan.

Oil.—Oil is a possibility in Sind. But after the costly failure at Lakhra, oil companies are not likely to take it up again in the near future. Discoveries of gas at Sui may induce them to change their mind. In the postwar development plans mining development was considered as a subject that should be investigated. In the report on the plan it has been stated, "No scheme has yet been worked out on mining development. Mineral resources of Sind are not yet fully exploited and have not been fully surveyed. At the request of the Provincial Government, the Geological Surveyor of India has included in his programme for the current year a systematic survey of mineral resources in Sind." At present there is no production of mineral oil in the province. Drilling at Lakhra, 160 miles from Karachi, went down to a depth of 12,666 feet, but was unsuccessful and the work was abandoned in 1950.

Much of the account of minerals in the 1907 Gazetteer is true today and some of it is worth repeating here.

Alum.—At various places in the Khirthar hills, beds are found among the limestone of a kind of shale from which alum is manufactured by a rough and simple process. Ranikot, 12 miles north of Thano Shah Beg, and other places are mentioned in connection with this manufacture; but the quantity is evidently insignificant and the quality crude.

Building stone.—of good quality is to be found in all the hilly parts of Sind. The best is a light yellowish-brown, fine grained limestone belonging to the "Ranikot" beds, almost the oldest sedimentary rocks in Sind, which is much used at Jherruck in Muslims tombs. The condition of the carvings and in-

scriptions on these are a certificate of the quality of the stone. The nummulitic limestone of the "Khirthar" beds is much quarried and used for building purposes at Sukkur, Hyderabad and Kotri. The porous, yellowish limestone of which Karachi houses are built is obtained from out-crops of the more recent "Gaj" beds at Ghizri and elsewhere. There is much variety in colour and quality of these limestones, even of those belonging to the same geological group.

Carbonate of Soda—In the desert of eastern Sind there occur salt lakes and salt dhandhs. In some cases the water of these dhandhs is impregnated with carbonate of soda instead of, or in combination with, common salt. As the water dries up in the hot season the alkali is deposited as a thick crust on the bottom, and has only to be dug out and dried. It is sold throughout Sind under the name chaniho and is used as "washing soda." The best quality (also called phuli) enters into the composition of the pulse-biscuits; or curry wafers, known in Sind by their Marathi name paper. The right to excavate chaniho in several places in the Hyderabad district was farmed out annually at the time of the last Gazetteer for about Rs. 1,700. The quantity excavated varied with heat and dryness of the season, ranging from 500 to 2,000 maunds. A considerable revenue used to be raised from the same source in the Thar Parkar district. When it came, however, to the notice of the Salt Department that some of the so called chaniho removed from the deposits there contained as much as 70 or 80 per cent. of chloride of sodium and was presumably intended for use as common salt, after a controversy between the Salt and Land Revenue authorities the Government decided that whenever the proportion of chloride of sodium exceeded 50 per cent, the stuff should be chargeable with duty as salt. Under this order a large proportion of the contractors' stocks became contraband and the traffic stopped. A pure quality of chaniho is produced in great abundance in the Khairpur State and exported to Bombay. A crude, black carbonate of soda known as khar, which is a "barilla" made from the ashes of plants, is also much used in Sind. The province abounds in plants of the genera *Salsola*, *Sueda* and others, rich in alkali, and the manufacture of both soda and soap seems to have been general until improved communications enabled the Punjabi to undersell the local maker. But khar is still made in Shahbandar and other places.

Celestine—was discovered by Mr. Fedden of the Geological Survey of India scattered in crystalline lumps about the size of a walnut over the surface of the limestone hills of Kohistan, especially on the east of the range which lies to the eastward of Thano Bula Khan.

Coal—In 1857 there was a good deal of excitement in Sind over the discovery of coal at a place called Lainyan, or Leilan. 27 miles north-northwest of Kotri. The first seam, only 40 feet from the surface, was said to be 8 feet thick, with another below it. The results of an analysis of specimens sent to England was pronounced "highly satisfactory." The quality of the lignite did not, however, prove to be satisfactory in the long run, and a coal expert who had been deputed to sink a shaft found that the beds thinned out so rapidly that in a second shaft, sunk only 100 yards from the first, it had dwindled to a thin layer, which at first escaped notice when the shaft was being driven through it. In short this expert concluded "there was nothing which could properly be called a coal seam, but merely a mass of lignite not extending much more than 50 yards in any direction." The quality also was inferior. The minerals was "a lignite brittle and abounding in iron pyrites, so that rapid decomposition sets in on exposure and there is much liability to spontaneous combustion." The prophecy of a coal industry in Sind, therefore, vanished. In the 1951 Census Report, however, it is stated that the only coal field in Sind is situated about 6 miles East of Jhimpir Station on the North Western Railway 50 miles from Karachi and about the same distance from Hyderabad. The deposits are relatively flat and are friable, lignituous in nature. The field has not yet been fully surveyed geologically. At present a team from the Geological Survey of Pakistan is investigating the extent of the workable deposits. During the year 1951 the yield was 7,000 tons. The area in the Thatta District round Jhimpir and Jungshai appears to be the most favourable from the point of view of minerals and may well become the future industrial zone of Sind.

Fuller's earth—The shaly beds which are intercalated in the limestone on the western slope of the hills south of Rohri and also at places near Hyderabad, Jherruck and Thatta, contain a soft, yellowish clay, which is excavated and sold all over Sind under the name of met. The best met is obtained from the Ganjo Hills four miles south of Hyderabad. It is found underneath an upper stratum of limestone and is extracted by sinking shafts from 15 to 20 feet deep into the rock. It possesses detergent properties and is much used by the inhabitants as a substitute for soap.

Gypsum—Gypsum is abundant in Sind. It forms in crystalline lumps on the sides of the brine pits in the Maurypur Salt Works and beds. Beds of about 3 or 4 feet thick are found in the limestones of the Khirthar hills at many places.

Iron ore of a kind occurs in many places in Sind, sometimes of sufficient quantity to allow of regular smelting, for example in the Kotri taluka, north-west of Kotri and east of Band Wiro, also in the hills west and south-west of Jherruck. But the little manufacture that went on at such places was extinguished long ago by the cheapness of iron imported from Europe.

Limestone suitable for making lime is obtainable in Sind wherever there are hills, excepting in parts of the Thatta district where only sandstone prevails. Lime burning is carried on, therefore, at one place or another as the demand arises. Sukkur is one of the principal centres of this industry. Sea-shells, from which nearly all lime used in Bombay is made, are never employed for this purpose in Sind, except by fishermen on the coast who make the little lime that they require for preserving their nets by burning shells.

Salt—Kalar Soil, from which salt can be extracted simply by pouring water through it and evaporating the liquid, is abundant in most parts of the country and is one of the principal sources of salt supply. A large salt works for the manufacture of licit salt was opened at Maurypur near Karachi in 1878. But salt is still illicitly manufactured from kalar in many parts of the country on a small scale. Deposits, varying in quality from a mere saline efflorescence, rendered unfit for human consumption by the presence of magnesium sulphate and other salts, to a solid mass of crystals of almost pure sodium chloride, are found in Sind wherever the sea penetrates at spring tides, and also wherever water percolates through a soil highly impregnated with salt. Such deposits are of course very valuable resources of the province. They occupy an area of several square miles on both sides of the Sir creek, about 10 miles from its mouth, and are said to be two feet deep in parts. The crystals are of very large size, more like the rock salt of the Punjab than salt formed either naturally or artificially by the evaporation of sea water. Salt deposits are very numerous in the Tharparkar district. These differ essentially from the deposits found near the coast, which are formed by the evaporation of sea water. These are lakes, or tanks (dhandhs), fed by springs or rain water, which, flowing through a saline stratum, become impregnated with salt to the point of saturation, so that, as the water is condensed by evaporation, the salt is deposited at the bottom in a mass which may attain a depth of several feet. It is dug out with pick and shovel and heaped on the bank to dry. In 1878, when the Sind Salt Department was recognised, excavation was prohibited except at two places, where it continues to be carried on to the present time by the Government and supplies nearly the whole of the Thar Parkar district and some parts of Hyderabad. One of these places is at Saran, near

Diplo, and the other at Dilyar near Khipro. Salt is a valuable export from Sind. The administration of salt is now done through the Central Government. The native rulers of Sind claimed a share in the profits of salt manufacture, which they took under the name of batai. But the revenue which they derived from this source is not known. When Sind came under British rule batai was abolished and salt remained untaxed till 1848, when certain major speculators obtained permission to excavate and export salt from the vast Sirganda deposits on payment of a duty of 12 annas per Indian maund, which was then the rate of Excise Duty in Bombay. It was not till 1861 that the Government of India suggested the imposition of a duty on salt consumed in Sind. After some discussion as to methods a license system was adopted. It was declared contraband to open any salt work without a license, one condition of which was that a duty of 8 annas should be paid on every maund of salt removed. The same was levied on all salt imported from neighbouring districts. Thar Parkar was almost entirely supplied from the numerous salt lakes in that region and the southern part of the former Karachi and Thatta districts from the deposits in the Jati, Shahbunder and Badin talukas, while manufacture from brine wells was carried on in the Moach plain near Karachi. The mode of manufacture described in the 1907 Gazetteer is not in vogue at present. Salt manufacture is now carried out by means of brine wells and salt pans as in most parts of the world where salt is manufactured by the evaporation of brine through the heat of the sun.

It is reported in "The Pakistan News Digest" of October 15th 1959 that a new gas field as rich as the one at Sui has been discovered at Mari, between Sukkur and Khanpur, in West Pakistan. The gas has been hit at a depth between 2,300—2,450 feet, and there are indications that the formation is capable of producing as much as 5 million cubic feet of gas per day. The reserve, according to preliminary estimates, is expected to be between 700-800 million cubic feet.

Preliminary measurements indicate that the gas is composed of 67 per cent. combustible and 33 per cent. inert materials.

SALT AND EXCISE.

The responsibility of the Excise Department in the former Province of Sind was mostly confined to looking after the import, export, transport, manufacture, sale and possession of liquor and all intoxicating drugs and opium. The administration pertaining to revenue was looked after by the Collectors of the Revenue Department and the supervision and control over the Excise vendis, and the detection of Excise crimes were assigned to the Excise Officers who were appointed to aid the Collectors in carrying out the provisions of the Excise laws. With the establishment of

West Pakistan, the scope of the administration of the Excise Department was widened to the extent that the powers and duties of the Collectors of the Revenue Department were transferred to the Officers of the Excise Department and the responsibilities of other Departments in all provincial fiscal measures were also transferred to the Excise Department which is now known as the Excise and Taxation Department.

Regarding 'Salt' the administration remained in charge of the Central Government but, after the Constitution framed by the Government of Pakistan during the year 1956, the responsibility for 'Salt' was transferred to the Provincial Government and such duties have been continued by the Excise and Taxation Department.

Salt.

Kalar soil is abundant in most parts of the former Province of Sind and was at times one of the principal sources of salt supply. Numerous salt deposits are found in the Thar Parkar District. These deposits differ essentially from the deposits found near the coast which are formed by evaporation of sea salt. These are natural lakes fed by springs of rain-water which flowing through a saline stratum become impregnated with salt to the point of saturation, so that as the water is condensed by evaporation, the salt is deposited at the bottom in a mass which may attain a depth of several feet. It is dug out with pick and shovel and heaped on the bank to dry. Certain salt deposits in the desert area of Thar Parkar District worthy of note are (1) Saran Salt Depot at Saran situated at a distance of 6 miles from Diplo which is a taluka Headquarters in the District, and (2) Dilyar Salt Depot near Khipro, which also is a taluka Headquarters in the District. Both these salt depots being Government concerns were run departmentally by the Central Excise Department. The Annual Administration report for the year 1955-56 issued by the Central Excise Department shows the following statistics :—

Name of Depot.	Year.	Excavation	Gross Revenue derived.
		Mds.	
Saran.	1952-53	16,000	41,923
	1953-54	14,300	33,561
	1954-55	12,800	30,775
	1955-56	13,000	30,096
Dilyar.	1952-53	43 114	38,774
	1953-54	6,493	52,608
	1954-55	13,444	32,997
	1955-56	16,400	23,472

In addition to the above mentioned two concerns, there are three privately owned concerns situated in the District of Thatta known as (1) Hirjina Salt Works (2) Qureshi Salt Works and (3) Dabheji Salt Works. These salt works are functioning on a large scale and the salt manufactured is mostly exported to East Pakistan and foreign countries.

Excise.

Country Liquor.—Prior to 1920 the country liquor required for consumption was imported from the distilleries situated at Amritsar and Cawnpore. It was only in the year 1920 that there was introduced the system of manufacture of country liquor by distillation and supply thereof on a contract basis to retail vendors in the Province of Sind. Warehouses for storage and issue of liquor to retail vendors were opened at Kotri, Hyderabad, Sukkur and Larkana to facilitate the drawing of that ration by the vendors. A ration system was introduced by which the ration of each shop was fixed on the basis of the consumption of the preceding three years. In other words no unlimited ration was assigned to any vend. This system was introduced in order to promote, enforce and carry into effect a gradual policy of prohibition. The right of sale of such vends was annually auctioned. The consumption of liquor was confined mostly to the Hindu community and so the trade was monopolised by Hindus of the Province and no Muslim ventured to enter the trade because of religious scruples. From the year 1920 to 1938 two kinds of liquor were allowed to be manufactured viz: 25° U.P. and 40° U.P. The liquor was manufactured from Gur and Molasses. The change in the strength of liquor was introduced from the year 1938; and 25° U.P. liquor was raised to 15° U.P. To distinguish the two kinds of liquor 40° U.P. liquor was coloured. In addition to this a third kind of liquor known as 'Amrit Jiwni' was allowed to be manufactured. This was perfumed and spiced but the strength of the liquor was allowed to remain at 15° U.P. After independence the exodus of Hindus carried a considerable drop in the sales of country liquor so the trade experienced a great set-back. The Government therefore found it difficult to auction the vends. In these circumstances, country liquor vends were disposed of on a commission basis and the Commission agents were allowed to draw their ration at the fixed issue rate and to dispose of it at a fixed selling rate. This system did not prove satisfactory and the auction system was revived in the year 1951-52.

Because of the exodus of Hindus, who were the main consumers of liquor, it was found expedient to close down many vends scattered in the country districts.

The following statistics are given to show the total sales of country liquor and revenue derived therefrom:—

Year.	Consumption.	Revenue derived.
	Gallons.	Rs.
1936-37	1,16,008	15,95,095
1937-38	1,35,873	18,17,972
1938-39	1,12,695	17,33,024
1939-40	1,01,691	18,17,540
1941-42	1,02,484	22,17,540
1942-43	1,17,031	29,31,842
1943-44	1,15,779	54,34,677
1944-45	1,10,243	50,17,306
1945-46	1,17,331	58,69,874
1946-47	1,24,019	57,33,372
1947-48	84,923	39,68,121
1948-49	18,794	1,72,312
1949-50	16,222	98,588
1950-51	17,589	1,19,907
1951-52	21,287	2,80,845
1952-53	13,418	5,25,472

Note:—The above figures include statistics for Karachi.

The limit of possession by an individual consumer was restricted with effect from 1st April, 1946 to two quart bottles and this limit is still in force in the area of the former Province of Sind.

The consumption of liquor was prohibited in public places which were defined so as to include religious places, recreation grounds etc,

The duty imposed on the manufacture of liquor has been increased from time to time in order to check its sale and to derive the maximum revenue from it. The following table shows the rate of still-head duty charged from time to time :—

Year.	STILL-HEAD DUTY ON BULK GALLON.		
	15 U.P.	25 U.P.	40 U.P.
	Rs.	Rs.	Rs.
1921-22	..	7.0	4.8
1922-23	..	8.0	6.4
till			
1937-38	..		
1938-39	9.0	8.0	6.4
1940-41	9.0	8.0	7.0
1941-42	10.0	..	7.0
1943-44	12.0	Abolished.	8.8
1944-45	15.0		10.8
till			
1947-48	18.12	"	12.10
1948-49			
o			
1956-57 } 1957-58 }	28.2	"	18.15

Intoxicating Drugs.

(a) Charas.

This drug, which is a product of the hemp plant, was considered to be a cheap intoxicant for consumption by poor classes of people. It was imported from Hoshiarpur and stored

after auction of vends annually in the government warehouse from where it was issued to licensed vendors who were given the right of sale.

The following statistics show sales, rates of duty, minimum retail selling prices and number of vends functioning in the Province (including Karachi):—

Year.	Sales in Seers.	Duty Per Seer.	Minimum retail price.	Number of vends.
	Seers.	Rs.	Annas	
1910-11	17,500	8.0	3	506
1911-12	15,000	12.0	4½	432
1912-13	10,550	16.0	6	216
1913-14	7,200	20.0	7	156
1914-15	7,000	20.0	7	110
1915-16	7,300	20.0	7	90
1916-17	6,100	20.0	7	72
1917-18	4,300	30.0	9	33
1918-19	4,800	30.0	9	32
1919-20	5,800	30.0	9	29
1920-21	4,700	40.0	11	29
1921-22	6,000	40.0	11	29
1922-23	5,000	50.0	13	22
1923-24	5,900	50.0	13	22
1924-25	4,600	60.0	15	14
1925-26	4,200	60.0	15	14
1926-27	3,200	60.0	15	14
1928-29	2,558	60.0	15	14
1929-30	6,964	20.0	Nil	14
1930-31	7,180	20.0		14
1931-32	6,884	20.0		14
1932-33		25.0		14
1937-38	10,179	25.0		14
1938-39	7,861	40.0	Rs. 1-2-0	14
1939-40	..	60.0		14

As Charas was considered to be a pernicious drug, the Government of Sind prohibited its import, possession and use with effect from 1-10-1939.

(b) *Ganja*.

Another intoxicating drug, known as “Ganja”, was allowed to be sold at the excise vends and such vends were auctioned annually. The following table shows sales of Ganja and rate of duty levied thereon:—

Year.	Sale in seers	Duty per seer.
		Rs.
1923-24	1,189	20/-
1924-25	1,146	22/8
1925-26	1,211	22/8
1926-27	1,154	25/-
1927-28	828	25/-
1928-29	582	25/-
1929-30	500	20/-
1930-31	287	20/-
1937-38	554	20/-
1938-39	532	20/-
1939-40	..	30/-
1940-41	..	30/-
1941-42	..	40/-
1942-43	..	60/-
1943-44	..	80/-
1944-45	..	100/-
1945-46	..	120/-

This drug was also considered to be detrimental and its import, possession and use were prohibited by the Government with effect from 30-4-1946.

(c) *Hemp (Bhang)*.

This drug is commonly used in the hot season as a cooling beverage by the poorer classes of people. Bhang is cultivated at Bubak in taluka Sehwan in the district of Dadu directly under Government supervision. After harvesting the crop it is stored in the warehouse wherefrom it is issued to licensed vendors throughout the province of former Sind at the prescribed rate of duty. Sale of vends is conducted by auction.

The following statistics show the sales of bhang and the duty imposed thereon:—

Year.	Sale in seers.	Duty per seer.
		Rs. A. Ps.
1923-24	1,08,461	1—8—0
1924-25	1,06,713	
1925-26	84,727	2—0—0
1926-27	81,578	
1927-28	80,281	
1928-29	81,481	
1929-30	72,613	
1930-31	65,951	
1931-32	60,591	In 1931-32 it was reduced to Rs. 1/8 per seer.
1937-38	70,925	
1938-39	72,104	
1939-40	57,480	2—0—0
1940-41	68,520	
1941-42	69,360	
1942-43	76,760	
1943-44	91,440	
1944-45	90,520	2—8—0
1945-46	83,960	
1946-47	88,380	
1947-48	74,960	
1948-49	26,960	3—2—0
1949-50	14,200	
1950-51	8,720	
1951-52	18,760	
1952-53	18,800	

The above sales are inclusive of Karachi.

Opium.

This drug was imported from the Ghazipur Opium Factory of the United provinces in India and the consignments were stored in Treasury and Sub-Treasury offices, from where it was issued to licensed vendors at the prescribed rates of issue, which included cost of the opium, and the duty thereon. The right of sale to individuals was by auction. The limit of possession by individual addicts was fixed at one tola and subsequently changed to 2 tolas. During the year 1953-54 (1-4-53); the Government of Sind introduced a Prohibition Policy, by which the sale of opium was

restricted to bonafide addicts as certified by Government Medical Officers. The ration of an individual person was also determined under medical advice and each addict was supplied with a ration card showing therein his permanent address and the ration to be drawn by him each month. The vend at which he was registered for his ration was also shown on the ration card. The opium was supplied to the addict at the considerably reduced rate of Rs. 6/13/- per tola. Commission Agents were appointed to run the Government Opium shops and they were allowed a commission of Rs. 1-0 per tola. The issue rate from the Treasury was Rs. 5/13/- per tola. It was further contemplated that every year the individual ration might be reduced by 10% under medical advice. This system continued in the province of Sind till the establishment of West Pakistan in 1955. Thereafter the prohibition policy was abandoned and the old method restored.

The following table shows the sale and revenue derived from opium:—

Year.	Sales in seers.	Issue Price.	Revenue derived,
			Rs.
1937-38	5,682		5,02,630
1938-39	6,085		4,93,367
1939-40	3,356	75-0-0	4,61,405
1940-41	3,563		4,62,898
1941-42	3,783		5,05,591
1942-43	4,050	80-0-0	5,85,196
1943-44	3,747	100-0-0	8,04,633
1944-45	4,775		10,19,376
1945-46	5,235		12,00,999
1946-47	4,093	120-0-0	16,67,656
1947-48	2,947		12,52,286
1948-49	1,443		7,03,203
1949-50	1,344		7,01,150
1950-51	1,560		7,44,499
1951-52	1,649		5,17,769
1952-53	1,704		4,60,727

Toddy.—In the province of Sind the consumption of toddy has never been on a large scale. Originally there were only 4 vends in the entire province and this number was reduced to 2. During the year 1938-39 for the first time Government imposed a tapping charge on the trees producing toddy. The rate of tax varied from Rs. 2/- to Rs. 7/- per tree every year. In addition to this the right to sell toddy was auctioned annually.

Foreign Liquor.—In the year 1930 a new Foreign Liquor Scheme similar to that in the Bombay Presidency proper was introduced into the former Province of Sind. The number of excise shops then in existence was as under:—

Name of Distt.	Hotels.	Ref. Rooms	"Off."	"On."	Clubs.	Beer.	Dining Car.
Hyderabad.	1	..	5	3	4	1	1
Nawabshah.	..	..	2	..	..	..	..
Thar Parkar.	..	..	2	..	..	..	..
Sukkur.	..	1	5	..	6	4	..
Larkana.	..	..	2	..	..	1	..
Jacobabad.	..	..	1	..	..	1	..

According to the above Scheme the system of classification of 'off' shops and of charging fixed fees was abolished. Instead assessment fees were charged at the rates prescribed by Government on actual sales subject to a minimum of Rs. 250/- in the towns of Hyderabad, Sukkur and Shikarpur and Rs. 100/- elsewhere.

Foreign Liquor Bars ('On' shops) are always auctioned annually and in addition to the good-will fee, assessment fees are charged on actual sales.

Hotel and Refreshment Rooms, which are permanent licensees are charged annual license fees in addition to assessment fees on the actual sales.

Clubs, Canteens, Railway Refreshment Rooms, Dining Cars were also liable to assessment fees in addition to the license fee fixed annually.

The assessment fees on actual sales on Cheap spirits (Pakistan made Foreign Liquor) were chargeable at 50% above that on imported spirits. These orders have since been modified and a uniform rate of assessment has been prescribed at Rs. 120 per dozen bottles.

The following table gives sales of Foreign Liquor:

Year.	Spirits in gallons.		Wines in gallons.		Beer in gallons.	
	Imported	Pak.	Imported	Pak.	Imported	Pak.
1937-38	5515	97	255		39,313	1792
1938-39	4170	44	247		32,790	1458
1939-40	4883	60	182		30,824	747
1940-41	4413	185	184		23,228	1674
1941-42	3491	919	136		16,823	5625
1942-43	3801	5609	207	10	7,392	5352
1943-44	5015	3956	218		4,667	3145
1944-45	6954	7595	254		4,487	2792
1945-46	4360	16324	456	40	351	3386
1946-47	9022	15736	365	27	9,356	7954
1947-48	6353	5055	208	17	26,296	4139
1948-49	1524	1396	92		4,714	2326
1949-50	1816	1118	32		5,296	2402
1950-51	2204	1373	14		6,288	2232
1951-52	2091	1840	16		9,735	2854
1952-53	2085	2005	15		11,195	2371

Note.—The information includes the sales of the Karachi area.

There is no restriction on the limit of possession of foreign liquor.

The manufacture of Pakistan made Foreign Liquor is also permitted under the official supervision. Over-proof spirit manufactured is reduced to the prescribed strength of 25° U. P. in the case of whisky and brandy; and 35° U. P. in the case of gin and liquor; which is then blended, flavoured, compounded and bottled. Issues are made to licensed vendors on payment of the prescribed duty and vend (pass) fee. No Brewery existed in the former Province of Sind; hence trade depended mostly on imported beer and the indigenous product of the Murree Brewery.



Zeal-Pak Cement Factory, Hyderabad.

CHAPTER XV
LOCAL GOVERNMENT

Gul Hayat Institute



Gul Hayat Institute

TABLE OF CONTENTS

	Page
Local Government—General history and nature...	647
Establishment of Local Funds... ..	648
Local Government—Main defects. ..	651
Local Boards—Franchise. ..	656
Local Government—Sanitary Committees. ..	657
Local Government—Municipalities. ..	657
Karachi Municipal Corporation. ..	660
Local Government—Reform. ..	667
Local Government—Cantonments. ...	668

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CHAPTER XV

LOCAL GOVERNMENT

General
History and
Nature.

The record of local self-government in Sind, after more than one hundred years of experience since the time of the British occupation, cannot be described as impressive. The record, in fact, reads rather like that of the small and impudent boy who, indulging in a multiplicity of petty misdemeanours, remains consistently near the bottom of the class. The reasons for the comparative lack of success in local self-government are obvious enough. They spring from historical and social causes. The country remained feudal in outlook and political structure throughout, and it was without experience in the petty-self-government which is provided by the panchayet system. The panchayet system hardly existed in Sind and does not in its present state afford much hope on which could build the kind of public opinion that is necessary for the successful functioning of local self-government.* When the history of the municipalities and local board is examined it is found that there have been too many suspensions and supersessions and that the main defects arise from faction and unwillingness to finance projects and to assume responsibilities for larger undertakings. The unsatisfactory nature of the present condition of things has been recognised in the First Five-Year Plan 1955-60 published by the National Planning Board of Pakistan, December, 1957.

The report on Local Self-Government states that the local self-governing bodies which Pakistan has inherited from undivided India did not grow spontaneously out of the public life of the sub-continent. They were grafted upon certain early executive experiments performed by District Officers in building up civic amenities with officially enlisted help. The legislation that brought them into existence was, therefore, based upon the assumption that they would need a good deal of official control and guidance, provided by far-reaching executive controls directed to efficiency, and the principal objective was to make progress in the provision of local amenities, roads, schools, dispensaries, waterworks, sewerage systems, etc. The result was that so long as the official Chairman and nominated members managed the affairs of local bodies a considerable amount of useful work was done. But when, partly under the presence of the growing popular demand and partly owing to the increased pre-occupation of the district authorities with their other duties, official participation was withdrawn, local bodies found themselves unprepared to shoulder the task of civic management grown to large proportions in the contacts of the social and economic progress that had

*Introduction of B.D. System seems to have rectified this state of affairs. (Editors).

been going in the meantime. The unfortunate thing was that, with the withdrawal of official participation, there was a rapid relaxation of official supervision as well. Instead of constructive guidance, recourse was freely had on the one hand to supersession and on the other to withdrawal of functions.

The assumption of control by the British in 1843 had not been long in existence before a regular effort was made to adapt local institutions framed on British models to the conditions prevailing in the countryside of Sind. The object was, of course, to encourage the growth of a body of opinion capable of working on a small scale the forms of representative government which, it was hoped, would eventually be applied to the government of the country as a whole. No separate fund for expenditure on local works of public utility existed in Sind generally prior to 1863. The miscellaneous taxes upon trade levied by the Talpurs were abolished under the British annexation, though in the territories resumed nine years later under the ruler of Khairpur the principle was retained as embodying the germ of future taxation for local purposes. In these territories the opposition which was at first manifested to the retention of the taxes relaxed as soon as the taxpayers realised that the money was actually expended on local requirements and that they, in consequence, escaped the calls frequently made on the time, labour and purse of the public, where no such fund existed. When in course of time the inherent evils of the system forced themselves into notice, the character of the taxation was altered. The town and transit duties were abolished, and a cess of 9 pies per rupee of the land revenue was substituted. The poll and professional taxes were replaced by a light tax of 4 annas a month on permanent shops and of 2 annas a month on temporary stores for the sale of fish and vegetables. From that time all opposition to the taxes vanished and they continued in force until 1860, when they were abolished on the passing of the Income Tax Act.

**Establish-
ment of
Local Fund**

In 1863 the Government ordered the establishment of Local Funds throughout the Bombay Presidency. The fund in each district consisted of a cess fixed at 1 anna per rupee of assessment of the land revenue, toll and ferry receipts, the surplus income from cattle pounds and other items. One-third of the proceeds of the cess was apportioned to the service of education in rural tracts and the balance to the construction and repairs of roads, wells and buildings, the planting of road side trees and other works of public utility. The system was conducted at first without resort to legislation. But eventually it was found necessary to legalise the levy of the cess. The validating enactment applying to Sind is

Bombay Act VIII of 1965, the substantive provisions of which are still in force. The act authorises the levy of a cess on land not exceeding 1 anna on every rupee of the ordinary land revenue, of a cess in the case of jagir and other alienated lands of 5 per cent upon the assessable value, of a cess not exceeding 1 anna per rupee leviable under the head of land or other revenue from the farmers of revenue and of a tax upon shops at rates not exceeding 10 rupees per annum. The last mentioned provision was, however, never enforced after the passing of the Act, and a cess leviable from the farmers of excise revenue was discontinued in 1874. But the cess on land, whether alienated or not, is still in force and provides the bulk of the revenue assigned to local funds. The intention that the taxpayers should have an influential voice in the disposal of the funds was one of the cardinal features of the scheme of 1863. But invitations enlisted no response from the taxpayers and in 1880 it was averred that the committees which had been constituted rarely met and that all initiative, control and responsibility rested with the Collectors and their Deputies. In 1882 Lord Lytton's scheme for the extension of local self-government was formulated and it was embodied two years later in an enactment, Bombay Act I of 1884, regulating the administration of Local Funds throughout the Bombay Presidency. Under this statute the management of local affairs in each district was entrusted to a District Local Board having authority over the entire district and to Taluka Local Boards. The District Local Board consisted, except in the Upper Sind Frontier and Thar Parkar districts, of between twenty and thirty members, of whom half were elected, exclusive of the president, and half nominated by the Commissioner in Sind. The elected members represented the Taluka Local Boards, Municipalities and inamdars who were holders of entire villages. The nominated members included Collectors, Assistant and Deputy Collectors, Executive Engineers of districts, the Educational Inspector, the Deputy Sanitary Commissioner and the Civil Surgeon, who was the Health Officer, and had the right of attending the meetings and joining in the deliberation of the Board without voting. The Taluka Local Boards consisted of about fifteen members, of whom half were nominated and half elected. The Assistant or Deputy Collector in charge of the taluka was invariably appointed a member and president of the taluka board. In these circumstances the boards had the right of electing a member to the office of vice-president which, however, in practice was without exception bestowed on the mukhtiarkar. The electorate comprised two classes of persons, the first deriving its privilege from real property situated in the taluka and bearing an assessment on assessable

value of 48 rupees per annum, or a value of 5,000 rupees, and the second including residents in the taluka whose annual income was not less than 500 rupees, or whose monthly pension was not less than 50 rupees. Under the system in force the District Board would meet twice a year, generally in October when the Budget for the next financial year was framed, and once in June when the savings of the past year were reported and appropriated. The current business of the Board is usually entrusted to an Executive Committee of half-a-dozen members. Though no regulations were prescribed for the meetings of Taluka Boards, they were expected and generally contrived to meet at least four times a year. In some cases they met monthly. The Taluka Local Boards drew up their own budgets. These were submitted for the sanction of the District Board which, after such revision as might be necessary, sanctioned them and prepared one budget for the whole district. In the year 1936 the taluka local boards were abolished as unnecessary and the work which they did was taken over the District Board itself.

The boards derived their income from revenues vesting in them by law, from the receipts assigned to them by Government, from grants made by Government and municipalities and from sums received in execution of their function. The first head comprised the net proceeds of the cess on land, of public ferries, of license fees for the sale of poisons in non-municipal areas, and the fees levied on the removal of sand and stone. The second description of receipts comprised the net income derived from cattle pounds, of sums realised by the sale of fishing rights and of fees levied on the removal of fuller's earth. The annual grants made by Government consist of a lump sum in lieu of the 1 anna cess formerly levied from the farmers of excise revenue, grants in aid of primary and technical education, grants for construction of school buildings and grants for public works. Contributions are received from almost all mufassil municipalities towards the pay of local fund vaccinators. The other income of the boards embraced such items as interest on investments, schools and examination fees, receipts from technical schools, dispensaries, veterinary dispensaries, experimental farms, fairs, roadside trees, staging bungalows, gardens and the sale of materials. While the Taluka Local Boards were in existence the District Local Board distributed amongst them so much of the receipts from land cess and excise grants as remained after deducing the portion devoted to education and providing for its own requirements. The portion of the fund devoted to education comprised, in addition to receipts from educational institutions and specific grants, one-third of the proceeds of the cess on land and of the compensation paid by

Government in lieu of the abolished cess on excise revenue and one-third or two-fifths of the cess on jagir land. The recent decision in 1958 of the martial law administration, which now controls the Government of Pakistan, that jagirs should be abolished will necessitate some change in the financial arrangement between Government and the District Local Boards. Charges on account of the administration of the Local Fund are required to be defrayed by the District Board, which is also responsible for the construction and repair of main roads in the district other than Government roads and the maintenance of public vaccinators and dispensaries. In addition to these services, the District Board digs wells and maintains veterinary dispensaries, experimental farms, botanical gardens and other works of general utility to the district. The funds at the disposal of the Taluka Boards were devoted principally to the repair of roads and other works within the taluka, including the local water supply and sanitation. Regulations provide for the nature and the amount of money which can be expended on works by the boards without professional assistance. Execution of works costing more than a certain amount is required by Government to be entrusted to the Public Works Department and the Executive Engineer's approval is also necessary to road projects of which the cost exceeds a certain stipulated amount per mile.

One of the main defects of the existing system of local government has been noted in the Local Government Review published in 1957. In this review the criticism is made that, while in the case of Central and Provincial Governments budgets and taxation proposals are worked out simultaneously and taxation measures are enforced as soon as the budgets are passed, in the case of local bodies there is no co-ordination between the budgets and the taxation proposals. This want of co-ordination lends instability to the finances of local bodies. Sometimes budgets are framed with the expectation that certain tax proposals will be enforced next year. In most cases such expectations are not realised with the result that the income side of the local bodies is adversely affected. At present local bodies consider taxation proposals at all odd periods during the year. Divorced from the budget expectations such taxation proposals are not appreciated by the public and there is always opposition to their imposition.

Local Govt
Main
defects.

Procedure for the imposition and sanction of taxation proposals is very cumbersome. In some cases proposals do not materialise for years. It appears that some system should be evolved whereunder all taxation proposals should be sanctioned with the least possible delay. The income and expenditure of local boards are shown in the table appended.

1955-56

I N C O M E .

Name of District Local Board.	Provincial rates (now local-cess).	Cattle pound receipts.	Contri- bution.	Total on ferries.	Total Income.
1	2	3	4	5	6

HYDERABAD DIVISION.

Hyderabad	Not supplied.				
Thar Parkar	12,15,110	13,971	..	...	2,29,081
Sanghar	3,32,367	6,723	..	...	3,39,090
Thatta	Not supplied.				
Dadu	Not supplied.				

KHAIRPUR DIVISION.

Larkana Not supplied.

Jacobabad Not supplied.

Nawabshah Not supplied.

Sukkur Not supplied.

Khairpur Not supplied.

1955-56

EXPENDITURE.

Name of District Local Board.	Education.	Hospital and Dispensaries	Civil Works.	Total Expenditure
1	7	8	9	10
Thar Parkar	3,72,313	1,13,881	3,47,534	8,34,128
Sanghar	1,39,507	82,782	1,39,919	3,62,208
Thatta	Not supplied.			
Dadu	Not supplied.			
KHAIRPUR DIVISION.				
Larkana	Not supplied.			
Jacobabad	Not supplied.			
Nawabshah	Not supplied.			
Sukkur	Not supplied.			
Khairpur	Not supplied.			

Public opinion today is not satisfied with the manner in which the Local Boards maintain roads, and there is a constant demand that all roadwork should be taken from the boards and handed over to the Public Works Department of Government for construction, maintenance and improvement. The trunk roads in the country are at present under the control of the Public Works Department and the District Boards are responsible for minor and subsidiary roads connected therewith. The following table shows expenditure on original works and repairs to roads for the year shown.

Name of Board.	1954-55			1955-56		
	Original Works.	Repairs.	Total.	Original Works.	Repairs.	Total
1	2	3	4	5	6	7

KHAIRPUR DIVISION.

Larkana ..	63,239	43,021	1,06,260	21,097	73,472	94,569
Jacobabad ..	33,168	68,593	1,01,761	39,579	25,743	65,322
Nawabshah ..	16,179	1,21,511	1,37,690	2,388	50,383	52,771
Sukkur ..	Nil.	2,41,097	2,41,097	Nil.	80,053	80,053
Khairpur	Not supplied			Not supplied		

HYDERABAD DIVISION.

Thar Parkar ..	2,61,704	1,18,348	3,80,052	1,17,099	1,16,904	2,34,003
Dadu ..	28,842	56,049	84,891	7,689	44,344	52,133
Sanghar ..	71,340	40,286	1,11,626	8,179	70,513	78,692
Thatta ..	10,307	15,200	25,507	15,138	18,132	33,270
Hyderabad ..	18,762	66,747	85,509	47,041	3,43,683	3,90,724

Name of Board.	1956-57			1957-58		
	Original Works.	Repairs	Total	Original Works.	Repairs	Total
	8	9	10	11	12	13

KHAIRPUR DIVISION:

Larkana ..	..	27,365	34,729	62,104	11,601	5,429	17,030
Jacobabad ..	..	28,552	5,885	34,437	32,969	3,569	36,538
Nawabshah ..	..	9,283	35,484	44,767	3,651	43,265	46,916
Sukkur ..	..	Nil.	1,22,401	1,22,401	Nil.	75,390	75,390
Khairpur ..	..	Not supplied			Not supplied		

HYDERABAD DIVISION.

Thar Parkar ..	..	2,90,708	1,54,026	4,44,734	2,32,838	1,30,317	3,63,155
Dadu ..	..	1,069	39,513	40,582	10,257	37,141	47,398
Sanghar ..	..	6,571	1,33,743	1,40,314	36,573	1,85,935	2,22,508
Thatta ..	..	28,112	15,968	44,080	5,575	10,958	16,533
Hyderabad ..	..	Nil.	94,302	94,302	Nil.	1,09,301	1,09,301

1958-59

Name of Board.

Original
Works.

Repairs

Total

1

14

15

16

KHAIRPUR DIVISION.

Larkana	..	..	..	4,564	4,760	9,324
Jacobabad	..	..	..	5,582	24,247	29,829
Nawabshah	..	..	..	439	42,340	42,779
Sukkur	..	..	..	Nil.	1,67,647	1,67,647
Khairpur	..	..	..	Not supplied		

HYDERABAD DIVISION.

Gul Hayat Institute

Thar Parkar	..	..	..	1,76,396	66,047	2,42,443
Dadu	..	..	..	21,896	56,907	78,803
Sanghar	..	..	..	8,989	1,55,279	1,64,268
Thatta	..	..	..	14,315	10,591	24,906
Hyderabad	..	..	..	16,186	2,87,938	3,04,124

FRANCHISE OF DISTRICT LOCAL BOARDS AND POWERS OF CHIEF OFFICERS AND CONTROL OF EDUCATION.

**Local
Boards &
Franchise.**

The following paragraph explains the nature of District Local Board franchise, the powers of Chief Officers of District Local Boards and the control of Education under District Local Boards.

(i) The existing position of elections and electoral Franchise of District Local Boards is that the Boards are at present superseded. The franchise is adult franchise. Every person of 21 years of age who on the 1st day of January next preceding the date on which the list is published had a place of residence within the constituency is eligible to be placed on the voters' roll. Lists of Voters are prepared separately for each village by the Collector based on his records and past decisions. Such lists are published in the local language at least 3 months before the date fixed for election. These lists are revised by the Collector of the District when necessary. Names of Muslims and Non-Muslims appear separately in electoral rolls for each constituency. All stages for elections, for instance, publication of electoral rolls, presentation, scrutiny and final acceptance of nomination papers, date of ballot, counting of votes and declaration and publication of the results are fixed by the Collector and election is held by him.

(ii) The Chief Officer is the head executive officer working under the board. He has to execute all orders and resolutions passed by the Board. He has to prepare Budget estimates and get them sanctioned by the Board through the President. He has to carry out all correspondence on behalf of the Board and the President, except with Government. He has to exercise supervision and control over the acts of the entire staff of the Board. He has to spend 10 days in a month on tour exercising supervision and inspecting all institutions run from Local Board funds.

(iii) The District Local Boards receive Education grants from Government for secondary education only. The grants are authorised by the Inspector of schools and credited to District Local Board funds at the end of the financial year. The District Local Board incurs expenditure on secondary education from its own funds without waiting for the Government grant. Grants for primary education are distributed by the District Inspector of Schools.

Control over primary education vests in Government. There are no School Boards at present. They were abolished from 1st April, 1948.

MUNICIPAL FRANCHISE.

The other units of local self-government besides District Boards are Village Sanitary Committees, Municipalities, Notified Areas and Cantonments. Local Govt.
Sanitary
Committees

Village Sanitary Committees—The question of devising some remedy for the normally insanitary condition of the villages was under consideration for some time before Act I of 1889 provided legal machinery for the purpose. A beginning was made by the application of part II of that Act to selected villages. In 1894 the government intimated its wish that the Act should be applied only where a desire for it was expressed, and this principle has been observed since. It has not prevented the extension of the operation of the Act and there are at present 136 villages in which there are sanitary committees. The Act and rules issued under it allow much liberty of adaption to circumstances and accordingly there is a good deal of variety in the constitution of committees and their operations. The number of members of committee varies from three to seven. The Mukhtiarkar of the taluka and the local Medical Officer, if there were one, were usually members, the former being the Chairman. But there are committees on which there is no official member. They commonly meet once a month; but from some quarters complaint comes of apathy and indifference. As regards income the usual rule is that the village raises one half by subscription, while the Local Fund gives one-third and the Government one-sixth; but in some villages a good deal more than half has been found by the inhabitants, while in others it has been found difficult to collect their share. The money is expended in paying sweepers to keep the village clean, lighting it, clearing away jungle, repairing tanks, digging cuts or wells and other petty works having a sanitary tendency. Sanitary committees have undoubtedly raised the standard of their village sanitation; but there is much that still remains to be done and the verdict on the sanitary committees is rather like that which can be pronounced on the work of local bodies in general, mainly that on the whole it is not very impressive, and the committees suffer generally from the same defects as have hindered the effective functioning of municipalities and local boards, where personal and sectional jealousies, factions and nepotism are inclined to diminish the good work which is undoubtedly intended.

Municipalities.

District Municipal Government in Sind falls into three divisions; the first from 1852/1878, during which Act XXVI of 1850 was in force; the second embracing the years between 1878 and 1901, the period covered by Bombay Act VI of 1873 (as amended

Local Govt.
Municipa-
lities.

by Act II of 1884); and the third beginning with the introduction of the District Municipal Act III, of 1901. To this period may be added a fourth stage, 1933-1947, namely the creation of Karachi as a Municipal Corporation in 1933 bringing it into line with the major municipalities of India like Bombay and Calcutta. The period lasted till 1947 when Karachi was assumed by the Federal Government of Pakistan.

As regards the first period, after the conquest of Sind in 1843 Boards of Conservancy were constituted under Act XXI of 1841 in Karachi and Hyderabad by Sir Charles Napier to advise the Governor on conservancy matters. In the rest of Sind the responsibility for the cleanliness of the towns rested with the inhabitants and the local officials. This collective responsibility could be enforced by resort to the provision of Section 19 of Bombay Regulation XII of 1827 and fines could be inflicted upon persons found creating nuisances. But the larger municipal measures, such as provision of roads, lighting, water supply within towns, were left to panchayets and the townspeople. Government indeed provided in 1850 a small amount for expenditure by the Collector and District Magistrate on works of public utility like roads, dharamshalas and wells. But such Government assistance went but a very short way. The chief obstacle to progress was lack of funds. In some towns, such as Hyderabad, it was customary for the panchayets to levy a small town duty on all grain imported. In other places a light poll tax or a fine on marriages was levied and the proceeds utilised in defraying the cost of conservancy. On the 8th September 1852 Act XXVI of 1850 was applied to Karachi and then extended to Hyderabad, Sukkur, Shikarpur and many other towns. The Act could not be applied to any town except at the express desire of the majority of the townspeople. The Magistrate of the town and principal inhabitants were to be appointed Commissioners by Government. Power was taken to levy house tax or house assessment and town duties and the expenditure of such funds was left entirely to the municipality. Power was taken to define nuisances and, if necessary, to punish offenders. To prevent control passing entirely into the hand of Government officers, the Government directed that propositions should not be carried except by majorities of not less than three-fourths and that the magistrate's interdiction of any works which at least one-fourth of the Commissioners desired carried out should be reported to Government. The provision of schools was not a part of the duties of municipalities, as the Government did not consider the schools could be regarded as municipal institutions of such a nature that their expenses should be defrayed from municipal funds raised for general municipal purposes. But no objection was taken to the maintenance of dispensaries, as these

being available to all classes, were of general utility. House tax, always unpopular, was opposed from the outset by several municipalities. The principal sources of revenue were Octroi and Wool Tax. Several articles, such as opium, salt and country liquor, which are now specially protected, were subject to taxation. Till 1872 Octroi duties on imports, as well as on exports, were farmed out to contractors. In addition, the revenue from all or some of the following sources were usually assigned to municipalities, namely proceeds of unclaimed property up to a fixed amount, municipal fines under Regulation XII, 1827, and Act XXI of 1841, and the balance of registration fees. Act XXVI of 1850 was amended by Bombay Act I of 1871, which imposed on municipalities the duty of paying a portion, not exceeding 20 per cent of their gross revenues of the cost of the town police, until finally repealed by Bombay Act VI of 1873, which was not applied to the province of Sind till the 1st October 1878.

Under the latter enactment the municipalities were divided into city and town municipalities. The city municipalities, in which alone the elected principle obtained, were comparatively few, and town municipalities were composed entirely of nominated members. Under the new Act certain public property was vested in municipalities, who were now further empowered to raise by taxation funds which were to be applied to the promotion of public health, safety and convenience. The police charges borne by municipalities were limited to one half the cost of the police. Bombay Act VI of 1875 (amended by Bombay Act II of 1884) introduced rather important changes in municipal government. The principal of these were the extension of the elective principle, the exclusion of municipalities from all liability to pay for police and the obligation imposed upon them to establish and maintain middle-class and primary schools. A further stage in municipal development occurred with the enactment of the present Municipal Act III of 1901. Among other matters this Act provides for municipal councillors vacating their seats on failure, without leave from the municipality, to attend at least one meeting for a period of four months, the appointment of ex-officio councillors and presidents, the election of councillors by sections of the inhabitants, public bodies and associations the management of trusts and the enforcing of information as to dangerous diseases and liability to municipal taxation. Municipalities were now bound to make reasonable, instead of adequate, provision for fulfilling their obligatory duties and, if called upon by Government to provide for the maintenance and treatment of lepers and lunatics at any asylum or hospital within the municipal district. Another feature borrowed from a Punjab Act was the power to constitute Notified Areas

in places which are not large or important enough to have municipalities. There are now 31 municipalities in Sind and Khairpur. In the course of time a number of small municipalities disappeared and a few new ones were created. Thus nine of the little municipalities were abolished during the decade 1884-1894 and one more during 1894-1904. The electoral franchise was extended to Karachi, Hyderabad, Shikarpur and Sukkur in 1884/85 and to Kotri and Jacobabad in 1885/86.

Karachi
Municipal
Corporation.

The Karachi Municipal Corporation, established in 1933, marks the fourth period of municipal development. As this Corporation was a part of Sind till 1947, some description of it is necessary in this Gazetteer. The Karachi Municipal Corporation was elevated as such in 1933 when a separate Act was enacted for it. Previously it had been a Municipality governed by the Bombay District Municipal Act, 1901 and was constituted with the following authorities.

1. *Council*:—(Comprising President, Vice-President and elected & nominated Councillors).
2. *Chief Officer*:—A list showing the powers conferred upon the above functionaries of the Municipality under the Bombay District Municipal Act, 1901 is appended.

The main changes in the administration resulted from the enforcement of the City of Karachi Municipal Act 1933 are that the Karachi Municipal Corporation is now an autonomous public body constituted with the following authorities.

1. *Corporation*:—Comprising 100 members. (Mayor, Deputy Mayor, 94 elected members and 4 representative each from Karachi Port Trust, Karachi Improvement Trust, Karachi Joint Water Board and Port Hajj Committee).
2. *Standing Committee*:—Comprising 16 members, Corporation with the approval of the members).
3. *Chief Officer*:—Executive Head appointed by the Corporation with the approval of the Provincial Government.

A list showing the duties and powers imposed and conferred upon the Karachi Municipal Corporation under the City of Karachi Municipal Act, 1933 is appended.

In 1948, the Government of Pakistan promulgated an ordinance embodying that if at any time the Corporation is found to be incompetent to perform or it is found to be persistently making default in the performance of duties imposed under the said Act, or exceeds or abuses its powers, the Provincial Government is empowered under the said Act to dissolve the Corporation. When the Corporation is dissolved, all Councillors vacate their office and all powers and duties of the Corporation, Standing Committee and Chief Officer are exercised by a Municipal Commissioner appointed by the Provincial Government.

Obligatory Functions.

- (a) Lighting Public streets, places and buildings;
- (b) Watering public streets and places;
- (c) Cleaning public streets, places and sewers, and all spaces not being private property, which are open to the enjoyment of the public, whether such spaces are vested in the Municipality or not; removing noxious vegetation; and abating all public nuisances;
- (d) Extinguishing fires, and protecting life and property when fires occur;
- (e) Regulating or abating offensive or dangerous trades or practices;
- (f) Removing obstructions and projections in public streets or places, and in spaces not being private property, which are open to the enjoyment of the public, whether such spaces are vested in the Municipality or belong to His Majesty;
- (g) Securing or removing dangerous building or places, and reclaiming unhealthy localities;
- (h) Acquiring and maintaining, changing and regulating places for the disposal of the dead;

- (i) Constructing, altering and maintaining public streets, culverts, municipal boundary-marks markets, slaughter-houses latrines, privies, urinals, drains, sewers, drainage-works, sewerage works, baths, washing places, drinking fountains, tanks, wells, dams, and the like.
- (j) Obtaining a supply or an additional supply of water, proper and sufficient for preventing danger to the health of the inhabitants from the insufficiency or unwholesomeness of the existing supply, when such supply or additional supply can be obtained at a reasonable cost;
- (k) Naming streets and numbering houses;
- (l) Registering births and deaths;
- (m) Public vaccination;
- (n) Suitable accommodation for any calves, cows or buffaloes required within the municipal district for the supply of animals lymph;
- (o) Establishing and maintaining public hospitals and dispensaries, and providing public medical relief;
- (p) Establishing and maintaining primary schools;
- (q) Printing such annual reports on the municipal administration of the district as the Government in council by general or special orders requires the Municipality to submit;
- (r) Paying the salary and the contingent expenditure on accommodation as may be required by Government the Municipality for the purposes of this Act or for the protection of any municipal property and providing such accommodation as may be required by Government under section 77 of the Bombay District Police Act, 1890.
- (s) Providing special medical aid and accommodation for the sick in time of dangerous disease; and taking such measures as may be required to prevent the outbreak of, or to suppress and prevent the recurrence of the disease;

- (t) Giving relief and establishing and maintaining relief works in time of famine or scarcity to or for destitute persons within the limits of the municipal district.
- (u) Treatment of lunatics and lepers.

Discretionary Functions.

- (a) Laying out, whether in areas previously built upon or not, new public streets, and acquiring the land for that purpose, including the land requisite for the construction of buildings or curtilage thereof, to about on such streets;
- (b) Constructing, establishing or maintaining public parks, gardens, libraries, museums, lunatic asylums, halls of offices, dharamshalas, rest-houses and other public buildings;
- (c) Furthering educational objects other than those set forth in sub-clause (p) of Section 54;
- (d) Planting and maintaining roadside and other trees;
- (e) Taking a census; and granting rewards for information which may tend to secure the correct registration of vital statistics;
- (f) Making a survey;
- (g) Providing the salaries and allowances rent and other charges incidental to the maintenance of the Court of any stipendary or Honorary Magistrate, or any portion of any such charges;
- (h) Making arrangements for the destruction or the detention and preservation of such dogs within the municipal district as may be dealt with under section 49 of the Bombay District Police Act, 1890;
- (i) Securing or assisting to secure suitable places for the carrying on of the offensive trades mentioned in sub-section (1) of Section 151;

- (l) Supplying, constructing and maintaining, in accordance with a general system approved by the Sanitary Board, receptacles, fittings, pipes and other appliances whatsoever, on or for the use of private premises, for receiving and conducting the sewage thereof into sewers under the control of the Municipality;
- (k) Establishing and maintaining a farm or factory for the disposal of sewage;
- (l) Carrying out any other measure not specified in section 54, likely to promote the public safety, health, convenience or education, and;
- (m) Making provision, with the previous concurrence of the Commissioner, or in other cases of the Collector, for any public reception, ceremony, entertainment or exhibition within the municipal district.

In addition to the functions enumerated above, the Act provides for further duties within the competence of the Karachi Municipal Corporation:—

Directive Duties.

1. The organisation, maintenance of management of:—
 - (a) Institutions within or without the city, for the care of the sick or incurable, or for the care and training of the blind or other partially helpless persons or children;
 - (b) maternity homes or shelters, dispensaries, hospitals and milk depots, for infants;
 - (c) chemical or bacteriological laboratories (within or without the city) for the examination or analysis of water, food or drugs, for the detection of diseases or for researches connected with public health;
 - (d) publish wash-houses, bathing places and other institutions designed for the improvement of public health;
 - (e) dairies or farms within or without the city, for the supply of milk or milk products for the benefit of public health or profit to the corporation or for the purpose of experiments in the breeding of cattle or in cultivation or crops;

2. The furtherance of educational objects other than those mentioned in clause (26) of section 34.
3. The building or purchase and maintenance of:—
 - (a) dwelling for municipal officers or servants;
 - (b) Suitable dwellings for the poor and working classes;
 - (c) sanitary stables, or byres for horses, ponies or cattle used in hackney carriages or carts or for milch-kine;
4. The construction, purchase, organisation, maintenance of management of tramways, trackless trams, or motor transport facilities for the conveyance of the public;
5. The laying out, or the maintenance of public parks, gardens or recreation grounds, and the planting and care of trees on road-side and elsewhere;
6. The construction and maintenance in the public streets of drinking fountains for human beings and water troughs for animals;
7. The laying out in areas (whether previously built on or not) of new public streets and the construction of buildings to abut on such streets; not new public streets;
8. The establishment and maintenance of libraries, museums, art galleries, botanical or zoological collections and the purchase or construction of buildings thereof;
9. The holding of agricultural, industrial or scientific fairs or exhibitions or of athletic sports;
10. The promotion of public or infant welfare;
11. The organisation or maintenance, in time of scarcity, of shops or stalls for the sale of necessities of life;
12. The prevention of cruelty to animals, including the construction or maintenance of infirmaries under sub-section (2) of section (6) of the Prevention of Cruelty to Animals Act, 1890;

13. The destruction of birds, or of any animals causing a nuisance, or of vermin or the confinement or destruction of stray or ownerless dogs;
14. Contribution towards any public fund raised for the relief of human sufferings within or without the city;
15. Music in public places or places of public resort;
16. Public ceremonies or entertainments, including the presentation of addresses to persons of distinction;
17. The promotion, formation, extension or assistance of any provident fund or benefit society whose objects include the erection, improvement, maintenance or management of suitable accommodation for the poor and working classes by any or all of the following means;
 - (a) the acquisition of land with a view to selling or leasing the same to such society; or
 - (b) the making of grants or loans thereto;
 - (c) subscription for any share-capital therein; or
 - (d) guaranteeing the payment of interest on money borrowed by such society or of any share-capital issued by such society;
18. The maintenance of an ambulance service;
19. The construction of any encampment;
20. The purchase of any undertaking for the supply of electric energy or gas or the starting or subsidising of any such undertaking which may be in the general interests of the public;
21. The formation and maintenance of a fire insurance fund for the protection of municipal property;
22. The formation and maintenance of workmen's compensation fund;
23. The acquisition of immovable property for any of the purposes above mentioned or the cost of surveys or the examination of such property, or the construction or adaptation of buildings necessary for such purposes;

24. The grant of scholarships, provided that if any such scholarship be tenable outside the city such scholarship may be granted only on a resolution passed by at least one-half of the whole number of councillors.
25. The grant of loans for building purposes to servants of the Corporation drawing a monthly salary of not more than two hundred rupees, on such terms and subject to such conditions as may be prescribed.
- 25-A. Any other measure not specified in section (34) likely to promote public safety, health and convenience.

Since the creation of Pakistan events have moved very quickly in the sphere of local self-government and much attention has been devoted to evolving a more satisfactory system than has been in existence for the past century. In the First Five-Year Plan of the Government of Pakistan 1955-1960, the working of local self-government bodies, especially with regard to finance and the conditions of their employees, should, according to the plan, be made the subject of an enquiry, the object of which should be to suggest measures for improvement. Wrong administration is due to two main causes, the relatively low standard of qualification, training and experience of the holders of key-posts and interference by members in the day-to-day administration frequently motivated by personal or factional considerations. The Provincial Government, it is urged, should help local bodies to develop properly qualified provincial cadres of such officers as secretaries, executive officers, municipal engineers, public health officers, assessors of properties, accounts officers and the like. Another method which would help would be to define the powers of key-officers which would tend to discourage interference by the members in matters which should not concern them. The growing complication of government in the modern state has led to serious thought being given to the proper relationship which should exist between local bodies and the Provincial Government. The Five-Year Plan makes several suggestions. District Officers and heads of Development Departments should revive the practice of inspecting frequently local bodies, institutions and works and send their inspection notes to local bodies for their guidance. On reviewing local bodies' budget statistics officers should invite the comments of the Development Departments in order to ensure that the budget proposals fit in with general policies and programmes. The local bodies should be represented on the development or advisory bodies to be set up in the districts at different levels. The Provincial Government should utilise to the maximum extent the agency of local bodies for implementing their social service programmes, such as primary and secondary schools, public health schemes, rural dispensaries, veterinary centres, urban community development centres and institutes for the handicapped.

Local
Government
Reform.

Local
Government
Cantonments.

The fourth type of local self-government unit is the Cantonment. Of the military cantonments established with the British conquest, only that of Karachi survives today. One was established at Jacobabad in 1847 when Major Jacob was appointed in charge of the frontier and made his headquarters there. Manora was constituted a cantonment in 1903. They are all now under the Cantonments Act XIII of 1889, and are controlled by committees constituted under the Cantonment Code of 1899. They derive their income from taxes imposed under the Act and applied to conservancy, maintenance of roads and other necessary purposes. At Karachi, and formerly at Hyderabad, the Cantonment Committee had an arrangement with the Municipality under which certain municipal dues paid by residents in the Cantonment were adjusted by an annual payment to the Cantonment Committee by the municipality.

In the Local Government Review of 1957 the relations between Cantonment Boards and Municipal Committees has received some attention. That report states that, under the constitution of Pakistan, local government is a provincial subject but local self-government in cantonment areas is a Central subject. Cantonment Boards were set up in the first instance to provide for amenities for the areas where military troops were stationed. In course of time the limits of cantonments were extended to include such civil areas as were not of much importance for military purposes. During the British period municipal committees were not vigorous and therefore it was immaterial for municipal purposes how the limits of the majority of cantonments were extended. After the birth of Pakistan the position has changed. Municipal Committees have now to be evolved as progressive civil organs and in the process of development it is now being felt that there are some handicaps because of the unscientific frontiers between municipalities and adjoining cantonments. The limits of the cantonments were fixed many years ago and most of the considerations which weighed with the then authorities for fixing such limits would not apply to the changed circumstances of today. It would be in the interests of the Cantonment Boards, as well as Municipal Committees, if the limits could be re-adjusted on some rational principle. The compiler of this Gazetteer is much indebted to Sir Patrick Cadell, Kt., C.S.I., V.D., for an account of the military cantonments in Sind. This account is given below:—

“Until the Province of Sind was added to the territories of the Company's Government of India, the encampments and stations of the military forces traversing the Province were inevitably of a temporary character. Many of them were in unhealthy localities such as Thatta, and the regiments from Bombay in particular were almost incapacitated by fever. Even after the Conquest, while Sir Charles Napier was Governor, an army of from

twelve to sixteen thousand men was maintained, partly because of a remote prospect of invasion from Afghanistan, but principally because of the threat of the powerful Sikh army of the Punjab. Several of the stations were unhealthy and subject to extreme heat at Sukkur, for example, the 78th Highlanders suffered greatly from fever and cholera. With the breaking of the Sikh power, the necessity for a large force in Sind ceased. Of the stations established by Napier, only Karachi and Hyderabad remain as Cantonments. That at Shikarpur, the original capital of Upper Sind, was abandoned in the eighteen sixties. It had always been unhealthy, and the safety of the Frontier was sufficiently protected by the Station established in 1847 by John Jacob at Khangarh, which afterwards bore his name. A considerable force was maintained at this place, which was diminished with the establishment of Quetta in Baluchistan as the principal strong point. Jacobabad ceased to be a military station after the first World War.

Karachi having been selected as the capital of the Government of the Province, a large area was allotted for the Regimental lines, for an Arsenal, and for the bungalows and offices. Depot lines were also provided for the European troops arriving by sea for stations in Upper India, and for those returning for embarkation overseas. The Depot continued to be so used till 1871 when the superiority of railway connections led to the Port of Bombay being used for preference. The great use of Karachi as a port in subsequent years, and particularly during the two World Wars, necessitated the establishment of a Cantonment at Drigh Road, outside Karachi.

As Hyderabad had been the capital of the Mirs and contained a fort of considerable strength, it became a Cantonment for a large number of troops. The principal arsenal in Sind was also maintained here. Both at Karachi and at Hyderabad Sir Charles Napier arranged for the erection of barracks and hospitals for the troops, far superior at the time to the buildings provided elsewhere in India for these purposes."



Gul Hayat Institute

CHAPTER XVI
EDUCATION

Gul Hayat Institute



Gul Hayat Institute

TABLE OF CONTENTS.

	Page
Education, General history and nature... ..	675
Educational, History. Three periods.	678
Education, Primary... ..	680
Education, Mullah Schools.	682
Education, Primary Control.	682
Education, Secondary.	683
Education, Secondary, Prominent Colleges.	685
Education, Expansion.	691
Education, University.	693
Literacy.	697

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CHAPTER XVI

EDUCATION

Education,
General
history and
nature.

When the British annexed Sind in 1843 the glories of Thatta, Rohri, which had seen their heyday in the sixteenth, seventeenth and early eighteen centuries, had long since departed. The Talpurs, were not distinguished for their efforts to encourage Education amongst the population of Sind. Some of the Mirs themselves were scholars and even poets, but they did not patronise learning, though they exercised some patronage amongst the Sayids, who were the depositories of learning. Outside Thatta and Rohri and Mafiari and other places where learned Sayids resided it was not an uncommon thing for a rich man to employ an akhund or tutor, for his children, to allow the children of poorer neighbours to share the benefit. There were pious scholars too who taught on Fridays the humanities, meaning by that Persian and Arabic for the love of God and such fees as the children could bring. Their incomes were supplemented by gifts on the Id, and when a child had mastered the first ten lessons of the prayer they would bind his hands with silk as a diploma and send him round to collect a benefit for the master. Persian was the language of literature and business, and not only Mussulmans but Hindus who hoped for Government Service acquired it by these agencies. Besides these there were hundreds of Maulvis sitting on the platforms of the village mosques, or under tree, teaching little boys and girls to read the Holy Quran without understanding, and receiving in return an allowance of grain at harvest time and other humble perquisites. In 1853 the number of small schools of these kinds in Karachi, Hyderabad and Shikarpur Collectorate was reported to be over six hundred. Sindhi was the language of common life among all, from the Mir to the Mohano, although it was considered a fit vehicle for learning or polite correspondence. The Hindu traders kept their accounts and carried on all their business in it, using a Hindu character based on the Devanagri of which there were several varieties. There were a few Hindu schools for instruction in this, but for the most part the sons of men in business appear to have acquired their commercial education at home or from neighbours. Such was the condition of learning under the Talpurs.

The British Government confiscated the endowments or stopped the allowances of the Thatta Sayids, and British influence dried up to a great extent the spontaneous springs which had nourished the indigenous educational agencies. This can be described only as a tragic occurrence. At the same time the British annexation created a new want, namely schools in which the English language could be learnt. Earnest Executive

Officers, working under many difficulties, were the first to see the need and make efforts to meet it. The system of education which the British introduced was, of course, that already being adopted in British India generally, and it was largely directed by the principles which had guided Macaulay in drawing up his famous minute on Education in India. It must be remembered that when the British occupation of Sind occurred the Hindus occupied a very unimportant place, except for the few who had acquired wealth and position as servants of the Talpurs in administrative or executive appointments. But, apart from these more or less privileged individuals, the Hindus were a down-trodden race and the vast majority of the population, which was Muslim, was not characterised by any great inclination to study even the indigenous forms of study then in force. Though the trend was not very strong in Sind, there was an undoubted reluctance on the part of the Muslims to accept the British standard and system of education. The point has been made very clear in Mr. Hampton's "Biographical Studies in Modern Indian Education", from which the following passage is taken, as it explains the state of mind of the Muslim population at the time when the British started their method of education and their idea of what should constitute the studies for children beginning their education. If we take the British control of India as starting after the Battle of Plassy in 1757, we may agree with the words of Mr. Hampton that in the early days of British supremacy no sweeping administrative changes were introduced or attempts made to substitute Western for Persian and Arabic learning, or to overthrow the established system of education. "Indeed for the first seventy years of British rule," says Mr. Hampton, "this system was used to train officials for the conduct of civil administration and Hindus showed little reluctance to continue their Persian studies. By degrees a new system of public instruction was introduced, and once the results of the spread of Western learning was the substitution of English for Persian as the language of official business. Mohammadans viewed with dismay the displacement of Persian and they held themselves aloof from a movement which had dealt a heavy blow to their culture and was even calculated to undermine their faith. Hindus, on the other hand, were more adaptable and far-seeing. They readily availed themselves of the facilities offered for the acquisition of Western knowledge and they managed to secure a disproportionate share of administrative and judicial appointments. In consequence the relative position of the Hindu and Mohammadan communities steadily changed, the former rising in knowledge, wealth and influence, the latter declining. This reversal of fortune", Mr. Hampton continues, "not unnaturally made a firm and sensitive people solemn and despondent, and they came to regard themselves as a race ruined under British

rule. They complained with some justification that the new system of public instruction was opposed to their traditions, unsuited to their requirements and hateful to the religion of the Mussulmans. They recalled that a comparatively short time ago their own system of education had been the basis of their intellectual and material supremacy, as well as the medium by which Hindus had proved their unfitness to wield authority in their own country." Sir William Hunter supported the Muslim point of view when he wrote. "The truth is that our system of public instruction ignores the three most powerful instincts of the Mussulman heart. In the first place, it conducts education in the vernacular language, which educated Muhammadans despise, and through Hindu teachers, whom the whole Mohammadan community hates. In the second place, our real schools seldom enable a Mussulman to learn the tongues necessary for his holding a responsible position in life and for the performance of his religious duties. In the third place, our system of public instruction makes no provision for the religious education of Mohammadan youth." Writing of the results, J. N. Parker in his "Modern Religious Movements in India, 1929" considers that "the Maulvis, religious leaders of the people, from a mistaken loyalty to Islam forbade their people from acquiring the learning of the Farangi. The consequences were disastrous because, while Hindus inspired by the arts and sciences of Europe were experiencing an intellectual and moral renaissance, Muslims all over India were falling into a state of material indolence and intellectual decay." In Sind and Khairpur this influence was, of course, strong and it must account to a considerable extent for the slowness and unwillingness with which the Muslim population took to the kind of education provided under British rule. This prejudice was eventually broken by the efforts of far-sighted Muslims able to foresee what the future would hold. The Hindus acquired through their support of education the material advantages in employment, in administration and in influence which the Muslims in their neglected education were unable to obtain. Amongst the pioneers of Muslim education are: Sayid Ahmad Khan, the founder of the Muslim university at Aligarh and a great inspirer of Muslim education all over India, and, as far as Sind was concerned, Hasanali Effendi, who in 1885 succeeded in creating the Sind Madressa Board. The scheme of modern education as drawn up by Khan Bahadur Hasanali was to take one promising boy from each of the fifty-two talukas of Sind, feed and educate him and on his completing the course take another. Later on the scope was widened and education opened to everybody. This institution has been educating prominent members of the Mus-

lim community ever since. Amongst the most prominent were Qaid-e-Azam, Muhammad Ali Jinnah, the first Governor-General of Pakistan, Sir Ghulam Hussain Hidayatullah, who became the first Sindhi Governor of Sind, and Dr. U. M. Daudpota, the very competent Sindhi scholar whose recent death has left a blank which it will be very hard for many years to fill.

The educational history of Sind falls conveniently into three periods: first, the period of British rule from the time of Sir Charles Napier up to 1936, when Sind became a Governor's province in its own right; second, from 1936 to the partition of India in 1947, when Pakistan became an independent country; and third, the post-partition period from 1947 to the present day, when the educational ideals which animate the Islamic Republic of Pakistan are the mainspring of educational policy. The three periods have distinct characteristics. During the first, the British period to 1936, when Sind was part of the Bombay Presidency and Khairpur was a native state, the problem of education followed the lines laid down by the British administrators in the educational sphere. When Sind became a Governor's province the emphasis changed a little more in favour of encouraging an Islamic type of education. After partition this trend has become predominant and now directs the educational institutions of the country, since with the disappearance of Hindus of the educated class there is no longer any great necessity to make provision for Non-Muslims in the educational system. The section on education and training in the Five-Year Plan of the Government of Pakistan 1955-60 remarks that immediately on the gaining of independence the country was faced with staggering problems. In education its immediate task was to save the system from collapse, a task which was made difficult by loss of supervisory and teaching personnel. Schools, colleges, universities were maintained and most of the abandoned institutions were revived and reconstructed. Since then there has been a considerable increase in the number of educational institutions and enrolment. Whereas in 1948/49, as far as Pakistan is concerned, the expenditure on education represented 5.3 per cent. of the total Government expenditure, in 1954-55 expenditure on education amounted to 7.7 per cent. of a much larger total. Amongst the early British pioneers in education were Captain Rathborne, Collector of Hyderabad, who in 1845 asked the Government of India to sanction Rs. 3,000 a year for education and Captain Preedy, Collector of Karachi, whose name remains on one of the prominent Karachi streets today, found the Karachi Free School apparently at his own expense, and in 1846 entrusted it to a local committee on the express condition that all instruction, as far as the subject permitted, should be given through the medium of Christian religious publications and that these should include the whole Bible. In 1853

this school was handed over on the same condition to the Church Missionary Society and the continues to the day. In Shikarpur an English school was started and kept up by the liberality of Captain Goldsmid. After some time the Bombay Board of Education took up the question of organising an education agency in Sind and about the same time there was a movement in favour of making Sindhi the official language of the province, which involved the question of vernacular education.

Few of the English officials could speak Sindhi and none of their munshis could write it. The administration was carried on through interpreters and records were kept in mongrel Persian. In 1851 Mr. Bartle Frere (later Sir Bartle Frere) issued a circular requiring all officers in civil employ to pass an examination in colloquial Sindhi. But the language could not be used for official correspondence until it had an alphabet. Captain (afterwards Sir) Richard Burton strongly advocated the adoption of the Arabic alphabet with such addition of dots and signs as might be necessary to indicate sounds, cerebral, guttural and pectoral in which Sindhi is peculiar. When in 1853 the Court of the Directors of the East India Company decided that Arabic should have a trial, and at the same time sanctioned an annual expenditure of Rs. 10,000 for educational purposes, Mr. Bartle Frere acted at once. Through his action one of the most remarkable achievements in the history of language was accomplished. Mr. (afterwards Sir) Barrow Ellis, with the assistance of some native scholars, devised an alphabet extending from the twenty-nine Arabic letters to fifty-two letters. The alphabet was printed and issued in July 1853, after which the preparation of school books by translations from Persian, Urdu, Marathi and Gujarati went on apace. In December 1854 Mr. Ellis was able to report that ten books in arithmetic, history, geography and other subjects were ready. Thus the Sindhi language has been printed for more than a hundred years, in this respect quite outdistancing Urdu, which is still not generally printed but reproduced by the laborious production of lithographic plates. An English school was opened in Karachi in October, 1855, with sixty-eight pupils. A school building was sanctioned at Hyderabad and Shikarpur and smaller buildings for vernacular schools in twelve other towns. The greatest difficulty in the way of immediate progress was the want of teachers. To meet this a normal school was afterwards opened in Karachi in 1854 from which instruction was imparted to such masters of indigenous schools and others as desired it. This was afterwards transferred to Hyderabad and is now the Male Teachers' Training College. A result of these preliminary measures ten years later in 1864-65 was four high schools, three middle and fifty-six primary schools and one training college in the province, of which three were aided and the rest maintained by Government. In 1863 a local fund was

established and one-third of the cess on land was allocated to rural education, with the result that the next decade showed a great increase in the number of primary schools. Aided private schools also began to appear and girls' schools, of which there were 20 in 1874-75. The total number of recognised institutions in that year was 230 with 14,299 pupils. In January 1887 Mr. A. Charles was appointed on special duty to report on the whole subject of the condition of education in Sind. The following July Mr. H. P. Jacob, a nephew of General John Jacob, was appointed Educational Inspector in Sind, and from that time the department has been continuously administered by officers of educational experience. An immense development of educational activity marked the decade of Mr. Jacob's administration 1884-85 to 1894-95. The number of recognised schools rose from 375 to 1,616 and pupils from 24,159 to 62,595. A large number of indigenous schools were brought into connection with the department raising the list of aided primary boys schools from 52 to 978. The number of girls' school, in the same class increased from 2 to 137 with 4,467 pupils. Other steps in the path of progress were the establishment of the Arts College at Karachi 1887, the founding of two aided high schools, the transfer of numerous middle and primary schools to municipalities and the institution of 4 normal or training colleges for women.

Primary Education.

It will be clear from the above that right through the period of British rule educational instruction was on the lines as understood by British educationalists based on the system prevailing in Britain. If one criticism of a general nature is to be made against this system it is that not sufficient attention was paid to the indigenous schools which had been in existence in Islam from the the beginning. This defect in the British system was recognised as time went and a grudging acceptance was made of mullah schools by the Education Department. But throughout the mullah schools or maktabas were treated very much as the Cinderellas of the educational world. The opposition of educational department officers to mullah schools centred on their technical inefficiency in the imparting of knowledge according to curricula laid down and another centre of criticism was that mullahs were for the most part completely untrained as teachers, and their method of teaching was not acceptable by modern standards of accomplishment. During the time when Sind was a Governor's province from 1936 onwards, the Education Department began to take greater interest and to give greater support to the mullah schools, and since independence was gained in 1947 by Pakistan the existence of the mullah schools in recognised

as one of the foundations on which a sound state education for everyone can be based. The Five-Year Plan 1955-60 of Pakistan has emphasised this point in its general criticism of the nature of primary education under British rule. It says the maktabas were the smallest teaching units in Muslim India before the days of British rule. These units, many of them co-educational, had a religious bias. Not a few were conducted in mosques. Perhaps of special significance was their emphasis upon the interests and aptitudes of the pupil. The individual child became a school class in itself working at his own place. Having finished at the maktab the child could proceed to a madressa for cultural and professional education, or to a guild for artisan or craft training. This indigenous system attuned to a local environment continued to flourish until the last quarter of the nineteenth century, when Government primary schools supplanted it. The Government primary schools divorced education from the children's hereditary culture and environment. Their almost exclusive emphasis was on reading, writing and arithmetic. The teaching method was repetition and drill. Although in the early period the system consisted of lower primary schools of three years' and upper primary schools of another two years duration, it was later modified to a single four-year primary school programme. Through this comparatively sterile system primary education continued till independence and no significant improvements have been made in it since. The mullah schools, or maktabas, the importance of which has become more realised since the time when the British system was modified under the Sind Government in 1936, and is still more accentuated since partition under the educational policy of Pakistan, are described by Dr. Gilani in the brochure "Sind People and Progress" as under: "The mullah schools are the heirs to the old schools and monasteries and mosques run by Sufis, darvishes and other educated philanthropists. The scope of the education is elementary, reading and writing and the imparting of religious education. These institutions have been running without much care and protection by the authorities. After the British conquest Persian was replaced by Modern Sindhi as a Court language, necessitating the establishment of Sindhi schools by Government to meet the demand. The mullah schools naturally introduced the teaching of Sindhi. In 1886 the mullah schools were given grants on simple and elastic conditions provided that Sindhi was retained as a compulsory subject. In 1889 Mr. Jacob, then Educational Inspector in Sind, relaxed all conditions and teaching of the Holy Quran was the only condition for registration of mullah schools. In 1901 Mr. Wright laid down a definite policy with regard to the grant to be paid to the schools. His aim was to develop the schools into primary schools. A curriculum of studies was drawn up and grant was awarded on the attainments of individual pupils in each class. At the instance of Mr. Sheikh Abdullah

Haq in 1914 all mullah schools were taken over by the Government. At present mullah schools, or private schools of the mullahs, are registered as grant-in-aid institutions on the following conditions: that they should follow a regular course of primary education; that they should teach the Holy Quran; that they should maintain an average monthly attendance of at least fifteen pupils in the case of boys and ten pupils in the case of girls; that they keep all the registers prescribed by the department and that they provide sufficient accommodation. Dr. Gilani considers that these schools have done considerable service in the spread of primary education in the more outlying part of the country.

**Mullah
Schools.**

A Mullah School is a primary school in charge of a Mullah, in which a regular course of secular primary education is followed, in addition to instruction from the Quran Sharif. These schools get handsome grant every year and also obtain the services of Government paid assistant masters. Grant is allowed in respect of Hindu pupils studying therein, provided that there is no primary school within a radius of 1 mile from the Mullah School and that the majority of pupils in the schools are Muslims. In addition to this, Mullah Schools receive grants for other purposes, namely Capitation Grant and Accommodation Grant and Equipment Grant, Lungis and other awards, prizes for good attendance, books and writing materials and prize books. The number of Mullah Schools and the pupils attending them in the year 1953/54 was as under: The number of Boys' Schools 544, the number of Girls' Schools 43. the number of pupils in the Boy's Schools 35,434 and the number of pupils in Girls' Schools 2,220. The total expenditure on Mullah Schools during the year was Rs. 8,37,203, namely consisting of Rs. 5,58,136 direct expenditure and Rs. 2,79,667 indirect expenditure. Of the total expenditure Rs. 81,823 were met from the provincial funds and the rest from other sources.

**Primary
Control**

Since the beginning of this century primary education has been administered and controlled by the Provincial Government, Government aided local bodies with grants in aid. Before the separation of Sind compulsory primary education was introduced only in one taluka, Larkana. The Government was anxious to introduce compulsion throughout Sind, but they could not take any practical steps until 1940. Immediately after partition the Government took over the control of primary education under the Sind Primary Education Act. Under new legislation the district local board paid one-third of the local fund levied at the maximum rate of 2 annas per rupee as a contribution to Government for the maintenance of the primary schools. Municipalities pay Government a contribution of nearly half the expenditure on primary education. A scheme of compulsory education was

started in 1938. It is being implemented at present at the rate of three talukas per year. Since partition both Sindhi and Urdu have been made an integral part of the syllabus of post-primary schools. Urdu was already a regional language of the province; but in the post-partition period it was considered necessary to introduce Urdu in Sindhi schools to create a homogenous population.

The great problem facing educationists in Sind and Khairpur has always been how to prevent the wastage of primary education and how to keep at school the children who have reached the fourth primary standard. This problem is, of course common to all oriental countries and is not peculiar to Sind, which indeed is better off than some other parts of Pakistan in this respect. There is still, it must be admitted, a great prejudice in certain parts of the country, particularly in the backward rural areas, against education, and this is particularly pronounced in places like the Upper Sind Frontier where the Baluchi element is strong and where the Sardars of the tribes, even as recently as twenty years ago, were opposed to education on the ground that it unfitted a man for his real place in life, which was being able to fulfil the duties and maintain the prestige of the Baluchi tribesman in the tuman. The compiler of this Gazetteer has many memories of several Baluchi Sardars telling him that education was fit only to turn men into clerks or babus as they called them and this was an occupation which they despised. Prejudice against female education was even stronger, and most of the Baluchis up to a very short time ago considered that educating girls unfitted them for their true function in life. There is no doubt that feelings of this kind are still widespread over a large part of Sind and that this accounts to a considerable extent for the slow progress which education is making over the population as a whole. The problem is recognised by the authorities today and no doubt, as a result of the Five-Year Plan, strenuous efforts will be made to break down the prejudices and achieve more satisfactory educational results.

Secondary Education: During the British period the traditional secondary school system was created and developed to fill the need for training English-speaking clerks and office workers. Secondary education also was dominated by the universities through their administration of the Matriculation Examination and their power to advise on syllabuses and textbooks. Secondary education, therefore, had little meaning as an educational programme in its own right. It was largely a restricted type of Government employment or served as a passport to higher education. Secondary education beginning with

the sixth and ending with the tenth class is a five-year programme. Secondary schools include lower and upper middle schools and high schools. Middle schools also include the primary classes. Lower middle schools teaching to the sixth class are now decreasing in number very rapidly, chiefly because the primary school is becoming a five, instead of a four, year class school and because in some cases the seventh and eighth classes are being added to the lower middle schools. High schools invariably have ninth and tenth classes, in addition to classes from fifth, sixth to eighth. At the time of independence the middle schools in some of the provinces were divided into two types, vernacular schools and Anglo-vernacular schools. This led to an invidious distinction in the course of instruction and between pupils, since some pupils were ordinarily marked for advancement and some were not. Unlike primary education which was dominantly supported by government, secondary education is financed equally by private societies, by local bodies such as municipalities and by religious organisations. By this is meant that schools of private enterprise and beneficence were available and as a result high schools are not well distributed geographically. The disproportionately small number of girls' schools must also be attributed in some measure to the same cause. In Pakistan as a whole there are fourteen times as many secondary schools for boys as for girls and more than ten times as many boys as girls in the secondary schools. The idea behind the present system of secondary education is that changes are needed to enrich the programme by putting emphasis on the humanities and social sciences and the great principles and history of Muslim culture, in order to develop individual character, righteous, living, dignity amongst youth and to strengthen and purify the basic patriotism founded on the historic role of the nation in the marching life of mankind. The major problem in the secondary curriculum is that of language. Whereas the mother-tongue is the medium for instruction in the primary, middle and high schools, English is the medium for instruction at colleges and universities. Whereas the mother-languages are the key to history, literature and the great cultural traditions of the country, English is still the language of government, industry and large scale commerce. This puts a tremendous burden on the secondary school system. This is a burden which must be borne. The vast difference in the extent to which the Hindu and the Muslim populations in the days of British rule took advantage of the secondary educational system has already been commented upon. Whereas early in the present century the Muslims, in addition to the Madressa at Karachi, had opened Madressas at Larkana and Naushahro doing a pioneer service in the educational field, the Hindus had three full fledged art colleges, one

law college and one engineering college, while Muslims were still preparing only to establish high schools. The Government of Bombay did not establish any college in Sind, and there was need for a secondary training college and a medical college.

The condition of education in Sind at the time of Sind's separation from the Bombay Presidency was as under: in all there were 3,748 schools of all denominations. The percentage of literacy for Muslims stood at 2.7. There were 30 high schools with 5,661 pupils on their roll. There were 300 Muslim students in the colleges. The position of scholarships was anything but favourable to Muslims. There was only one technical college, the N.E.D. Civil Engineering College. With the separation of Sind a new era of general and all round advance in education began. The pace of education accelerated and the first holder of the newly created post of Director of Public Instruction for Sind was the late Khan Bahadur Ghulam Nabi Kazi. He was succeeded in 1939 by Dr. U. N. Daudpoto, who revolutionised education. The percentage of pupils for Muslims and Hindus in the Government high schools was fixed at 60 and 40. The pace of primary education was further accelerated. The district local boards' and municipalities' control of education was not satisfactory. With the change of control, compulsory primary education was enforced. Impetus was given to mullah schools and female education. Up to 1939 the policy of Government as regards secondary education was to set up Government model high schools in some district towns and leave secondary education to private enterprise aided by the Government. But realising that secondary education amongst Muslims, especially in rural areas, would not progress, Government had to introduce reforms. These were the opening of secondary schools for boys and girls, raising them gradually to full-fledged high schools, taking over certain high schools, the institution of a State-aided provident fund to attract staff to take up teaching, the opening of new schools and the increase in pay scales for teachers and the increase in the number of scholarships. In order to encourage private enterprise to open more secondary schools the Government raised the percentage of grant-in-aid and also introduced compulsory military education in secondary schools. The number of colleges now stands at 15. There are at present 5 non-Government colleges which have been subsidised by Government. The scholarships and liberal free-studentships are provided to attract poor students to take up collegiate education. The following short account describes the more prominent colleges in Sind.

The Government College, Hyderabad:—Within six years of this college having been taken over by the Government of Sind it made phenomenal progress. Starting with a handful of staff

Prominent
Colleges.

and with little more than 100 students it became the premier educational institution of the province, having arrangements for teaching up to Honours classes in a wide range of both Arts and Science subjects. In the year 1953/54 the total number of students reached the record figure of 755, and many could not gain admission to the first year's science class. The strength of the teaching staff in the Science section nearly doubled, 3 professors, 3 lecturers and 7 demonstrators having joined the college during the course of the year 1953. The Arts section was also enriched by the appointment of 3 new lecturers.

The N.J.V. Government High School, Karachi:—The first headmaster of the English School at Karachi, which was raised to the status of a high school in 1863, was Mahadev Shastri, with an uphill task as the language and script were new to him. In 1874 the Karachi High School was renamed Narayan Jagannath High School (N. J. High School) in recognition of the valuable services of Mr. Narayan Jagannath, the first officer to hold the post of the Deputy Educational Inspector in Sind. His grandson, C. D. Vaidya, barrister-at-law at Bombay, represented to the Government of Sind that Vaidya, the family name, should be inserted in the name of the school. Consequently the Government of Sind renamed the school as "Narayan Jagannath Vaidya High School" in the year 1939. Amongst the many prominent educationists who have been associated with this teaching institution were Mr. P. C. Wren, who gained considerable distinction as the novelist of "Beau Geste" and Mr. William Grieve, M.A., B.Sc., Indian Educational Service, who subsequently at the end of his career became Director of Public Instruction, Bombay.

Sind Government College of Commerce and Economics, Karachi:—This college was founded in June 1945. Control was taken over by the Sind Government in June, 1948. Originally the plan was to build a separate building for the college together with a hostel of its own. This, however, did not materialise and the college continues to be housed in a wing of the D. J. College building. On account of the lack of accommodation the number of students is restricted to about 300. It is small, but well established, institution teaching to the Degree of Bachelor in Commerce.

Engineering School:—There is only one recognised Engineering School, namely the Subordinate Engineering Diploma Classes, attached to the N.E.D. Government Engineering College, Karachi. Instruction is imparted in civil, mechanical and electrical engineering.

Industrial Schools:—The number of technical and industrial schools is 2, of these the Government V. J. Technical School, Sukkur, was maintained by Government, and the Technical School, Jacobabad, was maintained by a private body.

Commercial Schools:—There are 3 Commercial Schools in the province: the Diploma Training College, Sukkur, the Islamia Commercial College, Sukkur, and the Royal Commercial College, Hyderabad. The number of pupils on the rolls in commercial schools was 120; there were no girls amongst them. Of the 120 pupils 13 were Hindus and 107 were Muslims.

Schools for Oriental Studies.—Oriental studies were catered for by several institutions. There was 1 Patshala teaching Sanskrit and there were 34 Madressas teaching Arabic. The number of pupils in the Patshala was 81 and in the Madressas 683. The Patshala is situated in the Thar Parkar district at Umarkot and is run by a private body.

The Education of Girls and Women:—In the year 1953/54 the number of recognised institutions for girls increased from 235 to 260. The number of girls under instruction increased from 28,808 to 30,743. The table which follows shows the extent to which girls and women are being educated in educational institutions in Sind.

Stages of Instruction.	Number of girls under instruction.
University	29
Arts Colleges	201
Professional Colleges	23
High Schools	2,413
Middle Schools	922
Primary Schools	27,107
Training Schools	46
Other Special Schools	2
Total	30,743

Classification of Educational Institutions.—The classification of educational institutions is shown in the following table, which is taken from the Annual Report on Public Instruction in Sind for the year 1953/54.

	For Males.						For Females.					
	Government.	District Board.	Municipal Board.	Aided.	Unaided.	Total.	Government.	District Board.	Municipal Board.	Aided.	Unaided.	Total.
	1	2	3	4	5	6	7	8	9	10	11	12

RECOGNISED INSTITUTIONS.

University Boards of Secondary and Intermediate Education. 1 .. 1

Colleges—

Arts and Science*.. 4 3 .. 7 1 1 .. 2

Professional Colleges—

Law 1 .. 1

Medicine .. 1 1

Education .. 1 1

Engineering .. 1 1

Agriculture .. 1 1

Commerce .. 1 1 .. 2

Technology

Forestry

Veterinary Science Intermediate and 2nd grade College

Total .. 9 6 .. 15 1 1 .. 2

Public Schools

High Schools .. 17 13 11 16 .. 57 1 .. 1 3 .. 5

Middle School

Anglo-Vernacular 216 2 17 .. 235 5 3 .. 8

Vernacular

Primary Schools .. 3,247 591 .. 3,838 167 77 .. 244

Pre-Primary School

Total .. 3,264 229 13 624 .. 4,130 173 1 83 .. 257

	For Males.						For Females					
	Government.	District Board.	Municipal Board.	Aided.	Unaided.	Total.	Government	District Board.	Municipal Board.	Aided.	Unaided.	Total.
	1	2	3	4	5	6	7	8	9	10	11	12
Professional Schools												
Art and Music												
Law												
Medical .. 1		1				1						1
Normal and Training. 5		5				5	1					
Engineering** .. 1		1				1						
Technical and Industrial 1		1				2						
Commercial 3				3		3						
Agricultural												
Special Schools												
Reformatory School for Defectives												
Blind												
Deaf and Dumb												
Delinquents												
Schools for Adults												
Other Schools 35 35				35		35						
Total .. 8 39 47 1		8		39		47	1					
Total for Recognised Institutions 3,281 229 13 669 .. 4,192 175 .. 1 84	3,281	229	13	669		4,192	175		1	84		
Unrecognised Institutions.												
Grand Totals, all Institutions. 3,281 229 13 669 .. 4,192 175 .. 1 84 .. 260	3,281	229	13	669		4,192	175		1	84		260

*Includes Oriental Colleges.

**Includes Survey Schools.

***Includes Ayurvedic and Tibbia Colleges.

The Government Girls' College, Hyderabad:—This came into existence in July 1953. It has been paying a useful part both in curriculum and extra curriculum activities. Students of the college, in addition to their usual studies, are engaged in important activities outside the usual academic course. Small batches of girl students were deputed to participate in the inter-collegiate debates organised in Lahore and Miss Bilquis Abbasi won the prize. Special attention is also paid to the physical development of the students by encouraging them to participate in such sports as badminton, throw-ball, basket-ball and ring-tennis within the premises of the college. Equally important is the teaching of Domestic Science.

Sarwaria Islamia College, Hala:—The Sarwaria Islamia College, Hala, was founded in the year 1951 by the great educational philanthropist, the late Makhdum Ghulam Hyder of Hala. In its short lifetime the college has progressed rapidly and has attained the status of a degree college which was the aim and ideal of its founder.

D. J. Sind Science College, Karachi:—This is the oldest college in Sind, having been founded in January 1887. Originally it was a combined Arts and Science College. Control of the college was taken over by the Government of Sind on the 20th June 1948. The Arts section was abolished and the college became a purely Science College. Over a thousand students are studying at present in various classes from the first year Science class to the B.Sc., Class. From July, 1953 post-graduate teaching in Science has been taken over completely by the Karachi University, leaving under-graduate teaching work up to the B.Sc., in the College.

The C.N.S. Government College, Shikarpur:—Since the C.N.S. Government College, Shikarpur, was taken over by the Government. After a short period of gloom and uncertainty, it has been consistently marching on the path of progress and prosperity. The number of students which was only 48 during 1948/49 has risen to nearly 400 within the short period of five years, and with the rise in number there is a proportionate rise in the quality of the students, taking into consideration the physical, as well as the academic and cultural side of their development. The teaching staff is in the hands of well qualified and experienced men. The College imparts education up to the B.A. Hons. on the Arts side and up to intermediate Science on the Science side.

Shah Abdul Latif Government Arts College, Mirpurkhas:—Opened in June 1952 the Shah Abdul Latif Arts College, Mirpurkhas, is already functioning as a degree college. It was started as

a private college, but the Government of Sind, bent upon improving the educational facilities of the province, took over its control in August 1953.

Nazareth College, Hyderabad—Another institution, in Hyderabad, is the Nazareth College run by an American mission exclusively for girls and affiliated to the University of Sind. It offers Arts courses up to the B.A. Hons. and Science courses up to the intermediate certificate. Special efforts are being made to give a broader education by inclusion of subjects like domestic science and geography which involve laboratory and practical work as part of the Arts course.

Training Institutions and Training of Secondary Teachers—There is only 1 institution, the Government S.C. College, Karachi, for the training of graduate teachers of secondary schools. There are 5 primary training institutions, namely the Government Training College for Men, Hyderabad, the Government Training College for Women, Hyderabad, Government Training School, Larkana, Government Training School, Sukkur, Government Training School, Matiari. The number of trainees at these five institutions was 983, of whom 940 were males and 43 females.

Professional Schools and Classes—The table which follows shows the number of technical and professional schools and the number of pupils attending each:—

Kind of School.	No. of Institutions.	No. of Pupils
Medical	1	70
Engineering	1	356
Technical and Industrial	2	44
Commercial	3	120
Total	7	590

The Sind Government, before it disappeared in the constitutional re-organisation of Pakistan in 1955, had many excellent achievements to its credit. An idea of what was being done is conveyed by part of the speech which Mr. Abdus Satar Pirzada the Chief Minister of Sind, made while presenting the Budget for the year 1954-55 in the Sind Legislative Assembly. The Chief Minister said in his Budget speech, "With the expansion of primary education there are increasing demands from rural areas for setting up middle schools and high schools. My Government attach great importance to the rapid completion of

Education
Expansion.

hostels at Dokri, Thatta, Tando Jan Mohammad, Mirpurkhas, Kandkot, Dadu and Mirpur Mathelo, the construction of which has already started during the current financial year. A sum of 12.5 lakhs has been provided in the Budget for this purpose. During the next financial year compulsory primary education will be extended to Sinjhor, Kara and Nagar Parkar talukas. Compulsory primary education will also be extended to over two-thirds of the province and in the remaining non-compulsory area 145 new primary schools are being started to cater for the growing educational requirements of the rural population. These measures for the expansion of primary education will involve additional revenue expenditure of about 8½ lakhs. The main bottleneck in the way of expansion of primary education has been a dearth of trained primary teachers. My Government has decided to allow full pay and allowance to primary teachers undergoing training so as to make it more attractive for them to join training institutions. The Budget provides for the construction of a primary teachers training institute in Mirpurkhas at a cost of about 5 lakhs. During the next financial year the expenditure on primary education alone will reach the unprecedented total of about 1 crore and the province will thus be spending more than 2 rupees per head on primary education alone, which I believe is higher than other provinces in Pakistan. For some time past the question of setting up a provincial library and museum at Hyderabad has been under constant consideration. The site for the library and the museum has already been selected. It has been decided that the institution will be located in the Pir Alibuksh Gardens. Construction work will start shortly. The building is estimated to cost 3 lakhs. Government has set up a Sind Adabi Board sometime ago for the advancement of Sindhi literature. The board has done very useful work. A comprehensive dictionary of the Sindhi language is being compiled under the direction of the board. The first volume of the dictionary has already been completed. The board has also an ambitious scheme for writing the History of Sind in eight volumes. Various well-known authors have been invited to write this history and two of the eight volumes have already been completed. The Board is expected to expand its activities during the next financial year. A number of books have been translated into Sindhi from foreign languages dealing with basic, social and natural sciences and world literature. To help the board to expand its activities a grant of 1 lakh has been provided for in the budget." The carrying out of such schemes is now the responsibility of the West Pakistan Government, which under the reconstituted organisation of the provinces of West Pakistan superseded the provincial governments of Sind, the Punjab, and the North-West Frontier Province.

University Education.—Plans for a separate university for Sind began to be formulated from 1937 and the Sind University Committee was appointed to go into the entire problem in its academic, administrative and financial aspects. The Committee published a comprehensive report in 1942 and, after much delay, it resulted in the passing of the Sind University Act in 1947. As soon as the Act was passed the university started functioning at Karachi from the 3rd April, 1947, and His Excellency the Governor of Sind, Sir Francis Mudie, became its first Chancellor, Sir Ghulam Hussain Hidayatullah, the first Pro-Chancellor, Mr. A. B. Halim, the first Vice-Chancellor, and Khan Sahib Agha Taj Muhammad, the first Registrar of the University of Sind. Immediately after their taking over, various bodies, such as the Senate, the Syndicate, the Academical Council, the Faculties and the various boards of studies and other statutory bodies were constituted. But in the first few months of its existence the Sind University authorities took up the work of framing new courses and syllabuses keeping in view the changed circumstances. In April 1951 Allama I. I. Kazi was appointed Vice-Chancellor of the University of Sind, and the university headquarters were moved to Hyderabad on the 4th May 1951 because of the separation of Karachi from the Province of Sind and the establishment of the Karachi University for the Karachi area. By this change the university had come to a central place in the Province of Sind, the interests of which it was expected to serve. The development of the university was speeded up further by establishing post-graduate university training departments, the number of which has now risen to 15. There has been a very great increase in the number of affiliated institutions as the number of colleges has increased from 3 in 1947 to 12 in 1954, and the number of high schools from 20 in 1947 to 53 in 1954. The University authorities have taken special interest in improving the tone and standard of teaching and in inculcating a healthy spirit of co-operation amongst the affiliated institutions. The new Matriculation scheme, which has been under consideration for many years, has been brought to completion and introduced with effect from the 1st April 1954. The library has been considerably expanded; its collection contains works on all major subjects and is adequately equipped for serving the needs of the University's post-graduate departments. The total number of books in the collection up-to-date is 22,000, excluding books which are in transit from various suppliers. Side by side with the education of students it has been necessary to educate the general public as well on the various aspects of life. The Islamic Study Circle has, therefore, been established under the aegis of the University and the Vice-Chancellor, Allama I. I. Kazi, has been kind enough to deliver lectures regularly. The M.B.,B.S. degree of the University of Sind had been recognised by the Medical Council of

Pakistan and all the degrees and examinations of the University of Sind have been recognised by all the other Universities of Pakistan, with the exception of a few examinations by the Punjab University, and most of the Universities of India on a reciprocity basis. The degrees of the University of Sind have also been recognised by the important Universities of the United Kingdom and the United States of America according to the procedure and rules obtaining with them. In the annual report of the University of Sind for the year 1954/55 it was announced that the Faculties of Arts and Religion had been completed and that teaching departments under the Faculty of Science had been established in Mathematics and Botany. In addition to these, teaching departments under the Faculty of Science, which it was proposed soon to establish, were Zoology, Physics, Chemistry and Geology. The report says. "It would also be correct to say that the University of Sind has started post-graduate training in three Faculties, namely Arts, Religion and Science under its direct management and control. It can also contemplate that post-graduate teaching in the Faculty of Law will be established from the next academic year. The post-graduate teaching departments are Education, Religion, Islamic Culture, Muslim History, Arabic, Sindhi, Urdu, Economics, Philosophy, Persian, English, General History, Psychology, Political Science, Mathematics and Botany. The tables that follow show the working of the University of Sind for the six years from 1951-57 including the period when the University was at Karachi up to the 4th May, 1951. The tables show the number of affiliated High Schools and Colleges, the number of students appearing in University Examinations and the number of Post-Graduate Teaching Departments.

Item.	at Karachi 1951.	After shifting to Hyderabad May 4, 1951	at Hyder- abad 1955-57.
1. Number of Affiliated High School	59	34	87
2. Number of Affiliated Colleges ..	16	5	22
3. Number of Students appearing in University Examinations ..	6,074	2,776	7,790
4. Number of Post-Graduate Teach- ing Departments	Nil.	Nil.	24

The table below shows the increase in the number of High Schools and Colleges between 1951 and 1956/57.

NUMBER OF AFFILIATED HIGH SCHOOLS AND COLLEGES.

Year.					No. of High Schools	No. of Colleges
1950-51	..	..	..	..	36	5
1951-52	..	..	..	..	43	11
1952-53	..	..	..	..	48	11
1953-54	..	..	..	..	53	12
1954-55	..	..	..	..	59	16
1955-56	..	..	..	..	59	17
1956-57	..	..	..	..	87	22

The table below shows the number of students appearing and passing the various Sind University Examinations from 1951/52 to 1956/57.

Matriculation Exam.			Other Exams.		Degree Exam.		Total.	
Year.	Ap- peared I.	Passed I.	Ap- peared.	Passed	Ap- peared.	Passed	Ap- peared.	Passed
1951-52	1,757	753	887	376	135	98	779	1,227
1952-53	2,050	1,256	887	488	191	144	3,128	1,888
1953-54	2,412	1,408	1,128	685	284	216	3,824	2,309
1954-55	3,385	1,592	1,500	852	423	289	5,308	2,733
1955-56	3,650	1,680	3,480	1,762	660	414	7,790	3,856
1956-57	4,553	2,026	3,250	1,696	1,017	645	8,820	4,367

The table which follows, which is up to the year 1954/55 only, shows the distribution of affiliated Colleges according to district and according to nature of instruction. The table also

shows up to 1954-55 the district distribution of affiliated High schools with permanent and temporary affiliation.

COLLEGES.

District	Arts.	Science.	Law.	Medi- cal.	Com- merce	Agri- culture	Tib- bya.	Total
Hyderabad	.. 6	3	1	1	1	..	1	13
Sind	..	(Common) with Arts						
Thar Parkar	.. 1	..	..	..	..	..	..	1
Nawabshah	.. 1	..	..	..	..	1	..	2
Sukkur	.. 1	1	1	..	..	..	..	3
		(Common) with Arts.						
Larkana	.. 1	..	..	..	..	..	..	1
Total	.. 10	4	2	1	1	1	1	20

HIGH SCHOOLS.

District	With Permanent Affiliation.	With Temporary Affiliation.	Schools under con- sideration.	Total.
Thatta ..	..	2	..	2
Hyderabad Sind ..	..	6	8	14
Dadu ..	..	1	2	3
Thar Parkar ..	..	2	7	9
Nawabshah ..	..	3	3	6
Sukkur ..	..	3	11	14
Larkana ..	..	2	2	4
Jacobabad ..	..	1	1	2
Khairpur State ..	..	1	2	3
Sanghar ..	..	..	2	2
Total	..	19	40	59

It has been decided to construct a Sind University town at a site between the Lower Sind Barrage and the Kotri Railway Station. The University township scheme has been drawn up and envisages a non-recurring expenditure of 6 crores and 30 lakhs. The Chief Minister of Sind in his budget speech in 1954 said: "The University of Sind was initially merely an examining body. Recently the University is also doing post-graduate teaching and is fast becoming a full-fledged residential teaching University. It is proposed to set up a new University town on the right bank of the Indus below the Kotri Barrage opposite the city of Hyderabad. The site has already been selected. A grant of 20 lakhs has been sanctioned during the current financial year to help the University to start work. A further expenditure of 20 lakhs has been provided for in the budget estimates for the coming year to further progress of the University township scheme. Provision has also been made for an additional grant of 4 lakhs to enable the University to set up a modern printing press for the publication of books of scientific and cultural value. This grant will also help the University to expand its library which in its present condition is inadequate for the growing needs of this institution. In this year, 1954, the Government of Sind is fully aware of the dearth of medical facilities in the province. Basically the problems of medical relief with which this province is faced are the training of medical personnel, the extension of hospital accommodation for both indoor and outdoor patients and the provision of medicines for the hospitals. On the training side the Government opened the Liaquat Medical College at Hyderabad. This institution was handicapped for want of adequate accommodation and teaching staff. The College has been temporarily located in a building within the premises of the Hyderabad Civil Hospital. A new building has been constructed in the vicinity to cater for the immediate requirements of the institution. Work has already started on the construction of the new building for the Liaquat Medical College on the right bank of the Indus opposite Hyderabad within the projected University township. The estimated expenditure on this college is about 1½ crores and 30 lakhs have been provided in the budget 1954/55 for the construction of the college buildings the following year."

Literacy.—The 1951 Census of Sind and Khairpur showed that the population of Sind and Khairpur has a long way to go before it can be regarded as an educated people. The standard of literacy laid down in the Census was fairly elementary. A person who claimed to be able to read need not be able to read handwriting, but only clear print. A person who said he could write needed only to be able to write a simple and easy letter. No proper comparison with the standard of literacy in previous

censuses was possible owing to a change in the category of literacy employed in the 1951 Census. The total number of literates in Sind, including Khairpur State, was 652,587, which represents 13.2 per cent. of the total population as against 352,552 persons, 8 per cent. of the total population recorded as literates in 1941. Everyone of these persons could read printed matter in one or more languages, although some might be able to read nothing but the Holy Quran. Arabic, being the language of the Holy Quran, showed the largest number of persons, namely 419,616, or 8.5 per cent. of the total population, but of these 416,912 know Arabic only in portions of the Holy Quran and are otherwise ignorant of the language; next the language of the province, namely Sindhi, was read by 342,345, or 7 per cent. of the total population, Urdu by 120,263, or 2.4 per cent. of the population. The following tables which have been taken from the 1951 Census throw light upon the extent of literacy in Sind:

Literacy in Sind and Khairpur State.

Name of Province.	Total.	Male.	Female.
Sind Including Khairpur State Population ..	49,25,342	4,84,711	1,67,876
Literate ..	6,52,587	4,56,376	1,60,086
Literacy % ..	13.2	17.9	7.6

Number of Literates and their Percentage.

Area.	Total Population.	Number of Literates.	Literates Percent. of Total Population.	Percent of Literate Population.
Sind including Khairpur State ..	49,25,342	6,52,587	13.2	100
Sind	46,05,934	6,16,462	13.4	94.5
Khairpur State	3,19,408	36,125	11.3	5.5

As is to be expected, literacy is greater in urban than in rural areas, and this is brought out by the following table:

Literates percent. in Urban and Rural Areas

District.	URBAN			RURAL		
	Population	Number Literates.	Literates Percent.	Population	Number of Literates.	Literates Percent
Sind including Khairpur State ...	5,54,620	1,42,506	25.7	43,70,722	5,10,081	11.7
Khairpur State ...	—	—	—	3,19,408	36,125	11.3

The two statements which follow show literacy by religion and literacy by sex.

Literates by Religions.

District.	Total Literates.	Muslims.	Hindus.	Scheduled Castes.	Others.
Sind including Khairpur State ..	6,52,587	6,23,682	23,286	5,098	521
Sind ..	6,16,462	5,88,420	22,799	5,043	500
Khairpur State ...	36,125	35,262	787	55	21

Literates by Sex

District, Selected Cities and Towns.	Total Population		Total Literates.		Literates Percent	
	Males.	Females.	Males.	Females.	Males.	Females
Sind including Khairpur State	27,06,863	22,18,479	4,84,711	1,67,876	17.9	7.6
Sind ..	25,29,632	20,76,302	4,56,376	1,60,086	18.0	7.7
Khairpur State ..	1,77,231	1,42,177	28,335	7,790	16.0	5.4

Taking literates as a whole in Sind, including the Khairpur State, it will be seen that on an average fewer than 17 per cent. are literate even by the elementary standards of the Census. Of children under ten years of age attending school the proportion is in Sind only 10 per cent. and in the Khairpur State 9.2 per cent. The following table shows the position:

Children under 10 years of age attending School.

	5-9 years Age Group.								
	Total Number			Attending School			Percentage.		
	Total.	Male.	Female.	Total.	Male.	Female	Total	Male	Female
Sind including Khairpur State.	7,37,285	3,92,770	3,44,515	73,830	64,055	9,775	10.0	16.3	2.8
Sind ..	6,87,222	3,65,952	3,21,270	69,233	59,799	9,434	10.1	16.3	2.9
Khairpur State.	50,063	26,818	23,245	4,597	4,256	341	9.2	15.9	1.5

Notes.—1. Children under 5 years may all be assumed not to be attending school.

2. Number attending school as percentage of total children 5-9 years.

The extent to which education is pursued to its higher stages is shown in the table which follows, displaying the educational level of the non-agricultural population according to the various main groups of occupation.

EDUCATIONAL LEVEL OF NON-AGRICULTURAL
LABOUR FORCE

Census 1951.

Sind is the upper figure and Khairpur is the lower figure (000's)
(—) less than 1,000.

Educational Level Both Sexes.

Group.	Total.	Male.	Female.	Below	Primary.	Middle.		
			Primary or nil.		Matriculation. Degree.			
TOTAL ..	..	458	449	9	413	28	8	6
		(22)	(22)	(—)	(19)	(19)	(2)	(1)
Professional and Technical		18	17	1	7	3	3	2
		(2)	(1)	(—)	(—)	(—)	(—)	(—)
Administrative ..	..	41	41	(—)	24	10	4	3
		(2)	(2)	(—)	(1)	(—)	(—)	(—)
Sales workers and keepers	Shop ..	100	98	1	91	8	(—)	(—)
		(6)	(6)	(—)	(6)	(—)	(—)	(—)
Fishermen	..	10	10	(—)	10	(—)	(—)	(—)
		(—)	(—)	(—)	(—)	(—)	(—)	(—)
Transport operatives	..	13	13	(—)	12	1	(—)	(—)
		(1)	(1)	(—)	(—)	(—)	(—)	(—)
Manufacturing Workers ..	..	76	75	1	75	2	1	(—)
		(4)	(4)	(—)	(4)	(—)	(—)	(—)
Metal ..	..	15	15	(—)	15	(—)	(—)	(—)
		(1)	(1)	(—)	(1)	(—)	(—)	(—)
Textiles	..	20	19	1	20	(—)	(—)	(—)
		(1)	(1)	(—)	(1)	(—)	(—)	(—)
Wood ..	..	11	11	(—)	11	(—)	(—)	(—)
		(1)	(1)	(—)	(1)	(—)	(—)	(—)
Leather	..	13	13	(—)	13	(—)	(—)	(—)
		(1)	(1)	(—)	(—)	(—)	(—)	(—)
Building	..	6	6	(—)	6	(—)	(—)	(—)
		(—)	(—)	(—)	(—)	(—)	(—)	(—)

Group.	Total.	Male.	Female. Primary nil.	Below	Primary. Matriculation. Degree.	Middle.			
Glass and Ceramics	..	7	7	(—)	7	(—)	(—)	(—)	(—)
		(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)
Food, Drink and Tobacco		9	9	(—)	(9)	(—)	(—)	(—)	(—)
		(—)	(—)	(—)	(—)	(—)	(—)	(—)	(—)
Unskilled Labourers	..	130	127	3	130	(—)	(—)	(—)	(—)
		(4)	(4)	(—)	(4)	(—)	(—)	(—)	(—)
Domestic Service	..	31	30	1	31	(—)	(—)	(—)	(—)
		(1)	(1)	(—)	(1)	(—)	(—)	(—)	(—)
Other Service Workers	..	17	17	(—)	17	(—)	(—)	(—)	(—)
		(1)	(1)	(—)	(1)	(—)	(—)	(—)	(—)
Police, Fire etc. Services	..	12	12	(—)	7	3	1	1	(—)
		(1)	(1)	(—)	(—)	(—)	(—)	(—)	(—)

As has been made clear in this Gazetteer, the population of Sind has been greatly disturbed since partition by the influx of a large number of refugees from India and the departure of the majority of the educated caste Hindus. The educational level of the muhajirs differs to some extent from that of the rest of the population and the following table, which is taken from a special table in the 1951 Census, shows the educational level of muhajirs for districts and selected cities.

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Census 1951
EDUCATIONAL LEVEL OF MUHAJIRS

Table 19-B.

Males first.

Females below.

(000's.)

</

Table 19-C.

MUHAJIRS IN LABOUR FORCE

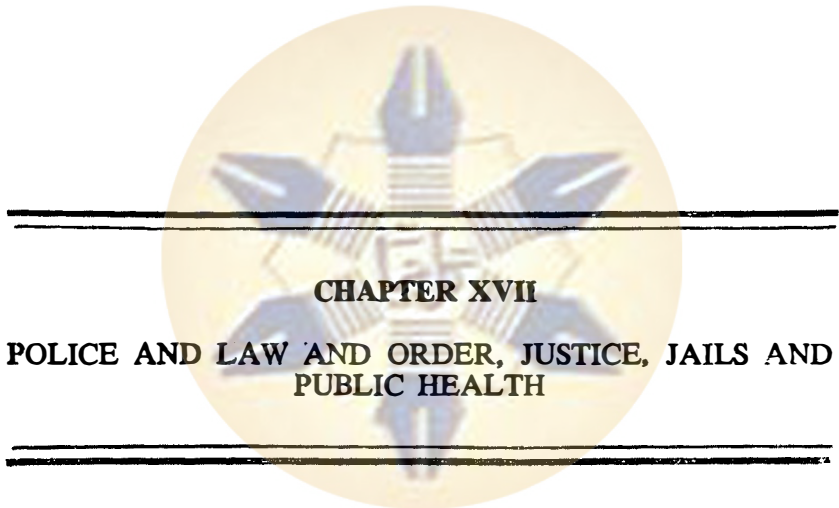
(000's).

	Total.	Civilian Agricul- tural,	Labour Force. Non- Agricul- tural.	Not in Civilian Labour Force.	Depend- ents.
Sind and Khairpur	550	58	130	3	358
Sind	540	57	128	3	352
Khairpur	10	1	2		7

SIND AND KHAIRPUR.

The following shows in thousands the number of self-supporting muhajirs over the age of 12 in various occupations: Total 188; Cultivation 56, Animal Husbandry 1; Other Agriculture 2; Manufacture 24; Building 2; Trade and Commerce 38; Transport 6; Education 1; Medical Services 1; Government Municipal Services 11; Domestic Services 10; Religion, Arts etc. 1; Other and Unclassified (including unemployed) 36.

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CHAPTER XVII

**POLICE AND LAW AND ORDER, JUSTICE, JAILS AND
PUBLIC HEALTH**

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TABLE OF CONTENTS.

			Page
Police and Law and Order.	..	..	707
Corruption.	..	..	718
Village Police.	..	..	722
Jails.	..	..	723
Justice.	..	..	729
Public Health.	..	..	734
Vaccination.	..	..	738
C.M.S. Work.	..	..	739
C.Z.M.S. work.	..	..	740
Mortality rates.	..	..	741
Hospitals and Welfare Development.	..	..	443
Mental Hospitals.	..	..	744

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CHAPTER XVII

POLICE AND LAW AND ORDER, JUSTICE, JAILS AND PUBLIC HEALTH

Police and
Law and
Order.

In the days of the Talpurs the administration of the country was entrusted to kardars in charge of the different districts who were both revenue and judicial officers. The law they administered was the Qoran as interpreted by accredited doctrines. The Mirs were not cruel; they had an aversion to capital punishment. Mutilation was the penalty for the worst crimes and was commuted to prolonged imprisonment in the case of the privileged classes. Other punishments were fines, shaving the beard, blackening the face, flogging and confinement in the stocks. There were no proper jails, nor was any provision made for the subsistence of prisoners; that was the concern of their relatives or the charitable public. Trial by ordeal was allowed. The unwritten law of the Baluch which allows the husband to kill his wife for infidelity prevailed generally. The Police Department consisted of a few miserable sowars in the chief towns. But where every man carried arms and defended and also avenged himself policemen were superfluous. For the detection of crime they had an excellent system, the abolition of which under British rule was regretted by many officers. The liability for all stolen property rested on the village or estate in which the theft occurred until the footprints of the thief were traced to another, in which case the liability was transferred to that village or estate. Thus it became the interest of every zamindar to see that he harboured no thief within his limits. Capital sentences were decided by the Mirs in person who also heard appeals against the decisions of their kardars in the cases judged by them. It was a general state that both plaintiff and defendant had to pay highly for a hearing and still more for a verdict.

The introduction into the province of an organised police service was entirely the work of the British Government. The duties of police were entrusted by the Mirs to the kardars and jagirdars, under whom watchmen were employed to guard the town gates by day and to patrol by night, while villages had their own watchmen and trackers who were paid at harvest time like other village servants. In Hyderabad a kotwal or city magistrate with police powers and a force of twenty peons was employed whose remuneration, like that of all the Amir's establishments, consisted partly of perquisites. In the country an unwritten law held every zamindar answerable for any criminal tracked into his limits until he was tracked out again. This, seconded by the prompt and stern punishments in vogue, was very effective; and there is evidence that the introduction of British methods was followed by a notable increase of ordinary crime. The system of military police was introduced by Napier. Not wishing to bring his army

into familiar contact with the people, Napier organised a force of 2,400 armed police under military officers and apparently quite independent of the Collector. Napier's system was indeed considered to have been the model for most of what was good in the subsequent reforms of the Indian police. It has undergone less change than any other branch of his administration. Two cardinal principles of this system were that a police officer should be independent of the magistracy and that he should exercise no magisterial functions. The command of the Sind police was entrusted to a military officer, styled the Captain of Police, under whom three Lieutenants of Police, also military officers, controlled the district forces of Karachi, Hyderabad and Shikarpur. The second Captain of Police was Lieutenant E. C. Marston who saved Napier's life at the Battle of Miani and he remained the head of the department till the appointment was abolished. Afterwards General Marston was a well-known figure on the Karachi race-course until his death in 1902, about fifty-nine years after the conquest. In 1861 the designation of "Captain" was altered to that of "Commandant", Lieutenants becoming Captains of Police. In 1865 when the posts of "Commandant" and "Captain" had been abolished, the immediate control of the police devolved upon the Commissioner in Sind, and the district forces were placed under the command of Superintendents. In 1905 the Commissioner's supervision of matters concerning the equipment, discipline and efficiency of the force was transferred to a Deputy Inspector-General of Police for Sind.

The general structure of the Indian Police Force was set out in the legislation of 1861, which provided for a provincialised police administered by the local government, and not subject to the general control of the Governor-General. Under the general system now in force the District Superintendent of Police is subject to dual control. The force he commands is subject to the general control of the District Magistrate for the enforcement of law and the maintenance of order in the district. But the departmental working and efficiency of the force is governed by a departmental hierarchy, of Deputy Inspector-General of Police and Inspector-General of Police. Generally speaking, the District Superintendents of Police correspond with the District Magistrates on judicial and magisterial topics and with their departmental chiefs on the internal working of the force. The Curzon Police Commission of 1902/3 modernised police working by providing for the direct enlistment and training of educated Indians as Police Station Officers and by creating specialised police agencies under each local government for the investigation of specialist and professional crime. This was the birth of the Criminal Investigation Departments working under a Deputy Inspector-General. The Criminal Investigation Departments control also the working of such scientific police developments as the finger-print identification

bureaux. There also came into being an Intelligence Bureau under the Home Department of the Government of India which collected information from all provincial Criminal Investigation Departments and worked out inter-provincial liaison. The present-day organisation of the police is as follows:

In the chief town of each district the Superintendent of Police has his office, also his headquarters, police lines and parade ground. This is the main centre for accumulation and distribution to the police stations and out-posts of the district of clothing, arms, ammunition and accoutrements. Here are the stores and the armoury. Here also constabulary recruits enlisted by the Superintendent are taught drill, department and duties and are turned out to fill vacancies. The headquarter lines contain also armed police who mount guard on treasuries in the district and also provide prisoner and treasury escort. The armament of the police has been improved. The main weapons are the .410 bore musket and .303 rifle. At most headquarters there is also a reserve of armed police, and at populous towns a police station and Police Station Officer. (Thana and Thanedar.) It is at the police station that the public are most in touch with the police and the police with the public. Whether it be in a large city or in a mofussil hamlet, the thana is the place people come to with their troubles and their grievances. In dealing with such callers the thanedar who, like police of all ranks, is supposed to be always on duty, is chiefly guided by the fourteenth chapter of the Code of Criminal Procedure and the Second Schedule at the end of that code. This schedule shows nearly all the penal offences and states whether or not they are cognizable by the police. The fourteenth chapter lays down that the cognizable complaints must **there and then** be recorded, visited and investigated. A non-cognizable complaint is merely noted in a separate book and the complainant has still to go to court. The complainant in a cognizable case not only has his complaint recorded, but also investigating a *prima facie* case against the accused, the prosecution in court is conducted free of charge by a Police Prosecutor, who is a police officer. Personal inspection and supervision are the common means by which the District Superintendent knows whether his subordinates are doing their work properly. When the Police Commission in 1860 devised a plan of police that still holds the field, they laid down two criteria of the numbers required; one was one policeman per square mile, the other was one per thousand of population. In towns it is well enough to have the available police concentrated at the police station. But in the mofussil the thana is very often fifty miles distant from portions of its jurisdiction. It is in such cases profitable to detach a portion of the police station's strength under a head constable to man an out-post where complaints can be received and investi-

gation begun without the injured party having to undertake a long journey. The secret of good police working in normal times is dispersion. A constable may aspire to become a Police Station Officer, or higher officer. A directly recruited candidate who comes in through the Police Training School as a thanedar is, it is understood, a graduate and may quite often rise to be an Inspector or Deputy Superintendent or, exceptionally, a Superintendent. The direct Deputy has a good chance of becoming Superintendent and perhaps Deputy Inspector-General. The direct Assistant Superintendent is sure of a Superintendentship and has chances of a Deputy Inspector-Generalship after twenty-five years' service. The period of service for all ranks for full pension is thirty years, and if an officer dies in the process of earning full pension, his pension dies with him. In the days of British rule members of the police force were eligible for the award of the King's Police Medal and the Indian Police Medal for long and meritorious services and for conspicuous gallantry. Space does not permit more than a brief account of the work of the Sind Police during the half century which has elapsed since the edition of this Gazetteer in 1907. The half century was a period of great difficulty from the police point of view, including as it did two world wars, heavy retrenchment after the end of World War I, the long period of depression and low prices in the twenties and thirties and from the thirties onward the great increase in the amount of political agitation and communal tension often resulting in serious outbreaks of disorder. The decade also saw the confusion consequent on the emergence of Pakistan; and the constitutional changes which had disturbed the systems of administration since 1947 have also brought problems which add to the difficulties of the police. After partition when there were for several years shortages of food, the problems of smuggling became formidable and these and black market offences, which arose out of the system of controls so prevalent a feature of the economy from the beginning of the Second World War, increased still further the burden imposed upon the police force in the maintenance of law and order.

A perusal of the police reports during the period under examination now shows that the pattern of crime in Sind and Khairpur has remained little changed and the amount of crime conforms to a pattern that displays few divergencies from decade to decade. The main features of the police reports during the period under review are: the prevalence of cattle theft throughout the country; the persistence of murders and violent crime usually occasioned by disputes over women; the unsatisfactory nature of the treatment of certain tribes and the gradual increase in police duties and responsibilities caused by the growth of communal tension. Occasional riots of serious dimensions occurred, for example at Karachi and Sukkur and the Hur Rebellion of 1942, and a great

increase in police work was entailed by the operation of the Arms Act and the Motor Vehicles Act. Almost throughout the period the complaints of the superior officers in charge of the police forces relate to the persistent failure of Government to provide sufficient police for the duties required; duties which were made heavier as a result of retrenchment and later on as a result of the great growth in population, the inadequacy of police accommodation and amenities for the force, and particularly the difficulties caused by the dispersed nature of accommodation for the police constables in various parts of the country, the lack of co-operation from the public, especially after 1936, when the responsibility for Government passed into the hands of ministers obtaining power through the electoral system, this lack of co-operation making itself most prominent in the growing disinclination of the zamindars to afford the assistance which had been provided with considerable readiness during the days of the bureaucratic system of British Government prevailing up to that time.

Some brief extracts from the Police Administration Reports will perhaps suffice to indicate the nature of the problem of law and order which prevailed in Sind and Khairpur during the last half century and the manner in which the police dealt with the difficulties which faced them. In the Police Administration Report for 1924 it is stated; "The population of the province, according to the Census of 1921, is 3,279,377, with the total of true crimes standing at 9,047, the proportion of true crime works out to a highest ratio, shown again by Karachi headquarters, as 1 to 907. The proportion of true crime to police works out at 3.1 offences to 1 policeman, exclusive of the armed and some of the mounted police whose ordinary duties are not connected with crime investigation, and of cognizable crime investigated, to 3.88. The proportion of population to each policeman is 623 men.

Statement showing incidence by districts per 1,000 of the population of cognizable Crime, etc., during 1924.

District.	Cognizable Crime reported.	Murders.	Attempts at murder and culpable homicide.	Dacoities.	Robberies.	House breaking with intent to commit an offence.	Thefts including cattle thefts.	Cases of receiving stolen property.
Karachi Headquarters	9.61	.04	..	..	.11	1.54	4.30	.22
Karachi District	2.94	.05	.01	.02	.04	.57	1.57	.10
Hyderabad	2.57	.05	.02	.002	.01	.62	.95	.12
Sukkur	4.09	.06	.03	.03	.05	1.36	1.29	.07
Larkana	3.47	.07	.05	.02	.07	1.10	1.03	.13
Thar Parkar	1.86	.03	.02	.605	.02	.32	.88	.05
Upper Sind Frontier	2.86	.20	.09	.02	.02	.53	1.07	.11
Nawabshah	2.50	.08	.05	.01	.04	.62	1.04	.10
Sind Railways	..	..	..	..	..	..	..	..
Total	3.61	.06	.63	.01	.04	.85	1.47	.12

The report remarks that "on looking at the previous report for 1923, it will be seen that the proportion of reported crime per 1,000 of the population is higher in Sind than in any other province, except Burma, which has 4.15. The next lowest is the Central Provinces with 2.81 as compared with Sind's 3.61. Then as regards crime per policeman Sind heads the list with 3.88, the Central Provinces coming next with 3.64, and Bombay very low down the list with 2.58. Sind has 9.55 square miles per policeman as compared with 2.66 in the Northern Division, 5.58 in the Central Division and 6.01 in the Southern Division of the Bombay Presidency. As regards crime per policeman Sind is again a very bad last with 2.28 crimes; the Northern Division has 1.28, the Central Division 1.54 and the Southern Division 1.29." The comment of the Deputy Inspector-General of Police on this is: "I think from the above figures it will be admitted that Sind is very much under-policed or the Presidency over-policed and a request for an increase is not unreasonable". As regards cattle theft the Administration Report of the same year states: "This of course has again been the outstanding feature of the year's crime. The average Sindhi policeman would not know what to do were this not the case. Before each wave of repressive action cattle theft recedes only to return to its original position, and demands of the efficient Police Station Officer endless effort and endless optimism. In my report last year, after commenting on exemplary punishment for cattle theft, I made the following remarks which I venture to repeat. 'The whole question of cattle theft turns on the facilities of report to the police and of trial in the courts. The cattle thief abounds because losers of cattle rarely report their loss to the police. A loser of cattle does report to the police because (1) the police post is distant, (2) the machinery of the courts takes so long to operate that he is involved in endless inconvenience and considerable expense before the property recovered by the police is restored to him. He naturally prefers to take the easy way out of it all and pay his "bhung" and to recover his property. The existence of 'bhung' is clear proof of the inadequacy of the law. The location of additional police posts would remove the first disability from which the complainant suffers; proof of this, if it be wanted, lies in the increased support of crime from any area in which a police post is newly established. But even the location of a police post will only benefit a tithe of the actual sufferers; the remainder would prefer to cut their losses because of the waste in journeys endlessly repeated to and from the courts".

On the question of the criminal tribes in Sind the Commissioner in Sind in his report dated the 30th April, 1926 remarks: "The report of the Deputy Inspector-General of Police is fairly satisfactory so far as it goes, as it shows that the Hurs have behaved well during the year, while the Jagiranis have not shown

any tendency to revert to the criminal habits which they have given up, at least for the time being. But it is obvious that we are present only on the fringe of the subject and that no real effort is at present in action either to prevent the activities of criminal sections of the population as a whole, or to reform the small proportion of those section which are under observation.

The steady pattern of crime is shown clearly by the number of offences in the Penal Code recorded for the year 1923, 1924, 1925 and 1926.

Offences under the Indian Penal Code.	1923	1924	1925	Triennial average.	1926
Murders	175	173	158	169	186
Attempts at murder and culpable homicide.	127	85	108	107	88
Dacoities	19	27	22	23	21
Robberies	101	89	100	97	77
House-breaking with intent to commit an offence.	2,990	2,546	2,659	2,732	2,589
Thefts (including cattle-thefts) ..	4,010	3,969	3,612	3,864	3,628
Receiving stolen property ..	412	306	360	359	411

“The police have always been concerned about the number of undetected cases and also about the percentage of cases which fail to end in conviction. In the year 1926 the number of real cases under the Indian Penal Code increased from 8,119 to 8,384, and the percentage of undetected cases dropped from 50.12 to 47.26. The percentage of cases ending in conviction in the cases tried fell from 76.45 to 68.28, which is certainly not satisfactory. The percentage of stolen property recovered fell from 37.05 to 32.00. Property valued at Rs. 6,93,623 was stolen in 1926 as against Rs. 6,72,466 in 1925. The percentage of persons arrested by the police and convicted, to persons tried, fell from 46.44 to 43.54 which was the lowest figure for the quinquennium commencing 1922. As regards magistrates cases, the percentage of persons convicted to persons tried dropped from 17.83 to 16.99. These results in the Commissioner’s opinion can be regarded only as unsatisfactory. In the Sessions Courts better results were obtained; the percentage of convictions to cases tried increased from 66.33 per cent. to 69.28.”

In the 1927 Police Administration Report the District Superintendent of Polile, Upper Sind Frontier, an area to which the Sind Frontier Regulations apply, remarked: “The Baluch has

changed his views very much. Many cases have come to my notice in which innocent women have been murdered. Avarice and escape from heavy punishment are easily satisfied merely by declaring their wife "kari" with no substantial proof to support the charge. Discouragement of this barbarous practice is called for. It can only be obtained by the infliction of heavier punishment and a considerable decrease in the amount of compensation awarded is necessary, for as long as a dead woman is worth a considerable amount of money, whereas alive she is valueless, we shall have dead women". The year 1930 was one of particular difficulty for the police. The Commissioner considered that the outstanding feature of the year was the loyalty and devotion of the police force in the face of very trying circumstances. In the first half of the year the Pir of Kingri was arrested. He is the spiritual leader of the Hurs and is held in high esteem by all Muslims. The second half of the year the Civil Disobedience campaign, preaching as it did the contempt of authority, put the police in a very awkward position. They were, particularly in Karachi, subject to constant abuse and ridicule. Not only did the police force hold fast, but it maintained throughout a very fine standard of discipline. Disorders in Sukkur that year took a very serious form. When the floods were at their height, a communal riot broke out in Sukkur, which went on intermittently for three days and resulted in thirty people being killed and two hundred injured. An attempt on the part of some banias in a political procession to hold up a Muhammadan tongawala was the case of the riot. The banias fled in large numbers from Sukkur and took refuge in the district. Then a rumour spread that the Sarkar had ordered the Muhammadans to loot the banias. This appealed to the credulous rustics. Looting started in the rural area and within a week spread to five talukas. The police forces were reinforced by British and Indian infantry; but sporadic looting went on till the 16th September. The police were operating for over two months under the most trying conditions in the middle of the Upper Sind hot weather to protect the banias from the natural consequences of their political activities. Throughout the operation the District Superintendent of Police, Mr. Ray, displayed extraordinary energy and resource. Twenty murders and over three hundred dacoities were recorded.

During the same year, 1930, cattle thieving proved a greater menace than ever. In the Upper Sind Frontier District, the District Magistrate considered that the large increase in reported offences against property was to a great extent due to thefts of cattle to replace the many cattle that were drowned in the floods of the Sukkur district. Cattle were required for agricultural operations. Owing to the unsettled condition of the country

cattle lifting was more prevalent than ever. "This form of crime," says the Deputy Inspector-General of Police in his report, "does not give the police much work, as the owners of stolen cattle usually get their cattle back by compounding with the thieves and do not worry the police. At first sight it might appear to be a blot on the administration that the public are not protected against the ravages of the cattle thieves; but this is not so. The state of affairs that exists is really a reflection on the ethical conceptions of a large proportion of the landed gentry of the province. Cattle lifting is not considered to be an offence involving moral turpitude. An effort will shortly be made to strike at the principal organisers which will lead to considerable reduction in this form of crime. When cattle lifting is eventually stamped out the police force will have to be considerably augmented, as the bad characters will then have recourse to other forms of crime, such as highway robberies and burglaries, the victims of which will be much more vocal than the long-suffering cultivators of Sind".

The Deputy Inspector-General of Police in his report for the year 1934 remarked that the increase in crime in the Upper Sind Frontier district was attributed to the general economic depression, restriction of agricultural credit and consequent exhaustion of zamindars' accumulated resources and the partial failure of the recent kharif and rabi crops. He continued, "In Sind, the crime barometer used to rise and fall with the quality of the harvest, but nowadays the position is more complex. Since the construction of the Lloyd Barrage most of the districts have an assured perennial water supply. But the development of the newly irrigated areas has led to a large influx of agricultural labourers, particularly from the Punjab, about whom the local police know nothing. The Punjab police have warned us against their criminals visiting Sind in the guise of labourers and an effort is being made to check the antecedents of all newcomers in co-operation with the landowners. The population of Sind is growing rapidly without any corresponding increase in the strength of the police." The stubborn continuation of cattle theft is the subject of a notice by the District Superintendent of Police of Sukkur in the Administration report for the year 1937. He says "Bhung is still prevalent in the district" and quotes a remark of Major Dunsterville, who was magistrate of the Sukkur district seventy years ago. It is a distressing thought that justice or redress is still rejected in favour of the quicker and more convenient system of "bhung," and it is with some diffidence that I offer any suggestions regarding this problem. It is still an unsolved problem, and might receive the attention of social reform organisations after they have eradicated such vices as rasai, lapo and cher." In the Police Administration report for the year 1937 the rise in cognizable crime was notable in

every district, except Karachi. The Deputy Superintendent of Police states: "The rise in cognizable crime may be due to a certain extent to the growing lack of respect for authority and to a realisation on the part of persons with criminal tendencies that the arm of the Law is not as long as it used to be. In spite of the continuous abuse to which the police have been subjected, and the frequency of false or exaggerated charges against them, I have no reason to believe that the morale of the services has suffered to any appreciable extent. A sustained effort is being made by the superior officers of the force to give effect to the policy of Government in respect of the eradication of corruption and malpractices. We welcome criticism, but except a fair deal from public speakers and the Press. The most serious event of the year from the police point of view was the raid on the village of Kathiar, in the Dadu district, by a gang of Brahuís from the Kalat state. On their way back to Kalat they looted the camp of Mr. Majumdar, Archaeological Superintendent, whom they killed. The work of Mr. Majumdar has already been favourably commented upon in the Archaeological chapter of this Gazetteer. His murder was a great loss to archaeology. The Deputy Superintendent of Police remarks in the report for the year 1937 that since the advent of democratic Government the amount of assistance received by investigating officers from the zamindars has steadily diminished. Though this absence of public spirit is regrettable, I hope it will lead to a higher standard of investigation on the part of Police Station Officers. In those districts in which too much reliance was placed on the help of zamindars the investigation was apt to be slipshod and inadequate with the result that many cases ended in the acquittal of guilty persons."

The economic controls which came during World War II, the partition of India and the subsequent confusion which lasted for several years from 1947 greatly added to the responsibilities of the police and also tested their discipline and integrity. It is feared that there has been some decline in the morale and honesty of the forces responsible for law and order, on account of the many temptations to which they have been subjected in the unsettled conditions which have prevailed for the last ten years. In 1953 the Sind Government in its brochure "Sind, People and Progress" state that a very bright aspect of the story of law and order is that the Hur crimes have been completely washed out. With regard to crime all the districts, except the Upper Sind Frontier, Nawabshah and Tharparkar, showed an increase and on the whole the crime figures showed an increase in the year 1953. The increase is due to the externment of bad characters from the Punjab and Karachi and also to the increase in the population. With regard to the bhal areas, there are two sections, the eastern

and the western and they present different problems. Eastern border—the problems in this area can be divided roughly into three categories: (1) Hur crime, (2) trans-border raids and (3) smuggling. Due to the surrender of the Hurs on the call of the Pir Pagaro and the end of Wariam Hingoro there has been a lull in Hur crimes. Every effort is being made to check smuggling. The Western border—this border on the whole is calm, except for tribal disputes. A conference between representatives of Baluchistan and Sind in 1951 has proved successful in reducing crime. A further conference of the Baluchistan States Union, Sind Karachi Administration and Baluchistan will, it is hoped, help in still further reducing tribal disputes. The sending of police officers for training in various courses from time to time to the Army and abroad under the Four-Point Programme of the Colombo Plan is in progress. Due to the creation of Sanghar district, the Police Training School was shifted from Sanghar to Shahdadpur in 1953. Besides the training of Head Constables, Constables, Assistant Sub-Inspectors, arrangements also exist for the training of Deputy Superintendent of Police. Sub-Inspectors and Assistant Sub-Inspectors are also being sent to the Police Training School for refresher courses regularly.

The evidence of the Inspector-General of Police for Sind, before the Sind Agricultural Commission in January 1954, presents some disquieting features. The Inspector-General stated that the present police staff is inadequate to provide protection, especially in the vast rural areas of the province. Drastic retrenchment and reorganisation was effected in the Police Department in 1951, inspite of the fact that crime and conditions were far from normal. The Inspector-General was of the view that after partition there has been a general degeneration and deterioration of efficiency in practically all departments, including the police. He suggested that the police should be kept strictly out of party politics, and that any officer found taking sides should be given severe and exemplary punishment. He condemned also the growing tendency in officers of the belief that they can get promotion and transfers by pleasing and flattering influential zamindars. He considered also that the standard of education should be raised, not only amongst officers, but also amongst the constabulary, by increasing the literary allowance for the latter and raising the educational qualifications for the former. He advocated also an increase in welfare and amenities to inferior staff in such matters as housing, free higher education for children, free and proper medical attention and hospital diet. The Inspector-General had little encouragement to give on the view that the theft of cattle has been successfully checked. He says that the present system of detection of cattle thefts has not succeeded. This system was

discussed at great length by the Committee appointed by Government to enquire into the question of cattle lifting in Sind.

On the question whether corruption in the Police Department was a serious matter, he said, "Yes, the Police Force is as much corrupt as are the members of any other departments, like the Public Works Department, the Revenue Department etc. While admitting the existence of this evil, I am unable to suggest any short-cut to improve it. Experience has shown that the spread of education and culture is the only true remedy for eradicating corruption. It is idle to demand a higher standard of morality in the police than is found in the public which surrounds it, and the most energetic District Officers have been baffled in their attempts to eliminate dishonesty amongst their subordinates. The Inspector-General believes that inefficiency and apathy in the Police Department interfere with efficiency, the registration of complaints and the detection of crimes. He says "There is inefficiency and apathy in the Police Department, and the main causes for this are the conditions produced by the post-partition period. Any one and everyone has received promotion. Officers who would not have been considered fit even for the posts of District Superintendents of Police and Superintendents of Police, officers who can hardly write a sentence of English are in administrative charge of large district office where the only medium of correspondence is English. These officers have neither the drive, nor the initiative, to produce the best from their subordinates. These reasons are greatly responsible for the non-registration of complaints and the non-detection of crimes."

Corruption.—The Five-Year-Plan for Pakistan 1955-60 says: "There is a widespread feeling in the country that the standard of integrity has deteriorated in recent years. This feeling is shared by the public services themselves. The country has been passing through revolutionary conditions and it is a mistake to view the present period of its history as a mere continuation of the pre-partition period. The former standards were in a way imposed from without, while in freedom the moral and social forces of the community are alone to sustain high standards of integrity. Large demands of a new character had to be met by the public services in the area of planned development which the country has entered." It continues, "While we do not dispute the view that standards of integrity and efficiency have been deteriorating in recent years, we nevertheless think the structure and system of public administration inherited from British rule have served well. The period since independence has been characterised by political and economic crises, but in spite of the small number of experienced officers the public services have a

magnificent record of achievement and deserve well of the country." Corruption has become a serious problem ever since the days of the controls that became necessary during the time of the Second World War. These controls were associated with shortages of various goods; and the temptation for persons in privileged positions to take advantage of opportunities which enables them to enrich themselves are only too often taken. After partition there were serious shortages of food-grains and these led to the imposition of more regulations which directly encouraged dishonest persons to take advantage of them for their own gain. Legislation was concerned with the procurement of food grains and with the movement and control of such food grains. As the demand for food grains was insistent from the Indian borders across the frontier of Sind, a vast trade in smuggling of these food grains took place, and it is to be feared that there was much bribery and corruption engendered in consequence, since smuggling became a most profitable enterprise. Corruption in pre-partition days was confined mostly to the subordinate ranks of certain services and very rarely were superior officers of any department involved in this kind of dishonesty. In the days of British rule the classes of Government servants which had a bad reputation for taking bribes or inducements were tapedars in the Revenue Department, darogas in the Public Works Department, and Sub-Inspectors and Police Constables in the Police Department, Forest Rangers and Forest Guards in the Forest Department, the lower ranks of the Excise Department and the peons of every department of Government. The corruption in which minor officials were involved was for the most part petty; it was only occasionally that serious instances of corruption amongst the higher staffs were brought to light. Actually few cases were proved, as the public was not inclined to give supporting evidence, being usually an accomplice in bribery and in attempts to gain favour by dishonest and underhand means.

The imposition of wartime controls brought a host of corrupt practices into being; these were mostly concerned with black market operations and under-the-counter transactions of many kinds. The goods mostly involved were medicines and drugs, watches, fountain pens, motor vehicles and food grains. In the days of British rule there were occasional 'black sheep' amongst Mukhtiarkars, Deputy Collectors, Assistant Engineers and some Inspectors of Police. But conditions which ensued after partition had much to do with a decline in integrity amongst the higher officials. The evidence given before the Sind Agricultural Commission in 1953-54 leaves no doubt of the extensive corruption found in many classes of public servants. So serious a problem was corruption considered that the Sind Government

appointed an Anti-Corruption Department under a special Commissioner to deal with the matter as early as 1948. At the time of the Sind Agricultural Commission the Officer-in-Charge of the Anti-Corruption Department, called the Anti-Corruption Officer, was Mr. A. W. Pryde, who had been Inspector-General of Police previously. In his evidence Mr. Pryde said that in the year 1953, 948 complaints were received, 283 cases were registered and 104 cases were challaned. During the same year 113 cases were decided in the courts, out of which 44 resulted in conviction. Mr. Pryde stated that the results achieved so far are very promising, in view of the handicaps under which Anti-Corruption Inspectors are working. The figures collected show that from June, 1948, the month in which the Anti-Corruption Department was created, to 31st December 1953, 6,049 complaints were received, 1,637 cases were registered, 651 cases were challaned, 179 cases were convicted and 190 cases were recommended for departmental action. Mr. Pryde considered, however that the department was seriously handicapped and mentioned some of the difficulties which are met with. He said; "There were 17 officers competent to investigate anti-corruption cases throughout the province and the only means of transport available to them were the railways, public service vehicles and on rare occasions, police vehicles, when and where, such could be spared. If an Anti-Corruption Inspector happened to be camping at a place some distance from district headquarters or in some out-of-the-way place, and received information calling for immediate action he had to depend on the railway or a public bus to get to his destination. This invariably took a long time and, while he was waiting for a train or bus and while he was enroute, his time was wasted. Sometimes a vehicle broke down after covering a few miles and the officer, who set out full of zeal, found himself stranded by the wayside for several hours. The duties of an officer in the Anti-Corruption Department were not confined to investigation, he had to collect intelligence about corrupt officials and those who collaborated with them, as well as those who placed temptation in the way of Government servants. He had to attend court to give evidence in cases that he had investigated, see that the witnesses were present and had an opportunity to refresh their memories before they entered the witness box. Another great advantage which could be removed only when the officers of the department had their own transport was that their movements were betrayed whenever they set out on the journey. The moment an Anti-Corruption Inspector and other officer of the Anti-Corruption Department bought a railway ticket his destination was known and intimation was sent by railway telegraph. When he had requisitioned police transport there was invariably much delay before a vehicle was placed at his disposal, and in the meantime, timely warning was given and his

plans failed. The same thing happened when he moved about by public bus. Furthermore, it was pointed out that each officer had a charge which in area was equivalent to an entire district. Their duties called for their presence at remote corners of their charges and often at very short notice. Failure to reach a given point in time, or to keep an appointment, might well lead to a good case being lost, and without mechanical transport no officer of the department could hope to attend to the several calls which he received." For the year 1956 the number of complaints made was 1,141, the number of cases registered 281, the number of cases sent up to the Courts 103, the number of convictions 62.

There can be little doubt that the working of civil supplies regulations in the Department of Food and Agriculture had a good deal to do with the growth of corruption. The functions of the department were to procure food grains, that is rice and wheat, and to arrange for the distribution, to distribute sugar allocated to the province by the Central Government, also to arrange for the equitable distribution of various other essential commodities. The department was started in the year 1942. Food grains were procured through the Sind Food Grains Nationalisation Board, which was a Government organisation set up for that purpose. It buys food grains, either through its agents, or directly. The distribution of sugar was controlled under the Sind Sugar Distribution Movement and Price Control Order of 1947, and sugar was distributed in the districts under the orders of the Collectors. There were restrictions on the movement of rice, gram, wheat and their products and the export of various kinds of fodder from the province was restricted, namely, parlas, copra oil-cakes, groundnut, oil-cakes, rape-seed, oil-cakes, jamba seed oilcakes, buh, hay and lucerne. The Managing Director of the Sind Food Grains Nationalisation Board in his evidence before the Sind Agricultural Commission in January 1954 stated that the Sind Food Grains Nationalisation Board was established to purchase food grains on behalf of the Sind Government and it procured sugdasi, ghangani, joshi and red rice and wheat. Procurement was made through agents appointed by the Board and also direct from producers and sellers. The Board had forty-six agents for rice procurement for the year 1953-54 and thirty-one agents for wheat procurement for the year 1953-54. Commission at 9 pies per maund for all varieties of rice was paid for the years 1949-50 to 1952-53 and 1 anna per maund for wheat for the years 1951-52 and 1952-53 and 2 annas per maund for 1953-54. For 1953-54 the rice crop commission was 1 anna per maund to the agents. There is no doubt the system of grain procurement had many loop-holes of which dishonest persons were able to take advantage, and it was common talk in Sind that there was much corruption in the department over the working of the procurement system. The Government was procuring

wheat through the Sind Food Grains Nationalisation Board at the rate of 9 rupees 4 annas per maund for fair quality wheat and the procurement agents were appointed to important rail heads. Apart from this, the Sind Government in order to help growers decided to procure 25,000 tons of wheat direct from the sellers and set up a wheat receiving depot for the purpose at Hyderabad. When the position as regards food grain improved Government relaxed to some extent the movement of wheat outside the province throughout West Pakistan, except at the border and the provisioned areas. The Sind Food Grains Control Order of 1952 was also repealed and no licenses were then required for dealing in food grains in Sind, nor was any limitation placed on the possession of food grains by individuals or the trade within the province. As regards corruption generally in the public services what the Inspector-General of Police said in his evidence before the Commission holds true generally, when he said the police force was as much corrupt as members of any other department, like the Public Works Department, the Revenue Department and others. It is in fact true that, unless there is a higher standard of integrity and morality amongst the population at large, the scandal of corruption will not disappear. With the influx of large numbers of refugees at the time of partition, Sind found that amongst many of them were persons of criminal tendencies, many of whom had been deliberately released from jails in India in order to make their way into Pakistan. Many of the District Magistrates had loud complaint to make about the character of the refugees flooding into their districts. Conditions such as these combined with shortages of essential goods and shortages of food and the unsettlement caused by the mass movement of thousands of indigent people, are perhaps sufficient cause for the increase in corruption found amongst public services in the country. The problem is still one to be faced and the new Administration of Pakistan has said that it will take severe measures against any Government servant found guilty of corrupt practices, or of making undue exactions from the public. This is often a rather difficult matter to decide in Sind where traditional usage comprises many kinds of payment which are on the border line between perquisites and bribes.

Village Police.

The village police system does not exist in Sind. The only village police in Sind consist of village headmen and trackers. Formerly under a system introduced by Bartle Frere the village headman on behalf of the magistracy and police was awarded a grant of the revenue free tenure of a small area of land. The grants of this nature which constitute a charge upon provincial revenues are no longer made and are extinguished on the deaths of the holders. The remuneration of village headmen whose services to the administration it is considered expedient to reward.

or whose co-operation it is desired to enlist, is now provided for by the Sind Village Officers' Act 1881, and instead of their being paid in cash the money is devoted to the discharge of the assessment on a small portion of the incumbent's holding. The number of headmen remunerated in this manner in 1905 was 88 and the average annual compensation in each case 48 rupees. The only police assistants today in villages are the trackers, or pagis. The duty of a tracker is to track offenders and stolen animals when called upon to do so village headmen or by the police, to report the appearance of suspicious characters and animals suspected to be stolen or strayed and to give information likely to prevent the commission of an offence. The skill with which the trackers of Sind follow the footprints of men animals for long distances seems miraculous to an outsider. With their help a "pag" becomes a record for identification as good as a thumb impression, and during the Hur troubles the movements of the principal outlaws and their participation in particular crimes were often ascertained by this means. The skill of the Sind pagis is not exaggerated.

The compiler of this Gazetteer knows of an instance in which the experience of the late G. E. Chatfield, when he was Collector of the Thar Parkar district, affords an amazing example of this particular form of skill. Mr. Chatfield's camel-man when driving his employer's camel suddenly exclaimed that he saw on the ground, as the camel moved, the footprints of a camel of his own which had been stolen a year before. He recognised the camel footprint after this passage of time, and by means of it tracked the animal and recovered it by following the marks through the jungle for miles.

Jails.

Under the Mirs imprisonment in default of payment of a fine was very common. When a thief was caught he was fined four times the value of the property stolen, three-fourths of the fine being taken for Government and one-fourth restored to the complainant. If the man was too poor to pay he was kept in durance till his friends paid for him. But he was not maintained at the expense of the state; on the contrary, he was taken out daily to beg for food, and whatever he got in excess of actual necessities was appropriated for Government, so he became a source of revenue. Imprisonment for an indefinite period was also a common punishment for murder. But it does not appear that there were many prisons. Criminals were shut up in a guard-house, or put in stocks or chained up. The jail of modern civilisation was, therefore, a novelty to the Sindhi. Principal jails were established by Napier at Hyderabad, Shikarpur and Karachi and minor prisons in many places. The management

of the first was entrusted to the Lieutenant of Police and that of the others to the Deputy Magistrates. The Captain of Police controlled the whole. With the introduction of the Criminal Procedure Code and the remodelling of the machinery of justice, the administration of prisons passed out of the sphere of police duties. Jail administration in the sub-continent is regulated generally by the Prisons' Act of 1894 and by rules issued under it by the Government of India and the Provincial Governments. The punishments authorised by the Indian Penal Code for convicted offenders include transportation, penal servitude, rigorous imprisonment, which may include short periods of solitary confinement, and simple imprisonment. Accommodation has also to be provided in the jails for civil and under trial prisoners. Since the introduction with effect from the 1st April 1937 of the Government of India Act the administration of jails had been a provincial matter and the power of legislation in respect of prison administration vests in the Provincial Governments, the Central Government exercising only concurrent legislative powers with the Provincial Governments in the matter of the transfer of prisoners and accused persons from one unit to another.

The origin of all jail improvements in recent years was the Jail Commission of 1889. The most important of the recommendations of the Commission was that there should be in each presidency three classes of jails; in the first place, large central jails for convicts sentenced to more than one year's imprisonment; secondly, district jails at the headquarters of districts; and thirdly, subsidiary jails and lock-ups for under trial prisoners and convicts sentenced to short terms of imprisonment. The Jail Department in each province was under the control of an Inspector-General, who was generally an officer of the Indian Medical Services with jail experience, and the Superintendents of certain jails were usually recruited from the same service. During the Second World War the number of I.M.S. Officers in the Jail Department was reduced to a minimum. The district jail is under the charge of the Civil Surgeon and is frequently inspected by the District Magistrate. The staff under the Superintendents includes in the large central jails the Deputy Superintendent to supervise the jail manufactures, and in all central and district jails one or more subordinate Medical Officers. The Executive Staff consists of jailors and warders and convict petty officers are employed in all central and district jails, the possibility of promotion to one of these posts being a strong inducement to good behaviour. Since 1863 the jurisdiction of the Inspector-General of Prisons of the Bombay Presidency included Sind, and this continued up to 1936, when Sind became a Governor's Province. There are now in the province two central prisons, one at Hyderabad and another at Sukkur, the Nara prison with a juvenile training centre and a

special prison at Sukkur. There are in addition 66 third-class subsidiary jails in talukas and districts. Central Jails exist at Hyderabad, Sukkur and Khairpur, and District Jails at Sukkur. Extramural Jail 1, Juvenile Training Centre 1.

The table below shows the total of daily average numbers of each class of prisoners (Male and Female) separately for the years 1954 and 1955.

Class	1954			1955			Variation		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Convicts	3,654	20	3,674	4,569	28	4,597	915	8	923
Undertrials	2,811	11	2,822	3,458	17	3,475	647	6	653
Civil Prisoners	..	..	..	..	..	..	..	..	..
Total	6,465	31	6,496	8,027	45	8,072	1,562	14	1,576

The following table shows the nature of sentences awarded to prisoners for the years 1954 and 1955.

Nature.	1954		1955	
	Admission	Percentage	Admission	Percentage
Prisoners sentenced to				
(a) Simple Imprisonment	2,522	34.08	2,753	30.93
(b) Rigorous Imprisonment	4,878	65.92	6,146	69.07
TOTAL	7,400	100	8,819	100

Under-trial Prisoners.—This class of prisoner constitutes about 3/4ths of the total prison population. Owing to general delay, a large number of them remain in prison for over a year and even longer while the cases of the majority take over 3 months to decide.

The number of admissions and deaths from principal diseases among convicted prisoners for the years 1954 and 1955 were as shown below:—

Principal disease	1954		1955	
	A	D	A	D
Cholera	..	..	1	1
Dysentery	569	1	192	6
Malaria	1651	2	1317	3
Tuberculosis { Lungs	27	1	51	1
{ Others	28	..	5	1
Anaemia and Debility Diseases	789	..	62	..
Pneumonia	9	1	53	3
Other respiratory Diseases	89	..	177	2
Diarrhoea	58	..	84	2
Abscesses, boils and ulcers of all kinds	320	..	182	1
All other causes	84	1	32	1

The average cost per head per jail inmate per annum was in 1953 Rs. 420/4/4, 1954 Rs. 353/2/-, 1955 Rs. 378/3/8.

The cost of the jails in 1954 and 1955 is given in the table below.

Head of Charge.	1954			1955		
	Total Expenditure.		Cost per head.	Total Expenditure.		Cost per head.
	Rs.	Rs. As. Ps.		Rs.	Rs. As. Ps.	
1. Establishment ..	7,43,220	114—9—2		11,39,698	141—3—0	
2. Dietary Charges ..	10,44,903	161—1—0		12,55,409	155—8—8	
3. Hospital Charges ..	80,652	12—6—7		68,877	8—8—6	
4. Clothing Charges ..	89,382	13—12—2		1,29,185	16—0—1	
5. Sanitation Charges ..	1,19,398	18—7—1		1,47,830	18—5—0	
6. Moving Prisoners ..	17,662	2—1—2		31,469	3—14—5	
7. Other miscellaneous services and supplies ..	1,41,495	21—13—6		1,87,042	23—2—9	
8. Travelling Allowances..	13,069	2—0—2		20,152	2—7—11	
9. Contingencies ..	34,913	5—6—0		47,808	5—14—4	
10. Extraordinary Charges	10,234	1—9—2		25,736	3—3—0	
TOTAL ..	22,94,928	353—2—0		30,53,103	378—3—8	

In the last few years attempts have been made to lessen the burden of the jails on the taxpayer by developing jail industries, gardens and other methods of employment. As a result of this policy the total receipts for jails in Sind, excluding Khairpur, were in 1953 Rs. 2,33,922/-, in 1954 Rs. 3,81,714/- and in 1955 Rs. 4,38,052/-. Gardens have been improved by the planting of fruit trees and flowers giving the prisons a more pleasant appearance to counteract the dull and dreary life within.

The total number of prisoners held in subsidiary jails were 1,625. on the 31st December 1951 and 2,626 on the 31st December 1952. The Inspector-General of Prisons speaking before the Sind Agricultural Commission in 1954 said that most of the jails, especially the sub-jails, have inadequate accommodation and are overcrowded; prisoners are put to great hardship for want of speedy trial by courts. The sub-jails are under the direct control of the District Magistrates and only the expenditure incurred there is borne by the Jail Department. The Sind gang was an extra mural prison located in temporary premises wherever there was work for it to do for the time being. The Sind gang was employed mostly on out-of-door work, chiefly for the Public Works Department, such as the excavation and clearance of canals, the making of bunds and

railway work. After partition it was not possible to keep in charge of the Prison Department officers of the Indian Medical Service with jail experience. The present incumbent of the post of Inspector-General of Prisons in Sind is a B.Sc., and a lawyer. With the shortage of medical personnel in the province it is difficult to obtain a sufficient number of suitable Medical Officers for jail service, though this is undoubtedly desirable. The work in which convicts are employed is mostly carried on within jail walls, and extra mural employment, as in the Sind gang, is sometimes allowed. Within the walls prisoners are employed on jail service and repairs and in workshops. The main principle laid down with regard to jail manufactures is that the work must be penal and industrial. As far as possible industries are adapted to the requirements of the consuming public departments; printing, tent-making and the manufacture of clothing are among the commonest employments. The employment of prisoners on useful and profitable industries is a practice of old-standing in the Sind jails; but it received a serious check sometime ago by an outcry that was raised against interference with private enterprise. Since then prisoners have been employed mainly in the production of articles of clothing and food for their own use and that of the prisoners in minor prisons. But certain articles which are not considered likely to enter into competition with any local industry are made for supply to other Government departments and sale to the public. Foremost among these are cotton and woollen carpets, coir matting, towels, table-cloths and other cotton fabrics, articles of cane and reed, such as chairs, baskets, chiks, and some newly invented fabrics, among which mats of munj grass have for some time been in great demand. In order to train prisoners in cottage industries several useful occupations have been established like nawar making, tape making, carpentry work, smithy work, blanket weaving, making of net bags, dyeing yarn, shoe making and sewing clothes. Articles of daily use, like hand-fans, baskets and chitais made of palm leaves, are in great demand in Sind and have been ordered to be manufactured in the Sukkur Central Prison, near where palm-trees are in abundance and the articles can be made cheaply. The development of jail gardens for the supply of fresh vegetables, to reduce the cost of jails, is another feature of jail management.

New emphasis is now being put upon the reformatory nature of punishment. Lectures on religious matters are now given to prisoners by moulvis and school-classes are held regularly in all the big prisons. Efforts are also being made to remove illiteracy amongst prisoners. In the sub-jails, where there are mostly under trial prisoners or prisoners with short sentences of a month or less, it is not possible to provide regular teachers for the purpose. But readings of the Holy Koran and Sindhi translations have also been started in some sub-jails. Elementary

primary Sindhi books have also been provided to impart as much education as is possible in the circumstances. The authorities are also devoting attention to the starting of After-Care or Released Prisoners' Aid Societies in the districts. In 1953 the Inspector-General of Prisons was greatly concerned with the great cost of maintaining prisons and jails in Sind, and he reported that expenditure ran to Rs. 27,00,000 per annum, while the income from cottage industries, gardens and convict labour was on an average only about 1½ lakhs a year. In consequence he wished to expand jail industries and garden produce in order to make the jails self-supporting in the province. But the production of goods necessary to pay for the up-keep of the jails can hardly be such that a very considerable profit can accrue from jail industry, unless departure is made from the principle which has regulated industrial activities in jails, and which was one of the recommendations of the jail committee on which modern jail administration is based, that jail industry should not be conducted on such a scale or be of such a nature as to compete seriously with private enterprise outside. The idea that the Sind jails should now become self-sufficient would, if carried out, be in effect going back to the principle of jail management in the days of the Mirs when the prisoners had to beg for their living and there was no charge upon the state.

Conditions in the sub-jails are, on the whole, not satisfactory. The Sub-Jailor is usually the Mukhtiarkar of the taluka. But the Officer-in-Charge of the sub-jail and the one who attends to detail is usually the Head Munshi in the Mukhtiarkar's office. He is usually fully engaged on his ordinary revenue work, and the amount of time which he can devote to sub-jail work is comparatively small, and it is to be feared that he treats it as a very minor part of his duties. There is much to be done in improving the system of sub-jails and the policy which the present Inspector-General of Prisons has in view is obtaining first-hand information about the condition of prisoners in the out-lying sub-jails situated in the interior and in out-of-way places. The Inspector-General visits personally as many of the sub-jails as possible. Prisoners' main complaints in sub-jails are about the inordinate delay in the trial of their cases; but generally sub-jails have some uncomfortable and out-of-date accommodation. Health in the jails is generally good and as a rule prisoners improve in physique as a result of their treatment during incarceration. The methods of education employed in the jails are that primary education is given in regular classes held in the prison by Government teachers and there is teaching of the Holy Qoran with translations in Urdu and Sindhi. There is also an imparting of religious and moral instruction by local moulvis on jail holidays. Indoor games have recently been ordered to be introduced in the jails for the recreation of prisoners.

to keep them happy and busy in leisure hours. The games introduced include ludo, snakes and ladders, chess and carrom. Newspapers and books are also provided for reading. The administration of jails in Sind and Khairpur is in accordance with the Jail Manual. The standard set is on a level with that prevailing in the prisons of the Indian sub-continent. The Government is fully aware of the need for paying greater attention to the reformatory nature of punishment, and there is no doubt that the next few years will show considerable improvement in this respect.

Justice

When Sind was annexed in 1843 the system of British justice was already well-established in British India. Napier's system superseded that of the Mirs, an account of which has been given in this chapter in the section dealing with the police. Napier's system continued until the beginning of 1849, when regular tribunals were established and cases ordered to be disposed of according to the spirit of the Code of 1827. The criminal courts were presided over by the Commissioner in Sind, who was given a judicial assistant, by the District Magistrates and the Deputy Magistrates. Two years later the kardars, the present Mukhtiar-kars, were invested with criminal jurisdiction. The ordinary powers of kardar authorised the infliction of a fine of Rs. 15, or imprisonment for twenty days. But he might be empowered to pass sentence of fine up to Rs. 100, or imprisonment for four months, and of flogging not exceeding twenty-five stripes. Authority was also given to the Kardar's Head Munshis to exercise jurisdiction during the absence of their superiors. Deputy Magistrates were empowered to inflict, without confirmation, punishments of one year's imprisonment, fine and flogging and, subject to the Commissioner's confirmation, the sentence might extend to seven years' imprisonment. Extra Assistant Magistrates held without confirmation the same powers as a Deputy Magistrate exercised. A District Magistrate was invested with power to pass sentences of seven years' imprisonment without confirmation, or for a longer term, subject to the Commissioner's confirmation. Every sentence of death or transportation for life required the sanction of Government. The combination with executive duties of work now disposed of by the Courts of Session soon proved impracticable, and in 1855 a Judicial Deputy Magistrate holding powers extensive with those of the District Magistrate and exercising purely judicial functions was appointed in each district. The general development of the judicial system in Sind followed the lines which the criminal and civil law, as improved and amended, took in British India from the first days of its condification and

regular establishment. In the Indian Year Book for 1947, it is stated that before the transfer of India to the Crown the law was in a state of great confusion. Henry Cunningham described it as hopelessly unwieldy, entangled and confusing. The first steps towards general codification were taken in 1833 when a commission was appointed, of which Lord Macaulay was the moving spirit, to prepare a Penal Code. Twenty-two years elapsed before it became law, during which period it underwent revision from his successors in the Law Membership and especially Barnes Peacock, the Lord Chief Justice of the Supreme Court of Calcutta. The Penal Code, which became law in 1860, was followed by a Code of Criminal Procedure. Substantially the whole Criminal Law of British India is contained in these two codes. One of the most eminent lawyers who ever came to India, James Stephen, said: "The Indian Penal Code may be described as the criminal law of England freed from all technicalities and superfluities, systematically arranged and modified in some few particulars (they are surprisingly few) to suit the circumstances of British India". It is practically impossible to misunderstand the Code. The Indian Penal Code has from time to time been amended. The rules of civil procedure have been embodied in the Code of Civil Procedure. The Code of Civil Procedure was remodelled in 1908 and the Code of Criminal Procedure in 1898. These codes amended from time to time are now in force. The years between 1870 and 1885 saw a great deal of legislative activity in British India, and important branches of the Law, like evidence, contract, transfer of property, trusts and negotiable instruments, were codified in the form of Acts of the Indian Legislature applicable to the whole of British India. These amended from time to time and supplemented by rules derived from numerous decisions, constitute the bulk of the law administered in British India upto the days of partition. Since partition there has been little change in the substance of law, or in the manner of its enforcement. The British system has been made the basis for the legal system of Pakistan which is in force in Sind and Khairpur today.

As far as Sind itself was concerned the administration of criminal justice was placed on a more satisfactory footing by the enactment of the Indian Penal Code, Act XXXV of 1860 and the Code of Criminal Procedure Act XXV of 1861, the provisions of which came into force in the province on January 1st. and November 1st. 1862 respectively. Under the latter statute the jurisdiction of the magistrates was curtailed and a Court of Session constituted for the trial of important cases, the Judicial Deputy Magistrate giving place to a Sessions Judge. The authority of the District Magistrate, or other Magistrate invested with full powers, was limited to infliction of two years' imprisonment with

fine. A First-Class Magistrate was empowered to award imprisonment for six months and a Second Class Magistrate for one month. In 1866 the criminal jurisdiction of the Commissioner in Sind, who had hitherto continued to exercise the functions assigned by the Code of Criminal Procedure to a Sadar Court ceased, and the office of Judicial Assistant was abolished on the appointment under Bombay Act XII, 1866, of a Judicial Commissioner to preside over the Sadar Court of Sind and to superintend the judicial administration of the province. The law regulating the procedure of the Criminal Courts was consolidated and amended by Act X of 1872, which substituted for the designations of magistrates introduced by the earlier code those of the First, Second and Third Class Magistrate respectively. Increased administrative powers were also conferred on magistrates in charge of divisions or districts. Amendments to the Code of Criminal Procedure have since been promulgated. But the constitution of the courts established in the districts has undergone no material change. An important change, however, was introduced in the principal court of the province by Bombay Act I of 1906 which came into force on the 25th June 1906. In place of the Sadar Court and the District Court, or Court of Sessions, of Karachi, there is now a court called the Court of the Judicial Commissioner, which is the highest Court of Appeal in civil and criminal matters in the province, and also the District Court and Court of Session, Karachi. It consists of three or, with the sanction of the Government of India, more judges, of which one is a Judicial Commissioner and the others are Additional Judicial Commissioners. Of the latter one must be a barrister of no less than five years' standing. Each of the judges has all the powers and exercises all the jurisdiction of a judge of a District Court and Sessions Judge within the Karachi district. All appellate or revisional jurisdiction, other than that of a District or Sessions Court, is exercised by a bench of not less than two judges. In the event of their disagreeing, the appeal or case is referred by the Judicial Commissioner to the third Judge or to a bench consisting of three judges.

Subordinate to the Court of the Judicial Commissioner there are Session Judge, Additional Session Judge, Assistant Session Judges, First-Class Magistrate, Second-Class Magistrates and Third-Class Magistrates, the powers of whom are all strictly defined. In each district the Collector, or Deputy Commissioner, is the District Magistrate, and the Assistant Deputy Collectors in charge of divisions for the districts are Sub-Divisional Magistrates; these are First-Class Magistrates. The officers in charge of talukas and Head Munshis are also magistrates in their own charges with such powers as may be conferred on them. Where there is much work for these, Additional Resident Magistrates are appointed of

the same rank as Mukhtiarkars. Besides these there are City and Cantonment Magistrates and a Harbour Magistrate and Special Magistrates who are honorary Magistrates appointed by the Commissioner. Honorary Magistrates have since been abolished. Appeals from decisions of Magistrates of the second and third classes are heard by their District Magistrates and their Sub-divisional Magistrates if especially empowered. But appeals from the sentences of First-class Magistrates and Assistant Sessions Judges lie to the Court of Session. From the Courts of Session and from the Court of the Additional Sessions Judge appeal lies to the Court of the Judicial Commissioner. Under the Sind Frontier Regulation No. III of 1892 the action of the ordinary Criminal Courts can be suspended in all the frontier territories of Sind from Kohistan to Kashmore whenever it appears to the District Magistrate inexpedient that any case of an offence punishable with death or transportation for life should be tried by a Sessions Court. In such cases he is authorised to refer the question to a decision of a Council of Elders, called a "Jirga", and to sentence the culprit, if convicted, to fine or transportation for a term not exceeding seven years.

Sub-judges of the First-class had the ordinary powers of Second-class Sub-judges and special jurisdiction in respect of substitutes; for instance where the subject matter exceeds Rs. 5,000 as may arise within the local jurisdiction of the courts in the district presided over by Second-class Sub-Judges. Sub-Judges of the Second-class have power to deal with suits the value of which does not exceed Rs. 5,000. Mamlatdars' Courts have power to give immediate possession and pass other orders in accordance with the Mamlatdars Courts Act of 1906. Mamlatdars for the purposes of the Act are Mukhtiarkars in charge of talukas.

Courts of Small Causes.—The Karachi Small Cause Court has powers to try suits the subject matter of which does not exceed Rs. 2,000; the Cantonments' Small Cause Court, Karachi, up to Rs. 200; Subordinate Judges of the First-class up to Rs. 500 and Subordinate Judges of the Second-class up to Rs. 200 or Rs. 50.

Under the Sind Frontier Regulation III of 1892, the District Magistrate has special powers in the frontier talukas in civil cases similar to those described above in connection with the Criminal Courts. Whenever he is satisfied that a dispute exists which is likely to lead to a blood-feud, murder, culpable homicide, mischief, or breach of the peace, he may refer the dispute to a Council of Elders and pass a decree on their finding, but he is not bound by their finding.

Since the last edition of the Gazetteer in 1907 the following creations have occurred in the constitution of District and Sessions Courts:—

The District and Sessions Court of Larkana, with effect from 1st April, 1913, the territorial limits of which comprised the Revenue District of Larkana.

The District and Sessions Court, Nawabshah, on 2nd June, 1942, the territorial limits of which comprised the Revenue District of Nawabshah.

The District and Sessions Court, Thar Parkar, at Mirpurkhas on 18th December, 1946, the territorial limits of which comprised the Revenue District of Thar Parkar.

The District and Sessions Court, Dadu, on 18th July, 1952, the territorial limits of which comprised the Revenue District of Dadu.

The District and Sessions Court, Jacobabad, on 8th December, 1942, the territorial limits of which comprised the Revenue District formerly known as Upper Sind Frontier.

Sind became a separate Province on 1st April, 1937 when part 3 of the Government of India Act, 1935, came into operation, and the Judges of the Court of the Judicial Commissioner of Sind were appointed by a Royal Warrant of His Majesty the King. As the internal organization, however, of the court of the Judicial Commissioner of Sind required adjustment to meet the needs of the great and growing city of Karachi with its sea and air-ports and that need became even more urgent with the Constitution of the Province of Sind as a separate Province, it was felt that the immediate needs of the Province could be satisfied by bringing the Sind Courts Act, Act VII of 1926 into operation thereby raising the status of the court of the Judicial Commissioner of Sind to that of Chief Court of Sind. On 15th April, 1940, therefore, the Sind Courts Act, 1926, was brought into operation and the Court of the Judicial Commissioner of Sind became on that day the Chief Court of Sind.

The Chief Court of Sind was the highest Civil Court of appeal and revision and the highest Court of Criminal appeal and revision for Sind and also the principal court of original Civil Jurisdiction for the Civil District of Karachi. Further the Chief Court of Sind also exercised the powers and performed the duties of a Sessions Judge in the Sessions Divisions of Karachi. All appellate or revisional jurisdiction other than that of a District and Sessions Court is exercised by a Bench of not less than two Judges, and in the event of their disagreeing the appeal or the case is referred to the Chief Judge of the Chief Court of Sind who is empowered either to decide the matter himself or to refer it to a third Judge or to a Bench consisting of 3 Judges.

Finally all appeals which lie to the Court of Sessions from the Sentences or orders of courts of Magistrates exercising Jurisdiction in the Sessions Division of Karachi lie to the Chief Court of Sind.

It has already been stated above, that on 18th December, 1946, the District and Sessions Court of Thar Parkar was created which is the principal civil court of the District. In order, however, to afford some relief to the District Court so far as original Civil work was concerned, an F.C. Subordinate Civil Court was also created for the District on the same date, i.e., 18th December, 1946, which commenced functioning on 10th January, 1947. The Court of the F.C. Subordinate Judge which is located at Mirpurkhas exercises original Civil Jurisdiction throughout the District of Thar Parkar.

The Deputy Commissioner Thar Parkar has ceased to be the District Judge, and the Deputy Collectors, Mukhtiarkars and Head Munshi have also ceased to exercise Civil Jurisdiction in the District or in any of the other District in the former province of Sind. Civil Jurisdiction is exercised only by the District Judges and Subordinate Judges who are under the administration control of the Chief Court of Sind.

With regard to Upper Sind Frontier referred to on page 450 of the 1907 Gazetteer, the Sind Frontier Regulations which governed its administration was repealed on 21st March, 1952, and that part of Sind which was hitherto known as the Upper Sind Frontier now constitutes the Revenue District which is known as the District of Jacobabad. On the repeal of the Sind Frontier Regulations the administration of civil and criminal justice was exercised by civil and criminal courts except that the Revenue District of Jacobabad fell within the jurisdiction of the District and Sessions Divisions of Sukkur. As stated above, it was on the 8th December, 1954 that a District and Sessions Court was established at Jacobabad which exercised jurisdiction over the Revenue District of Jacobabad.

Public Health

After the British occupation the climate of Sind was believed for a considerable time to be pre-eminently unhealthy. The first experience which the British Army had of it were unhappy. In the autumn of 1843 more than two-thirds of Napier's forces in Sind were frustrated with illness. But ampler experience has shown that Sind is upon the whole a healthy country. This is not surprising considering the great strength of the sun for most of the year and the dryness of the atmosphere. It is only in times of inundation in the flooded areas and in the rice tracts that malaria is a serious scourge for three or four months

in the year from the end of the inundation season till the setting-in of the cold weather. Vital statistics giving details of births and deaths are not reliable as far as Sind and Khairpur are concerned. Up to the 1931 Census statistics of infirmities were recorded in the Census enumeration. But these were given up after 1931 because expert opinion believed that the Census statistics of infirmities were completely unreliable. All that could be said about them was that they presented from decade to decade a uniform margin of error; but what the extent of this margin was it was impossible to determine. In the large towns the registration of births and deaths has been made compulsory by a bye-law under the Municipal Act. But the penalties for non-compliance are rarely enforced with a reasonable ideal of efficiency and the ex-officio Registrar is the Municipal Secretary or Chief Officer, who has more than enough of other work to perform. In the rural districts there is not even that. Nobody is obliged to report a domestic occurrence and the source of all vital statistics is village gossip. The person responsible for collecting them is the tapedar; but he cannot always attend to this duty personally and must entrust it to his kotar. In some villages registers are kept by school-masters, or shop-keepers who enter all the births and deaths of which they hear. The information thus collected is gathered up every month by the tapedar and submitted to the Public Health Authority. When the compiler of this Gazetteer was a District Officer in Sind he noted many times on examining the Births and Deaths Registers of the villages in his charges that often for two or three months at a time there would be no entry of births or deaths in the village and then subsequently in a single month thirty to forty entries would be recorded. The inaccuracy of these entries was obvious by working out what the average birth and death rate should have been based on the population of the village. To incompleteness must be added certain sources of positive error, such as ignorant suspicion among the lower orders, and among the higher reluctance to talk about matters of the zenana. These causes affect the births more than the deaths and the female statistics more than the male. While the vague ignorance of all classes about diseases discredits all figures relating to causes of death, the vital statistics, such as they are, can be studied in the district volumes of this Gazetteer.

The Five-Year Plan of Pakistan, 1955-60, says that the standards of health in former days were inevitably low. Inadequate nutrition, insanitary conditions, insufficient medical facilities and meagre parental care all contributed to the prevalence of ill-health, epidemics and the high rate of infant mortality. Death rates were about double and infant mortality rates were about five times those of developed countries. The

available health personnel was grossly inadequate in relation to the population and the size of the problem. The Five-Year Plan compares the figures for Pakistan with those of the United Kingdom in respect of the number of doctors, nurses, health visitors and trained mid-wives. For doctors the approximate ratio to population was 1 doctor to 13,500 as compared with 1 to 1,000 of population in the United Kingdom. For nurses, the total of whom was 1,600, the ratio was 1 nurse to 50,700 persons in Pakistan, as against 1 to 300 persons in the United Kingdom. The number of health visitors was 200, giving a ratio in Pakistan of 1 health visitor to 406,000 of the population as compared with 1 to 4,800 in the United Kingdom. The number of trained mid-wives was estimated at 1,040 giving a ratio of 1 mid-wife to 78,000 of the population in Pakistan as compared with 1 to 600 in the United Kingdom. The Five-Year Plan, talking of conditions in Pakistan as a whole, states that potable water supplies are available to only 6 per cent. of the population and that even this is inadequate in both quantity and quality. Arrangements for the disposal of sewage are even less satisfactory, with underground drainage arrangements available to only about 2 per cent. of the population. As a result bacillary diseases are widespread. Malaria takes a heavy toll of life and health. It incapacitates millions often at seasons of the year when agricultural work is at its peak. The percentage of deaths among mothers and infants is still amongst the highest in the world. These statements are more or less true of Sind; while in the country as a whole water supply is adequate in quantity, recourse is had to many sources which must carry pollution and there is no general practice of boiling water before it is drunk. In any village it is possible to see water-pots for drinking and cooking water being filled at the same place where buffaloes and cattle are drinking and stirring up the mud. The Five-Year Plan states that for maternity and child health services, for both preventive and curative work, the need in this field is great. The infant mortality rate is estimated at 110 to 130 per 1,000 live births and the number of mothers who die in childbirth may be 440 to 680 per 1,00,000 births. This is about five times the rate in more developed countries. The solution depends in large part on improved nutrition, better housing and increased knowledge of health principles. During the planned period provision can be made for expanding courses for maternity cases and maternity hospitals in areas now inadequately served, and for the improvement of some of the existing institutions. But there are insufficient doctors, nurses, health visitors and other personnel required to staff a larger programme. The funds recommended in the Five-Year Plan will provide for about 36 maternity and child health centres in Hyderabad and Khairpur Divisions. In the proposed allocation of funds under the Five-Year Plan in

West Pakistan the following are the amounts allocated to various items; malaria control in millions of rupees 23.0, tuberculosis hospitals, clinics and sanatoria 17.1, V.C.G. vaccination for tuberculosis 2.3, medical colleges 31.2, hospitals 35.1, establishment improvement and extension of dispensaries 7.1, infectious diseases hospitals 1.5, higher training for doctors in and for research 4.8, mortality and child health centres 6.2, nurses' training 5.5, other training 3.1, school health services and health education 2.8; a total of 139.7 million rupees. The exact allocation made to Sind and Khairpur from this amount is not known; but it will probably be in proportion to the population concerned and distributed under the orders of the West Pakistan Government. The plan points out that the combination of preventive and curative services under one administration, which was a live issue in the past, is now largely accomplished. The Central Government and West Pakistan have completed this amalgamation. But the rule of which local bodies complain in carrying out the health programme remains an unresolved issue. Most local dispensaries are still run by the District Boards and other local bodies; but there is a consistent move towards transferring control of the Provincial Government on the ground that local dispensaries suffer from insufficiency of funds, from political interference and from general mal-administration. The authors of the plan, however, consider that local bodies should be strengthened and given even greater authority, even if this results in some temporary loss of efficiency.

The brochure on "Sind People and Progress" published in 1954 states that there has not been any spectacular organisational change in public health during the year 1953-54. "The health situation in the province continues to be satisfactory. There have been no cases of cholera in the quinquennium ending 1953. Smallpox has also presented no serious problem, as vaccination is continued throughout the year. In order to intensify the vaccination campaign to cover as large a section of the population as possible, the number of vaccination stations and the number of days for vaccination are being increased, and the average fixed for each vaccinator is under revision. Malaria can aptly be called the scourge of Sind. It is perhaps the only major health problem of the province. The Provincial Malaria Organisation of the province has been tackling the problem with all the available means at its disposal for the last several years, and has largely succeeded in reducing the occurrence of the disease in the area. D.D.T. spraying operations have been carried out since 1949. The Provincial Anti-Malaria Organisation has also been conducting classes for basic training in malariology. Arrangements exist for two sessions in a year. Sixteen mobile health units, two in each district, are working to provide medical

aid in villages which are out of easy reach of the static dispensaries. The Government are also continuing the policy of training personnel for midwifery services, awarding scholarships for two lady health visitors, five midwives and thirty assistant midwives. In order to encourage local bodies to provide trained maternity services grants-in-aid are being paid by the Government to the extent of one-third of the expenses. Although there is no separate publicity organisation, every effort is being made to educate the public and every opportunity for this has been fully availed of. Public health stalls are put in shows and exhibitions. World health days are also observed with zeal; while celebrations are held in almost every taluka. Hyderabad and Sukkur are the centres of these celebrations. To commemorate World Health Day 3,000 paludrine tablets are supplied to each Mukhtiarkar for distribution. The Government also revived the scheme of subsidising Unani Hakims and in 1954 it was proposed to appoint fifty Hakims on a subsidy basis in various villages in Sind. A training institution where nurses, midwives and assistant midwives started functioning in Hyderabad in 1954 under the Social Uplift programme. The Church Mission boarding house building in Hyderabad, Sind, was acquired for the purpose of a hostel for the students. Training was also sanctioned for twelve candidates as Sind Government nominees in the X-ray and Laboratory Course in the Karachi T.B. Hospital. Sind and Khairpur tend to be singularly free from serious epidemics. Apart from the plague epidemic at the end of the last century and the great influenza epidemic of 1918-1919 (to which reference has already been made in the History chapter of this Gazetteer), Sind has not been troubled by any epidemic catastrophe."

Vaccination.

Vaccination in Sind is under the control of the Director of public Health, who has Inspectors of Sanitation and Vaccination to assist him. In the town of Karachi vaccination was made compulsory in 1879 by a special enactment, Bombay Act IV of 1879, in accordance with which it is provided with public vaccine stations, vaccinators, and a superintendent, all controlled by the Deputy Commissioner of Sanitation. In the towns of Sukkur, Rohri and Larkana vaccination was made compulsory later at the request of the municipalities by notification, bringing Act I of 1892 into force. Generally the progress of vaccination is dependent on the persuasive arts of the vaccinators, assisted by the headman of the village. Vaccinators are paid from local funds, but the municipalities maintain their own vaccinators. The opposition to vaccination which persisted for many years has gradually weakened, and very possibly the departure of the caste

Hindus, many of whom objected to vaccination on grounds of principle and religion, has helped the permanent establishment of vaccination as a protection against the ravages of smallpox.

C.M.S. Work.

An account of medical progress in Sind would be incomplete without some reference to the outstanding services rendered to the Sind countryside by the devoted work of the Church Mission Hospital which had its headquarters in Quetta. The compiler of this Gazetteer is indebted to Henry Holland, Kt., C.I.E., who, over fifty years, has proved himself to be one of the foremost Ophthalmologist in the whole world and who has given an account of his career in the autobiographical form "Frontier Doctor" published in 1959. Sir Henry Holland has contributed the following note for this Gazetteer as this is an appropriate place for recording the inestimable services which have been given to the people of Sind:—

"Dr. Sutton in 1885 founded the first Mission Hospital in Baluchistan. All other medical work of the Church Mission Society was derived from this hospital in Quetta. Dr. Summerhayes succeeded Dr. Sutton in 1897 and I was in charge from 1902, though I joined the Church Mission Society Hospital in 1900. At that time it was a small hospital of 28 beds.

It soon acquired a reputation for opthalmic work and in 1908 I was invited by some Hindu shopkeepers in Jacobabad to operate in a building adjoining a Hindu Temple; I was there for about two weeks and operated on some 40 patients.

Two years later I was asked to pay a visit to the Shikarpur is by Seth Hiranand Mendha. He offered to pay all the expenses and to entertain us. He put the front verandah of his bungalow outside the hospital at our disposal, and it became thronged by patients of all kinds. I could not cope with the crowds and so telegraphed for assistance to Dr. Neve, who was then in the Punjab. We performed some 600 operations including 250 cataracts.

After the Clinic was over I signed a 10 years agreement to visit Shikarpur for six weeks to two months in January and February. The Seth put up a very rudimentary hospital and was responsible for all expenses in connection with the running of it. Up to 1935, the year of the great Quetta earthquake, the Clinic continued to function, but the buildings were

miserable and really unfit for human habitation, and we were able to obtain a new site to the south of the railway by the kindness of the Government. Sir Hugh and Lady Dow collected about 2 lakhs of rupees to put up a concrete building to house 1,000 patients and their friends and a good operation block.

The Shikarpur Hospital is now called the Sir Henry Holland Hospital, and every year big Eye Clinics were held 180 surgeons have attended the hospital in Shikarpur in order to gain operative experience. At the present time Dr. Ronald Holland is in charge of this work. Since work began in 1909 some 70,000 operations for cataract have been carried out. As a rule 1,800 to 2,000 operations were performed in six weeks; 200 operations have been done in one day including 109 cataracts.

Some 37 years ago I was asked by the Poor Patients Relief Society of Karachi to hold a Clinic in Karachi, which I visited for 6 or 7 years and where I operated on many cases. For several years we had an annual Clinic in the Khairpur State, where 600 or more operations were performed each year".

C.Z.M.S. Work.

No account of public health in Sind and Khairpur can be complete without some word on the pioneer work carried out over a generation by two very courageous ladies, namely Miss Rachel Piggott and Miss Alice Ward, of the Church Zanana Mission Hospital. The compiler of this Gazetteer has a vivid memory of meeting these intrepid pioneers in the sandy wastes of the Khandhkot taluka of the Upper Sind Frontier district in 1927, where they were establishing centres for the training of the village dais, or midwives, in a countryside largely populated by Baluchis. In those days they used to drive in an old Ford car, popularly called a 'Tin Lizzie', over the rough sandy tracts, through the scrub jungles and the distant rural areas in Sind, in order to carry out their mission of humanity. The compiler of this Gazetteer is indebted to Miss Ward for a brief account of the operations of this beneficent venture, which laid the foundation of all subsequent training of midwives and maternity nurses in rural Sind. Miss Ward is still alive and shows her interest in her life work, though she is now well over eighty years of age, by returning every year to Hyderabad, where the original Zanana Mission was started. It is right that an achievement of this kind should receive suitable notice in the present Gazetteer.

Miss Ward's Account.

"The medical work of the Church of England Zanana Missionary Society in Hyderabad was started by Miss Compton in the early nineties of the last century. When Miss Compton was killed in a carriage accident at Quetta, Rachel Piggott followed her. As Rachel said, "Most of her work was trying to repair the damages caused by the indigenous midwives, who received no training but just inherited their knowledge from their mothers, so she set about trying to make these women less dangerous." Classes were started for them and they were paid 8 annas for each attendance. It was uphill work as the women considered that they knew more than their teacher, whose mother had been ignorant, while their people had been in the profession for generations. Medical headquarters at Delhi were interested and gave Rachel Piggott every encouragement. So in 1918 the Dais' Improved Scheme was officially started. From an attendance of one the class went up to thirty-three pupils, all of them now keen on learning. A conference for Dais was held and was attended by the wife of the then Governor of Bombay."

Mortality Rates.—Sind's population, like that of India, is characterised by high levels of fertility and mortality. Inter-connected with this feature is the high infantile mortality. Thus the birth rate, death rate and infantile mortality rate are much higher than those of Western countries, where population shows a decreasing rate of growth, or actual decline, at low levels of fertility and mortality in the process of industrialisation and urbanisation. On the other hand, the rise in the death rate during a quinquennium was not so uniform. In fact, in the quinquennium preceding the War the rates for British India varied between 22 and 24 per mille and it was 21 per mille in 1940 and 1942 and 22 per mille in 1941. It was only in 1943 and 1944 that it increased to 24 per mille. The infantile mortality rate for British India came down from 164 per 1,000 live births in 1935 to 156 in 1939; but from 1940 onwards there was an upward swing. In 1940 there were 160 per 1,000 live births, and 158, 163, 165 and 169 in the preceding years from 1941 to 1944.

The following tables, inadequate though they are, show:—

- (i) Birth and death rates for Sind and the infantile mortality rate for Sind for the years 1952-56.
- (ii) The causes of mortality for the last five years (1952-56) available from the chief diseases classified by diseases in Sind.

Years.	Area.	Birth rate per 1,000 of population.	Death rate per 1,000 of population.	Infantile mortality per 1,000 of live births.
1952 ..	Sind.	5.59	3.46	85
1953 ..	Sind.	5.74	3.01	74
*1954 ..	Sind.	4.31	2.05	75
*1955 ..	Sind.	4.19	2.24	74
*1956 ..	Sind.	5.31	3.02	86

The system of registration of births and deaths did not exist in Khairpur State, now Khairpur district of Khairpur region.

Years	Area.	Cholera.	Smallpox.	Plague.	Fevers.	Dysentery & Diarrhoea.	Respiratory Diseases.	Injuries.	All other causes.
1952	Sind Province.	..	263	..	11,200	217	2,207	..	2,332
1953	Sind.	..	19	..	10,803	231	1,077	..	2,144
**1954	Sind.	..	14	..	5,656	88	1,217	89	2,750
†1955	Sind.	..	66	..	6,748	136	2,108	71	1,747
††1956	Sind.	..	95	..	9,970	162	2,404	113	2,104

The system of birth and death registration does not exist in Khairpur State, now Khairpur district of Khairpur region.

According to a statement made in the First Five-Year Plan for Pakistan 1955-1960, the infant mortality rate is believed to be between 110 and 130 per mille, and the maternal death rate in childbirth from 4.4 to 6.8 per 1,000 births. From the fact that, despite the fall in the birth rate, the population of Sind and Khairpur has been increasing at the rate of about 10 per cent. per decade, it may be inferred that the measures for preserving life in the general population are having a very marked effect. The Indian Year Book for 1947 on the subject of maternity and child welfare remarks that amongst the most pressing problems of India's health is that presented by the appalling maternal and infant mortality. The figures of maternal mortality are not accurately known; but some 2,00,000 mothers lose their lives each year as the result of pregnancy and childbirth. The number of mothers who suffer from ill-

*Only 80%, 60% and 78% data are available for the years 1954, 1955 and 1956 respectively.

* Only 80% information is available.

** Only 60% information is available.

† Only 78 % information is available.

†† The separate figures are not available. These figures are included under Head "All other causes" noted against the years 1952 and 1953.

health and are disabled temporarily, or permanently, as the result of the normal physiological function of child-bearing, is at least twenty times the annual maternal deaths. Every year more than $2\frac{1}{2}$ million children die before the age of five years, while many others survive, only to grow weak and feeble from unhygienic surroundings, during infancy and childhood.

Hospital and Welfare Development.—The maternity and child welfare movement, which aims to promote maternal and child health and to reduce deaths, owes much to the All-India Maternity and Child Welfare League initiated by Lady Chelmsford in 1918, and also, since 1920, to the Indian Red Cross Society. The amalgamation of these two bodies in 1931, forming the Maternity and Child Welfare Bureau, Indian Red Cross Society, has undoubtedly increased and developed the work. The individual figures for Sind and Khairpur on this important subject are not available. It would be safe to infer that the progress made in India generally has certainly been repeated in Sind. Sufficient has been said in this chapter and in the chapter on Rehabilitation, Welfare and Reforms to warrant the belief that the authorities are keenly alive to the importance of continuing and expanding activities whose aim is the improvement of conditions for mothers and for young children. Since the curative and preventive branches of medicine have now been combined under a single administration, it is not necessary to describe in detail the history and working of the hospitals and dispensaries during the last half century. Details of hospitals and dispensaries as they exist today will be found in the District Volumes of this Gazetteer. Improving medical facilities has been one of the chief objects of planning in the last ten years. In its brochure "Sind People and Progress" the Sind Government has stated that the establishment of an Eye Hospital is one item in the Social Uplift Programme. It is proposed to establish a full fledged and independent Eye Hospital in Hyderabad, in addition to a wing for eye diseases which will form part of the 50-bed Clinical Hospital to be constructed on the permanent site of the Liaquat Medical College, Hyderabad. It was finally decided that the new buildings of the Liaquat Medical College and its 500-bed Teaching Hospital should be located on the right bank of the River Indus in the University town, for which 20 acres of land have been earmarked. Final plans have been passed for a construction project with a capital outlay of Rs. 1,55,00,000. The foundation stone of the college was laid by His Excellency the Governor-General of Pakistan on the 6th January, 1954. The blocks in this hospital which were accorded priority were hostels for boys and girls with an intake capacity of 250 and 50 respectively and residential accommodation for the staff. Plans and estimates have also been prepared for a T. B. Sanatorium and the foundation stone of the sanatorium was laid by His Excellency the Governor of Sind. Under the same

programme there is a scheme for the extension, improvement and re-organisation of hospitals and dispensaries in Sind. It includes the extension of the Civil Hospital buildings at Nawabshah, Dadu and Mirpurkhas and the Mental Hospital at Hyderabad, Sind, by providing extra accommodation for 152 beds, the extension and renovation of 33 taluka town dispensary buildings and the establishment of a new Civil Hospital at Thatta with an indoor accommodation of 100 beds. In addition to the above Social Uplift Schemes for the expansion of medical facilities in the province, the Government of Sind have also sanctioned a scheme for the construction of a new Civil Hospital building at Larkana, Sukkur and Jacobabad with an indoor strength for 126, 200 and 100 patients respectively at an estimated cost of Rs. 53,61,000, and it was contemplated to raise the bed strength of the Civil Hospital, Hyderabad from 132 to 500 and to provide other necessary extensions in it at an estimated cost of Rs. 20,00,000. The construction work of the new civil hospitals at Larkana, Sukkur and Jacobabad in 1954 was nearing completion. Additions and alterations, including the construction of 20 nurses' quarters, private wards, canteen blocks and bathrooms involving an expenditure of Rs. 2,88,000 had already been carried out in the Civil Hospital, Hyderabad. Under the Five-Year Development Plan the following additional schemes were formulated by the Sind Government for inclusion in the new Five-Year National Development Plan 1955-1960, namely, the establishment of a T.B. Hospital in each district, reorganisation and establishment of the Provincial Medical Stores Depot at Hyderabad, the improvement of district headquarter hospitals by providing facilities for eye, dental, ear, nose and throat and skin diseases and for the treatment of gynaecology, children's and maternity diseases, the opening of 64 new dispensaries in the province, the strengthening of hospital staff, post-graduate training abroad and post-graduate training in Pakistan.

Mental Hospitals.—There is only one Mental Hospital in Sind and Khairpur. This is the Cowasji Jahangir Mental Hospital situated at Gidu Bandar near Hyderabad. It was built in 1871, Sir Cowasji Jahangir Readymoney of Bombay having given half a lakh of rupees for the purpose. It is a mental hospital for the whole of Sind and superseded one which had hitherto been in use at Larkana. The building cost Rs. 68,441 and the Government paid the balance. It covers over 25 acres and comprises six yards for different classes of patients. There was originally accommodation for 180 males and 20 females. The hospital that is attached had room for six patients. Extensions have since had to be made in view of the increase in the number of mentally afflicted persons requiring treatment. The Civil Surgeon at Hyderabad is the Superintendent and two assistants under him reside on the premises. The Mental Hospital is visited, once, a month by official visitors.

The following table shows the total population of patients for the years 1954 to 1958 inclusive.

Years.				TOTAL POPULATION.		
				Males.	Females.	Total.
1954	..	..	..	373	92	465
1955	..	..	..	416	112	528
1956	..	..	..	420	93	513
1957	..	..	..	403	117	554
1958	..	..	..	479	130	609

The following table shows the religion, sex and residence of patients admitted into the Hyderabad Mental Hospital during the year 1958.

District.	Christians			Hindus.			Muhammadans.		
	Natives.								
	Males.	Fe- males.	Total	Males.	Fe- males.	Total	Ma le	Fe- males.	Total
1. Hyderabad ..	1	..	1	2	..	2	155	52	207
2. Sukkur ..	..	..	..	..	..	..	15	3	18
3. Quetta ..	..	..	..	..	..	..	7	3	10
4. Sanghar ..	..	..	..	..	..	..	20	1	21
5. Larkana ..	..	..	..	..	..	..	5	..	5
6. Jacobabad ..	..	..	..	..	..	..	3	..	3
7. Dadu ..	..	..	..	..	..	..	5	1	6
8. Karachi ..	1	..	1	..	..	..	14	3	17
9. Mirpurkhas ..	..	1	1	1	..	1	10	..	10
10. Khairpur Mirs.	..	..	..	..	..	..	4	..	4
11. Thatta ..	..	..	..	..	..	..	3	..	3
12. Nawabshah ..	..	..	..	..	..	..	4	..	4
	2	1	3	3	..	3	246	63	309

The following statement shows the form of mental disorder in the admissions, discharges, recoveries and deaths during the year ending 31st December, 1958.

SHOWING THE MOST PREVALENT FORMS OF MENTAL DISORDER

Nature of disorder.	Admissions during the years.			Total at end of year.			Discharges						Deaths.		
							Recoveries.			Otherwise.					
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	Y.	M.	F.	T.
Mental Deficiency.	1	..	1	43	11	54	2	..	2	..	..	..	5	1	6
Manic Depressive Insanity.	62	26	88	120	44	164	62	13	75	..	..	..	..	..	..
Melancholia.	3	..	3	7	2	9	3	..	..	..	..	..	..	..	..
Schizophrenia including Dementia Praecox.	168	34	202	273	59	332	134	33	167	..	..	..	12	4	16
Paranoia and Paronoid states	..	..	..	4	4	8	..	..	..	..	..	..	1	..	1
Epilepsy and Epileptic Insanity	3	1	4	11	6	17	1	..	1	..	..	..	1	1	2
Toxic Psychosis of Endocrine origin	9	1	10	14	1	15	14	..	14	..	..	..	..	..	..

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CHAPTER XVIII

**THE REFUGEE PROBLEM AND REHABILITATION
DEVELOPMENT AND SOCIAL WELFARE**

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TABLE OF CONTENTS.

				Page.
The Refugee Problem of 1947-48.	---	..	..	751
Unsettlement of Populations.	..	..	..	752
Rehabilitation of Refugees.	..	..	..	755
Rehabilitation measures by Sind Government after partition.	---	---	---	757
Industrial Development.	---	---	---	758
Social Welfare.	---	..	..	761
Five-Year Plan of 1955-60.	..	..	..	762
Welfare measures by Sind Government after partition.	..	..	---	763
The Revolution of 1958.	---	..	..	769
Land Reforms.	..	..	..	770
Abolition of jagirdari by Sind Government.	..	..	..	772

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CHAPTER XVIII

THE REFUGEE PROBLEM AND REHABILITATION, DEVELOPMENT
AND SOCIAL WELFARE.

The refugee problem was the direct result of the partition of India in August 1947. It was occasioned by religious and political disagreements in Upper India. Much bloodshed and great misery ensued in the area affected which included the Punjab on the borders of Sind. Wholesale migrations of populations followed. The migration of people was due chiefly to the fear of ill-treatment by persons of different religion. The migrations continued for at least four years from 1947 and were still important in the Sind and Khairpur area in 1952. From the stand-point of development the major effects of partition were the enormous upheaval that accompanied the wholesale transfers of population, disruption of trade and business, of channels of communications, of marketing relationships, of industrial and commercial organisation and the pressing need to establish new central and provincial governments. It is estimated that a group of 6 million refugees with few assets of their own crossed over from India after partition. Rarely before in the history of mankind has such a large scale transfer of population taken place under such adverse conditions and within so short a time. The refugees had no shelter to go to, no cash to support them. Towards the early months of 1948 the expenses of feeding them were running into crores of rupees. Then there were the huge tasks of compensating, resettling and rehabilitating them. The background of the Muslim refugees who arrived in Pakistan was different from that of the Hindu and Sikh evacuees who left. Many of the latter lived in towns and were engaged in trade, business and money-lending, following the professions of law, medicine, engineering and business management. But the Muslim refugees who crossed over into Pakistan were mostly agriculturists and craftsmen. The vast departure of non-Muslims created a void in many vital fields which the Muslim refugees with different occupational patterns could not always fill. Banks and insurance companies, manufacturing and commercial firms were crippled as Hindus who had operated them left in large numbers, leaving only inexperienced and lower grade staff behind them. The village money lenders who, with all their faults, nevertheless provided a much needed source of credit for cultivators largely disappeared, and the resulting absence of rural credit facilities remains a problem to this day.

Refugee
Problem of
1947-48.

Despite its preoccupations with the immediate effects of partition, the Government of Pakistan from the very outset realised the importance of development. To co-ordinate national building schemes and determine their priorities a Development Board, a Planning Advisory Board and an Economic Committee of the

Cabinet was set up as early as 1948. Later on the Ministry of Economic Affairs was established in 1949 to co-ordinate planning and the economic activity of different ministries. A Six Year Development Plan was prepared and was scheduled to go into effect from the middle of 1951. In order to execute the six year plan the Government of Pakistan set up an autonomous administrative machinery consisting of an Economic Council, a Planning Commission, a number of sub-commissions replacing the earlier Development Board, the Planning Advisory Board and the Economic Committee of the Cabinet. Despite the progress made since independence, which was spectacular in some fields the industrial basis was still too small, agricultural production was inadequate and the foreign exchange position was precarious. There was a mal-adjustment between agricultural and industrial development with consequent pressure on food grain prices and on the balance of payments. The taxation basis remained narrow, and national income and living standards continued low. The building capacity was extremely small and there was a serious shortage of technical skill of all sorts. A solution of the country's greater economic problems, namely low per capita income, chronic food shortages, precarious balance of the payments position and an unbalanced economic structure, called for a more comprehensive, expanded and co-ordinated approach to planning and development. Advantage had to be taken of the past progress to accelerate development even further since the rate of progress in 1954-55 was inadequate for the needs of the country. These considerations influenced the formulation of the First Five-Year Plan which aims at promoting healthy economic growth with stability. The First Five-Year Plan must, however, be viewed as the beginning of a determined effort to bring about co-ordinated and balanced development in Pakistan which should advance towards the attainment of a satisfactory standard of life materially and culturally for the people.

Unsettling of Popula- tions

Though Sind and Khairpur were spared the horrors of bloodshed and violent crime which disgraced parts of the Punjab and Upper India, they did not escape the harrowing experience created by the rapid transfer of unsettled populations, and the proportion of refugees settling in Sind and Khairpur was about the same as the proportion of refugees settled in Pakistan as a whole. In Sind the figure was a little over 11 per cent. of the total population, which means that in Sind and Khairpur today about 1 person in 10 is refugee, or muhajir, uprooted from his ancestral home and trying to adapt himself to the conditions prevailing in Sind and Khairpur which were completely unfamiliar to him. When it is remembered that the number of muhajirs who settled in Sind was more than half a million according to the Census of 1951, one can realise the extent of the administrative problems which faced the authorities in dealing with this vast army of haras-

Sed and, for the most part, indigent people. The partition of the Indo-Pakistan sub-continent was immediately followed by a two-way exodus of population on a huge scale, the entire Sikh population and the majority of the caste Hindus migrated to India in hot haste. The exodus of the latter shook the very foundation of the Government services which were to a large extent manned by them. Reorganising the administration from top to bottom, therefore, became the most urgent of all the problems with which the Provincial Government was confronted. Another vital point where the exodus hit the province was its business economy, of which the outgoing caste Hindus, who were traditional financiers, formed the backbone. The normal channels of trade and commerce dried up and the banking system was almost paralysed. The task of filling the void thus created in the economic structure of the province could not be completed without a series of essential intervening developments. The Muslims of Sind had perforce to shake off their shyness of trade and commerce, and they successfully adapted themselves to business. This enterprising spirit, coupled with the expansion of the co-operative banking system by Government and aided by the influx of muhajirs belonging to business communities, largely restored economic conditions in the province. The total Sikh population enumerated in the Province of Sind and the Khairpur State in the year 1941 was 31,011 and 6,616 respectively. All of them migrated immediately after partition. The first influx of muhajirs started in 1947, immediately after partition and at a time when the Government machinery was greatly weakened by the desertions of the old and experienced Hindu government servants. The depleted staff was still struggling with the settlement of the muhajirs who were coming into Sind on their own initiative, when the Central Government in 1948 transferred to Sind more than 2 lakhs of muhajirs from the Punjab camps. All the while large numbers of muhajirs from all over India continued to pour in. Hardly had these muhajirs been settled, mostly through their own efforts, either on agricultural evacuee lands under the Government plan or in urban areas, than communal disturbances broke out again in India early in 1950. Muslims in large numbers crossed the border *via* Khokhrapar in the Thar Parkar district to seek asylum in Pakistan. The influx continued for several years and made the task of settlement one of great complexity and some hardship.

The bulk of those who came later from India belong to the urban classes, and even those from rural areas included a proportion of tradesmen and non-cultivating landowners needing absorption in commerce and industry, for which there is still little scope in Sind and Khairpur. The land of evacuated Hindus and Sikhs in the province was largely utilised for the resettlement of muhajirs, and the balance still available consists of lands which are either uncultivable or require substantial expenditure before

they can be rendered fit for cultivation. Some of this land is also situated in places which to muhajirs appear most unattractive. The settlement of muhajirs on agricultural land evacuated by Hindu landlords was not an easy task in the special circumstances prevailing in Sind where most of the actual cultivation was done by Muslim haris, land workers sharing the produce of the land. A certain amount of redistribution and reduction in the haris' holdings was inevitable and this process naturally evoked local opposition. Nevertheless, the problems were being gradually solved and the number of muhajir cultivators who reported themselves in the Census as unemployed was very small indeed. Where muhajirs cultivate land themselves and belong to the genuine agriculturist class they appear on the whole to be fairly content with their lot. The influx has not been confined to complete families. It also brought many widows and destitute women without any source of support or help. Efforts are being made to establish industrial homes for such women on a training-cum-production basis. Nearly two-thirds of the muhajirs are settled in urban areas and in many cases they have been allowed to occupy houses, shops and industrial concerns evacuated by departed Hindus. In addition to this section, however, the Government has found it necessary to establish satellite towns at Hyderabad, Mirpurkhas and Nawabshah to keep pace with the rapid expansion of the urban population, largely due to the influx of muhajirs. According to the 1951 Census the proportion of muhajirs in urban areas in Sind was 64 and in rural areas 36 per cent, and in Khairpur State the figures were 48 and 52 per cent.

DISTRIBUTION OF MUHAJIRS

Districts	Total Muhajirs.		In Urban Areas.		In Rural Areas.	
	Numbers.	%	Numbers.	%	Numbers.	%
Sind ..	5,40,278	100	3,44,720	63.9	1,95,558	36.1
Dadu ..	20,720	3.8	9,194	1.7	11,526	2.1
Hyderabad ..	2,05,641	38.0	1,77,180	33.0	28,461	5.0
Larkana ..	25,682	4.8	16,501	3.0	9,181	1.8
Nawabshah ..	93,345	17.3	41,136	7.6	52,209	9.7
Sukkur ..	93,739	17.3	66,636	12.3	27,103	5.0
Thar Parkar ..	88,765	16.4	28,323	5.2	60,442	11.2
Thatta ..	5,851	1.4	1,813	0.3	4,038	0.8
U.S.F. ..	6,535	1.3	3,937	0.8	2,598	0.5
Khairpur State.	1,00,013	..	4,889	48.2	5,124	51.8

The occupational distribution of the muhajir population is shown in Table 19 C of the 1951 Census which those interested in the matter may consult. According to the census enumeration out of 5.50 lakhs of muhajirs 3.39 lakhs are dependents, 0.6 lakhs are in the agricultural labour force, 1.30 lakhs are working in the non-agricultural labour force and only 4,000 are not in the civilian labour force including the inactive. Out of the 2.54 lakhs of muhajir females only 1,436 are self-supporting. The largest number of muhajirs in the labour force is 56,100 employed in cultivation, 37,700 in trade and commerce, 24,200 in manufacture, 10,700 in Government Service, 9,900 in domestic and personal service and 6,500 in transport. In the occupations as apart from labour 3,600 muhajirs have technical and professional occupations, 1,500 have administrative and managerial occupations and 11,200 have clerical occupations, 35,100 are sales workers, 58,400 agricultural and fishery workers, 31,700 are skilled operative and 32,700 unskilled labourers and 14,000 are service workers.

The schemes for the rehabilitation of refugees are difficult to separate from the general development plan for Pakistan. The history of development since the end of World War II is complicated because in 1946 extensive plans were drawn up under the direction of the Government of India for the expenditure on welfare and development schemes by provincial governments using the money that had been saved during the war years on account of the stoppage of major works. Another complication was the rapid constitutional changes which have affected Sind and Khairpur since 1946. On the partition of India and the independence of Pakistan, Sind remained a Governor's Province with full provincial powers under the Federal Government of Pakistan, and this continued until 1955 when the administrative division of Pakistan was altered into the two units of West Pakistan and East Pakistan and the Sind Government, like the other provincial governments, disappeared. The Khairpur State similarly lost its status when the one unit policy was adopted in 1955. It became absorbed in West Pakistan and the ruler of Khairpur was granted a privy purse to compensate him for the loss of his chieftain's rights and his income from the state. The result of all this on development has been that after the end of World War II comprehensive schemes of development were drawn up; but were not implemented as far as Sind and Khairpur were concerned, owing to the unsettlement created by the partition of India and the disorders which followed upon it. In 1955 when the Sind Government ceased to exist as an independent governing authority the main direction in development matters devolved upon the Central Government, which is now responsible in large measure for the wider schemes of development in contemplation, and indeed under execution, in accordance with the Pakistan Five-Year Plan 1955-60.

Rehabilitation of Refugees.

Before it was absorbed in the administrative reconstruction of Pakistan in 1955, the Sind Government had drawn up many ambitious plans for the betterment of the province and the amelioration of social and economic conditions of its people. The ambitious nature of these proposals can be gauged from a list of the main heads of development contemplated, namely multi-purpose waterways, irrigation and power development, agriculture and kindred subjects, veterinary and livestock, forestry, mining development, education and technical education, improvements in medical services and public health services, extension of roads and road transport, industries and industrial training and the development of fisheries, both marine and inland, and amongst other matters resettlement and re-employment, co-operation, rural uplift and village amenities, housing and town planning, labour and labour welfare and scientific research. As mentioned above, these plans could not be put into operation owing to the unsettlement consequent upon partition in 1947. Real progress in development in Pakistan became possible only when massive foreign aid was made available as part of the political policy of the western nations in their fight against the onset of communism from Russia and the East. As a result of subventions from abroad Pakistan was in a position to contemplate very large advances in almost every sphere of administrative, economic and social development. It is the execution of the plans so envisaged that has produced the remarkable achievements of the years from 1955 onwards. As far as Sind and Khairpur are concerned they can share in the work that has been allotted to the West Pakistan Government by the Central Government. But the general nature of what was contemplated is clear from the announcement made by the Chief Minister of Sind when presenting the Budget for the year 1954/1955. In his speech the Chief Minister outlined the main items in an imposing programme of development. Speaking of rehabilitation, the Chief Minister said: "My Government will give priority to the rehabilitation of new Sindhis. The problem is a stupendous one and it has many complexities. The position has been made more difficult by interested parties who for various reasons are trying to create a rift between the old Sindhis and the new settlers. It would considerably simplify the rehabilitation operations if the new settlers identified themselves with Sindhis and refrained from maintaining their separate existence. Formation of sectarian, social and political organisations, especially for the new settlers, has resulted in antagonising the old Sindhis and has thereby rendered the rehabilitation problems exceedingly difficult. Basically the problem of rehabilitation is to absorb the new settlers in the economic life of the province, and to give them, in the first instance, shelter and aid till they are economically rehabilitated. Conditions have, therefore, to be created by providing towns where they can be settled in large numbers, by removing congestion in towns, and by providing adequate accom-

modation for refugees. Government is already implementing three schemes for setting up new townships. The township of Hyderabad has made considerable progress, roads are being constructed, temporary water supply has been made available, plots have been laid out, levelled and cleared of shrubbery. A number of pukka houses have been constructed for the new settlers. A total amount of 91 lakhs has been provided in the budget for this purpose. Another similar town development project is being implemented near Mirpurkhas for which 22 lakhs of rupees have been provided. At Nawabshah, too, certain portions of the town will be developed for housing new Sindhis. Work on this scheme will start early next year. The ambitious social uplift and development programme outlined will involve a net capital expenditure of about 17 crores. If the expenditure to be financed from the grant sanctioned by the Central Government and that debitable to local bodies is taken into consideration, the gross expenditure will exceed 19½ crores”.

Until the year 1952/53 Sind has been granted development loans of only 60 lakhs. The mechanism for development was provided by the Provincial Development Board assisted by several expert committees. This development board held 75 meetings and 51 committee meetings. As a result of their deliberation an overall provincial six-year plan, which is in the nature of a collection of activities of the province within the framework of the country's six-year plan, was taken up. The objectives of the plan were to develop the natural resources of the province to the maximum potentiality, to expand social services, including provision of health and education facilities to a reasonable standard, and to improve the general economic condition of the province. A plan was drawn up consisting of 59 development schemes covering activities in various fields. The scope of the schemes may be understood from the main items comprised in them. These items included technical assistance with the object of training personnel for such specialised jobs as overseers, public works department mechanics, tractor operators, dragline operators, fitters, trained teachers, midwives, nurses and doctors. As regards irrigation the Lower Sind Barrage, the Ghulam Muhammad Barrage at Kotri, was being pushed on to its completion, and the Upper Sind Barrage at Gudu was being taken in hand. There was a combined water supply and drainage scheme for Hyderabad and Shah Latifabad, its satellite town, and a Lower Sind dam or grid project, providing for the 15,000 Kw. thermal station interlinking with the existing 5,000 Kw. Hyderabad steam station, was being set up. In the major road programme it was contemplated to spend 235 lakhs of rupees on 39 roads, the construction of which was started under the post-war development programme. A cement factory in Hyderabad was to be undertaken by the Pakistan

Rehabilitation measure by the Sind Government after partition.

Development Corporation and 204 lakhs were provided for mechanisation of the essential works of the Public Works Department. The mechanisation of agriculture was considered and arrangements made for the purchasing of more machinery of augment the mechanisation of the agricultural programme. A scheme was started to reclaim and colonise about $1\frac{1}{2}$ lakhs of acres of land in the Makhi Dhandh at a total cost of 1.05 crores of rupees. Amongst other major projects were the village agricultural development scheme, a pumping scheme for land between Laki and Kotri, the shifting of the agricultural college from Sakrand to Tando Jam near Hyderabad, where the soil was considered suitable for the purpose of the college. The subsidised distribution of sulphate of ammonia was sanctioned, and during the year 1953/54 13,000 tons were distributed. Other important plans included the building of up-to-date accommodation for the Liaquat Medical College at Hyderabad, the opening of an institute at Hyderabad, for cottage industry and others at Sukkur, Nawabshah and Larkana, construction of houses for poor refugees and the building of the satellite town at Shah Latifabad. A training institution for nurses was under contemplation in Hyderabad, where a building for the permanent location of the institution was acquired from the Church Mission there on the payment of 14,000 rupees. The Pakistan Industrial Development Commission also took in hand a sugarcane seed plantation farm in the Lower Sind Barrage area. The scheme was split into three distinct schemes. According to one of these schemes 50,000 acres were selected out of the $1\frac{1}{2}$ lakhs of acres which were surveyed for the purpose. Under a second scheme plantation work was soon to start and the third scheme aimed at the setting up of sugar mills, details of which were being worked out by the Pakistan Industrial Development Commission. It is contemplated too to nationalise electrical undertakings, in addition to the electrical undertaking at Hyderabad which had been already nationalised, and have generation stepped up by another 3,500 Kw. by the better and more regular supply to the area served.

**Industrial
Development.**

As regards Industrial development, development of large scale projects was a Central subject, as under the Development of Industries Federal Control Act, 1949 development planning and regulating the setting up of almost all major industries was put under the control of the Central Government. Twenty-seven industries have so far been specified in the schedule attached to this head. Of the twenty-seven industries controlled by the Central Government, the following units have so far been allocated for development in Sind: the cotton textile industry 250,000 spindles, the whole amount of which was allocated, three textile mills having already gone into production and four more being under installation. wool spinning: 4,000 spindles were allocated

for Sind and advertised for applications; in hosiery units the Sind allotment was 1 unit consisting of at least 20 power-driven big machines and 100 hand-driven small diameter machines; for carpet factories the Sind allotment was 1 unit consisting of at least 20 power looms, in addition to hand looms, potteries—the Council of Industries decided that a modern pottery unit be set up in Sind, clay being very suitable round Hala and Sehwan. 1 unit was allotted to Sind for small arms for sports. 5 units were allotted for sugar, the 5 units having a cutting capacity of 1,000 tons per day each. Each unit would have its own attached plantation of 10,000 acres, and the Pakistan Industrial Development Corporation has started survey work in this connection. 1 strawboard manufacturing unit has been allotted to Sind for the manufacture of paper, cardboard and pulp. The Pakistan Industrial Development Corporation considered the possibility of establishing it by making use of agricultural residue which was plentiful in Sind. Cement—1 factory of the production capacity of 400 tons per day was allotted to the province, which in view of the availability of raw materials was set up at Hyderabad in collaboration with the Pakistan Industrial Development Corporation. This cement factory is in operation and producing 20 tons per day. In order to encourage the industrial development of the province, which in the past has had a predominantly agricultural economy, the Sind Government established 4 trading estates for the facility of intending industrialists.

The scheme of trading estates implies the setting up of planned industrial zones where rail and road facilities, electric power, water supply, model factory buildings, storage accommodation and labour accommodation can be provided. With the return to peace after the Second World War and the urgent need for rehabilitation schemes, it was decided that an all-out attempt should be made to attract in a positive manner all industrialists who were willing to come to the province. In order to provide a practical method of encouragement it was decided to adopt the trading development estates scheme as developed by the British Board of Trade. Accordingly a preliminary industrial survey of the province was made, and it was first decided that three estates should be provided at Karachi, Hyderabad and Sukkur. Recently the Sind Government decided to establish another at Tando Adam. The Karachi estate is, of course, now within the area controlled by the Central Government and does not concern Sind any more. At Hyderabad the estate was intended to cater for industries relying on the surrounding districts for their raw materials, for example cotton textiles, tanning, oil seed crushing and refining, manufacture of vegetable cooking fat and for the large potential seasonal industry in the manufacture of fruit cordials, jams, preserves and the canning of grapefruit. The Sukkur estate was also intended to provide

facilities for factories utilising local raw materials, the main industry to be catered for being woollen mills, oil seed industries and hides and skins. The training estate at Tando Adam is mostly intended to provide for textile industry. The extent to which these numbour schemes can be carried to completion depends entirely on the extent to which the West Pakistan Government will now endorse the general policy outlines by the Sind Government in 1954, and on the support which, through the various corporations set up by the Central Government, the Government of Pakistan will provide funds for implementation. The immense cost of carrying out the Five-Year Plan is being met by foreign aid, which up to the end of December 1956 amounted to 640 million dollars, that is 306 crores of rupees. As much as 80 per cent of this came from the United States of America. Other major contributors were Canada, 55 millions as a grant; Australia, about 27 million dollars as a grant; the United Kingdom, over 30 million dollars, of which 28 million dollars were on a loan basis. Of the total aid of 640 million dollars 89 million dollars were in the form of loans and 120 million dollars in the form of sales of U.S. surplus agricultural commodities against Pakistan rupees, which however were again available for use in Pakistan. Of particular interest to Sind was the contribution of New Zealand, which was 4.2 million dollars; of this 3.1 million dollars were received for financing the cost of the Zealpak Cement Factory at Hyderabad. This factory, designed to produce 240,000 tons of cement, has contributed materially towards meeting the cement requirements, not only of Karachi and Hyderabad, but also of East Pakistan. The main items in which Sind and Khairpur have benefitted from the vast developmnt plan, which is being carried out through the Government of Pakistan with the assistance of the Provincial Government of West Pakistan, are cotton textiles, cement and the natural gas pipeline from Sui in Baluchistan to Karachi, which for greater part of its distance runs through Sind and Khairpur. No adequate idea of the scope of development in Sind and Khairpur can be got from an examination of what is happening in Sind and Khairpur alone, since the whole work of development is a vast co-operation between the Central Government through its various development corporations and the Provincial Government. But the allocation in the 1955/1960 Five-Year Plan shows that for Pakistan as a whole the following percentages of allocations are provided for under the main item of expenditure, namely village, agricultural and industrial development and rural development outside village, agricultural and industrial development areas 3.2 per cent; agriculture, including colonisation, animal husbandry and fisheries 12.9 per cent.; water and power development 28.8 per cent, industry including fuels and minerals 17.4 per cent.; transport and communications 17.8 per cent; housing and settlements 9.2 per cent; education and training 6.2 per cent.; health 3.1 per cent.; social welfare and other items

1.4 per cent. As regards the allocation for fields of development in the public sector 1957/1960 central and provincial schemes combined, the figures for West Pakistan, no separate figures for Sind and Khairpur being available, are village A.I.D. and rural development, 13 crores; agricultural, 47 crores; water and power development, 133 crores; industry, fuels and minerals, 38 crores; transport and communications, 65 crores; housing and settlements, 21 crores; education and training, 22 crores; health, 12 crores; social welfare, labour and employment and miscellaneous, 2 crores. Sind has of course benefitted greatly under the allocation for water and power development by means of subventions for the contribution of the two Barrages, the Ghulam Muhammad Barrage at Kotri and the Gudu Barrage at Gudu. The Sui-Karachi gas pipeline is another great undertaking. This pipeline was completed in August 1955 and is now supplying about 12,500 million cubic feet of gas per annum. Almost all the major industrial consumers are now utilising natural gas instead of other fuels. Schemes for the distribution of gas in the Sui-Karachi zone have already been finalised by the two distribution companies, namely the Karachi Gas Company Ltd. and the Indus Gas Company Ltd., and work relating to the laying down of distributing mains has already been taken in hand.

SOCIAL WELFARE.

The idea of social welfare, as far as the Indo-Pakistan sub-continent is concerned, is a completely modern idea. During the days of British rule social welfare was in its infancy and the chief means of improving social conditions was through the extension of medical aid and enlarging the scope of rural dispensaries by the free distribution of quinine to attack malaria, and, in the educational field, by bringing into the curriculum regular hours for the carrying out of physical exercises and organised games in order to improve the physique of children. The other main line followed in the early days of social welfare was by the encouragement of the facilities for rural credit under the co-operative societies. Some good was done by these measures, but nothing was achieved thereby in reaching the great object of social welfare plans, which was to bring about in rural areas co-operation between persons living in the same village in matters affecting their common interest. The social and religious structure of the Sind and Khairpur countryside provided few parallels with the conditions which made the carrying out of social welfare schemes in Western Europe so successful. The reason is that the social structure of the Sind and Khairpur village is based, not on residence in the same area, but on belonging to the same religion or being a member of the same tribe or caste. It is not true to say that in the average village each villager knew the other and was a friend of his. He might have acquaintances amongst his fellow-villagers, but his friendships did not extend beyond the demands of what an organised religion

or a fixed tribal or caste structure required. For measures of social welfare, therefore, to succeed it is necessary that a changed outlook should take the place of the existing parochial sectarianism.

**Five Year
Plan 1955-60**

This fact has been recognised in the Five-Year Plan 1955/1960 for Pakistan where emphasis has been placed, as far as rural areas are concerned, on the village agricultural and industrial development scheme, called for short village A.I.D., and agency for uplifting and developing the rural community. The economy of the country, the plan says, is based on the village, where over 80 per cent. of the population of Pakistan lives in 100,000 village whose manpower is the country's principal asset. The plan says millions of rural people can do more to improve their lives than can be done by the Government through a few large scale schemes. The Government can assist by providing specialists in agriculture, health, construction and community organisation, by making available physical resources not available in the villages and above all by supplying the village A.I.D. worker with a readily accessible advisor who can maintain continuous contact with the villagers and help them to understand their problems and take advantage of the services of the specialists provided through Government funds. The basic concept of the village A.I.D. programme is to provide a means by which technical and financial assistance from the Government can be used to draw forth the resources of skill, energy and money which exist in the villages, to channel them into productive use to create means by which they can be progressively enlarged. Vast efforts at rural development have achieved only limited success because of the inadequate range of the efforts, too restricted an approach to the problem, an attitude that encouraged hostility or indifference on the part of the villagers, failure to consult the villagers and to maintain continuous contact with them, meagre resources allocated to the effort and above all the failure of the Government to make rural development the main content, as well as the objective, of policies and programmes. The obstacles are great and well-known: illiteracy, ill-health, poor communications, inadequate technical staff, backward local institutions, particularly those for credit, for village government and for co-operation, listless and apathetic attitudes amongst the villagers, out-moded conditions and many others. This is all true; but the main obstacle to success must remain the attitude of the villager himself and until the semi-feudal and semi-tribal and semi-parochial outlook is in some way lessened, the chances of success in the immediate future will not be great. During World War II it was not possible to proceed with ambitious schemes for the improvement of social welfare. But after the coming of independence and the emergence of Pakistan as an independent state things began to move.

The basic unit in the village A.I.D. programme is the development area which normally will include about 150/200 villages with a population of about 100,000. The staff in the development area will consist of village workers, supervisors, a development officer and subject matter specialists of the various development departments. There will be one village worker for every group of five to seven villages and about thirty village workers for a departments. There will be on village worker for every group ment Officer village workers would maintain continuous contacts with the villagers and stimulate and guide self-help organisations in their planning and development activities. The taluka and sub-divisional headquarters are usually well provided with technical staff, except in certain areas. When the programme is extended to cover any administrative area fully specialists will be needed in the taluka sub-division in agricultural engineering, plant protection, village industries, forestry, fisheries, horticulture, soil conservation, range management, and the specialists who will give advice and assistance to village workers and the villagers will be representative of the following technical fields: farm management, agriculture, animal husbandry, co-operation and marketing, health and sanitation, work supervision, social education for males, social education for females and other subjects; such as cottage and small industries, fisheries, forests and range mangement. In the Five-Year Plan the areas opened, or to be opened, are set out in a table to the following effect for West Pakistan: in 1954-55 six areas, 1955-56 thirteen areas, 1956-57 eleven areas. 1957-58 nineteen areas. 1958-59 twenty-one areas, in 1959-60 twenty-three areas.

The Chief Minister for Sind, in introducing his budget in 1954, made the following remarks on the progress of social welfare in Sind: "To integrate and co-ordinate," he said, "all activities of Government in rural areas and to improve generally the conditions of the villages, both in the field of social and cultural uplift and economic development, Government have taken up the implementation of the village A.I.D. scheme. The budget envisages a modest gross expenditure of about 6 lakhs on this scheme. The expenditure will, however, mount up from year to year as the project area is extended. I am glad," he said, "to inform you that the Central Government have accepted the principle that they will contribute 50 per cent. of the nett cost of the scheme. The Ford Foundation is also giving substantial financial aid in the running of the training centre, and has promised to supply equipment for the projects. The policy of the Government is to pay full attention to the welfare of the tillers of the soil, the haris, on whom the agricultural economy of our province depends. The rights of haris will be fully safeguarded by Government and action will be taken to ensure that they are not evicted illegally from land

Welfare measures by Sind Government after partition.

cultivated by them. The provisions of the Tenancy Act are being re-examined to bring about suitable amendments to protect further the interests of the haris. Hari welfare centres will be started all over the province. During the first stage one such centre will be set up at each district headquarters. These centres will provide hostel facilities for haris visiting bigger towns and marketing centres. A Welfare Officer will be appointed at each centre, and arrangements will be made for giving visual instruction to the haris visiting the centres. Newsreels and films dealing with education, public health, agricultural and veterinary subjects will be provided for the purpose. Haris will also be provided with medical aid at these centres."

With a view to ameliorating the condition of Sind agriculturists, the Sind Government appointed the Sind Agricultural Commission consisting of non-official members with effect from the 24th July 1953. Amongst the terms of reference submitted to the Agricultural Commission were: to find out the causes of poverty and unsettled conditions of agriculturists in Sind; to suggest ways and means of improving the standard of living and economic conditions and also for their proper settlement; the settlement of nomadic tribes and persons living in scattered huts; to devise ways and means for the proper financing of all agriculturists. This committee published its report in 1955 in the form of a most valuable document throwing much light on the conditions prevailing in the country in that year. The various recommendations made by the Agricultural Commission have not, of course, been carried out, since in the end of 1955 the Sind Government itself disappeared in the reorganisation of West Pakistan, and the implementation of such recommendations as may be thought desirable is now left in the hands of the West Pakistan Government in Lahore. But, as that Government is fully sharing now in the carrying out of the Five-Year Plan for Pakistan, it may be assumed that such recommendations as are thought valuable will be implemented in due course. The report gives some interesting statistics of the condition of the country at the time the report was published, namely that about 71 per cent. of the entire population of the province depended upon agriculture and 13.6 per cent. were engaged in business, trade and industry. But, although the exact figures were not available, it was clear that about 50 per cent. of the agricultural population were not properly settled in life; most of them were either temporarily settled or nomads or semi-nomads living in scattered huts. This population would come to about 1,60,000. The remaining 50 per cent. were settled in villages, which were almost disorganised and built in a primitive style without the requisites for healthy living. The percentage of literacy in the province was 10.8, of which the percentage of higher education was 1.25; the remaining 89.2 were illiterate

As regards other measures of social welfare, those in the fields of public health are worthy of mention. In 1953-54 it was stated that the health situation was satisfactory. "There have been no cases of cholera in the quinquennium ending 1953, smallpox presenting no serious problem as vaccination continued throughout the year. Malaria, which can aptly be called the scourge of Sind, is perhaps the only major health problem of the province. The provincial malaria organisation was tackling the problem with all the available means at its disposal and has largely succeeded in reducing the occurrence of the disease in the area. D.D.T. spraying operations have been carried out since 1949. The provincial anti-malaria organisation conducted classes for basic training in malariology. Sixteen mobile health units toured each district and were working in the villages which were out of easy reach of dispensaries. The policy of training personnel for midwifery services and the awarding of scholarships was beginning to bear fruit as two lady health visitors, five midwives and forty assistant midwives were trained. In order to encourage local bodies to provide trained maternity services grants-in-aid were paid by Government to the extent of one-third of the expenses. Although there is no separate publicity organisation, every effort was made to educate the public in public health. Public health stalls were put up at shows and exhibitions. A public health stall at the National Industries' Fair in Karachi was a centre of attraction at the exhibition."

Closely connected with and complementary to the Public Health Department was the Medical Department. In order to provide a check on medical legal work with a view to preventing the issue of incorrect certificates by Medical Officers in charge of dispensaries and district hospitals, the Government of Sind appointed a Medical Legal Supervisory Board. The Government of Sind revived also the scheme of subsidising Unani Hakims and fifty Hakims were to be appointed in 1955 on a subsidy basis in the various villages of Sind. A training institution for nurses, midwives and assistant midwives started functioning at Hyderabad during the year under the social uplift programme. The Church Mission boarding house building in Hyderabad, Sind was acquired by the Government as a Hostel for the students. Government sanctioned the training of twelve candidates as Sind Government nominees in an X-ray laboratory course at the Karachi T.B. hospital. The establishment of an eye hospital was also one of the social uplift programme items. It was proposed to establish a completely equipped and independent Eye Hospital in Hyderabad, in addition to a wing for eye diseases, which will form a part of the fifty-bedded clinical hospital to be constructed on the permanent site of the Liaquat Medical College, Hyderabad. In order to provide modern and up-to-date equipment to hospitals and dispen-

saries, orders for the supply of X-ray and laboratory equipment worth Rs. 2,53,000 were placed by the Government, and the question of the purchase of the remaining X-ray and physio-therapy equipment, laboratory equipment, surgical instruments and apparatus, was accessories and hospital furniture worth Rs. 17,03,000 was under consideration. Under the uplift programme there was a scheme for the extension, improvement and reorganisations of hospitals and dispensaries in Sind. It included extensions to civil hospital buildings at Nawabshah, Dadu and Mirpurkhas, the extensions to the mental hospital at Hyderabad, Sind, by providing extra accommodation of 152 beds, the extension and renovation of 33 taluka town dispensary buildings and the establishment of a new civil hospital at Thatta with an indoor accommodation of 100 beds. In addition to the above social uplift schemes for the expansion of medical facilities in the province, Government sanctioned a scheme for the construction of new civil hospital buildings at Larkana, Sukkur and Jacobabad with an indoor bed strength of 126, 200 and 100 patients respectively, at an estimated cost of Rs. 53,61,000; and raising the bed strength of the civil hospital Hyderabad from 132 to 500, and providing other necessary extensions to it at an estimated cost of 20 lakhs of rupees. In the Five-Year Development Plan 1955-1960 the following items have been provided for: the establishment of a T.B. hospital in each district, the reorganisation and establishment of a provincial stores depot at Hyderabad, the improvement of district head-quarter hospitals for providing facilities for eye, dental, ear, nose and throat, skin diseases and for the treatment of gynaecology, children's and maternity diseases; the opening of 64 new dispensaries in the province; the strengthening of the hospital staff; post-graduate training abroad and post-graduate training in Pakistan.

"In the field of co-operation some progress was made. In the year 1955 it was intended that the Co-operative Societies should be organised to undertake secondary education in the province. The target was to have one society to each district in the province in the initial stage. Five such societies have since been registered and steps are being taken to organise similar types of societies in other district towns as well. Consumers' stores on the co-operative basis, which are ten in number, have not made much headway, due mainly to the illiteracy of the masses and to the lack of selfless-leadership. A provincial wholesale society called the Sind Provincial Co-operative wholesale Society Ltd., Hyderabad, with an authorised capital of 10 lakhs of rupees, has recently been registered. The idea underlying this venture is to face the acute scarcity of consumer goods and to provide raw materials for cottage and other industries. Industry in the province is also being built upon a co-operative

basis. The formation of the Sind Industrial Co-operative Corporation, Hyderabad, is an important innovation in the co-operative history of the province. This enterprise has been launched with an authorised capital of 50 lakhs of rupees as a novel institution of its kind. The idea underlying this venture is to set up industries on a co-operative basis, commencing with textile mills in the Sind industrial trading estates of Hyderabad. The salient feature of this co-operation is the harmony of interest between capital and labour, for which provision has been made in its constitution. The capitalists share their profits with labour and spend a portion of profits on labour welfare schemes. Attention is also being focussed on organising cottage industries on a co-operative basis. Some of the important industrial co-operatives are the Sukkur Blanket Producers' Co-operative Society Ltd., the Glass Cottage Industrial Society Ltd., Hyderabad, and recently over thirty Weavers' Co-operative Societies have been organised to develop handloom industry in the province. In order to ensure an adequate supply of the material required for this industry, cotton yarn worth 30 lakhs of rupees was imported, it is recorded in 1955, from Hong Kong and Italy for distribution among the weavers. With the announcement of the Government decision to establish satellite towns in the province, people have started forming themselves into co-operative housing societies to meet their housing requirements. Fifteen such societies have been registered in the provinces. They are not yet functioning, as the plots of land at the time of the report had not then yet been allotted to them by the Government."

As regards improvements in the conditions of commerce and industry, the following steps were taken. The Sind Shops and Establishments Act 1940 covers persons in shops, commercial establishments and places of public entertainment. It provides for working hours, rest intervals, spread-over of work, and overtime work. For overtime workers receive one and a quarter times the ordinary rate of wages. The Act also provides for a weekly holiday and 14 days privilege leave with pay for each year of service. The employment of children under 12 years of age is prohibited and persons below the age of 17 years can be employed for only eight hours a day and forty-two hours per week. It is the responsibility of the local authority to enforce the provisions of the Act, and the provincial government supervises the work of these local bodies through the Commissioner of Labour working as an ex-officio Chief Inspector of shops and establishment for the whole province. In 1955 fifteen local bodies had undertaken to enforce the provisions of the Act, namely, Hyderabad, the cantonment area of Hyderabad, Shikarpur, Jacobabad, Larkana, Shahdadpur, Kotri, Dadu, Mirpurkhas, Tando Allahyar, Tando Adam, Kambar, Nawabshah and Thatta. The Trade Union Act

dates from 1926. In 1955 there were twelve Trade Unions in the province, but only six of them sent annual reports for the year ending the 31st March 1953. These showed that the total membership at the close of the year was 1,585, of which 101 were women. Under the Industrial Employment Orders Act of 1946 any industrial establishment which employs 100 or more workmen was required to specify the conditions of employment and to make the conditions known to workmen employed by it, conditions to be defined regarding the classification of work, workmen, shift-working, attendance, termination of employment, suspension, and dismissal. The Government prescribed model standing orders and the standing orders of each establishment as far as possible have to conform to these model standing orders. The workers' representatives are shown the standing orders framed by their employers for their comments before they are certified. In 1955 84 industrial establishments in Sind came under the Act, of which 13 were perennial, and the rest 71 were seasonal, cotton pressing and ginning factories which worked for about four to six months in the year. The total number of employees coming under the Act was about 19,000, of which only about 3,000 were working on a permanent basis and the rest were either temporary substitutes or apprentices. The Fifth Annual Conference of the West Pakistan Federation of Labour was held at Sukkur from the 25th to the 27th December 1953. Trade Unionism from all over West Pakistan sent representatives in large numbers to take part in the deliberations of the conference. In pursuance of their policy of giving a fair deal to workers the Government of Pakistan called for a team of International Labour Office experts to survey the labour problems of Pakistan. These experts visited various industrial centres to gain first-hand knowledge of the conditions of work and living of the workers. In order to improve the standard of labour administration, the Government of Pakistan organised, with the assistance of the International Labour Office experts, six-monthly study classes in labour matters. The Sind Government fully availed itself of this opportunity by sending two persons for training. Both nominees passed in the second class the examination which was held after the completion of training. One of these nominees has since been sent to the United Kingdom under the Colombo Plan for the further study of labour matters. In order to provide a closer relationship between the public and the Government machinery, the Government constituted a District Advisory Board for labour in various districts of the province. These consisted of the Collector as Chairman, and the Commissioner of Labour or his representative, and non-officials nominated by Government as members. The function of the boards is to discuss questions of general application and to advise Government with regard to labour welfare. In order to

have some field staff to attend to the grievances of workers, Government sanctioned the post of a Labour Officer and it is proposed to create another such post later. Besides this the question of labour welfare centres received attention. The Government of Sind also framed canteen rules, according to which all industrial concerns which employ 250 or more workmen must provide canteen facilities for them. These canteens are to be run under the joint management of workers and employers. The rules provide further for sanitary conditions of canteen premises, the equipment to be used and the maintenance of necessary account books which are to be inspected by the officers appointed by Government for the purpose.

The October, 1958 Revolution abolished, the parliamentary institutions which had been in operation since the foundation of Pakistan. This change was justified by public opinion on the ground that the working of the parliamentary institutions in Pakistan had been such as to encourage abuse and corruption and hinder the proper development of the country and impede the protection and self-interest of its citizens. The regime under the new President, General Muhammad Ayub Khan, proceeded with, and was able to carry out, changes which under the parliamentary constitution proved incapable of fulfilment. In the chapter on Land Revenue in this Gazetteer it is stated that the Sind Government, shortly before it was merged into West Pakistan, had passed a resolution abolishing the system of jagirdari in Sind, but that this resolution was not put into effect as the validity of it was challenged in the Courts. Such objections could stand their ground under the constitution which was superseded by the new Government, but they proved of no weight in the changed circumstances where the new regime was in a position, with public consent, to carry out changes which can be described only as revolutionary. Much of the argument which preceded the Sind Government's decision to abolish jagirdari in 1955 was justified by considerations in favour of a wholesale remodelling of the land revenue system, with the object of abolishing the more extreme elements in its feudal character and providing a better distribution of the available land amongst those who cultivated it. The regime of President Muhammad Ayub Khan was able, in a few weeks, to change the whole land law of the country. The changes were, in fact, an improvement on the recommendations set out for land reforms in the Five-Year Plan for Pakistan. In that plan the lines on which the land revenue system should be remodelled were clearly explained. The land reforms which were decreed by the new regime in 1958 constitute the most revolutionary legal change ever seen in the sub-continent; but they were inherent in the conviction which

Revolution of 1958.

most persons held, even in the days of parliamentary government, that the time had come to equalise opportunity for all. By the mid-fifties of the present century public opinion was inclining to the view that the time had come for doing away with those aspects of the feudal system which offended against current ideas of social justice. The problem, as far as Sind and Khairpur were concerned, was not merely a question of land-ownership, but of the continuation of the sovereignty of tribal chiefs in landholding. The feudal system in Sind had a two-fold foundation: one was the possession of land and the other was tribal chieftainship based on land. It is important to note that the decree of the new regime did not contemplate the abolition of the zamindar-hari relationship, within limits considered to be useful and expedient, as it was recognised that the zamindar-hari relationship provided a system which possessed many merits, provided certain abuses were eliminated.

**Land Re-
form**

In the Five-Year Plan 1955-1960 it is stated that the question of land reform was one of the most urgent national problems to which the country had to address itself after the attainment of independence. In West Pakistan, the Muslim League Agrarian Reforms Committee had proposed in 1949 a series of short-term and long-term measures. The short-term proposals aimed at the abolition of occupancy tenancies and jagirs, security of tenure to tenants-at-will, reduced rents payable by tenants, and the abolition of illegal exactions imposed on them by landlords. The long-term proposals provided for ceilings on ownership of individual landlords with provision for compensation, and distribution of land thus released amongst cultivating tenants. In Sind, a Tenancy Laws Committee reported in 1945 and this was followed by a Hari Committee report in 1948. The period was thus noteworthy for numerous inquiries which are evidence of a new hope of better living aroused among people by the attainment of independence. The distribution of the holding of the land in Sind was certainly lop-sided; 30 per cent. of the total occupied area was in the hands of a barely 1 per cent. of the total occupants possessing more than 500 acres each. As against this 60 per cent. of the total occupants owning less than 15 acres each were in possession of only 12 per cent. of the total area; 80 per cent. of the total land was cultivated by tenants-at-will, known as haris. The Tenancy Laws Committee which reported in 1945 favoured a grant of tenancy rights to haris who had personally cultivated at least 4 acres of land annually for the same zamindar for an uninterrupted period of eight years. Haris acquiring such rights would be immune from ejectment, except for failure to cultivate the land personally, or efficiently and fully, or to live in a recognised village within a mile of the farm, or failure to pay the prescribed rent, or for conviction for certain offences. No action was taken in this report.

Another committee known as the Hari Committee was appointed in March 1947, under the chairmanship of Sir Roger Thomas, then a local zamindar, and reported in January 1948. This committee was required under its terms of reference to consider what reforms could be carried out without disturbing the rural economy. The committee in their report admitted that the hari has a hard life, but considered that his troubles are due to natural causes over which no one has any control, or to Government neglect, or to his own dishonest and improvident habits. The zamindar is represented as the hari's best friend, almost a loving parent ever ready to help him. This assessment of the situation, says the Five-Year Plan, cannot be accepted. It was challenged by one of the members Mr. M. Masud; C.S.P., in his minute of dissent and the challenge was supported by the evidence of impartial observers. The committee, however, was of the view that the Government should legislate through a Tenancy Rights Act to take powers to regulate share cropping practices and to grant rights to haris. In 1950 the Sind Tenancy Act, 1950 was passed which, as amended from time to time, abolishes non-statutory charges, fines and rents, and gives permanent rights to cultivators of at least four acres of land for the same landlord for a continuous period of not less than three years. Where he has cultivated the same piece of land for three years the cultivator acquires a permanancy right and tenancy rights in the particular piece of land, but where he has cultivated different pieces of land under the same landlord he acquires the right to continue to cultivate so much land as is declared to constitute a family holding. All tenants other than permanent tenants are to be tenants-at will. According to the Act they are not liable to be evicted before the end of the cropping season, the date for which may be prescribed. The plan states that it is doubtful whether the Act gave any substantial security even to the protected tenant. A former Sind Minister was reported to have said that a zamindar would not allow a tenant to cultivate a particular piece of land continuously for more than two years, for that would entitle the peasant to permanent tenancy rights. Further, even those few haris who acquire such rights are not able to enjoy them because of their ignorance, illiteracy and friendlessness in face of the landlord's political and social influence. The Hari Committee recognises the danger, which has been confirmed by Sir Malcolm Darling, who recently conducted an enquiry into the conditions of agricultural labour in Pakistan. He reported: "the hari is in the main too helpless to take advantage of the Act, and in many cases still too ignorant even to have heard of it." He added: "formal eviction is not necessary. A landlord can always make things so uncomfortable for a tenant that he leaves of his own accord. To a bad landlord this is an obvious temptation. A Collector said that, owing to incomplete or faulty revenue records, it was often

difficult to decide who had cultivated the land in the past three years. Names of tenants are not being shown in the Record of Rights, presumably on account of the fact that under the existing law a tapedar shall not enter any name as a permanent tenant, except on a written application." Lastly according to more than one authority, legal cesses are still being charged. The position is thus scarcely better than it was before the passing of the legislation. In 1954, the then Government of Sind issued orders abolishing jagir rights, but they were challenged in the Court and were never enforced. The Five-Year Plan states that the recent constitutional changes resulting in the merger of the various provinces and states in the western wing of the country into one unit afford an excellent opportunity for giving a uniform basis to the variety of tenancy laws and similar legislation in this area. This administrative change has raised new hopes in the country, including those on land reforms.

The condition of landholding as reported by the Sind Agricultural Commission in their report of 1955, was that out of the total agricultural population of 32,83,634 persons 4,95,606 held 19.2 per cent. of the land, that is 21,30,280 acres out of a total of 1,11,00,000 acres of land. The remaining 80.8 per cent., that is 98,99,553 acres of land, was possessed by 25 per cent. of the population owning land, that is 198,556 persons. The landless agriculturist class formed the total of 25,88,905 which was 79 per cent. of the total agricultural population. Furthermore, 954,237 acres of land were held by jagirdars as alienated holdings bearing hakabo to the extent of only half the assessment in the irrigated tracts. The Sind Government, therefore, in 1955, just before it disappeared as a legislative and executive body, was well in the line of thought, and indeed the harbinger, of future developments, when it decided that jagirdari should be abolished with compensation. As stated above, the Sind Government's order was not enforced and probably could not have been enforced while parliamentary conditions of Government remained. In any case the last Sind Government, while it thought it was turning over a new page and was mistaken in so thinking at the time, can gain credit for writing a foreward in the book of revolutionary change.

Abolition of
Jagirdari by
Sind Govern-
ment.

The decision of the Sind Government in 1955 may be regarded as an event of historical importance. Some portions of the order may suitably appear in this Gazetteer. The day the order was passed the Minister for Revenue, Sind, Pir Ali Muhammad Rashidi, said in a broadcast address: "I want to break to you today very important news. The Sind Cabinet in its today's meeting has finally taken an historic decision to abolish jagirdari in Sind. What had not been possible for Sind's previous eighteen or nineteen ministries to accomplish has

been, by the grace of God, achieved today. Today's Cabinet Meeting was presided over by my leader and chief, Mr. M. A. Khuhro, and was attended by his colleagues, namely myself and Haji Maulabuksh Sumro. When we had assumed the reins of office in November last we had given a promise that we shall abolish jagirdari and eradicate that evil for all time to come. That promise we have today fulfilled. From today onwards one-tenth of Sind's occupied land becomes permanently free from the malaise of jagirdari."

The decision of the Sind Government is recorded in the following words, of which an extract is given below: "The Government of Sind has been for a number of years now considering the question of abolishing jagirs. The scrutiny of the sanads conferring the jagir concessions on land for the first time, or confirming such concessions granted by previous rulers, as well as the careful examination of the legal aspects of the case, establish beyond any possibility of doubt the competence of the Government of Sind to terminate the jagiri rights on land which amount to no more than a transfer to jagirdars of the right of Government to levy assessment payable on the land. It is observed that the British Government at the time of the conquest of Sind cancelled many jagirs, created new ones and also confirmed some of the jagirs bestowed during previous regimes; but made the continuance of most of the jagirs dependent upon the loyalty and good behaviour of the holders of these concessions and their successors. With the disappearance of the British rule the jagirs have become an historical anachronism. It is quite obviously inconsistent with the dignity and strength of an independent state and a great reflection on the patriotism and self-respect of the jagirdars themselves to perpetuate in this age a system which to all intents and purposes amounts to no more than securing by the state the loyalty of a small section of its citizens by payment of material consideration. The Government of Sind is accordingly pleased to direct the Revenue Commissioner for Sind to issue formal notices to all persons in the province classified and entered in the records as jagirdars, cancelling with effect from the 8th February, 1955, their sanads under which the jagirs were granted to them. With the issue of these notices Government shall levy full assessments on all the lands in respect of which the jagirdar so far has been receiving assessment in terms of his sanad. All these lands will simultaneously, but temporarily, until the completion of the enquiry, be entered in the Record of Rights as held on ordinary occupancy tenure under the Land Revenue Code and become liable to pay full assessment in accordance with the settlement rates in force. The occupancy rights in jagiri land will be finally entered in the Record of Rights in the names of persons who, after proper enquiry, are found to be entitled to zamindari rights in such land.

Simultaneously with the entry of the makhadum, whether jagirdars or persons other than jagirdars, in the Record of Rights of occupants the Revenue Commissioner will arrange to ensure that the names of all haris, maurusi and others, are also at the same time recorded in the Field Books in accordance with the procedure already prescribed under the orders issued by the Revenue Department. In cases where the jagirdars, or their relatives or dependents, are left with no other source of livelihood, or are old and infirm or female dependents of the jagirdar, Government reserve to themselves the right to provide any reasonable cash allowances for their maintenance out of the revenues of the province."

Many items in the land reforms programme were carried out by the new regime shortly after it assumed power. These included the abolition of jagirdari, the fixing of ceilings on ownership, the prevention of the fragmentation of holdings, the determining of the economic size of holdings, the consolidation of existing holdings, the grant of full rights to tenants and provisions to enable the tenants to become owners of their holdings after certain prescribed periods. The President of Pakistan, General Mohammad Ayub Khan, in a nation wide broadcast from Radio Pakistan on the 26th January, 1959 announced the scope of the land reforms in West Pakistan. In making his announcement he said: "my object in setting up the Land Reforms Commission was to enable the Government to devise a rational land tenure policy which will satisfy, on the one hand, the social need for greater equality of opportunity and social status and, on the other the economic need for increasing agricultural production in improving the standard rural living through a more equitable distribution of income from land." The President stated "the main findings of the Commission are that in relation to the size of the rural population, land offers a limited economic opportunity; the ownership of the land is also in many areas inequitably distributed, the permanent opportunities outside agriculture being relatively few with a growing congestion on land, the pressure of population on land, laws of inheritance, resulting in uneconomic highly fragmented holdings. Despite the availability of necessary manpower, the development of large estates is often very slow and a considerable portion of the culturable land is not being utilised to full capacity. Opportunities because of the limited availability of land, being few, the sources of manpower are not fully utilised. Tenants are generally insecure on the land. They are also denied the rewards in proportion to the effort that they make. Initiative and enterprise are, therefore, lacking and there is little productive investment in agriculture. In view of the special prestige which ownership of land enjoys over large areas, political power is concentrated in the hands of a privileged few. Apart from its social consequence,

such concentration of power hampers the free exercise of political rights and stifles the growth of free political institutions. To remedy these defects the Commission has recommended certain specific measures with a minimum programme of land reform. My Government has considered the Commission's recommendations with great care and has taken a number of decisions. These are as follows: "First, no person will own or possess more than 500 acres irrigated or 1,000 acres of unirrigated land. Existing landowners will, however, be allowed to retain such additional areas as well to which they would be entitled had the ceiling on ownership been fixed as equivalent to 36,000 produce index units allowable in the case of refugees. They may additionally retain an area up to 150 acres under orchards and alienate by gift a limited area to their heirs.

"Second, land over and above the ceiling limit thus fixed in each case will be resumed by Government for redistribution to tenants and other deserving claimants. In order to avoid displacement of existing tenants and disruption of production, tenants already cultivating the resumed areas will be given the option to buy them on instalments spread over 25 years.

Third, the landlords will be paid fair compensation for the resumed lands in the form of interest-bearing bonds redeemable in 25 years.

"Fourth, occupancy tenants should be converted into full owners throughout West Pakistan.

"Fifth, tenants in congested areas will, as far as possible, be accommodated in the programme for the colonization of State lands.

"Sixth, tenants everywhere will have security of tenure. In the event of ejection according to a process of law, they will be entitled to a fair compensation for improvement of land and disturbance of possession. An embargo will be placed on the enhancement of rents, and illegal exactions in the shape of fees or free labour or services from tenants will be eliminated.

"Seventh, all Jagirs (feudal land holdings gifted by Mughal Emperors and others) will be resumed without payment of compensation and other intermediary interests will be abolished.

"Eight, in order to prevent progressive fragmentation of holdings, division of holdings below a certain economic or subsistence level will be forbidden and joint management of such holdings will be facilitated by law.

"Ninth, immediate steps will also be taken to introduce a province-wide scheme for the compulsory consolidation of fragmented holdings.

"A Martial Law Regulation will shortly issue to give immediate effect to these measures. It would provide for the setting up of a Provincial Land Commission with the Governor as its ex-officio Chairman to implement these measures.

"You will see that the most important of the measures is the imposition of a low ceiling on individual ownership and the redistribution of land in excess of the ceiling in each case to landless tenants and holders of uneconomic holdings on payment of a fair price in convenient instalments. This measure will go a long way towards breaking up the present concentration of landed wealth in the hands of some 6,000 landlords throughout West Pakistan. It will narrow down the existing inequalities of opportunities and will go a long way towards encouraging more intensive use of land and productive investment by the actual tillers of the soil.

Land Reform a Scientific Solution—Not an Emotional One.

"When I first announced my intention to undertake land reforms, I made it clear that we were not seeking an emotional solution of this problem but a scientific one. The steps which we have now decided to take in order to bring about reforms are the most far-reaching that this regime has thus far taken. It was of the utmost importance therefore that we examine this problem in a most dispassionate manner and take decisions which while eliminating social and economic injustice would contribute effectively to the establishment of a progressive agricultural economy. My Government's decisions, I claim, are designed to achieve just this result.

Landlords to Receive Fair Compensation.

"To the landlords these measures may seem drastic. I trust, however, that they appreciate the needs of the time. The history of other countries is before us and we have to take a lesson from it. Apart from the dictates of social justice to which, as Muslims, we all subscribe, I consider the introduction of these reforms as an absolute necessity for the survival of the system and values which we cherish and which brought Pakistan into being as a free State. While announcing the setting up of the Land Reforms Commission I had said that we shall not be vindictive and that

we shall do justice by all. We have seen to it that the landlords receive fair compensation and they are able to adjust themselves to the changed situation arising from limited holdings without undergoing undue hardships. It is now up to them to make the transition as smooth as possible. I must warn them that it will be in their interest to do so.

Reforms Will Ensure Better Production And Social Justice.

“In so far as the laws, practices and institutions governing the ownership and use of land influence production incentives, and, in an agrarian society like ours, determine the social attitudes of those engaged in agriculture, there is a direct link between land reforms and economic development and social growth. It has been my feeling for sometime that our low agricultural production and the general apathy of the rural masses arose principally from institutional defects in our agrarian structure and maladjustment in the terms on which land was being used for agricultural purposes.

“Ever since independence politicians have talked of introducing land reforms in West Pakistan with a view to removing these defects and revitalizing rural society, but, for reasons which you all know, nothing effective was done. On the other hand their empty talk of reforms raised false hopes and unfounded fears which resulted in embittering landlord-tenant relations and created uncertainties regarding the future rights and obligations of both landlords and tenants relative to the ownership and use of land. These uncertainties, I am sure, have contributed in some measure to the current stagnation of Agricultural production.”



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CHAPTER XIX
CONSTITUTION AND ADMINISTRATION

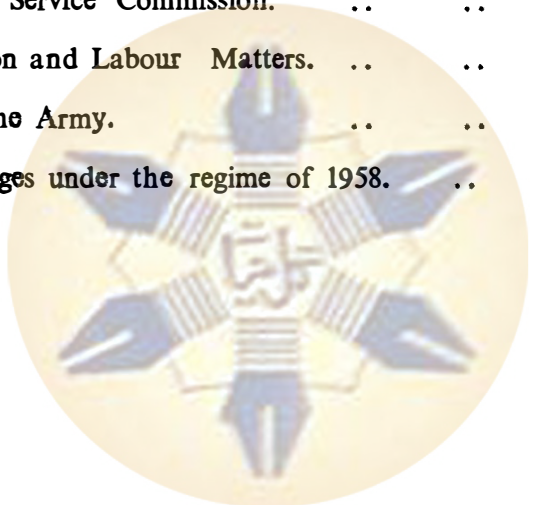
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TABLE OF CONTENTS.

	Page
Constitutional and administrative changes.	783
Structure of administration and the functions of government.	787
Finance.	788
Sind Public Service Commission.	793
Trade Union and Labour Matters.	795
Sind and the Army.	801
Rapid changes under the regime of 1958.	804



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CHAPTER XIX

SECTION 1

CONSTITUTION AND ADMINISTRATION

The half century that has passed since the last edition of this Gazetteer has been marked by profound constitutional changes. Some account of the political development of Sind during this period has been given in a previous chapter. During the time when Sir Charles Napier administered Sind, from 1843 to 1847, Sind was virtually an independent province, though officially it had a liaison with the Presidency of Bombay. The connection with Bombay became more real after the departure of Sir Charles Napier, and the chief local officer was the Commissioner in Sind. Administratively Sind became under Bombay merely one division in the Presidency, although the Commissioner in Sind had some powers not possessed by the Commissioners in the other three divisions of the Bombay Presidency. There was legally very little difference between the status of the Commissioner in Sind and the other Commissioners in the Bombay Presidency. Actually the chief influence which gave the Commissioner in Sind an appearance of authority greater than that of the other Commissioners in the Bombay Presidency was the geographical separation of Sind from Bombay and the difficulties of rapid communication between the two areas. The Bombay Presidency was, in fact, a Provincial Government exercising merely provincial powers and Sind was, in fact, merely a division of a province exercising provincial powers, while the Government of India was the Central Government and retained in its own hands such matters as external affairs and defence, customs, railways and the like. Till 1936 the position of Sind then was merely that of a division of the Provincial Government of Bombay Presidency.

Constitutional and administrative changes since 1907.

During the period up to 1936 three important steps were taken affecting the status of Sind, these were the third Indian Councils Act, 1909, popularly known as the Minto-Morley reforms, the Government of India Act of 1919, and the Government of India Act of 1935. As a result of discussions at the Round Table Conference in 1930 and 1931, it was decided that Sind should be separated from Bombay and formed into an independent province under a Governor, and provision to this effect was made in the Government of India Act of 1935 and it took effect from the 1st April 1936. The Minto-Morley reforms of 1909 had very little effect in Sind, which, as explained in the chapter on history, was politically much more backward than the other divisions of the Bombay Presidency at that time. The Minto-Morley reforms doubled the provincial legislature, which was in Bombay, and gave separate representation to minorities. An Indian was admitted into the Provincial

Executive Council but the Minister, who became a Member of Council in Bombay, was not connected with Sind. The electorate at the time was very limited and the effect of the Minto-Morley reforms was trifling. The reforms known as the Montagu-Chelmsford reforms, from the report made by the Viceroy and the Secretary of State in 1918, were embodied in the Government of India Act of 1919. The chief innovation in this Act as far as the provincial executives were concerned was the institution of the system of dyarchy by which certain portfolios, such as Public Works, Forests, Excise and Education, were transferred to ministers responsible to the Legislature, while other portfolios, such as Law and Order, and Defence were reserved to the Governor and his Executive Councillors who were responsible to the Secretary of State and Parliament. The Governors were also armed with emergency powers to be used in the event of a constitutional breakdown. The new constitution began working on the 1st January 1921 and was inaugurated in Bombay on January 10th 1921 by His Royal Highness the Duke of Connaught in the Convocation Hall of the University of Bombay, a ceremony which the compiler of this Gazetteer was privileged to attend as he was then occupying the post of Under-Secretary to the Government of Bombay in the Home Department. In the new set-up Sind had considerable interest as one of the new Ministers was Mr. Ghulam Hussain Hidayatullah, who received the portfolio for Local Self-Government. This was the commencement of the political career of Mr. Ghulam Hussain Hidayatullah, whom the compiler of this Gazetteer had known as a fellow Member of the District Local Board, Hyderabad. Mr. Ghulam Hussain was later knighted, became a Member of the Bombay Executive Council and later still was the first Prime Minister of Sind when it assumed the status of a Governor's Province and, finally, ended as the first Sindhi to be Governor of Sind. In 1930/31 discussion continued at the Round Table Conference to decide the form which a revised and new Government of India Act would take, and during these discussions the decision was taken that Sind should be formed into a Governor's Province. Sind, with its Muslim majority in the population, was regarded as the counterpart to the new Hindu province of Orissa created at the same time. The Muslim delegation at the first Round Table Conference had put forward the demand in London in the winter of 1930. The question was referred to a committee which accepted the principle of separation, suggested an expert inquiry to ascertain the financial aspect of the separation and threw the burden of proving the feasibility of separation on those who asked for it. An expert inquiry was held and it drew a gloomy picture of the financial future of Sind. Its findings can best be summarised by its remark: "There is thus obviously no question of Sind standing surety for the Barrage; the problem is

whether the Barrage can stand surety for Sind.” A conference of representatives of the people of Sind met in 1932 to devise measures to meet the financial objections to separation. Wide divergence of opinion prevailed at this conference, whose Chairman eventually submitted its report, according to which the annual deficit of the new province for the first six years of its life would be 80 lakhs of rupees, the revenue from the Barrage being eaten up by the interest charges. Roughly from 1945 onwards it was calculated there would be a surplus from the Barrage to help the province. Based on this assumption the authorities set about perfecting the administrative machinery in preparation for the inauguration of the new Regime.

With the stage set for the advent of the new province, an Order in Council was issued in January 1936 announcing that the new province would start on its career on the 1st April 1936 and creating transitional machinery for the conduct of government till provincial autonomy was inaugurated in accordance with the provisions of the Government of India Act of 1935. By this Act a full Cabinet system was instituted in the provinces.

Provincial Governors were given the right of exercising special responsibilities at all times to ensure peace and to protect minorities and also to legislate by ordinance and pass acts in times of emergency. The Act extended the provincial franchise but the property and educational qualifications still remained, and communal electorates were still continued notwithstanding the existence of a general electorate. As regards the Central Government the Government of India, (called the Federal Government by the new Act), dyarchy which was abolished in the provinces was introduced at the centre. Defence and Foreign Affairs were reserved for the Governor-General in Council who was responsible to the Secretary of State for India and not to the Legislature. Under the Government of India Act of 1935, Sind was allotted 5 out of the 150 seats in the Council of State; of these 5 seats 2 were general seats and 3 were Muslim seats. In the Legislative Assembly Sind was allotted 5 seats out of a total of 250, the 5 seats being 1 general, 3 Muslim and 1 European. It was in these circumstances that the Governor's Province of Sind was started, and a transitional period of one year occupied in preliminaries for the holding of elections, the Sind Legislature commencing to function in the year 1937. The first Government was Sir Lancelot Graham, I.C.S. who had been for years Secretary to the Government of India in the Department of Law and the first Prime Minister, called Chief Minister, was Sir Ghulam Hussain Hidayatullah, who gave up his post as Executive Councillor to the Government of Bombay in order to enter the new arena of Sind politics. Under the new administrative set-up the Commissioner in Sind, as such, disappeared, the post being changed to that of

Revenue Commissioner, Sind, which lacked the authority which had attached to the Commissioner in Sind's post in that it was now merely the headship of a department in the Secretariat responsible to the elected Government of the day. The last Commissioner in Sind was Mr. R.E. Gibson, C.S.I., C.I.E., whose intimate knowledge of Sind was thought by many to qualify him especially for the post of first Governor. Many were disappointed when he was not appointed. Mr. Gibson had the supreme merit of being popular with Sindhis of all classes and from his expert knowledge of colloquial Sindhi was able to joke in that language with complete facility, a capacity which endeared him to all the rural people with whom he came regularly into contact. Sind as a Governor's Province lasted for about nineteen years only, from 1st April, 1936 to 3rd October, 1955. This Gazetteer is no place for appraising the work of that Government during its short period of existence. It is to be hoped that sooner or later a special monograph will be written describing the action of that Government while it was in power. By the Government of India Act of 1935 Sind became an autonomous unit in the administrative set-up of British India and this continued till the partition of India in 1947. From then until 1955 Sind continued as a provincial unit in the Federal Government of Pakistan. By the establishment of the West Pakistan Act of 1955, which came into force on 3rd October 1955, Sind became amalgamated in the unit of West Pakistan, being incorporated in that unit with the Governor's Province of the Punjab, the Governor's Province of the North-West Frontier; the Chief Commissioner's provinces of Baluchistan and Karachi, the States of Bahawalpur and Khairpur and the Baluchistan States Union, the tribal area of Baluchistan, the Punjab and the North-West Frontier, and the States of Umb, Chitral, Dal and Swat. This amalgamation took effect from the 14th October 1955. In the new arrangement Sind lost its individuality as a province and became two divisions, named Hyderabad and Khairpur of West Pakistan, with provincial headquarters in Lahore. The position, therefore, was that after 1955 Sind reverted under West Pakistan to a position analogous to that which it held till 1936 as a division in the provincial unit of the Bombay Presidency.

The constitutional status of Khairpur has, like Sind, been greatly affected by changes during the half century since the last edition of the Gazetteer appeared. Khairpur remained an independent state until the amalgamation of West Pakistan in 1955. The rulers were Muslim Talpur Baluchis belonging to the Shia sect. Previous to the accession of this family on the fall of the Kalhoro Dynasty of Sind in 1783 the history of the state belonged to the general history of Sind. In that year Mir Fateh Ali Khan Talpur established himself as ruler of Sind and subsequently his nephew, Mir Sohrab Khan Talpur, founded the Khairpur branch

of the Talpur family. In 1882 the individuality of the Khairpur State was recognised by the British Government. The ruler was a first-class prince and entitled to a permanent salute of fifteen guns outside and seventeen guns inside the State limits. The State paid no tribute either to the British Government or to any other state. Until 1932 the Government of Bombay exercised political functions as agent to the Government of India and till that time the Collector of Sukkur was the Political Agent for the Khairpur State. The system was changed in 1932 when the Government itself took over the political functions. Khairpur came then directly under the supervision of the Political Department of the Government of India and formed one of the forty-five Punjab states in political relation with His Excellency the Crown Representative through the Honourable, the Resident of the Punjab States, whose headquarters was in Lahore. On the creation of Pakistan, political relations between the Khairpur State were maintained with the Federal Government of Pakistan through its Foreign Affairs Department. This system continued until the amalgamation of West Pakistan in October 1955. The result of this last change was that the State, as such, ceased to exist and the Central Government of what had now become the Islamic Republic of Pakistan guaranteed a Privy Purse to the ruler of Khairpur for his maintenance in consideration of the cession made by him of his rights in the territory comprising the former state of Khairpur. As a result the Khairpur territory is now part of the revenue administrative division of Khairpur which is included in the area administered by the West Pakistan Government, with headquarters in Lahore.

SECTION 2

The structure of the administration today is still based on the British system, without which, as a backbone, the difficult days of partition and the unsettlement of refugees would have resulted in complete chaos. The indebtedness of the Government of today to the administrative machinery left in working order when the British demitted control over the India sub-continent has been admitted in the First Five-Year Plan 1955/1960. The report says "The defects as well as the merits of the existing administrative system stem largely from the fact that it is a heritage from a colonial power which reared upon certain indigenous institutions a superstructure adapted to the needs of ruling a subject country; the combination yielded a system public administration admirably suited to the requirements of a government engaged largely in the primary functions of collection of revenue, administration of justice and maintenance of law and order. So far as law and order, administration of justice and collection of revenue are concerned the system continues to serve the country reasonably well. However, its efficiency in these essential fields tends to

Structure of
administra-
tion and the
functions of
Government.

invest it with the fictitious appearance of adequacy for all purposes including the new and supremely important task of planned development." This is a fair criticism as the functions of Government now embrace activities which were no part of the original scheme on which Britain developed a system of administration which was perfected for this purpose over a whole century. There has been a great increase in the responsibilities of the State since 1907, when the last edition of this Gazetteer appeared. In addition to all the old departments of Government, many new became inevitable with the increasing pressure for greater public enterprise and with the greater demands from a more educated public for facilities and amenities of all kinds. But the latest and most modern departments which have not been taken in the provincial sphere are aviation, telecommunications and broadcasting, which are obviously matters of wider scope than a provincial area can provide. But the emergence of the motor age has added the control of motor vehicles to the provincial list as a formidable new responsibility. The Second World War, with its vast organising of all kinds of effort both public and private, led to an increase in bureaucratic government and to the creation of many new and specialised posts. Partition, and the resettlement of population after it, added to the number of kinds of officials required. The shortage of foodstuffs which characterised the opening years of Pakistan's independence made the control of civil supplies and the distribution of food grains a necessity. All these influences have greatly complicated the government machine in the last thirty and, most particularly in the last twenty years. To show how the responsibilities and the functions of the government have increased reference is invited to the many types of official who gave evidence before the Sind Agricultural Commission in 1953 and 1954; some of the more unusual were the Locust Control Officer, the Town Planning and Valuation Officer, the Registrar of Co-Operative Societies, the Soil Classification Officer, the Director of Animal Husbandry, the professor of Agricultural Economics, the Agricultural Mechanical Engineer, the Deputy Rehabilitation Commissioner, the Commissioner of Labour, the Director of Civil Supplies, the Development Commissioner, the Assistant Secretary to the Government Refugee Rehabilitation Department, the Managing Director Sind Food Grains Nationalisation Board, the Anti-Corruption Officer, and the Government Horticulturist.

SECTION 3

Finance

Till 1936 Sind was merely an administrative division of the Bombay Presidency and not a viable economic unit, since the provincial revenues in themselves were not sufficient to make the territory self-sufficing in finance. The same general position has

occurred since 1955, when Sind, with Khairpur, became an administrative unit in the West Pakistan provincial economy, and that economy was not in itself able to become self-sufficient without subventions from the Central Government and allotment of funds from the central taxes applicable to the whole area of West Pakistan. The budgets of Sind up to the year 1936, therefore, were merely a portion of the budgets of the Bombay Presidency, and since 1955 the budget of Sind and Khairpur is similarly merely a portion of the budget of the West Pakistan Government. It is only for the years when Sind was a Governor's Province that one can form a complete picture of the revenues and expenditure of the area. Of the income realised from the territorial limits of Sind itself the main items were: Land Revenue, Provincial Excise, Provincial Stamps, Forests, Registration, the Motor Vehicles Act income and other dues and duties. Other income came from the working of civil administrative departments and from civil works, including electricity, and from miscellaneous. But the income from the working of civil administration departments and from civil works and miscellaneous is not important. Since the creation of Pakistan with a Central Government empowered to raise central taxation, the revenues of Sind have benefited from shares in the yield of the Central Excise Duties, from Income Tax and from Sales Tax; they have also been helped by a share of the taxes and duties levied under the Supplementary Finance Act of 1950, the object of which was to provide funds for the rehabilitation of refugees. The allotments are from the Central Excise Duties, from Taxes on income and from Sales Tax and are regulated by the Raisman Award, under which fifty per cent. of the net proceeds from Taxes on Income, other than Corporation Tax, Central Surcharge, Tax on Central Emoluments and the taxes attributable to the centrally administered area of Karachi, are payable to the provinces. As regards Central Excise Duties, which are levied on motor spirits and kerosene oil, sugar, matches, tobacco, tea, textiles and other items, under the Raisman Award one half of the net proceeds of duties on tobacco were payable to the provinces of East and West Pakistan. The share of the annual net proceeds of Excise Duties was allocable between East Pakistan and West Pakistan in the ratio of 46.26 per cent. to 53.74 per cent. As regards Sales Tax, which is imposed under the Sales Tax Act of 1951, West Pakistan receives 94 per cent. of one half of the Karachi collections, in addition to one half of the collections in its own area.

The financial position has greatly altered from the time of the Round Table Conference in 1930, when the solvency of Sind was a matter of deep concern before the decision was taken to

constitute Sind as a Governor's Province. A very gloomy view was then held by the Committee of Inquiry as to Sind's ability to pay for the Barrage advances. The gloomy prognostications of 1930 proved in the event to be without serious foundations, although at the time when the Sind Barrage was being constructed and at the time when it came into operation, in 1932, financial prospects were unfavourable so soon after the great period of stringency which ensued on the Wall Street crash of 1929, with the continuance of very low prices for agricultural products lasting well beyond the middle of the decade of the thirties. The situation was entirely altered with the outbreak of the Second World War. This showed an immediate rise in the price of agricultural commodities and the improvement in the financial condition of Sind was such that within a few years it was able, not only to pay off all the Sukkur Barrage debt, but to use a surplus for the erection of some imposing public buildings in Karachi, buildings which proved of great value to the Central Government on the creation of Pakistan, when Karachi was made the Federal capital of the new country. The end of World War II saw Sind in a favourable financial position, but the troubles which started after the partition of India soon disrupted finances and created great problems as to solvency once more. The statements which follow show first the revenue and expenditure of Sind for the years 1947/48 to 1952/53, which were the years of partition and the resettlement of refugees, and second the income and the expenditure of Sind for the accounts of 1953/54 compared with the revised estimate for 1954/55 and the Budget estimate for 1955/56. These statements show the main heads of account for both revenue and expenditure and are self-explanatory.

REVENUE (*in thousands of rupees.*)

Omitting outstanding items and
debt services.

	Accounts 1953-54.	Revised Estimate 1954-55.	Budget Estimate 1955-56.
Central Excise	40.44	36.96	39.00
Taxes on Income	42.50	40.50	41.65
Sales Tax	69.53	88.33	86.93
Land Revenue	254.25	177.76	123.55
Provincial Excise	29.00	27.00	21.38
Stamps	12.41	13.04	9.00
Forests	29.16	28.20	6.18
Registration	1.69	1.50	1.45
Motor Vehicles Acts	19.45	16.15	11.43
Other Taxes and Duties	14.98	5.15	14.70
CIVIL ADMINISTRATION			
Total	66.72	74.04	2,06.73
Largest items:—	education 30.02	education 35.65	education 1,33.04
	agriculture 14.91	agriculture 11.79	agriculture 34.47
CIVIL WORKS:			
Total (includes electricity).	21.39	13.31	9.96
MISCELLANEOUS	5.99	6.78	6.20
TOTAL	10,25.32	9,28.31	9,99.07

Sind Revenue and Expenditure for years 1947-48 to 1952-53.
(years of partition and resettlement of refugees).

	1947-48	1948-49	1949-50	1950-51	1951-52	1952-53
Revenue ..	823	764	708	830	971	975
Expenditure.	950	818	789	833	1,033	846
	—127	—54	—81	—3	—62	+129

EXPENDITURE (in thousands of rupees).

Omitting outstanding items and
debt services.

	Accounts 1953-54.	Revised Estimate 1954-55.	Budget Estimate 1955-56.
Sales Tax	.16	.16	..
Land Revenue	42.98	3,12.15	2,89.48
Provincial Excise	5.86	8.07	7.50
Stamps	.40	.49	.25
Forests	10.79	11.86	13.32
Registration	.95	1.08	1.09
Charges on account of Motor Vehicles Acts.	.80	1.01	.85
Other Taxes and duties	.19	.26	.35
Revenue Account of Irrigation etc. ..	1,15.01	1,15.93	1,17.32
Other Revenue Expenditure-Construction of Irrigation Works	29.31	31.81	26.68
CIVIL ADMINISTRATION	5,08.09	5,29.45	5,55.66
Chief items:—			
Police	1,52.68	1,33.35	1,26.52
Education	1,45.23	1,63.16	1,68.10
General administration	73.77	67.72	72.47
Justice	25.50	24.10	22.24
Jails	28.86	28.24	24.50
Agriculture	33.11	41.65	56.74
CIVIL WORKS (includes electricity).	1,90.91	72.35	81.94
MISCELLANEOUS (includes stationery and printing).	51.07	60.58	48.13
TOTAL	8,46.40	10,25.98	9,81.24

With the operation in the immediate future of three Barrages conveying water to the greater part of the alluvial plain of Sind capable of flow irrigation, Sind and Khairpur are bound to become sources of vast agricultural wealth in respect of the out-turn of food grains and cotton. It would be unduly pessimistic, therefore, to think that Sind has anything but a happy future before it. It should become, as it was some time ago, a part of the great granary of West Pakistan. As Khairpur has benefited probably more than proportionately from the Lloyd Barrage irrigation, its future should be as well assured as that of Sind. The state's income from all sources in 1944/45 was 52.77 lakhs of rupees.

SECTION 4

The Government of India Act 1935 provided for the first time that each province should have a Public Service Commission, either separately or jointly with another province. The provinces of Bombay and Sind decided to have a joint Public Service Commission; the two provinces agreed that the Commission should consist of a Chairman and two members, and their appointments would be made by the Governor of Bombay in consultation with the Governor of Sind, and that one of the members shall be from Sind. The first Commission was set up for a term of five years with effect from the 1st April 1937. The members of the first Commission were Chairman, Sir Hugh B. Clayton, C.I.E., M.A. (Oxon), I.C.S. (Retd.), Sir Shah Nawaz Khan Ghulam Murtaza Khan Bhutto, Kt., C.I.E., O.B.E., from Sind, and Mr. C.W.E. Arbuthnot, C.I.E., B.E., B.A., I.S.E. On the completion of the term of five years, a new Commission was set up with the Chairman, Sir J.A. Madan, C.S.I., C.I.E., I.C.S., (Retd.), Mr. H.V. Hampton, M.A., I.E.S. (Retd.), and Sir Shah Nawaz Khan Bhutto as the Sind member. This second Commission completed its term of five years on the 1st April, 1947 and a third Commission took office with a Chairman, Mr. Y.A. Godbole, C.S.I., C.I.E., I.C.S. (Retd.), B.A., LL.B., and members, Khan Bahadar Muhammad Daim Siddiqui from Sind, and Mr. P.G. Shah, C.B.E., I.A. and A.S. (Retd.), appointed by the Governor of Bombay. This third Commission continued to function until the 1st August 1947, when a separate commission for the Province of Sind was established. In 1947 Sind decided to have its own Public Service Commission. This Commission was established as stated above on the 1st August 1947, a few days before the creation of the new state of Pakistan. Khan Bahadar Muhammad Daim Siddiqui, who was a member of the Joint Bombay Sind Public Service Commission, was appointed the first Chairman of this new Sind Public Service Commission; the other two members appointed were Mr. H. B. Hingorani, B.A., LL.B., and Mr. M. A. Siddiki, B.A. The Chairman died on the 10th

Sind Public
 Service Com-
 mission.

January, 1948, and was succeeded as Chairman by Mr. H.B. Hingorani and Mr. Hingorani continued to be Chairman of the Commission until the integration of the province in the One Unit of West Pakistan. Mr. M.A. Siddiki died on the 31st March 1949, and Mr. G.H.K. Agha, O.B.E., was appointed as member on the 3rd July, and he retired after completing his term in July, 1954. Mr. Yar Muhammad Memon, B.A., LL.B., was appointed member in place of him from the 12th May, 1955 until the date of the establishment of the One Unit of West Pakistan. Shams-ul-Ulema Dr. U.M. Daudpota, M.A., Ph. D. (Cantab) was appointed against the vacant post of the second member on the 5th October, 1950. His term was extended by one year, so that he continued to be a member of the Commission till the date of integration of Sind in West Pakistan.

The Sind Commission discharged the same functions as the Joint Commission had done; certain additional duties were assigned to it, adding to its usefulness. The Commission was consulted on proposals for reducing an officer's pension or disallowing or reducing his special additional pension. It was also asked to make selections for overseas scholarships and fellowships, proposals for the confirmation of officers and selection of posts were also required to be referred to it before confirmations were actually made. The non-statutory functions assigned to the Commission were mainly the holding of language and departmental examinations for persons already in government service. In some respects the Joint Commission had certain wider powers than some provincial Commissions, for instance, it was consulted on the qualifications to be prescribed for a post; it was also consulted on promotions within the Service, and even on inter-grade promotions. This procedure gave the Joint Commission a fairly effective control, not only on official recruitment to a service, but also over promotions at every stage of an officer's career. Some idea of the work which the Sind Public Service Commission did may be obtained from certain remarks in the Report on the Working of the Sind Public Service Commission for the year 1953-54; therein it is stated that the Commission dealt with about 5,645 references during the year. The Commission held 51 formal meetings during the year, mostly for the interviewing of candidates for posts advertised by the Commission. The Commission advertised 311 posts and interviewed 263 candidates during the year. The number of cases of promotions, transfers and confirmations dealt with by the Commission during the year was 129 and the number of officers considered for these posts was 153. The number of cases referred to the Commission under paragraph C. of sub-section 3 of section 266 of the Government of India Act was 19; most of these cases concerned Hindu officers who had deserted their posts. After partition the Commission advised on such matters as the recruitment rules for gazetted posts in the

Refugee and Rehabilitation Departments, recruitment rules for the post of Labour Officer, recruitment rules for the Sind Treasury Service, amendment of rules for the training of Assistant Collectors and revision of the text books for the Hindustani Higher Standard Commercial Examinations. On the whole the work of the Public Service Commission over the years has been extremely useful in improving the standard of Government ways of dealing with important appointments and safeguarding the rights of Government servants. On the whole, the relations between the Executive Government and the Commission have been satisfactory and friendly. Now and again the Commission has noted a tendency of the Executive to by-pass the Commission, especially in the case of appointments which are made temporary for six months in the first instance and are then continued beyond that period without the Commission being called upon to confirm the appointments. These, however, are small matters. The benefit that has accrued to the working of Government on account of the service to the Commission can hardly be over-estimated.

SECTION 5.

Trade Unions in Sind are still in a very primitive stage of development and, despite the various efforts that have been made to industrialise the country in the last fifteen years, and particularly since the time of the creation of Pakistan in 1947, very little has been done to widen the field of Trade Union activity. Trade Unions still affect only a very small proportion of the population. The Sind area is almost entirely agricultural, as has already been described in an earlier chapter of this Gazetteer, and there are few evidences at present that the predominantly agricultural character of the country will be much changed in the near future. The Indian Year Book for 1947 described the position of Trade Unions in India as they were in that year. What was said then is very largely true of Trade Unions in the Sind area today. As far as workmen in Pakistan industries are concerned Trade Unionism has not taken on anywhere near to the extent which it has with workmen in the West. The fear of victimisation is still too strongly entrenched in the minds of the workers to enable them to enter freely into combinations promoted to safeguard their interests. One great difficulty experienced by Trade Union workers is the collection of subscriptions from members. The experience of the last decade or so shows that most of the unions which became defunct, went to the wall owing mainly to the fact that their officials were not able to collect subscriptions.

Trade
Union and
Labour mat-
ters

There are very few unions run on the model of the Ahmedabad Textile Labour Union; the vast majority of those which have been kept alive through the zeal of interested outsiders are hollow structures with no funds and bolstered up figures of membership

concerned with their bona fides recognition. The Pakistan Five-Year Plan 1955 to 1960 remarks that the Trade Union movement in the country is still relatively small. Unions exist in rather a few enterprises and not all the unions that exist influence the terms of employment for members. By far the greatest proportion of decisions about wages and working conditions are made by individual bargaining between employer and worker, in which the worker is inevitably at a great disadvantage. The growth of Trade Unions has been supported by Government policy. In 1955 the Government of Pakistan stated that its policy was to encourage the growth of genuine and healthy Trade Unions. But little has been done to effect any changes in this respect in the Sind area. The Report of the working of the Trade Unions Act 1926 for the year ending 31st March 1955, yields the following facts. Up to the end of the year the number of Trade Unions registered under the Act was fifteen, and of these five Trade Unions had to be served with a notice under Section 10-B of the Act requiring them to show cause in writing within two months why their registrations should not be cancelled on the ground of non submission of the annual returns. The total membership of all the unions registered under the Act at the end of 1955 on the 31st March, or that year was only 2,474; the total cash assets of the ten Trade Unions already registered at the beginning of the year was Rs. 7,586., As, 2. The Hyderabad Shroff Association had the largest cash assets of Rs. 2,638-3-9. No Trade Union held securities and no Trade Union maintained a political fund as provided under Section 16 of the Trade Unions Act of 1926.

A Labour Office was established in Sind in March, 1951 consisting of two part-time officers, the Commissioner of Labour in Sind, who is also Director of Industries, and the Assistant Commissioner of Labour who is also a Warden of Weights and Measures. In his evidence before the Sind Agricultural Commission in December, 1953, the Assistant Commissioner of Labour stated that the functions of the Labour Commissioner's Department were to administer the Industrial Disputes Act, the Industrial Employments Standing Orders Act of 1946, the Sind Shops and Establishments Act of 1940, the Trade Union Act of 1926, the Industrial Statistics Act, and to advise on International Labour Office Conventions and make recommendations on them to the Government. The Commissioner of Labour is a Conciliation Officer under the Industrial Disputes Act, a Registrar of Trade Unions under the Trade Unions Act, a certifying authority under the Industrial Employment Standing Orders Act and a statistical authority under the Industrial Statistics Act. The Factories Act, however, is administered by the Chief Inspector of Factories and the Payment of Wages Act is administered by the same officer. The Industrial Disputes Act of 1947 provides

for the investigation and settlement of industrial disputes. The Commissioner of Labour is the Conciliation Officer for the purpose of this Act; whenever any industrial dispute takes place it is his function to try to bring about a settlement; if there is no settlement, the matter has to be reported to Government for the appointment of a Conciliation Board, a Court of Inquiry or a Tribunal, for the settlement of the dispute. During the year 1953 there were six disputes which resulted in the stoppage of work; the total number of persons involved in these stoppages was 931 and the total number of man-days lost was 7,228.

The Sind Shops and Establishment Act of 1940 covers persons employed in shops, commercial establishments and places of public entertainment, provides for working hours, rest intervals, spread-over of work and overtime. It applies to industrial establishments which employ 100 or more workmen. These establishments are required to specify the conditions of employment and to make the conditions known to workmen employed by them, the conditions to be defined as regards the classification of workmen, namely, permanent, temporary and other classes, shift-working, attendance, termination of employment, suspension, and dismissal, and other matters. Government have prescribed model standing orders and the standing orders of each establishment, as far as possible, have to conform to these model standing orders. In 1953 eighty-four industrial establishments in Sind came under the Act, of which thirteen were perennial and the rest, seventy-one were seasonal, namely, cotton-pressing and ginning factories, which work for about four to six months in a year. The total number of employees coming under the Act is 19,000, of which only about 3,000 work on a permanent basis, the rest being either temporary substitutes or apprentices.

In pursuance of their policy of giving a fair deal to workers, the Government of Pakistan called for a team of I.L.O. experts to survey the problems of Pakistan. These experts visited various industrial centres and submitted their report to the Central Government. In order to improve the standard of labour administration the Government of Pakistan organised, with the assistance of the I.L.O. experts, six-month study classes in labour matters. The Sind Government took advantage of the opportunity and sent two persons for training; both nominees passed the examination which was held after the completion of training, and one of the nominees was afterwards sent to the United Kingdom under the Colombo Plan for a further study of labour matters. In order to have a closer relationship between the public and Government machinery, the Government of Sind constituted District Advisory Board for Labour in the districts of the province. The composition of these was the Collector as Chairman and the Commissioner of Labour or his representative, and

other non-officials nominated by Government as members. The functions of the Board were to discuss questions of general application and to advise the Government on matters of labour welfare. In his evidence before the Sind Agricultural Commission in 1953 the Assistant Commissioner of Labour stated that the welfare that was being done by his department concerned only labour coming within the purview of the labour laws for which the department was responsible and that no other specific labour welfare work was done. He added that only the Sind Cement Works at Rohri and the Indus Glass Works at Hyderabad provided medical facilities within the factory premises and in one other factory arrangements for medical assistance to the workers existed; but there was no arrangement for the insurance of unemployed factory workers, and no arrangement for any old age and infirmity pension, nor was any minimum fixed in the various factories. It is, therefore, clear that Sind has not progressed very far in the promotion of social welfare amongst industrial workers. Since the Sind Government disappeared in the One Unit amalgamation of Western Pakistan in 1955, the control of labour matters has been transferred to the Labour Directorate of the West Pakistan Government at Lahore, which in carrying out proposals which have been approved by the Government of Pakistan for the supplementing of the various recommendations in the Pakistan Five-Year Plan from 1955 to 1960. Before it disappeared the Government of Sind had framed canteen rules, according to which all industrial concerns employing 250 or more workmen were to afford canteen facilities to their employees; these canteens were to run under the joint management of workers and employers, and the rules provided for sanitary conditions in the canteen premises, for the equipment to be used, and the maintenance of the necessary account books, which were open for inspection by officers appointed by the Government for the purpose. Social legislation which can be said to be well established in Sind is the Sind Shops and Establishments Act. The following table for the three years 1949, 1950 and 1951 gives the statistical information relating to the administration of this beneficent piece of legislation.

TABLE
SHOWING THE NUMBER OF SHOPS, COMMERCIAL ESTABLISHMENTS
AND RESTAURANTS ETC. AND NUMBER OF EMPLOYEES COVERED
BY THE ACT.

Serial No.	Area	Shops		
		1949	1950	1951
1	2	3	4	5
1	Hyderabad Cantonment..	150	199	199
2	Hyd: Municipality ..	4600	3789	3789
3	Shikarpur Town ..	914	950	1053
4	Sukkur Town ..	2099	2432	2480
5	Jacobabad Town ..	5662	565	565
6	Larkana Town ..	1640	1750	1700
7	Shahdadpur Town ..	..	..	..
8	Kotri Town ..	153	170	170
9	Dadu Town ..	..	..	..
10	Mirpur Khas Town ..	..	700	887
11	Tando Allayar Town ..	..	..	..
12	Tando Adam Town ..	..	..	275
13	Kambar Town ..	297	297	308
	Total ..	10418	10852	11426

SHOWING THE NUMBER OF SHOPS, COMMERCIAL ESTABLISHMENTS
AND RESTAURANTS ETC. AND NUMBER OF EMPLOYEES COVERED
BY THE ACT—contd.

Serial No.	Area	Commercial Establishments.			Restaurants.		
		1949	1950	1951	1949	1950	1951
1	2	6	7	8	9	10	11
1	Hyderabad Cantonment..	50	1	1	15	15	15
2	Hyd: Municipality ..	200	90	90	1600	365	365
3	Shikarpur Town ..	80	80	93	94	100	89
4	Sukkur Town ..	346	586	595	192	162	173
5	Jacobabad Town ..	79	79	79	72	72	72
6	Larkana Town ..	56	60	70	220	235	230
7	Shahdadpur Town ..	..	..	..	..	..	..
8	Kotri Town ..	58	60	60	31	35	35
9	Dadu Town ..	..	..	..	..	..	..
10	Mirpur Khas Town ..	..	35	41	..	130	100
11	Tando Allayar Town ..	..	..	..	..	..	..
12	Tando Adam Town ..	..	..	16	..	..	66
13	Kambar Town ..	48	48	23	12	12	8
	Total ..	917	1039	1068	2236	1126	1153

TABLE—*contd.*SHOWING THE NUMBER OF SHOPS, COMMERCIAL ESTABLISHMENTS
AND RESTAURANTS ETC. AND NUMBER OF EMPLOYEES COVERED
BY THE ACT—*contd.*

Serial No.	Area	Number of persons employed in					
		Shops.			Commercial Estts.		
		1949	1950	1951	1949	1950	1951
1	2	12	13	14	15	16	17
1	Hyderabad Cantonment..	40	..	130	70	..	40
2	Hyd: Municipality ..	1000	2702	2702	1500	861	861
3	Shikarpur Town ..	130	150	277	150	150	205
4	Sukkur Town ..	1163	1342	1364	1752	1861	1602
5	Jacobabad Town ..	127	127	127	134	134	134
6	Larkana Town ..	1021	445	450	103	125	146
7	Shahdadpur Town ..	..	..	..	..	..	..
8	Kotri Town ..	..	..	..	..	..	..
9	Dadu Town ..	..	..	..	..	..	..
10	Mirpur Khas Town ..	..	260	366	..	110	144
11	Tando Allayar Town ..	..	..	..	..	..	..
12	Tando Adam Town ..	..	..	200	..	..	160
13	Kambar Town ..	..	93	105	..	120	86
	Total ..	3481	5119	5721	3709	3361	3378

TABLE—*concl.*SHOWING THE NUMBER OF SHOPS, COMMERCIAL ESTABLISHMENTS
AND RESTAURANTS ETC. AND NUMBER OF EMPLOYEES COVERED
BY THE ACT—*concl.*

Serial No.	Area	Restaurants.			Total No. of persons employed in Shops, Commercial Establish- ments and Restaurants etc.
		1949	1950	1951	
		18	19	20	
1	2	18	19	20	21
1	Hyderabad Cantonment..	75	..	50	220
2	Hyd: Municipality ..	3500	435	435	3998
3	Shikarpur Town ..	143	160	141	623
4	Sukkur Town ..	481	513	591	3557
5	Jacobabad Town ..	140	140	140	401
6	Larkana Town ..	507	580	604	1200
7	Shahdadpur Town ..	..	..	..	..
8	Kotri Town ..	..	..	..	205
9	Dadu Town ..	..	..	..	..
10	Mirpur Khas Town ..	..	225	225	735
11	Tando Allayar Town] ..	..	..	..	..
12	Tando Adam Town ..	..	..	206	566
13	Kambar Town ..	..	20	24	215
	Total ..	4774	2073	2416	11720

SECTION 6

Although the history of Sind contains many chronicles of bloodshed and fighting, the indigenous Sindhi population is neither a martial nor a military race. Most of the fighting that was done in the country in previous ages was conducted by immigrant peoples, the sole exception to this being some of the degenerating Rajput tribes who took possession of parts of Lower Sind and who displayed military valour of quite remarkable character. The pacific nature of the indigenous Sindhi was displayed towards the end of World War I, when an attempt was made to enlist Sindhis in one of the Baluchi regiments. The attempt was given up in 1918 as hopeless, owing to the fact that the recruits were completely impervious to any kind of military discipline and simply refused to understand it. What will happen in the future if, under a system of conscription, compulsory recruitment of the whole population becomes necessary as a measure of advancement for the country, is a problem which the future must solve for itself. The compiler of this Gazetteer is indebted to Sir Patrick Cadell, Kt., C.S.I., V.D., the historian of the Bombay Army and a former Commissioner in Sind, for the following account of the modern military history of Sind which shows both the strength and weaknesses of the population of the Lower Indus Valley in military affairs.

Sind and the Army.

“The history of Sindh is a record of a people, essentially unwarlike, subjected to the inroads of more virile or more united races, Arabs, Mughals, Baluchis and Afghans. Although Sindhis are often mentioned as among the best of the mercenary soldiery of warfare in the West of India, it is probable that these were by race Baluchis or from the Province of Mekran rather than original inhabitants of Sind. As an outlying Province of the Delhi, Persian or Afghan Empires, the position of Sindh varied with the fortunes of its distant overlords. Its connection with the East India Company's settlements in the West of India was confined to trade, precariously dependent on the goodwill of the local Rulers.

Although by the latter half of the eighteenth century the possibilities of the river Indus as an avenue of approach to the North West of India, and thus to Central Asia, has been realised, there was no attempt at penetration by any of the European trading companies. The first contact of the British authorities with the Rulers and people of Sind, apart from the slight commercial effort above alluded to, was due to the spread of British influence in Gujrat, Kathiawar, and Kutch, owing to the weakening of the authority of the Delhi Emperors, the internal disputes among the Marathas who took their place, and the damage to

trade from the pirates of the coasts of Kathiawar and Kutch. Their attacks compelled the Government of Bombay to undertake punitive expeditions against them, and, as the power of the Marathas weakened, to restore order in the northern portion of the Bombay Presidency. The first armed clashes with inhabitants of Sind arose from the inroads of Baluchis, particularly of the Khosa tribe, from Nagar Parkar in the South Eastern portion of Sind. The boundary between this area and Kutch across the Rann of Kutch was not clearly defined and is even to the present day a matter in dispute. These inroads from Sind compelled the Bombay Government to send forces to support their ally, the Raja of Kutch. On one occasion the marauders were followed into Sind territory by the troops of the Bombay Government and a fort was captured. This led to protests from the Talpur Rulers of Sind, and to threats from the Ruler of Afghanistan who still claimed suzerainty over, and collected tribute from Sind. The matter was amicably settled but the Resident in Kutch for a considerable period kept order in the Sind area of Nagar Parkar, with his corps of Irregular Horse. It became obvious that Sind could not continue to be an area closed to trade and peaceful penetration as the Indus afforded the easiest approach to the North-West of India, and the countries beyond. There was also the possibility of invasion and conquest, either by the Sikhs from the Punjab, or by a fresh inroad of Afghans, while the danger of a Russian approach to the plains of India became a possible contingency. It was the last of these reasons that led to the first Afghan war of 1838. Not only was a strong force sent by sea from Bombay to the mouth of the Indus, and a base established at Karachi, but the main body of the British-Indian forces, drawn from the Bengal army, being unable to traverse the neutral territory of the Sikhs, marched down to upper Sind, and, in conjunction with the force from Bombay, entered Afghanistan by the passes in Baluchistan leading to Kandahar. This use of their country was not welcome to the Talpur Rulers of Sind, but treaties were negotiated with them, and no opposition was offered.

The Talpur Mirs, after their final victory over their predecessors, the Kalhoras, had extended and consolidated their power, obtaining command of the Desert by the occupation of Umarkot, getting possession of Sukkur on the Indus, and finally persuading the Afghans in 1824 to relinquish Shikarpur without fighting. These successes were not, however, obtained by military action. Their only effort in that way resulted in the ignominious defeat of the Sindhi-Baluch army near Sukkur in 1833, at the hands of the feeble force with which Shah Shuja, the exiled Amir of Afghanistan, was seeking to recover his throne. On the advance of the British Indian army into Afghanistan, the unruly Baluch

tribes on the Sind Frontier were kept in check by John Jacob with his newly raised Irregular Horse at Khangarh, which later received his name as Jacobabad.

It cannot be fairly said that the Mirs took undue advantage of the disasters of the Indian Government's force at Kabul. The situation in Afghanistan was retrieved by the success of the Generals Pollock and Nott and a portion of the Expeditionary army returned from Mandahar to Upper Sind. The Indian Government's troops were now under the command of Napier, an officer anxious for military distinction and ignorant of Indian conditions. The fraternal system of the Talpurs, whereby Sind had been divided among branches of the family, was breaking down, and the ambition of a young member of it, Mir Ali Murad of Khairpur, tempted him to seek the control of Upper Sind. He easily persuaded Napier that his claim was justified, and the General was with equal ease convinced that the Mirs of Hyderabad had not behaved properly when the Indian Government was in trouble in Afghanistan, and that they were seeking aid from Persia. The Mirs were unprepared and unwilling to fight, but Napier refused to halt his march towards Hyderabad. Although the first act of hostility was the attack by the Baluchis on Napier's representative near Hyderabad, the war was rendered inevitable by the continued advance of Napier, and by the belief of the Mirs, and of their Baluch tribesmen, that he was determined on war in any circumstances. There followed, therefore, the brief campaign in Sind, marked by two important actions at Miani and Dabo. The campaign has attained fame owing to the picturesque character of the British General, his eloquent despatches and the history written by his talented brother, Sir William Napier. The first battle at Miani was fiercely contested, owing to the courage with which both sides fought, and the great disparity in numbers. While, however, the resolution of the General in attacking without hesitation an enemy so superior in numbers, and the bravery with which his soldiers fought, should be recognised, it should also be remembered that the Mirs' army had no qualification for battle beyond their superior numbers, and their personal bravery. Whereas other Indian Rulers, such as Sindia and Holkar, and above all Ranjit Singh of the Punjab, had formed formidable armies, trained and commanded by foreign officers of various races, and had paid special attention to a well-trained Artillery, the Mirs had never sought to entertain professional soldiers, or to employ experienced foreign officers to instruct and lead them. The few ancient artillery guns the Mirs possessed were commanded by a deserter from the ranks of the Company's Army, who had no influence in the Mir's Army. The Baluch mounted men had no idea of fighting on horseback as cavalry, in contrast to the

formidable cavalry of the Marathas and the Sikhs. The only leader mentioned in the Mirs' Army was a personal slave of the Mirs, of African descent, with no military training. The Baluchis fought as tribesmen under clan chiefs, not as trained soldiers. Moreover there was little unity among the Mirs themselves.

While the Talpurs of the Hyderabad branch were facing Napier at Miani, Mir Sher Muhammad of the Mirpus family was only six miles away with 10,000 men. Whether from jealousy of the other branch, or because he had no personal quarrel with the Indian Government, he made no effort to join his relatives.

Napier, after his victory at Miani, and receiving some reinforcement, marched against Mir Sher Muhammad and defeated him at Dabo, six miles from Hyderabad. Although the Baluchis again fought gallantly they had even less chance than at Miani against the force of the Indian Government, with its well-trained Cavalry and Artillery. After these two battles, there were only two trifling actions at Pir Ari near Sehwan, and near Shahdadpur, and peace was speedily restored after the annexation of the Province. Peace then prevailed throughout the Province, and even the rising revolt of the Bengal Army in 1857 caused little disturbance. With the exception of a small rising among the Rajput tribes of Nagar Parkar, which was easily checked by one of the regiments newly raised in Sind, the Province remained peaceful.

The inhabitants of the Province have not contributed largely to the armies of the sub-continent; in the case of the Sindhis because of the absence of military tradition, and of the Baluchis because of their dislike of the routine of military discipline. During the Second Afghan War from 1878 to 1881, the Province was a valuable base of operations, while the rapid construction of the Railway to the Frontier was essential for the success of the campaign. With the extension of authority over Baluchistan, and the creation of a military bastion at Quetta, Sind ceased to be one of the Frontier Provinces of India. The importance of its position and the growth of Karachi as a great Port was, however, of the utmost value during the World Wars of the present century."

SECTION 7

Rapid changes under revolutionary regime of 1958.

One of the greatest difficulties in compiling this Gazetteer has been the rapidity of change, especially since 1958, when radical alterations have taken place with an amazing speed in a manner impossible under parliamentary Government with its emphasis on argument and give-and-take and with the struggle of factions for political power by means of pressure groups. The writing of this Gazetteer was commenced in the late autumn of

1957, although material had begun to be collected from 1955. During the period between 1957 and now so many changes have occurred in Sind and Khairpur that much of what was written originally has had to be drastically revised and altered. The revolution of 27th October 1958, resulted in the setting aside of parliamentary Government in the form which Sind had enjoyed during the time when it remained a Governor's Province. The first effects of the change brought about by the new regime were the setting aside of all politicians and the substitution of a stable form of Government in place of the parliamentary one. This change undoubtedly took place with the goodwill of the vast majority of the population in Pakistan. The revolution which resulted in the deposition of the Parliamentary President, General Iskandar Mirza brought General Muhammad Ayub Khan to the head of the State. When reviewing the work done by the revolutionary Government during its first year, the President, Muhammad Ayub Khan, in a broadcast to the nation on October, 27th 1959 set out the ideals of the new Government. He stated; "In the early days of the Revolution, when we were grappling with many urgent and immediate problems, and it was by no means easy to predict the course of events, I had made some promises to you. I had made these promises with all humility, but with the confidence that the Revolution which we had ushered in had no meaning except in terms of what it could do to bring the first of freedom and progress to the masses of our people. We were there not to perpetuate ourselves or to exercise power for its own sake. The Revolution was merely a means to an end, a symbol of national and individual reconstruction, a prelude to constructive endeavour in every field of our life and activity. It was there to prepare the ground for a democracy which would no more be a mockery of democracy. The hydra-headed monster of smuggling, hoarding, and black-marketing, which was the order of the day, when most of our politicians were bartering away the resources the country for personal aggrandisement, has been curbed."

The system now in force in Pakistan under the revolutionary regime is, in fact, a Government of wise men, rather after the model of the Guardians in Plato's "Republic". The future will show whether the new system has features of permanency, or whether sooner or later dissident forces will endeavour to alter its character fundamentally and perhaps bring back some of the evils which the revolutionary Government set out to cure. The radical alterations in Pakistan which have taken place since October 1958, deal chiefly with Land Reforms, Legal Reforms, Constitutional and Electoral Reform, and Local Government Reform. These are common to all Pakistan, and Sind, in the form of its two divisions of Khairpur and Hyderabad, is a participator in what has happened.

It seemed desirable in this Gazetteer to give a brief summary of what these great reforms entail: First, as regards Land Reforms, this subject has been dealt with in a previous chapters of this Gazetteer and no more may be said on the matter now. As regards Law Reform, the Pakistan Law Reform Commission has recommended far-reaching forms to assure quicker and cheaper justice for all through an independent judiciary. It has suggested the establishment of judicial panchayets in the rural areas to be known as Dehati Adalats, or Rural Courts; they will decide petty civil or criminal cases. Similarly, Mahal, or Ward Courts, have been recommended for urban areas. Another important suggestion of the Commission is the setting up of a competent body somewhat on the lines of the Islamic Law Commission envisaged in Pakistan's late constitution. The Commission has also recommended the establishment of Special Courts to administer Family Law, as recommended by the Commission on Marriage and Family Laws. To avoid delay in criminal proceedings, the Commission has recommended the revival of the institution of Honorary Magistrates and the establishment of Mobile Courts for trial of particular cases and some types of minor cases. The Commission's Report states: "With regard to the system of procedure of Law prevailing in the country, the criticism is sometimes heard that it is too complicated and elaborate to suit the genius of our people, some critics consider that this system should be scrapped lock, stock and barrel, and replaced by a very much simpler system. Conditions of life have grown complex in the modern world, and this complexity must, in some measure, be reflected in the laws that govern a country. The procedure of Laws we inherited has frequently been abused, but this is more due to the human factor which is associated with its enforcement or exposition than with its inherent good sense. These laws are designed primarily to ensure justice between man and man and between the subject and State without fear or favour. To become inured to the technicalities of this law and to effect wholesale drastic changes in them would be too revolutionary a step to find general acceptance at the hands of the intelligentsia; a certain amount of formalism is a necessary adjunct of any legal system."

As regards Constitutional and Electoral Reform, probably the most momentous change is outlined in the Basic Democracies order promulgated on October 27th 1959; the order lays down that elections to the Union Councils will be held on the basis of adult franchise; in the nomination of members regard shall be paid to the representation of minorities and women's organisations along with the agricultural, industrial or community development and other interests; the Union Councils will have a wide range of functions, they will elect their own Chairman, frame their budgets and have a local fund, they can levy taxes with the permission of the Commissioner. The following Councils will be constituted

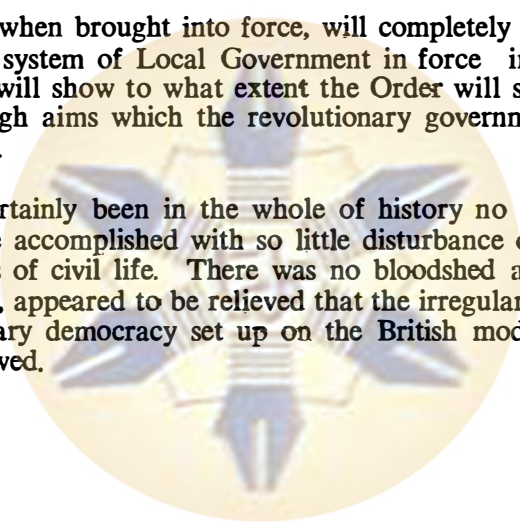
under the order: First, a Rural Council for a Union in rural areas and a Town Committee for a Town or a Union Committee for a Union in urban areas. Second, a Thana Council for a Thana in East Pakistan and a Tehsil Council for a Tehsil in West Pakistan. Third, a District Council. Fourth, a Divisional Council. Fifth, two provisional Development Advisory Councils for East Pakistan and West Pakistan. The Union Councils shall be responsible for agricultural, industrial and community development in the Union; they will have a wide range of functions including promotion and development of the Co-operative Movement, village industries, forests, livestock and fisheries, the adoption of measures for increased food production, provision and maintenance of wells, water-pumps, tanks, ponds and other works for the supply of water, the regulation of offensive and dangerous trades, sanitation, conservancy, the adoption of other measures for the cleanliness of the Union, provision and maintenance of public ways and public streets and other measures likely to promote the welfare, health, safety, comfort or convenience of the inhabitants of the Union or of visitors. In urban areas a Town Committee, or a Union Committee, shall consist of such a number of elected and appointed members as may be fixed by the Commissioner. As in the rural areas, the total number of appointed members shall be not more than one half of its elected members; elections to these Committees will also be held on the basis of adult franchise. The next tier in the basic democracies of the Thana Council for East Pakistan and the Tehsil Council for West Pakistan a Thana or Tehsil Council shall co-ordinate the activities of all Union Councils and Town Committees in the Thana or Tehsil. Subject to the rules, a Thana or Tehsil Council may, and, if required by the District Council, shall, undertake all such functions in the Thana or Tehsil as the District Council is competent to undertake in the district. The Government may also direct from time to time that any functions entrusted to the District Council or to any Union Council or Town Committee in the Thana or Tehsil shall be undertaken by the Thana or Tehsil Council concerned. The Thana or Tehsil Council shall consist of representative members and such number of official appointed members as may be fixed by the Commissioner. The Chairman of the Union Councils and Union and Town Committees shall, ex-officio, be representative members of this Council. This total number of official and appointed members of this Council shall not be more than one half of the total number of its representative members, the Sub-Divisional Officer shall ex-officio be a member of the Council and will be its Chairman. Another tier will be formed by the District Council; the District Council shall co-ordinate the activities of all local councils and municipal bodies and Contonment Boards in the district. The total number of appointed members of a District Council shall not be less than the total number of its official members, and at least one half

shall be chosen from among the Chairmen of the Union Councils and of the Town and Union Committees in the district. The Collector shall, ex-officio be, one of the official members of the Council and its Chairman. A Divisional Council shall co-ordinate the activities of all local councils and municipal bodies and Cantonment Boards within the division. The total number of appointed members of a Divisional Council shall not be less than the total number of its official members and at least one half of the appointed members shall be chosen from among the Chairmen of Union Councils and of the Town and Union Committees in the division. The Commissioner shall, ex-officio, be one of the official members of the Council and its Chairman. The terms of office of a Local Council shall be a period of five years, commencing on the day on which that authority assumes office. For the purpose of election to a Union Council or to a Town or Union Committee the Union or towns shall be divided into wards; for each ward there is to be maintained in the prescribed manner a register in which shall be entered the names of persons who possess the qualifications and are not subject to any of the specified disqualifications. As regard changes in Local Government, the existing system of Local Government is being fundamentally altered. The Basic Democracies Order states that a Local Fund shall be formed for every Local Council from the Union to the Divisional levels, and sets out the various items which must be placed to the credit of the Local Fund. The Order states that every Local Council shall prepare to sanction its annual budget, an annual statement of account shall be prepared for transmission to the controlling authority. A copy of it and such other statements as may be presented shall be placed at a conspicuous place in the office of the Local Council concerned for the public inspection, in order that objections or suggestions concerning such accounts received from the public shall be considered by the Local Council and brought to the notice of the audit authority. The account of every Local Council shall be audited in such manner and by such authority as may be prescribed. A Local Council may, and if required by the Government shall, prepare and implement development plans for such periods and in such manner as may be specified; such plans shall be subject to the sanction of a prescribed authority and shall provide for the promotion, improvement and development of such function or functions of the Local Council as may be specified; the manner in which the plans shall be financed, executed, implemented and supervised, and the agency through which the plans will be executed and implemented. All land in the district assessable to rent in East Pakistan and to Land Revenue in West Pakistan shall be subject to the payment of a rate to be known as Local Rate; the Local Rate in each district shall bear such proportion to the rent or Land Revenue in the district as the Government from time to time may fix, pro-

vided that the Local Rate shall not exceed 50 per cent, of the rent or Land Revenue. The Local Rate shall be collected with the rent or Land Revenue by the village revenue officials responsible for its collection, and its proceeds shall be credited to the Local Funds of the District Council and Union Councils in the district in such proportion as may be fixed by the Government from time to time. A District Council, with the previous sanction of the Government, and a Union Council, with the previous sanction of the Commissioner, may levy in the prescribed manner all, or any, of the taxes, cesses and fees specified in the Order.

This system, when brought into force, will completely revolutionise the whole system of Local Government in force in Sind. The future alone will show to what extent the Order will succeed in effecting the high aims which the revolutionary government of 1958 has set itself.

There has certainly been in the whole of history no revolution of this nature accomplished with so little disturbance of the ordinary processes of civil life. There was no bloodshed and the public, as a whole, appeared to be relieved that the irregular working of parliamentary democracy set up on the British model will no longer be allowed.



Gul Hayat Institute



Ayub Bridge at Sukkur.

APPENDICES I TO X

Gul Hayat Institute

APPENDIX I

Vertebrate fossils from the Manchhars of former Sind.

The Tertiary fresh water deposits of former Sind were grouped by Blandford into Lower and Upper Manchhars. The lower Manchhars have yielded a rich vertebrate fauna but only fragmentary and unidentifiable bones have been reported from the upper division. and R. Lydekker has identified the following vertebrate fossils from the Lower Manchhars :—

MAMMALIA.

Carnivora.

Amphicyon palaeindicus.

Proboscidea.

Mastodon perimensis.

Deinotherium pentepotamiae.

M. Latidens.

D. indicum.

M. Trilophodon falconeri.

D. sp. nov.

Ungulate.

Perissodatyta.

Rhinoceros palaeindicus.

Acerotherium perimense.

R. sp. near R. deccanensis.

ARTIODACTYLA.

Sushysudricus.

Anthracotherium silistrense.

Hemimeryx, sp.

Hyopotamus palaeindicus.

Sivameryx, 2 sp.

Hyotherium sindiense.

Chalicotherium sivalense.

Dorcatherium majus.

D. minus.

EDENTATA.

Manis sindiensis.

REPTILIA.

Cocodilus, s.p.**Chelonia, sp. indet.****Ophidia, sp. indet.**

In the Manchhars, silicified fossil woods, often large in size mostly dicotyledonous but also monocotyledonous, are of frequent occurrence.

In 1909, Pilgrim revised the material available in the Indian Museum and brought it up-to-date in the light of the subsequent knowledge. He identified the following :—

Reptilia.

Crocodylus palaeindicus Falconer.

Garialis pachyrhyncus Lydekker.

Garialis curvirostris Lyd.

Artiodactyla.

Anthracotherium silistrense Fentland.

Hemimeryx blanfordi Lyd.

Agriochoerus sp.

Choeromeryx sindiense Lyd.

Hyoboops palaeindicum Lyd.

Palaeochoerus sindiensis Lyd.

Listriodon sp.

Sus hysudricus Falconer and Cautley var.

Dorcatherium majus Lyd.

Dorcatherium minus Lyd.

Progiraffa sp.

Perissodactyla.

Chalicotherium sindiense Lyd.

Rhinoceros sivalensis F. & C. var.

Aceratherium perimense F. & C.

Proboscidea.

Deinotherium indicum F. type sp.*Deinotherium indicum* var. *pentapotamiae*.*Deinotherium sindiense* Lyd.*Tetrabelodon angustidens* Cuv. var. *palaeindicus* Lyd.*Tetrabelodon pandionis* F.*Tetrabelodon falconeri* Lyd.*Mastodon perimensis* C. & C.*Mastodon latidens* Ctlif.

Carnivora.

Amphicyon sp. (*palaeindicus*).

Subsequently in 1913, he assigned a Tortonian age to the lower Manchhars.

Nearly thirty years after Blandford and Fedden who probably made the first vertebrate collections from the Manchhars* in 1874-76, rich collections were obtained through the enterprise of Pilgrim and his collaborators, from the area near Bagathoro. The study of these collections enabled Pilgrim to establish 3 distinct divisions in the Lower Manchhars of Blandford as follows :—

1. Basal Part with the predominance of forms like *Tetrabelodon angustidens* var. *Palaeindicus* Lyd. and *Hychoops palaeindicus*. This part is also characterised by the presence of such species which are unknown in the Chinji stage. He correlated this zone with the Kamlials.

2. Intermediate Zone characterised by Chinji fossils.

*In the "Descriptive Catalogue of the fossil remains of vertebrate from the Sewalik hills etc. in the Museum of the Asiatic Society of Bengal" by Falconer and Walker (1859), mention has been made of the fossils of *Mastodon latidens*, *Rhinoceros* and *Crocodiles* etc. These fossils are said to have been presented by Dr. young through Dr. Spilsbury. They are supposed to have come from "Sehwan, on the north side of Jukkeo (Laki) hills" This apparently refers to an earlier collection.

3. Top zone with the forms of Dhok Pathan affinity. Above this come the coarse conglomerates and boilder beds comprising Upper Manchhars. According to Pilgrim the vertebrate fossils mentioned in the following list were recovered from different zones in the Lower Manchhars :—

Kamlial zone.

Deinotherium sindiense Lyd.

Tetrabelodon angustidens var. **palaeindicus** Lyd.

Hyotherium sindiense Lyd.

Listriodon nov. sp.

Hyoboops palaeindicus Lyd.

Hemimeryx blanfordi Lyd.

Microbunodon cf. **silistrensis** Pent.

Dorcabune sindiense Pilg.

Propalaeomeryx exigua Pilg.

Chinji zone.

Tetrabelodon Macrognathus Pilg.

Hyotherium chinjiense nov. sp.

Listriodon pentapotamiae Lyd.

Hemimeryx pusillus Lyd. sp.

Dorcabune anthracotheroides Pilg.

Dorcatherium minus Lyd.

Giraffokeryx chnjiensis Pilg.

Dhok Pathan zone.

Hipparion punjabiensis Lyd.

Rhinoceros sevalensis Lyd.

Antelopine. n. gen. Pilg. sp. latidens , Lyd.

In yet another paper, "Correlation of ossiferous sections in the Upper Cenozoic of India" Pilgrim (1934), has confirmed his earlier views. He considers the 3 divisions of the Lower Manchhars as equivalent to Kamliar, Chinji and Dhok Pathan stages whereas he has correlated the Upper Manchhars with the Boulder Conglomerate stage of the Siwaliks. Their respective ages will be Helvetian (kamliar), Tortonian (chinji), Pontian or Lower Pliocene (Dhok Pathan) and Lower Pleistocene (Boulder Conglomerate). The Boulder Conglomerate stage is now considered to be of Middle Pleistocene age.



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APPENDIX II

Jurassic/Cretaceous plant remains from the Jaisalmer area.

In the year 1877, Blandford recorded some dicotyledonous fossil wood from the Barmer sandstones of Lathi and Kita to which he assigned a Jurassic age. Later in 1902, La Touche found two specimens of impressions of veined leaves from the Barmer sandstones belonging to dicotyledonous angiosperms on the basis of which he thought that they could not be older than Cretaceous. very recently (1949-52) several dicotyledonous leaves were described by M.N. Bose of the Birbal Sahni Institute of Palaeobotany (Lucknow) from the sandstones of Lunu, Barmer dt. He favoured the view already expressed by La Touche that these sandstones are not older than Cretaceous.



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APPENDIX III

List of plants of former Sind and Khairpur

ANGIOSPERMAE

DICOTYLEDONEAE

I. RANUNCULACEAE.

1. *Ranunculus* Linn.

1. *Ranunculus sceleratus* Linn., F.B.I. I: 19.
Banks of Indus river : Stocks; Sukkur, banks o.
Indus : Woodrow.
Fl. Feb.-March.

II. ANNONACEAE

2. *Annona* Linn.

2. **Annona muricata* Linn., F.B.I. I : 78.
Fl. July-Sept.
3. **Annona reticulata* Linn., F.B.I. I : 78.
Fl. June.
4. **Annona squamosa* Linn., F.B.I. I : 78.
Fl. May-July.
3. *Polyalthea* Blume.
5. *Polyalthea longifolia* Benth. and Hook. f., F. B. I. I: 78
Fl. April-May.

III. MENISPERMACEAE

4. *Cissampelos* Linn.

6. *Cissampelos pareira* Linn., F.B.I. I : 103.
Sind : Duthie.
Fl. All the year round.

5. *Cocculus* D.C.

7. *Cocculus hirsutus* Deils., F.B.I. I : 101.
Syn. *C. villosus* DC.
Mirpur Khas, Thatta, Karachi.
Fl. Dec.
8. *Cocculus pendulus* Deils, F.B.I. I: 102.
Syn. *C. leaeba* DC.
Thatta, Karachi.
Fl. Nov. Dec.

IV. NYMPHAEACEAE.

6. *Nelumbo* Adans.=*Nelumbium* Juss.

9. *Nelumbo nucifera* Gaertn, F.B.I. I :116.
Syn. *Nelumbium speciosum* Wild.

7. *Nymphaea* Linn.

10. *Nymphaea lotus* Linn., F.B.I. I : 114.
Fl. All the year round.

11. *Nymphaea rubra* Roxb., F.B.I. I : 114.
Fl. Aug.

12. *Nymphaea stellata* Willd., F.B.I. I : 114.
Fl. All the year round.

V. PAPAVERACEAE.

S. *Argemone* Linn.

13. *Argemone mexicana* Linn., F.B.I. I : 117.
Hyderabad, Thatta, Sukkur, Malir.
Fl. All the year round.

VI. FUMARIACEAE.

9. *Fumaria* Linn.

14. *Fumaria parviflora* Lamk., F.B.I., I : 128.
Sind: Stocks, Cooke ; Hyderabad, Sukkur, Malir, Karachi.
Fl. Jan.

VII. CRUCIFERAE.

10. *Brassica* Linn.

15. **Brassica hirta* Moench., F.B.I. I : 157.
Syn. *B. alba* Rabenh.
Fl. March-April.

16. **Brassica campestris* Linn., F.B.I. I : 156.
Fl. Feb.-March.

17. **Brassica oleracea* (Linn.), Koch., F.B.I. I : 15.
Fl. Feb.- March.

18. ***Brassica nigra** Linn., F.B.I. 1: 156
Fl. Feb.-March.
19. ***Brassica napus** Linn., F.B.I. 1: 156.
Fl. Feb.-March.
20. ***Brassica juncia** Hook. f., and Thom., F.B.I. 1: 157.
Fl. Feb.-March.

II. Eruca Tourn.

21. ***Eruca sativa** Mill., F.B.I.I: 158.
Fl. Jan.-Feb.

12. Farsetia Desv.

22. **Farsetia jacquemontii** Hook. f. & F.B.I. I: 140.
Sehwan : Cooke.
Fl. Dec.-Jan.

23. **Farsetia hamiltonii** Royle., F.B.I. I: 140.
Khairpur : Y.R.R.
Fl. April-June.

13. Lepidium Linn.

24. **Lepidium sativum** Linn., F.B.I. I: 159.
Malir, Karachi.
Fl. March-April.

14. Moricandia DC.

25. **Moricandia tortuosa** Kook. f. & Thom., F.B.I. I: 158.
Syn. **Douepia tortuosa** Camp.
Karachi.
Fl. Dec.

15. Physorhynchus Hook.

26. **Physorhynchus brahuicus** Hook., F.B.I. I : 165.
Thano Bula Khan, Surjana Hills, Larkana : BSM.
Fl. Aug.

16. *Raphanus* Linn.

27. **Raphanus sativus* Linn., F.B.I.I : 165-166.
Fl. Winter.

17. *Coronopus* Linn.

28. *Coronopus didymus* (L). Sm.
Syn. *Senebiera pinnatifida* DC., F.B. Pres. I : 33.
Ruk : Cooke.
Fl. Feb.

18. *Thlaspi* Linn.

29. *Thlaspi arvense* Linn., F.B. Pres I : 33.
Kirthar mountains : Stocks.
F.I March.

VIII. CAPPARIDACEAE.

19. *Capparis* Linn.

30. *Capparis decidua* (Forsk)Edgew., F.B.I. I :173-174
Syn. *C. aphylla* Roth.,

Gholam, Ghara, Mirpur Sakro, Mirpur Khas, Khairpur, Pad
Idan, Nawabshah, Larkana, Sukkur, Mungopeer, Malir,
Karachi.
Fl. Feb-March.

31. *Capparis horrida* Linn., F.B.I. I : 178.
Hyderabad, Thatta, Karachi.
Fl. Nov.-April.

32. *Capparis spinosa* Linn., var. *galeata* Hook. f. & Thom., F.B.L.
I 173. Soorjana Hills: Stocks; Larkana: Y.R.R.; Kirthar
mountains : Cooke; Sukkur, Karachi.
Fl. Dec.-March.

33. *Capparis sepiaria* Linn., F.B.I.I. : 177.
Karachi, Hub-river.
Fl. Feb.

34. *Capparis zeylanica* Linn., F.B.I. I: 174.
Pad Idan, Nawabshah : Cooke; Malir, Karachi.
Fl. Nov.-Jan.

20. *Cadaba Forsk.*

35. *Cadaba fruticosa* (Linn.) Druce. F.B.I. I: 172.
Syn. *C. Indica* Lamk.
Thatta, Gholam, Mirpur Sakro : BSM; Karachi, Malir.
Fl. Nov.-March.
36. *Cadaba farinosa* Forsk. F.B.I. I : 173.
Thatta, Mirpur Sakro, Bugar : BSM.;
Fl. Jan.-March.
37. *Cadaba heterotricha* Stocks., F.B.I. I : 173.
Cape Monze, Karachi.
Fl. Nov.-Feb.

21. *Clcome Linn.*

38. *Clcome brachycarpa* Vahl., F.B.I. I: 169.
Thatta, Gharo : BSM.; Tharparkar, Laki, Sukkur, Larkana:
Cooke; Malir, Karachi.,
var. *longipetiolate* Sabnis.
Malir, Karachi.
var. *glauca* Blatt. & Hall.
Boogta Hills : Stocks ; Thatta : BSM.
Fl. Nov.-May.
39. *Clcome scaposa* DC., F.B.I. I : 168.
Syn. *C. papillosa* Steud.
Laki, Thano Bula Khan: Cooke; Karachi.
Fl. Aug.-Dec.
40. *Clcome rubicola* Vicary.
Syn. *C. stocksiana* Boiss., B.F.I. I: 169.
Boogta Hills, Laki : Stocks, Cooke; Karachi.
Fl. Aug.-Sept.
41. *Clcome viscosa* Linn., F.B.I. I : 170.
Larkana, Nasarpur, Mirpur Khas, Sanghar, Thatta, Gharo
Karachi.
Fl. Aug. Sept.
42. *Clcome quinquenervia* DC., F.B.I. I : 168.
Laki : Cooke ; Malir, Karachi.
Fl. Oct.

43. **Clcome Burmanni** W. & A. F.B.I. I : 170.
Hyderabad : Cooke.
Fl. Sept.-Nov.

22. *Crataeva* Linn.

44. ***Crataeva religiosa** Forsk., F.B.I. I : 172.
Fl. April-May.

23. *Dipterygium* Decn.

45. **Dipterygium glaucum** Decn., F.B.I. I : 40.
Jacobabad, Umarkot : BSM.
Fl. Sept.

24. *Gynandropsis* DC.

46. **Gynandropsis gynandra** (Linn) Brig., F.B.I. I : 171.
Syn. **G. pentaphylla** DC.
Padidan, Khairpur, Thatta, Ghara, Karachi.
Fl. June-Sept.

25. *Maerua* Forsk.

47. **Maerua arenaria** Hook, f. & Thom, F.B.I. I : 171.
Syn. **M. ovalifolia** Camb.
Gholam : Blatt. & Hall.; Karachi.
Fl. Sept.-Oct.

IX. RESEDACEAE.

26. *Ochradenus* Delile.

48. **Ochradenus baccatus** Delile. F.B.I. I : 182.
Gholam, Thatta : BSM; Hyderabad : Cooke; Karachi, Malir.

27. *Oligomeris* Camb.

49. **Oligomeris glaucescens** Camb., F.B.I. I : 181.
Kirthar mountains: Cooke.
Fl. March-April.

28. *Reseda* Linn.

50. **Reseda aucheri** Boiss., F.B.I. I : 181.
Thatta, Hyderabad : Blatt & MC., Karachi.
Fl. Feb.-April.

51. **Reseda pruinosa** Delile, F.B.I. I : 181.
Boogta Hills, Thano Bula Khan: Cooke; Karachi.
Fl. March.

X. VIOLACEAE.

29. *Viola* Linn.

52. **Viola stocksii** Boiss., F.B.I.I : 185.
Margalli, Moosa-Khail: Vicary; Malir, Karachi, Drigh Road
Fl. July-Aug.

XI. POLYGALACEAE.

30. *Polygala* Linn.

53. **Polygala abyssioica** Fres., F.B.I. I : 202.
Sind : Stocks.
Fl. Sept.
54. **Polygala erioptera** DC., F.B.I. I : 203.
Jamadar ka Landha: Cooke; Karachi, Malir, Mungopeer.
Fl. Aug.
55. **Polygala irregularis** Boiss., F.B. Pres. I : 61.
On the sandy coast of Sind : Blatt; Karachi.
Fl. Dec.

XII. CARYOPHYLLACEAE.

31. *Polycarpaea* Linn.

56. **Polycarpaea corymbosa** Lamk, F.B.I. I : 245.
Jamadar ka Landha: Stocks; Karachi.
Fl. Nov.-March.
57. **Polycarpaea spicata** W. & A., F.B.I. I : 246.
Sea shore near Karachi; Batter.
Fl. Nov.-Feb.

32. *Spergula* Linn.

58. **Spergula arvensis** Linn., F.B.I. I : 243.
Kirthar Hills : Stocks.
Fl. March-April.

XIII. PORTULACACEAE

33. *Portulaca* Linn.,

59. ***Portulaca oleracea*** Linn., F.B.I. I : 246.
Common weed in gardens and in cultivated fields.
Fl. Oct.-Dec.
60. ***Portulaca quadrifida*** Linn., F.B.I. I : 246,
A common weed in Sind and Karachi.
Fl. Nov.
61. ***Portulaca tuberosa*** Roxb., F.B.I. I : 247.
Jamadar ka Landha: Stocks; Malir river banks, Karachi.
Fl. Aug.-Sept.

XIV. TAMARICACEAE.

34. *Tamarix* Linn.

62. ***Tamarix dioica*** Roxb., F.B.I. I : 249.
Syn. ***T. gallica*** Linn.
In river beds: Karachi and Thatta.
Fl. Nov.-Dec.
63. ***Tamarix ericoides*** Rottl. F.B.I. I : 249.
In river beds: Karachi, Malir.
Fl. Nov. Jan.
64. ***Tamarix troupii*** Hole.,
Common, on the banks of Indus; coast of Karachi.
Fl. Sept.-Dec.
65. ***Tamarix aphylla*** Karst.,
Syn. ***T. articulata*** Vahl., F.B.I. I : 248,249.
Common in Indus delta, on the Banks of Indus, & in Karachi.
Fl. Aug.-Oct.
66. ***Tamarix stricta*** Boiss., F.B.I. I : 249.
Karachi Hub-river.

XV. ELATINACEAE.

35. *Bergia* Linn.

67. ***Bergia aestivosa*** W. & A., F.B.I. I : 251.
Sukkur.
Fl. April.

68. **Bergia ammanioides** Roxb., F.B.I. I : 251.
Thatta, Bughar river, Gharo, Mirpur Sakro: BSM.
Fl. Summer.
69. **Bergia odorata** Edgew., F.B.I., I : 251.
Jamadar ka Landha : Stocks ; Karachi.
Fl. Oct.-Dec.

XVI. MALVACEAE.

36. *Abutilon* Gaertn.

70. **Abutilon indicum** G. Don., F.B.I. I : 326.
Mirpur Sakro : BSM.; Karachi, Jamadar ka Landha: Stocks.
Fl. All the year.
71. **Abutilon bidentatum** Hoscht., F.B.I. I : 326.
Hub-river, Karachi.
Fl. Aug.
72. **Abutilon muticum** G. Don., F.B.I. I : 327.
Karachi, Mungopeer.
Fl. Sept.-Jan.
73. **Abutilon polyandrum** W. & A., F.B.I. I : 325.
Thatta, Bughar river, Gharo: BSM.; Karachi.
Fl. Nov.-Jan.
74. **Abutilon graveolens** W. & A., F.B.I. I : 327.
Sehwan : Woodrow.
Fl. Nov.-Jan.
75. **Abutilon glaucum** Sweet., F.B.I. I : 327.
Nawabshah, Pad Idan, Hyderabad, Ganja Hills, Mirpur Khas,
Jamesabad, Sanghar, Umarkot, Mirpur Sakro, Gharo, Thatta:
BSM.
Fl. All the year round.
76. **Abutilon cornutum** T. Cooke., F.B. Pres. I : 98.
Thatta, Gharo: BSM.; Karachi, Mungopeer : Perry; Malir.
Fl. Aug.-Sept.
77. **Abutilon fruticosum** Guill., F.B.I. I : 328.
Thatta, Mirpur Sakro, Bughar: BSM.; Malir, Karachi,
Fl. Aug.-Sept.

78. **Abutilon ramosum** Guill., F.B.I. I : 328.
Karachi, Malir.
Fl. Dec.
79. **Abutilon theophrastii** Medic., Malv. 28.
Syn. **Abutilon avecinnae** Gaertn F.B.I. I : 327.
Sind ! Stocks.

37. **Althaea** Linn.

80. ***Althaea rosea** Linn., F.B.I. I : 319.
Fl. Sept.-Feb.
81. **Althaea ludwigii** DC., F.B.I.I : 319.
Larkana, Sukkur: Vicary; Sehwan: Woodrow; Hyderabad: Cooke.
Fl. March-July.

38. **Gossypium** Linn.

82. ***Gossypium arboreum** Linn., F.B.I. I : 347.
Occasionally cultivated in the gardens.
Fl. Aug.-Nov.
83. **Gossypium bakeri** Watt., kew Bull., (1926), 210.
Near Gharo in the Indus delta : Baker.
84. ***Gossypium herbaceum** Linn., F.B.I. I : 346.
Fl. Aug.-Nov.
85. **Gossypium stocksii** Mast., F.B.I. I : 346.
Karachi, Drigh Road.
Fl. Dec.-Jan.

39. **Hibiscus** Linn.

86. **Hibiscus caesius** Gracks., F.B.I.I : 339.
Sind ! Stocks.
Fl. Aug.-Dec.
87. **Hibiscus punctatus** Dalz., F.B.I. I : 340.
Karachi: Woodrow; Cooke; Jamadar ka Landha: Stocks,
Karachi, Malir.
Fl. Aug.-Dec.

88. **Hibiscus trionum** Linn., F.B.I. I : 334.
Common : Karachi and Sind.
Fl. Aug.-Jan.
89. **Hibiscus micranthus** Linn., F.B.I. I.335.
Thatta, Gharo, Bughar: BSM.; Gadap: Y.R.R.; Karachi.
Fl. Oct.-N
90. **Hibiscus intermedius** A. Rich., F.B.I I : 336.
Gharo : BSM.; Karachi, Malir.
Fl. Oct.-Nov.
91. **Hibiscus esculentus** Linn., F.B.I. I : 343.
Fl. Summer.
92. **Hibiscus amblyocarpus** Hochst. in Webb, Fragm. Fl. Aethiop 45
Rahim ka bazar : Y.R.R.
93. **Hibiscus sindicus** Stocks., F.B.I. I : 336.
Jamadar ka Landha : Stocks; Karachi.
94. **Hibiscus solandra** L.'Her., F.B.I. I : 336.
Sind ! Stocks.
Fl. Oct.-Dec.
95. **Hibiscus Rosa-sinensis** Linn. F.B.I. I : 344.
Fl. All the year round.
96. ***Hibiscus cannabinus** Linn., F.B.I. I : 339.
Fl. Sept.
40. **Malva** Linn.
97. **Malva parviflora** Linn., F.B.I. I : 321.
Sind ! Stocks; Karachi, Malir, Mungopeer.
Fl. Dec.-Feb.
98. **Malva rotundifolia** Linn., F.B.I. I : 320.
Sind ! Stocks ; Karachi.
Fl. Jan.-March.
99. **Malva sylvestris** Linn., var. **mauritiana** Boiss., F.B.I. I : 320
Malir : gardens and cultivated fields.
Fl. Jan.-March.

41. *Malvastrum* A. Gray.

100. *Malvastrum tricuspidatum* A. Gray., F.B.I. I : 321.
Malir.

42. *Pavonia* Cav.

101. *Pavonia glechomifolia* Gracke., F.B.I. I : 331.
Sind ! Cooke; Jamadar ka Landha: Stocks; Karachi.
Fl. Sept.-Oct.
102. *Pavonia arabica* Steud., F.B.I. I : 331.
Jamadar ka Landha: Stocks; Karachi: Vicary, Cooke; Malir,
Karachi.
Fl. Winter.
103. *Pavonia Zeylanica* Cav., F.B.I. I : 331.
Jamadar ka Landha: Stocks; Karachi.
Fl. Sept.-Jan.
104. *Pavonia procumbens* Boiss., F.B.I. I : 330.
Sind ! Stocks.
105. *Pavonia odorata* Willd., F.B.I. I : 331.
Sind ! Stocks.
Fl. Oct.
106. *Pavonia ceratocarpa* Mast., F.B.I. I : 331.
Sind ! Stocks; Karachi: Cooke.
Fl. Dec.
107. *Pavonia propinqua* Gracke., F.B.I. I : 332.
Sind ! Stocks.

43. *Salmalia* Schott. and Endlicher.

108. *Salmalia malabarica* (DC). Schott. and Endlicher., F.B.I. I : 349
Syn. *Bombax malabaricum* DC. F.B.I. I : 349.
Fl. Feb.-March.

44. *Sida* Linn.

109. *Sida veronicifolia* Lamk., F.B.I. I : 322.
Common on sandy soils.
Fl. Oct.-Nov.
110. *Sida spinosa* Linn., F.B.I. I : 323.
Thatta. Mirpur Sakro: BSM.; Landhi: Cooke; Karachi.
Fl. Oct.-Nov.

111. *Sida grewioides* Guill., F.B.I. I : 323.
Hyderabad, Thatta, Karachi.
Fl. Nov.-Dec.
112. *Sida cordifolia* Linn., F.B.I. I : 324.
Sind ! Stocks.
Fl. All the year round.
113. *Sida rhombifolia* var. *retusa* Mast., F.B.I. I : 324.
Sind ! Stocks.
Fl. Oct.-Dec.

45. *Thespesia* Soland.

114. *Thespesia populnea* Soland., F.B.I. I : 345.
Karachi. Naturalized.
Fl. Winter.

46. *Senra* Cav.

115. *Senra incana* Cav. F.B.I. I : 334.
Hills in Sind! Cooke; Drigh Road, Karachi, Landhi, Bun
Murad Khan.
Fl. Nov.-Jan.

47. *Urena* Linn.

116. *Urena sinuata* Linn., F.B.I. I : 329.
Sind ! Stocks.
Fl. Oct.-Dec.

XVII. STERCULIACEAE.

48. *Melhanja* Forsk.

117. *Melhanja abyssinica* A. Rich., F.B.I. I : 372.
Hyderabad, Karachi.
118. *Melhanja denhmii* R. Br., F.B.I. I : 373.
Sind! Stocks, Cooke; Hills near Karachi: Strachan; Rahimka
bazar: Y.R.R.
Fl. Nov.-Dec.
119. *Melhanja futehporensis* Munro., F.B.I. I : 373.
Sind ! Stocks.
120. *Melhanja tomentosa* Stocks., F.B.I. I : 373.
Sind! Dalzell, Cooke, Woodrow.

49. *Sterculia* Linn.

121. **Sterculia populnifolia* Roxb., F.B.I.I ; 361.
Fl. Dec.-April.

XVIII. TILIACEAE.

50. *Corchorus* Linn.

122. *Corchorus acutangulus* Lamk., F.B.I. I : 398.
Sind ! Stocks; Jamadar ka Landha: Stocks; Karachi.
Fl. Sept. Oct.
123. *Corchorus depressus* Stocks. Proc. Linn. Soc. I. (1848) 367.
Syn. *Corchorus antichorus* Raensch., F.B.I. I : 398.
Hyderabad : Starachan; Thatta, Karachi.
Fl. Sep. -Nov.
124. *Corchorus fascicularis* Lamk., F.B.I. I : 398.
Sind ! Stocks; Karachi, Malir.
Fl. Sept.
125. *Corchorus olitorius* Linn., F.B.I. I : 397.
Thatta, Bughar, Gharo: BSM.; Karachi, Malir, Landhi.
Fl. Aug.-Sept.
126. *Corchorus tridens* Linn., F.B.I. I : 398.
Tharparkar, Hyderabad, Karachi.
Fl. July Aug.-Sept.
127. *Corchorus trilocularis* Linn., F.B.I.I : 397.
Karachi, Malir, Landhi.
Fl. July-Sept.

51. *Grewia* Linn.

128. *Grewia villosa* Willd., F.B.I.I : 388.
Sind ! Stocks, Dalzell, Cooke, Woodrow; Karachi Malir,
Fl. July-Nov.
129. **Grewia asiatica* Linn., F.B.I. I: 386.
Fl. April-June.

130. **Grewia betulifolia** Juss., F.B.I. I : 385.
Gadap, Karachi.
Fl. July-Sept.
131. **Grewia tenax** (Forsk). Ashers.&Schweinf. Agric. Colon., Ital. V
Supp. 24.
Syn. **G. populifolia** Vahl., F.B.I. I : 385.
Karachi, Thatta, Gholam, Gharo.
Fl. July-Nov.
132. **Grewia damine** Gaert. Fruct., ii. 113.
Syn. **G. salvifolia** Heyne., F.B.I. I : 386.
Hills in Sind ! Stocks.

52. **Triumfetta** Linn.

133. **Triumfetta pentandra** .A Rich., F.B.I.: I 396.
Thatta, Gharo, Gholam, Mirpur Sakro:BSM.
134. **Triumfetta rotundifolia** Lamk., F.B.I. I. :395
Thatta, Gharo, Mirpur Sakro, Gholam:BSM.
Fl. Aug.

XIX. ZYGOPHYLLACEAE.

53. **Fagonia** Linn.

135. **Fagonia cretica** Linn., F.B.I. I:425
Laki, Karachi, Mirpur Khas, Gadap, Mungopeer, Malir.
Fl. Oct.-Jan.

54. **Peganum** Linn.

136. **Peganum harmala** Linn., F.B.I. I:484.
Hyderabad, Mirpur Khas, Karachi.
Fl. Oct.

55. **Seetzenia** R. Br.

137. **Seetzenia orientalis** Dene., F.B.I. I 424.
Sind Hills; Dalzell, Stocks; Hala range: Vicary; Laki: Woodrow
Fl. Oct.

56. **Tribulus** Linn.

138. **Tribulus alatus** Delile., F.B.I. I: 423.
Sehwan: Cooke, Woodrow: Thatta, Gharo, Tharparkar:
B.S.M., B.M.
Hyderabad, Landhi, Malir, Karachi.
Fl. Oct.-Dec.

139. *Tribulus terrestris* Linn. F.B.I. I:423.
Jamadar ka Landha: Cooke; Laki, Khairpur Thatta: BSM.;
Malir, Karachi. Mirpur Khas, Larkana, Gharo. Drigh Road
Fl. Aug.-Oct.
140. *Tribulus Karachiensis* Sp. Nov. Hasanain and Lodhi.
Karachi.
Fl. All the years.

57. *Zygophyllum* Linn.

141. *Zygophyllum coccineum*. Linn., F.B.I. I. : 425.
Sehwan, Hyderabad, Laki, Mirpur Khas, BSM Karachi,
Malir, Landhi.
142. *Zygophyllum simplex* Linn., F.B.I. I. : 424.
Tharparkar, Larkana, Jacobabad, Sukkur, Hyderabad,
Thatta, Pad Idan, Karachi, Malir.
Fl. Nov.-Jan.

XX. GERANIACEAE.

58. *Erodium* L' Her.

143. *Erodium cicutarium* L'Her., F.B.I.: 434.
Thatta: Woodrow : Gharo, Bughar, Mirpur Sakro:
BSM: Thano Bula Khan, Malir, Drigh Road, Karachi.
Fl. Dec.

59. *Monsonia* Linn.

144. *Monsonia heliotropioides* (Cav). Boiss., F.B.I. I. 428.
Thano Bula Khan: Woodrow: Drigh Road, Malir, Karachi.
Fl. Aug.-Oct.
145. *Monsonia senegalenensis* Guill. F.B.I. I:427.
Jamadar ka Landha, Karachi, Drigh Road.
Fl. Aug.-Oct.

XXI. OXALIDACEAE.

60. *Oxalis* Linn.

146. *Oxalis corniculata* Linn..F.B.I. I: 436.
Common in shady places; Karac Malir, Hub.
Fl. April-May.

147. **Oxalis corymbosa** DC. Prod. I: 696.
Naturalized in moist shady places.
Fl. Feb.-May.

148. ***Oxalis Pes-caprae** Linn. Sp. Pl. 434.
Fl. March-May.

XXII. RUTACEAE.

61. Aegle Corr.

149. ***Aegle marmelos** Corr., F.B.I. I: 516.
Fl. April-May.

62. Citrus Linn.

150. ***Citrus limon** (L). Burm. f., F.B.I. I: 515.

151. ***C. medica** Linn., F.B.I. I: 515.

152. ***Citrus aurantium** Linn., F.B.I. I: 515

153. ***Citrus grandis** Osbeck., Bot. Crop Plants, 486 (1917) Hab,
Syn. **C. decumana** Linn.

63A. Murraya Linn.

154. **Murraya paniculata** Jack., F.B.I. I: 503.
Syn. **M. exotica** Linn.
Fl. April-June.

63. Ruta Linn.

155. **Ruta tuberculata** Forsk., F.B.I. I: 4 85.
Boogta Hills : Vicary.
Fl. Dec.

XXIII. SIMARUBACEAE.

64. Ailantus Desf.

156. **Ailantus excelsa** Roxb., F.B.I. I: 518.
Karachi.
Fl. Jan.-March.

65. Garuga Roxb.

157. **Garuga pinnata** Roxb., F.B.I. I: 528.
Karachi, Malir.

XXIV. BURSERACEAE.

66. *Commiphora* Jack.

158. *Commiphora Mukul* Engl., F.B.I. I: 529.
Hills in Sind: Stocks; Cp. Monze-Karachi.
Fl. Dec.-April.
159. *Commiphora stocksiana* Engl., F.B.I. I: 529.
Hills and rocky places in Sind: Stocks; Karachi.
Fl. March-April.

XXV. MELIACEAE.

67. *Melia* Linn.

160. *Melia azedarach* Linn., F.B.I. I: 544.
Naturalized.
Fl. April-Sept.

68. *Azadirachta* Juss.

161. *Azadirachta indica* Juss., F.B.I. I: 544.
Naturalized.
Fl. April-May.

XXVI. CELASTRACEAE.

69. *Gymnosporia* W. & A.

162. *Gymnosporia montana* Benth., F.B.I. I: 621.
Thatta, Bughar, Gharo, Mirpur Sakro: BSM.
Fl. Oct.-Nov.
163. *Gymnosporia senegalensis* Loes., Engl. and Drude. Veg-
Erde, IX III. 2,
Diplo : Y.R.R.
Fl. Aug.-Nov.

XXVII. RHAMNACEAE

70. *Rhamnus* Linn.

164. *Rhamnus persicus* Boiss., F.B.I. I: 638.
Thatta, Gharo : BM.
Fl. April-June.

165. **Rhamnus virgatus** Roxb., F.B.I. I: 639.
Syn. **R. dahuricus** Pallas.
Gadap : Y.R.R.
Fl. May.

71. **Zizyphus** Mill.

166. ***Zizyphus jujuba** Lamk., F.B.I. I: 632.
Cultivated and naturalized.
Fl. Sept.-Dec.
167. **Zizyphus horrida** Roth., F.B.I. I: 636.
Sind ! Cooke.
Fl. Winter.
168. **Zizyphus nummularia** W. & A., F.B.I. I : 633.
Thatta, Gharo, Bughar : BSM Karachi, Malir, Landhi.
Fl. Sept.-Oct.
169. **Zizyphus rotundifolia** Lamk., F.B.I. I: 634.
Karachi, Malir.
Fl. Sept.-Oct.
170. **Zizyphus rugosa**; Lamk., F.B.I. I: 636.
Hyderabad : Cooke.
Fl. Dec.-Jan.
171. **Zizyphus trinervia** Roxb. F.B.I. I : 633.
Sind ! Stocks, Cooke, Vicary.
Fl. Nov.-Dec.

XXVIII. VITACEAE.

72. **Vitis** Linn.

172. **Vitis trifolia** Linn., F.B.I. I: 654.
Karachi, Malir, Hyderabad.
Fl. Aug.
173. ***Vitis vinifera** Linn., F.B.I. I : 652.
Cultivated in Thatta, Karachi and Malir.
Fl. Feb-March.

XXIX. TROPAEOLACEAE.

73. *Tropaeolum* Linn.

174. **Tropaeolum majus* Linn. Sp. Pl. 345.
Cultivated in Hyderabad and Karachi.
Fl. Winter.

XXX. SAPINDACEAE.

74. *Cardiospermum* Linn.

175. *Cardiospermum microcarpum* Kunth., F.B.I. I: 670.
Syn. *C. Halicacabum* Linn.
Hyderabad, Malir.
Fl. Dec.

75. *Dodonaea* Linn.

176. **Dodonaea viscosa* Linn., F.B.I. I : 697.
Fl. Nov.-Dec.

XXXI. ANACARDIACEAE.

76. *Mangifera* Linn.

177. **Mangifera indica* Linn., F.B.I. II : 13.
Fl. Jan.-March.

77. *Rhus* Linn.

178. *Rhus mysorensis* Heyne. Ex. W.&A., F.B.I. II : 9.
Hills in Sind ! Stocks.
Fl. June.-July.

XXXII. MORINGACEAE.

78. *Moringa* Adans.

179. **Moringa oleifera* Lamk., F.B.I. II : 25.
Syn. *M. pterygosperma* Gaertn.
Fl. Jan.-April.
180. **Moringa concanensis* Nimmo., F.B.I. II : 25.
Fl. Jan.-March.

XXXIII. LEGUMINOSAE.

i. PAPILIONACEAE.

79. Abrus Linn.

181. **Abrus precatorius** Linn., F.B.I. II. 175.
Hyderabad, Thatta, Karachi.
Fl. Sept. Oct.

80. Agati Adans.

182. ***Agati grandiflora** Desv., F.B.I. II: 115.
Syn, **Sesbania grandiflora** Pers.
Fl. All the year round.

81. Alhagi Desv.

183. **Alhagi coamelorum** Fisch., F.B.I. II. 145.
Hyderabad, Thatta, Malir, Karachi.
Fl. March-May.

82. Alysicarpus Neck.

184. **Alysicarpus monilifer** DC., F.B.I. II. 157.
Thatta, Karachi : BSM ; Malir, Drigh Road.
Fl. Sept. Oct.

185. **Alysicarpus vaginalis** DC., F.B.I. II. 158.
Gadap Y.R.R.; Thatta, Gharo, Mirpur Sakro, Bugar:BSM.
Fl. Oct.

186. **Alysicarpus rugosus** DC., F.B.I. II. 159.
vsr. **Sytracifolius** Baker.
Jamadar Ka Landha : Stocks.
Fl. July-Aug.

187. **Alysicarpus longifolius** W & A, F.B.I. II : 159.
Karachi.
Fl. Sept.

188. **Alysicarpus tetragonolobus** Edgew., F.B.I. II: 159.
Sind; Stocks.
Fl. Aug.

83. *Aeschynomene* Linn.

189. *Aeschynomene indica* Linn., F.B.I. II: 151.
Thatta, Gharo, Bughar, Mirpur Sakro, BSM.
Fl. Aug-Dec.

190. *Aeschynomene aspera* Linn. F.B.I. II: 151.
Thatta, Gharo, Mirpur Sakro.

84. *Argyrolobium* Eckl. & Zeyh.

191. *Argyrolobium roseum* Jaub, & Spach., F.B.I. II: 64.
Sind ; Stocks : Boogta Hills : Vicary.

85. *Astragalus* Linn.

192. *Astragalus prolixus* Sieb., F.B.I. II : 121.
Sind. Stocks.

193. *Astragalus contortuplicatus* Linn. F.B.I. II: 122.
Hyderabad : Woodrow.

194. *Astragalus stocksii* Benth., Boiss. Fl. Orient. V. 2-492.
Kirthar mountains : James.

86. *Arachis* Linn.

195. *Arachis hypogaea* Linn., F.B.I. II : 161.
Fl. April-June.

87. *Butea* Roxb.

196. *Butea frondosa* Koing ex. Roxb. F.B.I. II: 194.
Occasionally planted in canal areas.
Fl. Feb.-March.

88. *Cajanus* DC.

197. **Cajanus cajan* Millsp., Manual S.E.Fl., 715 (1933).
Syn. *C. indicus* Spreng.
Fl. July-Aug.

89. *Cicer* Linn.

198. **Cicer arietinum* Linn, F.B.I. II: 176.
Fl. Jan. March.

90. *Crotalaria* Linn.

199. ***Crotalaria Burhia Hamilt.*** F.B.I. II. 66.
Mirpur Khas ; Woodrow ; Jamadar ka Landha ; Stocks
Shikarpur ; Cooke ; Gharo ; BSM.
Fl. Dec-Feb.

200. ****Crotalaria juncea* Linn.** F.B.I. II. 79.
Fl. July-Aug.

201. ***Crotalaria medicaginea* Lamk.**, F.B.I. II. 81.
Gholam ; BSM.

91. *Cyamopsis* DC.

202. ****Cyamopsis psoralioides* DC.**, F.B.I. II. 92.
Fl. In Karachi all the year round.

92. *Dalbergia* Linn.

203. ****Dalbergia sissoo* Roxb.** F.B.I. II : 231.
Fl. March-June.

93. *Dolichos* Linn.

204. ****Dolichos lablab* Linn.** F.B.I. II. 209.
Fl. July-Aug.

94. *Indigofera* Linn.

205. ***Indigofera linifolia* Retz.**, F.B.I. II. 92.
Hyderabad, Karachi.
Fl. July,-Oct.

206. ***Indigofera cordifolia* Heyne.** F.B.I. II. 93.
Kullan Kot Lake, Thatta ; B.S.M. Sind ! Woodrow ; Kara-
chi ;
Stocks.
Fl. Aug. Dec.

207. ***Indigofera trigonelloides* Jaub. & Spach.**, F.B.I. II. 94.
Common in Karachi and Sind.
Fl. July-Sept.

208. ***Indigofera uniflora* Buch-Ham.**, F.B.I. II. 94.
Mirpur Sakro ; B.S.M. Karachi.
Fl. Oct.

209. **Indigofera anabaptista** Steud., F.B.I. II : 102.
Sind ! Cooke, Malir, Hub-river, Karachi.
Fl. Aug. Oct.
210. **Indigofera pauciflora** Delile., F.B.I. II. 97.
Common in Sind and Karachi.
Fl. Sept.-Nov.
211. **Indigofera trifoliata** Linn., F.B.I. II : 96.
Thatta, Hyderabad Karachi.
Fl. Aug.-Oct.
212. **Indigofera articulata**. Gouan F.B.I. II. 98.
Fl. Nov-Dec.
213. **Indigofera tenuifolia** Rottl., F.B.I. II. 95.
Sind ! Bhola.
Fl. Sept. Oct.
214. **Indigofera viscosa** Lamk., F.B.I. II. 95.
Sind! Dalzell, Vicary : Gharo : BSM.
215. **Indigofera argentea** Burn., F.B.I. II. 98. (Not of Forsk)
Jamadar ka Landha : Stocks : Hub-river, Malir, Karachi.
216. **Indigofera parviflora** Heyne., F.B.I. II. 97.
Hyderabad, Sukkur.
Fl. Nov.
217. **Indigofera Hover**. Forsk., F.B.I. II : 99.
Sind ! Stocks.
Fl. Nov. Dec.
218. ***Indigofera tinctoria** Linn., F.B.I. II. 99.
Fl. Nov-Dec.
95. Heylandia DC.
219. **Heylandia latebrosa** DC., F.B.I. II. 65.
Common in Sind : Sabnis.
Fl. Feb-June.
96. **Lathyrus** Linn.
220. ***Lathyrus sativus** Linn. F.B.I. II. 179.
221. **Lathyrus incospiuus** Linn., F.B.I. II. 180.
Sind! Stocks.

97. *Lotonionsis* DC.

222. *Lotonionsis Leobordea* Benth., F.B.I. II. 64.
Sehwan : Woodrow.

98. *Lotus* Linn.

223. *Lotus corniculatus* var. *minor* Baker., F.B.I. II. 91.
Sind! Stocks, Bhola Puran, Woodrow.
Fl. Jan-March.
224. *Lotus Garcini* DC., F.B.I. II : 91.
Sind ! Vicary, Stocks ; Jamadar ka Landha : Stocks :
Karachi. Malir.
Fl. Nov.-Dec.

99. *Melilotus* Mill.

225. *Melilotus indica* All., F.B.I. II: 89.
Sind! Woodrow, Cooke.
Fl. Jan.

100. *Medicago* Linn.

226. *Medicago lupulina* Linn., F.B.I. II. 90.
Sehwan : Kantikar, Woodrow.
Fl. March.
227. *Medicago laciniata* All., F.B.I. II : 90.
Sind! Stocks.
228. *Medicago denticulata* Willd., F.B.I. II : 90.
Bubak : Cooke ; Sehwan ; Woodrow.
229. **Medicago sativa* Wall., F.B.I. II : 90.
Fl. All the year.

101. *Phaseolus* Linn.

230. **Phaseolus semierectus* Linn., F.B.I. II : 201.
Fl. Oct.
231. *Phaseolus trilobus* Ait., F.B.I. II : 201.
Hyderabad, Thatta, Malir, Karachi.
Fl. Oct.
232. **Phaseolus aconitifolius* Jacq., F.B.I. II : 202.
Fl. Aug.-Sept.

233. ***Phaseolus radiatus** Linn., F.B.I. II : 203.
Fl. July-Aug.

234. ***Phaseolus Mungo** Linn., F.B.I. II : 203.
Fl. July-Aug.

102. *Psorelia* Linn.

235. **Psorelia plicata** Delile., F.B.I. II : 103.
Sind Stocks, Woodrow.

103. *Pongamia* Vent.

236. **Pongamia glabra** Vent., F.B.I. II : 240.
Mirpur Sakro : BSM.
Fl. April-June.

104. *Rhynchosia* Lour.

237. **Rhynchosia minima** DC., F.B.I. II : 223.
Mirpur Sakro, Thatta, Kullam Kote, Gharo : BSM.
Fl. Sept-Jan.

238. **Rhynchosia rhombifolia** DC., F.B.I. II : 223.
Mirpur Sarkro, Thatta.

239. **Rhynchosia arenaria** Blatt. and Hall Jour. Bom. Nat. Hist.
Soc. XXVI (1918).
Hyderabad, Malir.

105. *Sesbania* Scop.

240. ***Sesbania aegyptiaca** Poir., F.B.I. II : 114.
Naturalized.
Fl. All the year round.

241. **Sesbania aculeata** Pres., F.B.I. II : 114.
Common in Karachi.
Fl. Sept-Oct.

106. *Smithia* Ait.

242. **Smithia bigemina** Dalz., F.B.I. II : 149.
Sind ! Stocks ex Prain.
Fl. Sept-Dec.

107. *Taverniera* DC.

243. *Taverniera cuneifolia* Arn., F.B.I. II: 140
Syn. *T. nummularia* DC.
Thatta : BSM.
Fl. Dec.

108. *Tephrosia* Pers.

244. *Tephrosia tenuis* Wall., F.B.I. II: III.
Jamadar ka Landha : Cooke ; Karachi, Malir, Hyderabad.
Sukkur.
Fl. Sept.-Oct.

245. *Tephrosia coccinea* Wall., F.B.I. II: 112.
Mirpur Khas, Tharparkar.
Fl. Oct.

246. *Tephrosia Apollinea* Link., Boiss. Fl. Oient. II: 192.
Sind ! Stocks.

247. *Tephrosia pauciflora* Grah., F.B.I. II: 114.
Jamadar ka Landha : Stocks.

248. *Tephrosia petrosa* Blatt. & Hall., Jour. Bom. Nat. Hist. Soc-
XXVI (1918), 239.
Gharo, Thatta : BSM.

109. *Trigonella* Linn.

249. *Trigonella occulta* Delile. F.B.I. II: 87.
Sind ! Stocks.
Fl. Jan.

250. **Trigonella Foenum-graecum* Linn., F.B.I. II: 87.
Fl. April.

ii. CAESALPINAE.

110. *Bauhinia* Linn.

251. **Bauhinia tomentosa* Wall., F.B.I. II: 275.
Fl. Nov.-Jan.

252. *Bauhinia racemosa* Lamk., F.B.I. II: 276.
Common throughout Sind and Karachi.
Fl. March-June.

253. ***Bauhinia variegata** Linn., F.B.I. II: 284.
Fl. Sept.-Nov.
- iii. **Cassia** Linn.
254. **Cassia Fistula** Linn., F.B.I. II: 261.
Fl. March-May.
255. **Cassia occidentalis** Linn., F.B.I. II: 262.
Abundant in Sind and Karachi.
Fl. Jan.-March.
256. **Cassia sophora** Linn., F.B.I. II: 262.
Tharparkar, Sukkar, Pad Idan, Hyderabad, Thatta, Karachi
Malir.
Fl. Nov.-Jan.
257. **Cassia Tora** Linn., F.B.I. II: 263.
A common weed in waste places throughout Sind and
Karachi.
Fl. Nov.-Dec.
258. **Cassia auriculata** Linn., F.B.I. II: 263.
Thatta, Gharo, Bund Murad Khan, Mungopeer, Hub-river,
Malir, Karachi.
Fl. Jan.-July.
259. **Cassia obovata** Collad., F.B.I. II: 264.
Syn. **C. obtusa** Roxb.
Karachi, Malir, Drigh Road, Hyderabad, Mirpur Khas,
Thatta.
Fl. Nov.-Feb.
260. **Cassia holosericea** Fresen., F.B. Pres. I: 422
Common in Sind and Karachi.
Fl. Nov.-Jan.
261. **Cassia angustifolia** Vahl., F.B.I. II: 264.
Mirpur Khas, Hyderabad, Tharparkar, also in forest planta-
tions.
Fl. Nov.-Jan.
112. **Caesalpinia** Linn.
262. **Caesalpinia Bonducella** Fleming., F.B.I. II: 254.
Sind ! Stocks; Malir, Landhi.
Fl. July-Sept.

113. *Parkinsonia* Linn.

263. *Parkinsonia aculeata* Linn., F.B.I. II: 260.
Thatta, Hyderabad, Karachi, Naturalized.
Fl. Jan.-March.

114. *Poinciana* Linn.

264. **Poinciana regia* Bojer, F.B.I. II. :60.
Fl. April-June.
265. **Poiniana elata* Linn. F.B.I., II. 260.
Fl. June-Sept.
266. **Poinciana pulcherrima* Linn. F.B.I. II 255.
Syn. *Caesalpinia pulcherrima* Sw.
Fl. All the year round.

115. *Tamarindus* Linn.

267. **Tamarindus indica* Linn, F.B.I. II. 273.
Cultivated and naturalized.
Fl. May-June.

iii. MIMOSEAE.

116. *Acacia* Willd.

268. *Acacia arabica* Willd., F.B.I. II. : 293.
Common in Sind and Karachi, also in forest plantations.
Fl. June-Jan.
269. *Acacia Farnesiana* Willd, F.B.I. II: 292.
Hyderabad Thatta, Karachi, Bund Murad Khan.
Fl. Aug.-March.
270. *Acacia eburnea* Willd., F.B.I. II:293.
Sind:Dalzell.
Fl. Nov.-Feb.
271. *Acacia Jacquemontii* Benth., F.B.I. II:293.
Sind:Talbot.
Fl. Feb-May.
272. *Acacia catechu* Willd., F.B.I. II: 295.
Occasionally cultivated along canal banks in Sind.
Fl. Aug-Sept.

273. *Acacia Senegal* Willd., F.B.I. :295.
Sind ! Stocks, Tharparkar, Dadu, Sukkur.
Fl. Nov.-March.

117. *Albizzia Durazz.*

274. **Albizzia Letbeck* Benth., F.B.I. II. 298.
Naturalized.
Fl. March-May.
275. *Albizzia procera* Benth., F.B.I. II. 299.
On the banks of Indus in Sind:Karachi, Malir, Hub-River
Fl. May-June.

118. *Mimosa Linn.*

276. **Mimosa pudica* Linn., F.B.I. II: 291.
Naturalized in places.
Fl. Sept.-Oct.
277. *Mimosa hamata* Willd., F.B.I. II. 291.
Widely distributed in Sind and Karachi.
Fl. Sept.
278. *Mimosa rubicaulis* Lamk. F.B.I. II :291.
Tharparkar, Dadu, Jacobabad, Thatta, Malir.
Fl. Aug.-Oct.

119. *Pithecolobium Mart.*

279. **Pithecolobium dulce* Benth., F.B.I. II. 302.
Fl. Jan.-March.

120. *Prosopis Linn.*

280. *Prosopis spicigera* Linn., F.B.I. II:288.
Hyderabad, Thatta, Malir, Common in Sind and Karachi.
Fl. Dec.-March.
- 280-a. *Prosopis juliflora* DC. Prod. II: 447.
Fl. April-May.

XXXIV. ROSACEAE.

121. *Neurada Linn.*

281. *Neurada procumbens* Linn, F.B.I., II:368.
Hyderabad, Sukkur, Thatta, Malir, Hub-river, Mungopeer,
Bund Murad Khan.
Fl. Nov-Jan.

122. *Potentilla* Linn.

282. *Potentilla supina* Linn., F.B.I. II:359.

Banks of Indus, Sukkur, Thatta.

Fl. Oct.

***Rosa spp.**

Commonly cultivated.

XXXV. SAXIFRAGACEAE.

123. *Vahlia* Thunb.

283. *Vahlia viscosa* Roxb., F.B.I. II:399.

Karachi, Malir, Hub-river, Bund Murad Khan.

Fl. Jan.

XXXVI. CRASSULACEAE.

124. *Bryophyllum* Salisb.

284. ***Bryophyllum ealycinum** Salisb, F.B.I. II: 413.

Fl. Jan.

XXXVII. HALORAGIDACEAE.

125. *Myriophyllum* Linn.

285. *Myriophyllum intermedium* DC., F.B.I. II:433.

Common in ponds and lakes.

XXXVIII. RHIZOPHORACEAE.

126. *Bruguiera* Lamk.

286. *Bruguiera gymnorhiza* Lamk., F.B.I. II:437.

Salt marshes and tidal zones of Indus Delta and Karachi.

Fl. Dec.-Feb.

127. *Ceriops* Arnott.

287. *Ceriops Candolleana* Arn., F.B.I. II:436.

Along the coast of Sind and Karachi.

Fl. July-Sept.

288. *Ceriops Roxburghiana* Arn. F.B.I. II: 436.

Along the coastal forests and tidal zones.

Fl. July-Sept.

128. *Rhizophora* Linn.

289. *Rhizophora Conjugata* Linn., F.B.I. II:436.
In Mangrove forest along the coast.
Fl. Aug-Dec.

290. *Rhizophora mucronata* Lamk., F.B.I. II:435.
Along the coast.
Fl. Aug-Dec.

XXXIX. COMBRETACEAE.

129. *Quisqualis* Linn.

291. **Quisqualis indica* Linn. F.B.I. II II. 459.
Fl. March-Aug.

130. *Terminalia* Linn.

- 291-a. **Terminalia Arjuna* W. & A., F.B.I., II:447.
Fl. April-May.
292. **Terminalia chebula* Retz. F.B.I. II. 446.
Fl. April-May.
293. **Terminalia tomentosa* W.&A., F.B.I. II: 447.
Fl. April-June.
- 294 **Terminalia catappa* Linn., F.B.I. 444.
Fl. April-June.

XL. MYRTACEAE.

131. *Callistemon* R. Br.

295. **Callistemon citrinus* Stap.
Syn. *Callistemon lanceolatus* DC.
Fl. March-Sept.

132. *Eucalyptus* L'Her.

296. **Eucalyptus Globulus* Labill.
Fl. April-June.

133. *Eugenia* Linn.

297. **Eugenia jambolana* Lamk.. F.B.I. II:499.
Fl. March-May.

298. **Eugenia bracteata* Roxb., F.B.I. II: 502.
Fl. April-July.

134. *Myrtus* Linn.

299. **Myrtus communis* Linn. Sp. Pl. (1753) p. 471.
Fl. May.

135. *Psidium* Linn.

300. **Psidium* *Guyava* Linn., F.B.I. II:468.
Fl. April.

XLI. LYTHRACEAE.

136. *Ammannia* Linn.

301. *Ammannia baccifera* Linn., F.B.I. II: 569.
Mirpur Sakro, Gholam, Limestone Hills, Thatta, Bughar,
Chunar: BSM.; Karachi, Mungopeer, Bund Murad Khan,
Malir.
Fl. Nov.

302. *Ammannia multiflora* Roxb., F.B.I. II: 570.
Sukkar : Y.R.R.
Fl. Nov.

303. *Ammannia salicifolia* Monti., F.B.I. II: 569.
Sind ! Woodrow.
Fl. Nov.

304. *Ammannia desertorum* Blatt. and Hall. Jour. Bom. Nat.
Hist. Soc. XXXII.
Thatta, Gharo : BM.
Fl. Nov.

137. *Lawsonia* Linn.

305. **Lawsonia inermis* Linn., F.B.I. II: 573.
Syn. *L. alba* Lamk.
Naturalized.
Fl. April-July.

138. *Punica* Linn.

306. **Punica granatum* Linn., F.B.I. II: 581.
Fl. April-May.

139. *Sonneratia* Linn.

307. *Sonneratia acida* Linn., F.B.I., II: 579.
Mouths of Indus and tidal zones.
Fl. Feb.-July.

140. *Lagerstroemia* Linn.

308. **Lagerstroemia indica* Linn., F.B.I. II: 575.
Fl. June-July.

XLII. CARICACEAE.

141. *Carica* Linn.

309. **Carica papaya* Linn., F.B.I. II: 599.
Fl. All the year round.

XLIII. ONAGRACEAE.

142. *Trapa* Linn.

310. **Trapa bispinosa* Roxb., F.B.I. II: 590.
Fl. Feb.-March.

XLIV. CUCURBITACEAE.

143. *Blastania* Kotschy.

311. *Blastania Gracini* Cog., F.B.I. II: 629.
Coastal regions of Sind.
Fl. Oct.

312. *Blastania fimbristipula* Kot., F.B.I. II: 630.
Mouths of the Indus.
Fl. Nov.

144. *Bryonopsis* Arn.

313. *Bryonopsis laciniosa* Naud., F.B.I. II: 622.
Common in Sind and Karachi.
Fl. Sept.

145. *Citrullus* Schd.

314. *Citrullus colocythis* Schd., F.B.I. II: 620.
Sukkur, Mirpur Khas, Thatta, Malir, Landhi, Bund Murad
Khan, Hub-river, Gharo, Karachi.
Fl. Nov.-Jan.

315. ***Citrullus vulgaris** Schd., F.B.I. II: 621.
Fl. March-May.

146. *Coccinia* W. & A.

316. **Coccinia cordifolia** Cogn.. F.B.I. II: 621.
Syn. *C. indica* W. & A.
Thatta, Gharo, Bughar, Hub, Malir, Hyderabad, Landhi,
Karachi.
Fl. Aug.-Sept.

147. *Corallocarpus* Welw.

317. **Corallocarpus epigaea** Hook. f., F.B.I. II: 628.
Gholam, Thatta : BSM.
Fl. June-Aug.

318. **Corallocarpus velutinatus** Benth., F.B.I. II: 628.
Karachi, Malir.

148. *Cucumis* Linn.

319. **Cucumis trigonus** Roxb., F.B.I. II: 619.
Landhi, Karachi, Malir, Drigh Road, Bund Murad Khar,
Sukkur, Hyderabad.
Fl. June.

320. ***Cucumis Melo** Linn.. F.B.I. II: 619.
Fl. March-April.

321. ***Cucumis Melo** Linn. var *agrestis* Naud., F.B.I. II: 619.
Fl. March-April.

322. **Cucumis prophetarum** Linn.. F.B.I. II: 619.
Karachi, Hub-river, Bund Murad Khan, Mungopeer, Malir

323. ***Cucumis sativus** Linn.. F.B.I. II: 620.

149. *Cucurbita* Linn.

24. ***Cucurbita pepo** Linn.. F.B.I. II: 622.
Fl. March-May.

325. ***Cucurbita maxima** Duch.. F.B.I. II: 622.
Fl. March-May.

326. ***Cucurbita moschata** Duch.. F.B.I. II: 622
Fl. March-April.

150. *Kedrostis Medikus.*

327. *Kedrostis rostrata* Cogn., F.B.I. II: 627.
Gholam : BSM.
Fl. Sept.-Nov.

151. *Lagenaria Ser.*

328. **Lagenaria vulgaris* Ser., F.B.I. II: 613.
Fl. July.

152. *Luffa Cav.*

329. **Luffa aegyptiaca* Mill., F.B.I. II: 614.
Fl. June-Sept.
330. **Luffa acutangula* Roxb., F.B.I. II: 615.
Fl. June-Sept.
331. *Luffa echinata* Roxb., F.B.I. II: 615.
Sind ! Stocks.
Fl. Sept.

153. *Melothria Linn.*

332. *Melothria maderaspatana* Cogn., F.B.I. II: 623.
Common in Sind and Karachi.
Fl. July.

154. *Momordica Linn.*

333. *Momordica dioca* Roxb., F.B.I. II: 615.
Sind ! Stocks.
Fl. June-Aug.
334. *Momordica Balsamina* Linn., F.B.I. II: 537.
Malir, Landhi, Karachi, Thatta, Gharo, Bund Murad Khan
Hub-river.
Fl. Nov.
335. **Momordica charantia* Linn., F.B.I. II: 616.
Fl. May-Aug.

155. *Trichosanthes Linn.*

336. *Trichosanthes anguina* Linn., F.B.I. II: 610.
Fl. May-Aug.

XLV. CACATACEAE.

156. *Opuntia* Mill

337. **Opuntia compressa* Macb., Bailey Manu. Cult. Pl.704.
Naturalized.
Fl. April-May.
338. *Opuntia vulgaris* Mill., Bailey Manu.Cult Pl. 704.
Syn. *O. monacantha* Haw.
Naturalized.
Fl. April-May.
339. **Opuntia stricta* Haw.
Fl. April-May.
340. *Opuntia Dillenii* Haw., F.B.I. II:657.
Naturalized.
Fl. March-May.

XLVI. FICOIDEAE.

157. *Aizoon* Linn.

341. *Aizoon canariense* Linn. F.B.I. II: 659.
Jamadar ka Landha:Stocks; Hub-river. Cooke.
Fl. Sept-Nov.

158. *Gisekia* Linn.

- 341-a. *Gisekia pharnaceoides* Linn. F.B.I. 664.
Dry sandy places: Malir, Karachi.
Fl. Aug.-Oct.

159. *Limeum* Linn

342. *Limeum indicum* Stocks ex T. Andres., F.B.I. II: 664.
Sind! Stocks Dalzell, Woodrow; Sehwan: Cooke: Malir-river:
Stocks.

160. *Mollugo* Linn.

343. *Mollugo hirta* Thunb., F.B.I. II:662.
Sind! Dalzell: Hills near Karachi:Bhola Puran; Thatta:BSM
Karachi.
Malir, Bund Murad Khan.
Fl. Feb.-April.
344. *Mollugo cerviana* Sering., F.B.I. II:663.
Sind! Stocks ex Aitson.
Fl. Sept-Nov.

345. *Mollugo nudicaulis* Lamk, F.B.I. II. 664.
Khairpur: Y.R.R.
Fl. Oct-Nov.

161. *Orygia* Forsk.

346. *Orygia decumbens* Forsk, F.B.I. II:661.
Sind:Stocks Karachi Woodrow, Bhola Puran, Cooke; Jamadar
ka Landha :Stocks: Gharo BSM: Common in Sind and Karachi
Fl. Dec.-Jan.

162. *Trianthema* Linn

347. *Trianthema monogyna* Linn. F.B.I. II: 660.
Malir, Landhi, Drigh Road, Karachi.
Fl. June-Nov.
348. *Trianthema crystallina* Vahl., F.B.I. II:660.
See *T. triquetra*.
Karachi
Fl. July-Sept.
349. *Trianthema hyaspica* Edgew., F.B.I. II: 661.
Landhi, Thatta, Gharo, Malir, Drigh Road, Karachi,
Nazimabad.
Fl. Dec.
350. *Trianthema triquetra* Rottl. and Willd. F.B.I. II: 660.
Syn. *T. crystallina*.
Common in Sind and Karachi.
Fl. Sept.-Nov.
351. *Trianthema pentandra* Linn. F.B.I. II: 660.
Dadu, Mirpur Khas, Sukkur, Hyderabad, Kotri, Landhi,
Hub-river, Malir, Karachi.
Fl. Oct.-Dec.

XLVII. UMBELLIFERAE.

163. *Carum* Linn.

352. *Carum armoaticum* Druce.. F.B.I. II:682.
Fl. April.

164. *Coriandrum* Linn.

353. *Coriaudrum sativum* Linn, F.B.I. II: 717.
Fl. March-May.

165. *Cuminum* Linn.

354. **Cuminum cyminum* Linn. F.F.I. II: 718.

166. *Daucus* Linn.

355. **Daucus carota* Linn., F.B.I. II: 718.

167. *Foeniculum* Mill.

356. **Foeniculum vulgare* Mill.. F.B.I. II: 695.
Fl. April.

168. *Hydrocotyle* Linn.

357. **Hydrocotyle javanica* Thunb., F.B.I. II:667.
Fl. Feb.-June.

169. *Zosimia* Hoffm.

358. *Zosimia orientalis* Hoffm..F.B.I. II:717.
Sind: Stocks.

XLVIII. RUBIACEAE.

170. *Gardenia* Ellis.

359. **Gardenia jasminoides* Ellis,F.B.I. Pres. I:603.
Fl. Rainy season.

171. *Gaillonia* A. Rich.

360. *Gaillonia hymenostephana* Jaubo, and Spach., F.B.I. III
202.
Thano Bula Khan: Woodrow.

172. *Mitragyna*.

361. *Mitragyna parvifolia* Korth., F.B.I. III:25.
Sukkur: Blatter.
Fl. May-Aug.

173. *Oldenlandia* Linn.

362. *Oldenlandia retrorsa* Boiss., F.B.I. III:68.
Malir, Landhi, Hyderabad, Thatta, Karachi.
Fl. Oct.-Nov.

174. *Rubia* Linn.

363. **Rubia tinctorum* Linn., F.B.I. III. 203.
Fl. All the year round.

XLIX. COMPOSITAE.

175. *Artemisia* Linn.

364. *Artemisia scoparia* Waldst. & Kit F.B.I. III:323.
Sind: Dalzell: Malir: Woodrow.
Fl. March.

176. *Blainvillea* Cass.

365. *Blainvillea latifolia* (Linn). DC., F.B.I. III: 305
Syn. *B. rhomboidea* Cass.
Thatta-BSM.
Fl. Aug-Oct.

177. *Blumea* DC.

366. *Blumea amplexans* DC. var. *maritima* Hook, f., F.B.I. III: 268.
Sind ! Stocks.
Fl. Dec.

178. *Caesulia* Roxb.

367. *Caesulia axillaris* Roxb., F.B.I. III:291.
Malir, Karachi, Hub-river, Bund Murad Khan.
Fl. Sept.-Jan.

179. *Dicoma* Cass.

368. *Dicoma tomentosa* Cass., F.B.I. III: 387.
Thatta. Blatter ex Woodrow.
Fl. Nov-March.

180. *Eclipta* Linn.

369. *Eclipta alba* Hassk., F.B.I. III : 304.
Malir, Karachi.
Fl. Aug.-Oct.

370. *Eclipta erecta* Linn. F.B.I. III 304.
Mirpur Sakro Bohara, Chunar: BSM.
Fl. Oct.-Dec.

181. *Echinops* Linn.

371. *Echinops echinatus* DC. F.B.I. III: 358.
Gholam Hills, BSM., Karachi.
Fl. Nov. Jan.

181A. *Erigeron* Linn.

372. *Erigeron asteroides* Roxb., F.B.I. III:256
Malir, Karachi.
Fl. Sept.-Nov.

182. *Gnaphalium* Linn.

373. *Gnaphalium luteo-album* Linn., F.B.I. III:288.
Sind! Stocks
Fl. Nov.-March.
374. *Gnaphalium indicum* Linn., F.B.I. III: 289.
Manchar Lake. Kantikar : Hyderabad, Karachi.
Fl. Dec.-March.
375. *Gnaphalium pulvinatum* Del., F.B.I. III: 289.
Bugar river : BSM.
Fl. Nov.
183. *Grangea* Forsk.
376. *Grangea maderaspatana* Poir. F.B.I. III: 247.
Mirpur Sakro, Bugar-river: BSM: Sukkur; Woodrow.
Fl. Nov.-April.

184. *Hochstetteria* DC.

377. *Hochstetteria Schimper* DC. F.B.I. III: 388.
Sind ! Bhola Puran; Sandstone rocks near Shah Bilawah:
Dalzell.
Fl. Jan.

185. *Inula* Linn.

378. *Inula grantioides* Boiss., F.B.I. III: 296.
Sind ! Stocks, Woodrow: Common on rocks: Dalzell; Moach
near Karachi; Cooke; Hyderabad; Cooke; Garra: Stocks:
Malir, Karachi
Fl. Nov.Dec.

186. *Lactuca* Linn.

379. *Lactuca remotiflora* DC., F.B.I. III: 403.
Jamadar ka Landha: Stocks.
Fl. Sept.

187. *Laggera* Sch. Bip.

380. *Laggera aurita* Sch. Bip., F.B.I. III. 271.
Sind ! Stock.
Fl. Dec.-Feb.

188. *Lasiopogon* Cass

381. *Lasiopogon lanatum* Cass F.B.I. III:287.
Kirthar mountains : Woodrow ; Karachi.

189. *Launaea* Cass.

382. *Launaea pinnatifida* Cass., F.B.I. III. 416.
Sind ! Cooke; Common on the sea shore.
Fl. Dec. Jan.
383. *Launaea chondrilloides* Hook, F.B.I. III;415.
Sea shore near Karachi Thatta, Gharo, Dilawar.
Fl. Oct-Nov.
384. *Launaea nudicaulis* Hook, f., F.B.I. III: 416.
Jamadar ka Landha: Stocks:Indus delta, Gharo, Mirpur
Sakro, Kullan Kote Lake. Bugar river, Chunar: BSM.
Fl. Oct-Dec.
385. *Launaea glomerata* Hook. f., F.B.I. III. 417.
Sind ! Stocks

190. *Pluchea* Cass.

386. *Pluchea tomentosa* DC. F.B.I. III;272.
Gholam Thatta, BSM. Sind ! Stocks.
Fl. Dec.-Feb.
387. *Pluchea lanceolata* Oliv., F.B.I. III: 272.
Thatta. BSM: Ruk, Cooke.
Fl. Dec.
388. *Pluchea arguta* Boiss, F.B.I. III;273.
Common on the side of water courses: Boogta Hills:Vicary:
Malir, Karachi, Hub-river, Bund Murad Khan.
Fl. Nov.-Feb.
389. *Pluchea Wallichiana* DC. F.B.I. III.272.
Hills in Sind ! Dalzell.
Fl. Jan.-Feb.

191. *Pulicaria Gaertn.*

390. *Pulicaria angustifolia* D.C. F.B.I. III: 299.
Gholam, Thatta BSM.; Jamadar ka Landha: Stocks; Karachi
Malir, Fl. Nov.-Jan.

391. *Pulicaria foliolosa* DC., F.B.I. III: 298
Hyderabad : Kantikar,
Fl. Nov.-Jan.

392. *Pulicaria glaucescens* Jaub. & Spach, F.B.I. III: 300.
Sind ! Cooke, Woodrow, Dalzell.

393. *Pulicaria Boissieri* Hook. f., F.B.I. III: 300.
Sind ! Stocks, Woodrow; Drigh Road.

394. *Pulicaria Stocksii* Hook. f., F.B.I. III: 300.
Gharo: BSM; Sind ! Stocks, Woodrow.
Fl. Oct.

192. *Sonchus Linn.*

395. *Sonchus asper* Vill., F.B.I. III: 414.
Sind ! Stocks.
Fl. Jan.-March.

396. *Sonchus oleraceus* Wall. F.B.I. III: 414.
Jamadar ka Landha: Stocks. Gholam, Thatta: BSM.; Malir,
Karachi. Fl. Sept-Feb.

193. *Vernonia Schreb.*

397. *Vernonia cinerea* Less., F.B.I. III: 233.
Thatta: Bhola Puran; Bohara, Gholam, Kullan Kote Lake,
BSM.; Karachi, Malir.
Fl. Jan.-Feb.

398. *Vernonia cinerascens* Sch.-Bip., F.B.I. III: 237.
Mirpur Sakro, Gholam, Kullan Kote Lake, Thatta: BSM.;
Jamadar ka Landha: Stocks; Karachi, Malir.

399. **Vernonia arborea* Ham., F.B.I. III: 239.

194. *Vicoa Cass.*

400. *Vicoa auriculata* Cass., F.I.B. III: 297.
Karachi.
Fl. Nov.-Feb.

401. **Vicoa cernua** Dalz., F.B.I. III: 297.
On the bank of Indus in the Lower Sind region.
Fl. Nov.-Feb.

195. *Voluteralla* Cass.

402. **Volutarella divaricata** Benth. ; & Hook., F.B.I. III: 383.
Thatta, Gharo, Bughar, Landhi, Hyderabad. Malir. Hub river,
Munghopir, Bund Murad Khan, Karachi.
Fl. Nov.-Dec.

196. *Xanthium* Linn.

403. **Xanthium strumarium** Linn., F.B.I. III: 303.
Banks of Indus-Sukkur, Hub river, Bund Murad Khan.
Fl. Jan.-Feb.

L. GOODENIACEAE.

197. *Scaevola* Linn.

404. **Scaevola frutescens** Krause in Engl. P. flenzenr.-Gooden,
Brunon. 125 (1912).
On the coast of Karachi and Sind.
405. **Scaevola plumierii** Vahl., F.B.I. III: 421.
Mouth of Indus delta: B.S.M.
406. **Scaevola koenigii** Vahl., F.B.I. III: 421.
On the coast; Mouth of Indus.
Fl. July.-Aug.
407. **Scaevola lobelia** Murr., F.B.I. III: 421.
Mouth of Indus river near Karachi, Sand drifts of the sea.

LI. PLUMBAGINACEAE.

198. *Statice* Linn.

408. **Statice stocksii** Boiss., F.B.I. III: 480.
Sind! Stocks, Cooke, Dalzell; Karachi: Vicary; Thatta:
Ritchie; Gharo, Gholam.; BSM Karachi, Malir, Drigh road
Fl. Dec.-March.

LII. PRIMULACEAE.

199. *Anagallis* Tourn.

409. *Anagallis arvensis* Linn., F.B.I. III : 506.
Malir, Karachi.
Fl. Sept.-Dec.

LIII. MYRSINACEAE.

200. *Aegiceras* Gaertn.

410. *Aegiceras majus* Gaertn., F.B.I. III: 533.
Mud forests in Indus delta : Stocks; Karachi, Mouth of
Indus : BSM.
Fl. Feb.

LIV. OLEACEAE.

201. *Jasminum* Linn.

411. **Jasminum bifarium* Wall., F.B.I. III: 591.
Syn. *J. Sambac* Ait.
Fl. June.
412. **Jasminum articulatum* Vahl., F.B.I. III: 600.
Fl. July-Aug.
413. **Jasminum grandiflorum* Linn., F.B.I. III: 603.
Fl. Oct.-Nov.

LV. SALVADORACEAE.

202. *Salvadora* Garcin.

414. *Salvadora persica* Linn., F.B.I. III: 619.
Near villages in the northern part of Indus delta : BSM.;
Malir, Karachi, Hyderabad, Hub.
Fl. Nov.-Feb.
415. *Salvadora oleoides* Dene., F.B.I. III: 620.
Common in northern part of Indus delta : BSM.: Karachi.
Fl. Jan.

LVI. APOCYNACEAE.

203. *Carissa* Linn.

416. *Carissa carandas* Linn., F.B.I. III. 630.
Thatta, Karachi.
Fl. Jan.-April.

204. *Lochnera* Reichb.

417. **Lochnera rosea* Reichb.
See *Vinca rosea* Linn.

205. *Nerium* Linn.

418. *Nerium oleander* Linn., F.B.I. III: 655.
Naturalized in Sind and Karachi.
Fl. All the year round.

206. *Rhazya* Decne.

419. **Rhazya stricta* Decne., F.B.I. III: 640.
Hills of Sind! Dalzell: Sehwan, Jacobabad; Cooke.
Fl. Dec-March.

207. *Thevetia* Adans.

420. **Thevetia peruviana* Schum., Stand. Nom. ed. 2. V. 2 (680)
Syn. *T. Nereifolia* Juss.
Fl. All the year round.

208. *Vinca* Linn.

421. **Vinca rosea* Linn., F.B.I. III: 640.
Syn. *Lochnera rosea*.
Fl. All the year round.

LVII. ASCLEPIADACEAE.

209. *Asclepias* Linn.

422. *Asclepias curassavica* Linn., F.B.I. IV: 18.
Naturalized.

210. *Calotropis* R. Br.

423. *Calotropis procera* R. Br., F.B.I. IV: 18.
Common in Sind and Karachi.
Fl. All the year round.

211. *Coralluma* R. Br.

424. *Coralluma edulis* Benth., F.B.I. V 76.
Jamadar ka Landha; BM.; Malir, Karachi, Kotri.
Fl. Sept.

212. *Cryptostegia* R. Br.

425. **Cryptostegia grandiflora* R. Br., F.B.I. IV: 6.
Naturalized in many parts.

213. *Daemia* R. Br.

426. *Daemia cordata* R. Br., Engl. Jahrb xxxv. 744. (1905).
Drigh Road, Malir, Karachi.
Fl. All the year round.

427. *Daemia extensa* R. Br., F.B.I. IV : 20.
Common in Sind and Karachi.
Fl. Aug.-Jan.

214. *Leptadenia* R. Br.

428. *Leptadenia pyrotechnica* (Forsk) Decne., F.B.I. IV : 64.
Syn. *L. spartium* Wight.
Common all over Sind and Karachi.
Fl. Dec.-Jan.

215. *Glossonema* Decne.

429. *Glossonema varians* Benth.. F.B.I. IV: 16.
Sind! Vicary, Dalzell, Bhola Puran, Woodrow ; Jamadar
ka Landha.
Stocks ; Karachi, Malir, Bund Murad Khan.
Fl. Dec.

216. *Oxystelma* R. Br.

430. *Oxystelma esculentum* R. Br., F. B. I. IV : 17.
Sind ! Stooks, Bhola Puran, Cooke, ; Common in Sind and
Karachi
Fl. Dec.

217. *Pentatropis* R. Br.

431. *Pentatropis cynanchoides* R. Br., F.B.I. IV : 19.
Sind ! Stocks, Bhola Puran, Dalzell ; Jamadar ka Landha ;
Karachi : Vicary ; Gharo, Mirpur Sakro, Kullian Kote
Lake, Thatta : BSM.; Common in Sind and Karachi.
Fl. Feb.
432. *Pentatropis spiralis* Decne.. F.B.I. IV : 19.
Larkana, Mirpur Khas, Hyderabad, Thatta, Karachi. Malir.
Fl. Jan.-March.

218. *Periploca* Linn.

433. ***Periploca aphylla*** Decne., F.B.I. IV : 12.
Sind! Stocks, Vicary ; Thano Bula Khan : Woodrow ;
Thatta, Gharo, Malir, Landhi, Hyderabad, Sukkur.
Fl. March.-April.

219. *Pergularia* Linn.

434. ***Pergularia daemia*** Blatt. & McCan., Journ. Bom. Nat.
Hist. Soc. xxxvi. 528 (1933).
Syn. *Asclepias daemia* Forsk.
Gholam, Thatta : BM.
435. ***Pergularia tomentosa*** Linn. Mant. I : 53.
Laki Hills : BM.
Fl. July.-Sept.

220. *Sarcostemma* R. Br.

436. ***Sarcostemma stocksii*** Hook. f., F.B.I. IV : 27.
Gholam, Limestone Hills : BSM.
Fl. July.-Sept.
437. ***Sarcostemma acidum*** Voigt., Pflanzenfam. iv. II : 251 (1895).
Umarkot, Sandy places in Tharparkar : BM.
438. ***Sarcostemma brevistigma*** Wight., F.B.I. IV : 26.
Sind ! Sabnis.

LVIII. GENT ANACEAE.

221. *Enicostemma* Blume.

439. ***Enicostemma littorale*** Blume., F.B.I. IV : 101.
Sind! Bhola Puran ; Mirpur Sakro, Gharo, Thatta : BSM. ;
Karachi.
Fl. Nov.-Dec.

LIX. BORAGINACEAE.

222. *Arnebia* Forsk.

440. ***Arnebia hispidissima*** DC., F.B.I. IV : 176.
Malir, Karachi, Drigh Road, Hyderabad, Kotri.
Fl. Oct.-Nov.
441. ***Arnebia Griffithii*** Boiss., F.B.I. IV : 176.
Malir, Karachi.
Fl. Oct.-Nov.

223. *Cordia* Linn.

442. ***Cordia Myxa*** Linn., F.B.I. IV: 136.
Common near villages and gardens.
Fl. March.-May.
443. ***Cordia Rothii*** Roem. ; Schult., F.B.I. IV: 138.
Bohara, Kullian Kote Lake, Mirpur Sakro: BSM,; Karachi,
Malir.
Fl. March-May.
444. ***Cordia sebestena*** Linn., Sp. Pl. (1753) p. 190.
Commonly cultivated in Karachi.
Fl. Jan.-March.

224. *Coldenia* Linn.

445. ***Coldenia procumbens*** Linn., F.B.I. IV: 144.
Sind! Stocks.
Fl. Sept.-Oct.

225. *Ehretia* Linn.

446. ***Ehretia aspera*** Roxb., F.B.I. IV: 142.
Sind ! Stocks, Dalzell; Shah-Bilawal: Stocks.
Fl. March-May.
447. ***Ehretia laevis*** Roxb., F.B.I. IV: 141.
Shah-Bilawal: Stocks.
Fl. Jan.-June.

226. *Heliotropium* Linn.

448. ***Heliotropium zeylanicum*** Lamk., F.B.I. IV: 148.
Sind ! Bhola; Karachi: Woodrow; Malir, Karachi, Landhi.
Fl. Oct.-Jan.
449. ***Heliotropium ophioglossum*** Stocks ex Aitch., F.B.I., IV: 149
Sind Woodrow, Strachan, Stocks, Dalzell; Jamadar ka
Landha: Stocks; Malir, Karachi, Thatta, Gharo, Mirpur
Sakro.
Fl. Jan.-March.
450. ***Heliotropium supinum*** Linn., F.B.I. IV: 149.
Sind ! Stocks ; Common in Karachi.
Fl. March.

451. **Heliotropium rariflorum** Stocks., B.F.I. IV: 152.
Sind ! Dalzell, Bhola Puran, Woodrow; Thatta, Karachi,
Malir, Hub-river, Bund Murad Khan.
452. **Heliotropium Eichwaldi** Steud.
(See **H. europaeum** Linn).
453. **Heliotropium calcareum** Stocks., F.B.I. IV: 150.
Hills of Sind ! Stocks; Karachi, Malir.
Fl. Feb.-March.
454. **Heliotropium ovalifolium** Forsk., F.B.I. IV: 150.
Thatta: BSM.
Fl. Jan.-Feb.
455. **Heliotropium undulatum** Vahl., F.B.I. IV: 150.
Syn. **Heliotropium tuberosum** Boiss.
Hyderabad, Kotri, Sukhar, Mungopeer, Bund Murad Khan,
Karachi, Malir.
Fl. Dec.
456. **Heliotropium paniculatum** R. Br., F.B.I. IV: 151.
Thatta, Hyderabad, Gharo, Mungopeer, Bund Murad Khan,
Malir, Karachi.
Fl. Oct.-Dec.
457. **Heliotropium marifolium** Retz., F.B.I. IV: 152.
Karachi.
458. **Heliotropium curassavicum** Linn.
Karachi, Malir.
459. **Heliotropium europaeum** Linn., F.B.I. IV: 150.
Syn. **H. Eichwaldi** Steud.
Karachi, Hyderabad, Sukkar, Mangopeer, Malir, Mirpur
Sakro.
Fl. Nov.-Jan.
460. **Heliotropium scabrum** Retz., F.B.I. IV: 152.
Sind ! Stocks; Karachi.

227. **Sericostoma** Stocks.

461. **Sericostoma pauciflorum** Stocks., F.B.I. IV: 175.
Karachi, Hyderabad, Thatta
Fl. Nov.-Dec.

228. *Trichodesma* R. Br.

462. *Trichodesma indicum* R. Br., F.B.I. IV: 153.
Gholam, Thatta: BSM.; Karachi.
Fl. Aug.-Oct.

463. *Trichodesma africanum* R. Br., F.B.I. IV: 154.
Sind ! Stocks; Thana Bula Khan, Laki: Woodrow.
Fl. Aug.

LX. CONVOLVULACEAE.

229. *Argyreia* Lour.

464. **Argyreia speciosa* Sweet., F.B.I. IV: 185.
Fl. September.

230. *Breweria* R. Br.

465. *Breweria latifolia* Benth. ex Clarke. F.B.I. IV: 224.
Sind ! Bhola Puran, Stocks, Dalzell, Vicary; Malir, Karachi,
Jamadar ka Landha: Stocks.
Fl. Dec.

231. *Convolvulus* Linn.

466. *Convolvulus rhynilspermus* Hoch st. ex Choisy, F.B.I. IV: 218
Sind ! Stocks, Dalzell, Bhola Puran, Cooke, Woodrow; Jama-
dar ka Landha: Stocks, Thatta, Ghara, Malir, Mungopeer,
Nazimabad.
Fl. Oct.

467. *Convolvulus Rottlerianus* Choisy. var. *tenella* Clerke. F.B.I.
IV: 219.
Sind ! Stocks; Ghara, Mirpur Sakro, Thatta, Gholam BSM.;
Karachi.
Fl. Sept.-Oct.

468. *Convolvulus glomeratus* Choisy., F.B.I. IV: 219.
Sind ! Stocks, Dalzell, Woodrow, Bhola Puran; Jamadar ka
Landha Stocks; Karachi, Malir, Landhi.
Fl. Dec.

469. *Convolvulus microphyllus* Sieb. ex Spreng., F.B.I. IV: 218.
Hyderabad, Sukkar, Mirpur Khas, Dadu, L kana, Landhi,
Malir, Thatta, Karachi, Hub-river.
Fl. Oct.

470. **Convolvulus arvensis** Linn., F.B.I. IV: 219.
Malir, Karachi; Bohara: BSM.
Fl. Dec.-Feb.
671. **Convolvulus plurivaulis** Choisy., F.B.I. IV: 218.
Khairpur: Y.R.R.; Malir, Karachi.
Fl. March-Feb.
472. **Convolvulus Scindicus** Stocks., F.B.I. IV: 217.
Garra: Stocks; Thano Bula Khan: Woodrow.
Fl. Aug.

232. *Cuscuta* Linn.

473. **Cuscuta reflexa** Roxb., F.B.I. IV: 225.
Common in Sind and Karachi.
Fl. Jan.-Feb.
474. **Cuscuta hyalina** Rath., F.B.I. IV: 226.
Thatta, Landhi, Hyderabad, Malir, Karachi.
Fl. June-Aug.
475. **Cuscuta chinensis** Lamk., F.B.I. IV: 226.
Karachi: Irtifaq Ali.
Fl. June-July.

233. *Evolvulus* Linn.

476. **Evolvulus alsinoides** Linn., F.B.I. IV: 220.
Common in Sind and Karachi.
Fl. July-Nov.

234. *Ipomoea* Linn.

477. **Ipomoea eriocarpa** R. Br. F.B.I. IV: 204.
Gholam: BSM.; Malir, Karachi.
Fl. Sept.-Oct.
478. ***Ipomoea Batatas** Lamk., F.B.I. IV: 202.
479. **Ipomoea pilosa** Sweet., B.F.I. IV: 213.
Jamadar ka Landha: Stocks; Karachi, Hyderabad, Mirpur
Khas.
Fl. Dec.
480. **Ipomoea biloba** Forsk., F.B.I. IV: 212.
Malir, Landhi, Clifton, Karachi.
Fl. All the year round.

481. *Ipomoea aquatica* Forsk., F.B.I. IV: 210.
Thatta, Karachi, Malir.
Fl. Nov.-April.
482. *Ipomoea chryseides* Ker., F.B.I. VI: 206.
Khipro: Y.R.R.
483. *Ipomoea sindica* Stapf. in Kew Bull. (1894) p. 346.
Jamadar ka Landha: Stocks; Karachi: Woodrow;
Fl. Oct.
484. *Ipomoea palmata* Forsk., F.B.I. IV: 214.
Karachi.
Fl. All the year round.
485. *Ipomoea Pest-tigridis* Linn., F.B.I. IV: 204.
Karachi. Malir.
Fl. Sept.-Nov.
486. *Ipomoea rumicifolia* Choisy., F.B.I. IV: 207.
Karachi.
Fl. Dec.

235. *Merremia Dennst.*

487. *Merremia chryseides* Hall., F.B.I. IV: 206.
Bughar river: BSM.
Fl. Oct.-Nov.
488. *Merremia aegyptia* Linn. Sp. Pl. (1753), 162.
Gholam: BSM.
489. **Merremia dissecta* Hall., F.B.I. IV: 214.
Fl. Nov.
490. *Merremia pentaphylla* Hall., F.B.I. IV: 202.
Malir, Drigh Road, Malir.
Fl. Sept.-Oct.

236. *Rivea Choisy.*

491. *Rivea hypocrateriformis* Choisy., F.B.I. IV: 184.
Gholam, Thatta: BSM., Malir, Karachi, Hills in Sind ! Stocks;
Jamadar ka Landha: Stocks.
Fl. Aug.-Oct.

237. *Cressa* Linn.

492. *Cressa cretica* Linn., F.B.I. IV: 225.
Very common in Sind and Karachi.
Fl. Nov.-Jan.

LXI SOLANACEAE.

238. *Capsicum* Linn.

493. **Capsicum frutescens* Linn., F.B.I. IV: 239.
Syn. *C. annuum* Linn.

239. *Datura* Linn.

494. *Datura Metal* Linn. F.B.I. IV: 243.
Syn. *D. fastuosa* Linn.
Common in Sind and Karachi.
Fl. All the year round.
495. *Datura alba* Nees., Trans. Soc. v. 17. (1834). p. 73,
Common in Karachi.
Fl. Sept.-Dec.

240. *Hyoscyamus* Linn.

496. *Hyoscyamus muticus* Linn. F.B.I. IV: 245
Boogta Hill : Vicary; Sind Hills! Dalzell; Kirthar Hills R
Woodrow.
Fl. March.

241. *Lycium* Linn.

497. *Lycium barbarum* Linn., F.B.I. IV: 241
Indus delta BSM.; Landhi, Malir, Karachi; Kh'pro:Y.R.R ;
Drigh Road.
Fl. Oct.-Nov
498. *Lycium europæum* Linn., F.B.I. IV: 340.
Thatta, Karachi, Malir.
Fl. Oct.-Nov.

242. *Lycopersicum* Mill.

499. **Lycopersicum esculentum* Mill., F.B.I. IV: 237.
Fl. May.

243. *Nicotiana* Linn.

500. **Nicotiana tabacum* Linn., F.B.I. IV: 245.
Fl. May-June.

244. *Physalis* Linn.

501. *Physalis minima* Linn., F.B.I. IV: 238.
Thatta: BSM.; Khairpur: Y.R.R.
Fl. Aug.-Nov.

245. *Solanum* Linn.

502. *Solanum gracilipes* Dene., F.B.I. IV: 237.
Hub-river Malir, Karachi, Drigh Road.
Fl. Dec.-Jan.
503. *Solanum tuberosum* Linn., F.B.I. IV: 229.
Fl. July.
504. *Solanum nigrum* Linn., F.B.I. IV: 229.
Very common in shady places in Sind and Karachi.
Fl. All the year round.
505. *Solanum surrattense* Burman f., F.B.I. IV: 236.
Syn. *Solanum xanthocarpum* Scrad.
Hyderabad, Sukkur, Dadu, Mirpur Khas, Thatta, Malir,
Karachi.
Fl. June-Nov.
506. *Solanum albicaule* Kots. DC. Prod. XIII, Pt. II. (1852), 204.
Gharo, Kullian Kote Lake, BSM.; Karachi: Cooke.
Fl. Oct.-Nov.
507. *Solanum melongena* Linn., F.B.I. IV: 235.
508. *Solanum incanum* Linn., F.B.I. IV: 236.
Syn. *Solanum coagulaus* Forsk.
Hyderabad, Sukkur: Sabnis; Karachi, Malir.
Fl. Sept.

246. *Withania* Pauq.

509. *Withania coagulans* Duna., F.B.I. IV: 240.
Karachi. Malir.
Fl. Dec.

510. *Withania somnifera* Duna., F.B.I. IV: 420.
Gharo: BSM,; Malir, Karachi, Hub-river.
Fl. Oct.-Nov.

LXII. SCROPHULARIACEAE

247. *Anticharis* Endl.

511. *Anticharis glandulosa* Aschers., F.B.I. IV: 249.
Sind ! Stocks, Vicary, Bhola Puran, Cooke, Woodrow; Thano
Bula Khan: BSM.
Fl. Oct.-Nov.
512. *Anticharis linearis* Hochst., Boiss. Fl. Orient. IV: 423.
Sind ! Stocks, Bhola Puran; Thano Bula Khan: BSM.
Fl. Oct.-Nov.

248. *Antirrhinum* Linn.

513. **Antirrhinum majus* Linn., Sp. Pl. (1753), p. 617.

249. *Bonnaya* Link and Otto.

514. *Bonnaya veronicaefolia* Spreng., F.B.I. IV: 225.
Thatta: BSM.

250. *Celsia* Linn.

515. *Celsia coromandeliana* Vahl., F.B.I. IV: 251.
Sind: Stocks.
Fl. Jan.-May.

251. *Campylanthus* Roth.

516. *Campylanthus ramosissimus* Wight., F.B.I. IV: 290.
Limestone range near Hyderabad: Stocks; Jungadi: Wood-
row; Hills of Sind ! Stocks.

252. *Kickxia* *Linaria* Juss.

517. *Kickxia incana* (Wall). Pennell., Boiss. Fl. Orient. V. 4., p.368
Syn. *Linaria cabulica* Benth.
Drigh Road.

518. *Kickxia ramosissima* (Wall). Janchen., F.B.I. IV: 25.1
Syn. *Linaria ramosissima* wall.

Sind ! Stocks, Dalzell, Gabson; Gharo, Thatta: BSM.
Fl. Sept.

253. *Limnophila* R. Br.

519. *Limnophila gratioloides* R. Br, F.B.I. IV:271.
Gholam:BSM
Fl. Nov-Jan.

254. *Lindenbergia* Sehm.

520. *Lindenbergia abyssinica* Hochst, F.B.I. IV. 262.
Sind: Dalzell: Thatta: BSM.
521. *Lindenbergia urticaefolia* Lehm. F.B.I. IV:262.
Gharo, Thatta BSM.; Gadap: Y.R.R.
Oct.-Nov.
522. *Lindenbergia polyantha* Royle ex Benth., F.B.I. IV 262.
Bootga Hills: Vicary.

255. *Monera* Juss ex Brown.

523. *Moniera cuneifolia* Michaux., F.B.I. IV:272.
Sind, Woodrow, Landhi, Cooke.
Fl. Jan-May.

256. *Peplidium* Delile.

524. *Peplidium humifusum* Delile, F.B.I. IV-287.
Bubak, Woodrow: Thatta Ket, BSM.
Fl. Nov-Dec.

257. *Schweinfurthia* A. Braun.

525. *Schweinfurthia sphaerocarpa* A. Braun., F.B.I. IV 252.
Sind Cooke, Dalzell, Stocks, Woodrow, Jamadar ka Landha:
Stocks: Thatta: B.S.M.
Fl. Dec.

526. *Schweinfurthia pedicellata* Benth & Hook f. Gen. Pl. V. 2.934
Sind: Cooke.

258. *Striga* Lour.

527. *Striga lutea* Lour., F.B.I. IV : 299.
Sind ! stocks.
Fl. Nov-Jan.

LXIII. OROBANCHACEAE.

259. *Cistanche Hoffm. & Link.*

528. *Cistanche tubulosa* Wight., F.B.I. IV. 324.
(On *Calotropis* sp. and on *Salvadora* Sp)
Gharo: BSM: Karachi, Malir, Mungopeer, Mirpur Khas,
Hyderabad, Sukkur.
Fl. Oct.-Dec.

260. *Christisonia Gardn.*

529. *Christisonia calcarata* Wight., F.B.I. IV:322.
Sind: on roots of a *Strobilanthes* Stocks ex Hooker.
Fl. July-Aug.

261. *Orobanche Linn.*

530. *Orobanche indica* Ham, F.B.I. IV. 326.
Karachi, Mirpur Khas.
531. *Orobanche aegyptiaca* Pers, F.B.I. IV. 326.
Mirpur Khas, Karachi.
Fl. Oct.

LXIV. BIGNONIACEAE ..

262. *Doxantha Miers—Bignonia* Auth. not Binn.

532. **Doantha Unguis-cati* Rhd., Bailey Manu. Cult. Pl. p. 902
Syn. *Bignonia tweediana* Lind
Fl. April.

263. *Millingtonia Binn*

533. *Milligtonia hortensis* Linn f., F.B.I. IV. IV. 377.
Fl. Oct.-Dec.

264. *Tecomella Seem.*

534. *Tecomella undulata* Seem., F.B.I. IV. 378.
Kullan kote lake, Thatta Ket. BSM,
Fl. Feb.-March.

265. *Stenolobium* D. Don.

- 535. *Stenolobium stans* Seem.** Bailey Manu. Cult Pl. p. 907.
Syn. *Tecoma stans* HBK.
Hyderabad, Malir, Drigh Road, Karachi.
Fl. Feb.-April.

LXV. PEDALIACEAE.

266. *Sesamum* Linn.

- 536. *Sesamum indicum* DC,** F.B.I. IV. 387.
Syn. *S. orientale* Linn.
Fl. Oct.-Nov.

LXVI. ACANTHACEAE.

267. *Adhatoda* Nees.

- 537. *Adhatoda vasica* Nees,** F.B.I. IV. 540.
Thatta, Malir Karachi.

268. *Blepharis* Juss.

- 538. *Blepharis sindica* T. Andres.,** F.B.I. IV. 479.
Sind ! Stocks, Dalzell, Bhola Puran, Woodrow; Karachi,
Malir, Thatta, Hyderabad, Bund Murad Khan.
Fl. Aug-Sept.

269. *Barleria* Linn.

- 539. *Barleria prionitis* Linn.** F.B.I. IV. 482.
Gharo, Kullan Kote Lake. BSM.
Fl. Oct.-Nov.

- 540. *Barleira acanthoides* Vahal.,** F.B.I. IV: 484.
Sind; Dalzell, Stocks, Bhola Puran, Woodrow : Jamadas ka
Landha :
Stocks, Gharo Thatta, BSM: Karachi.
Fl. Oct.

- 541. *Barleira Hochstetteri* Nees.,** F.B.I. IV. 483.
Sind : Dalzell, Stocks, Bhola Puran, Jamadr ka Landha
Stocks: Gholam Limestone Hills:BSM.
Fl. Oct.

270. *Dicliptera* Juss.

542. *Dicliptera micranthes* Nees., F.B.I. IV:553.
Sind Sakhpur:Woodrow.
Fl. Oct.

271. *Hygrophila* R. Br.

543. *Hygrophila polysperma* T. Andres F.B.I. IV. 406.
Sind ! Stocks.
Fl. Sept.-Oct.

272. *Justica* Linn.

544. *Justica heterocarpa* T. Andres., F.B.I. IV:531.
Jamadar ka Landha :Stocks: Kullian Kote Lake:BSM.
Fl. Oct.-Nov.
545. *Justica diffusa* Willd., F.B.I. IV: 538.
Sind:Cooke.
Fl. Oct.-Dec.
546. *Justica simplex* D. Don., F.B.I. IV. 539.
Sind ! Dalzell, Stocks, Cook.
Fl. Nov-Dec.
547. *Justica vahlii* Roth. F.B.I. IV. 538.
Hyderabad, Thatta: Blatter.

273. *Lepidagathis* Willd.

548. *Lepidagathis rigida* Dalz., F.B.I. IV. 518.
Sind ! T. Anders.
Fl. Dec.-March.
549. *Lepidagathis calycina* Hochst ex DC, F.B.I. IV. 519.
Sind ! Stocks.

274. *Peristrophe* Nees.

550. *Peristrophe bicalyculata* Nees., F.B.I. IV : 554.
Jamadar ka Landha : Stocks Karachi, Malir.
Ft. Oct-Nov.

275. *Ruellia* Linn.

551. *Ruellia patula* Jacq., F.B.I. IV : 412.
Sind ! Stocks, Dalzell, Bhola Puran; Jamadar ka Landha:
Stocks; Karachi, Malir, Mungopeer.
Fl. June-Nov.
552. *Ruellia graecizans* Baker., F.B.I. IV : 412.
Syn. *R. longifolio* T. Andres.
Sind ! Dalzell, Stocks, Woodrow.

276. *Thunbergia* Retz.

553. *Thunbergia fragans* Roxb., F.B.I. IV : 399.
Mirpur Sakro, Thatta, BSM.; Karachi.
Fl. Oct.-Nov.

LXVII. VERBENACEAE.

277. *Avicennia* Linn.

554. *Avicennia officinalis* Linn., F.B.I. IV : 604.
Along the coast.

278. *Bouchea* Cham.

555. *Bouchea marrubiifolia* Sch., F.B.I. IV : 564.
Sind ! Dalzell, Bhola Puran; Rocky grounds ! Stocks; Kotri.
Hyderabad, Karachi, Bund Murad Khan.

Gul Hayat Institute

279. *Clerodendron* Linn.

556. *Clerodendron phlomoides* Linn., F.B.I. IV : 590.
Fl. Aug.-Feb.
557. *Clerodendron inerme* Gaertn., F.B.I. IV : 589.
Karachi: near the sea.
Fl. Nov.-Jan.

280. *Duranta* Linn.

558. **Duranta repens* Linn., Baily Manu. Cult. Pl. 843.
Syn. *D. plumieri* Jacq.
Introduced and naturalized.

281. *Gmelina* Linn.

559. **Gmelina arborea* Roxb., F.B.I. IV:581.
Introduced and naturalized.
Fl. March-May.

282. *Lantana* Linn.

560. **Lantana camara* Linn., F.B.I. IV : 562.
Fl. All the year round.

283. *Lippia* Linn.

561. *Lippia nodiflora* Rich., F.B.I. IV : 563.
Mirpur Sakro, Bughar river : BSM.
Fl. Oct.

284. *Priva* Adans.

562. *Priva leptostachya* Juss., F.B.I. IV: 565.
Sind! Woodrow.
Fl. Dec.-Jan.

285. *Tectona* Linn. f.

563. **Tectona grandis* Linn. f., F.B.I. IV:570.
Fl. June.-Sept.

286. *Vitex* Linn.

564. **Vitex Negundo* linn., F.B.I. I :583
Introduced and naturalized.
Fl. All the year round.

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LXVIII. LABIATAE.

287. *Leucas* R. Br.

565. *Leucas nutans* Spreng., F.B.I. IV : 688.
Thatta, Malir, Drigh Road, Karachi.
Fl. Sept.-Nov.

566. *Leucas urticaefolio* R. Br., F.B.I. IV : 680.
Kullan Kote Lake, Thatta-Tomb: BSM.; Gadap: Y.R.R
Karachi.
Fl. Nov.-Dec.

288. *Mentha* Linn.

567. **Mentha Piperita* Linn., F.B.I. IV : 647.

568. *Mentha longifolia* Huds., F.B.I. IV: 647.
Syn. *M. sylvestris* Linn..
Common in damp places.

289. *Ocimum* Linn.

569. **Ocimum Basilicum* Linn., F.B.I. IV: 608.
Fl. Sept.-Oct.

570. *Ocimum canum* Sims., F.B.I. IV. : 607.
Thatta : BSM. Karachi.
Fl. Sept.-Jan.

571. *Ocimum sanctum* Linn., F.B.I. IV : 609.
Common in Sind and Karachi.
Fl. Oct.-Dec.

290. *Salvia* Linn.

572. *Salvia aegyptiaca* Linn., F.B.I. IV : 656.
Gharo, Thatta: BSM.; Karachi, Mali
Fl. Nov.-Dec.

573. *Salvia plebeia* R. Br., F.B.I. IV : 655.
Hyderabad, Sukkur, Karachi.
Fl. April.

LXIX. PLANTAGINACEAE.

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291. *Plantago* Linn.

574. *Plantago ciliata* Desf., F.B.I. IV : 707.
Sukkur, Thano Bula Khan: Blatter.
Fl. April-Nov.

575. *Plantago Stocksii* Boiss., F.B.I. IV: 706.
Mirpur Khas, Hyderabad, Malir.
Fl. March-May.

576. *Plantago ovata* Forsk., F.B.I. IV : 707.
Karachi, Malir, Laki, Sehwan : Blatter.

577. **Plantago amplexicaulis** Cav., F.B.I. IV : 706.
Common in Sind.
Fl. March-May.

LXX. NYCTAGINACEAE.

292. *Boerhaavia* Linn.

578. **Boerhaavia diffusa** Linn., F.B.I. IV : 709.
Syn. **B. repens** Linn.
Mirpur Sakro: BSM.; Nasirabad, Shoran: Y.R.R.; Malir
Karachi, Bund Murad Khan.
Fl. Oct.-Dec.

579. **Boerhaavia verticillata** Poir., F.B.I. IV:710.
Mirpur Sakro: BSM.; Gharo. Malir.
Fl. Oct.-Nov.

580. **Boerhaavia elegans** Choisy., F.B.I. IV : 710.
Hyderabad, Karachi, Mungopeer.
Fl. Nov.

293. *Bougainvillea* Comm.

581. ***Bougainvillea glabra** Choisy., Baiely Manu. Cult. Pl. p. 358.
Fl. All the year round.

582. ***Bougainvillea spectabilis** Willd., Baiely Manu. Cult.pl. p. 358
Fl. All the year round.

294. *Mirabilis* Linn.

583. ***Mirabilis Jalapa** Linn.. Bailey Manu. Cult. Pl. p. 358.
Fl. June-Oct.

LXXI. AMARANTHACEAE.

295. *Aerua* Forsk.

584. **Aerua persica** (Burm.) Merrill., F.B.I. IV : 727.
Syn. **A. tomentosa** Forsk.; **A. javanica** Juss.
Gharo, Mirpur Sakro, Thatta: BSM.; Malir, Karachi, Drigh
Road.
Fl. Oct.-Feb.

585. *Aerua pseudo tomentosa* Blatt. & Hall. Jour. Bom. Nat. His 6 Soc. XXVI (1919). 817.
Gharo, Mirpur Sakro, Gholam, Bohara: BSM.; Karachi.
Fl. Oct.-Nov.

296. *Amaranthus* Linn.

586. *Amaranthus viridis* Linn., F.B.I. IV : 720.
Syn. *A. gracilis* Desf.
Mirpur Sakro, Gholam, Bughar river : BSM.; Malir, Karachi
Fl. Oct.-Nov.
587. *Amaranthus polygamus* Linn., F.B.I. IV : 421.
Gharo, Mirpur Sakro, Gholam, Kullian kote lake, Bughar river: BSM.; Karachi.
Fl. Dec.-March.
588. *Amaranthus tricolor* Linn., F.B.I. IV : 719.
Syn. *A. gangeticus* Linn.
Sukkur, Hyderabad, Karachi.
589. *Amaranthas blitum* Linn., F.B.I. IV 721.
Common in Sind and Karachi.
Fl. March.
590. *Amaranthus caudatus* Linn., F.B.I. IV: 719.
Syn. *A. paniculatus* Linn.; *A. cruentus* Willd.
Common in Sind and Karachi.
Fl. In the rainy season.
591. *Amaranthus spinosus* Linn., F.B.I. IV : 718.
Common in Sind and Karachi..
Fl. April- Sept.

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297. *Achyranthes* Linn.

592. *Achyranthes aspera* Linn., F.B.I. IV : 730.
Gharo: BSM.; Malir, Karachi.
Fl. Oct.-Nov.

298. *Alternanthera* Forsk.

593. *Alternanthera triandra* Lamk. Encycl. Meth. I (1783). 95.
Mirpur Sakro, Bughar river : BSM.
Fl. Aug.-Dec.

594. *Alternanthera nodiflora* R. Br., F.B.I. IV : 732.
Thatta : BSM.

299. *Celosia* Linn.

595. *Celosia argentea* Linn., F.B.I. IV : 714.
Common in Sind and Karachi.
Fl. Oct.-Dec.

300. *Digera* Forsk.

596. *Digera arvensis* Forsk., F.B.I. IV : 717.
Mirpur Sakro : BSM.; Malir, Karachi.
Fl. Aug.-Sept.

597. *Digera alternifolia* Aschers., F.B.I. IV : 718.
Sind : Blatter.

301. *Nothosaerua* Wight.

598. *Nothosaerua brachiata* Wight., F.B.I. IV : 726.
Thatta : BSM.
Fl. Oct.-Nov.

302. *Pupalia* Juss.

599. *Pupalia lappacea* (Linn.) Juss., F.B.I. IV : 724.
Gholom-limestone hills : BSM.; Malir.
Fl. Oct.-Nov.

LXXII. CHENOPODIACEAE.

303. *Arthrocnemum* Moq.

600. *Arthrocnemum indicum* Moq., F.E.I. V : 12.
Mouth of Indus : BSM.; Karachi.

304. *Atriplex* Linn.

601. *Atriplex stocksii* Boiss., F.B.I. V : 7.
Banks of Indus, Karachi, Salt Marshes in Karachi.
Fl. Dec.-Jan.

305. *Basella* Linn.

602. *Basella indica* Linn., F.B.I. V : 21.
Hyderabad, Karachi, Hub-river, Malir.

306. *Beta* Linn.

603. **Beta vulgaris* Linn., F.B.I. V : 5.

307. *Chenopodium* Linn.

604. *Chenopodium murale* Linn., F.B.I. V : 4.
Mirpur Sakro, Bohara, Bughar river : BSM.; Karachi.
Fl. March.

605. *Chenopodium album* Linn., F.B.I. V : 3.
Hyderabad, Malir, Landhi, Karachi, Bund Murad Khan,
Hub-river.
Fl. March-July.

308. *Haloxylon* Bunge.

606. *Haloxylon recurvum* Bunge ex Boiss., F.B.I. V : 15.
Gharo, Kullam Kote Lake, Thatta : BSM.; Drigh Road.
Fl. Nov.-Dec.

607. *Haloxylon salicornicum* Bunge., F.B.I. V : 16.
Drigh Road, Nazimabad.
Fl. Oct.

608. *Haloxylon ammodendron* Bunge.
Thatta, Gharo, Karachi.

309. *Kochia* Roth

609. **Kochia indica* Wight., F.B.I. V : II.
Fl. March-Oct.

310. *Salsola* Linn.

610. *Salsola foetida* Del., F.B.I. V : 18.
Gholam-limestone hills, Bohara, Kullam Kote Lake, Thatta
BSM.; Karachi, Malir.
Fl. December.

311. *Spinacia* Linn.

611. **Spinacia oleracea* Linn., F.B.I. V : 5.
Fl. March-May.

312. *Suaeda* Forsk.

612. ***Suaeda fruticosa*** Forsk., F.B.I. V : 13.
Gharo, Mirpur Sakro, Gholam, Thatta. Mouth of Indus.
BSM.; Karachi.
Fl. April-Dec.

613. ***Suaeda nudiflora*** Moq., F.B.I. V : 14.
Mirpur Sakro, Bohara, Gholam, Thatta, Mouth of Indus
BSM.; Karachi. Dilawar.
Fl. April-Dec.

614. ***Suaeda monoica*** Forsk., F.B.I. V : 13.
Mirpur Sakro, Bohara, Kullam Kote Lake, Thatta : BSM.
Karachi.

615. ***Suaeda maritima*** Dumort., F.B.I. V : 14.
Karachi.
Fl. July.

LXXIII. POLYGONACEAE.

313. *Calligonum* Linn.

616. ***Calligonum polygonoides*** Linn., F.B.I. V : 22.
Common in Sind and rare in Karachi.
Fl. Jan.-April.

314. *Homalocladium* Baiely.

617. ****Homalocladium platycladum*** Baiely Manu. Cult. Pl. 351
Syn. ***Muehlenbeckia platyclados*** Meissn.

315. *Polygonum* Linn.

618. ***Polygonum plebejum*** R. Br., F.B.I. V : 27.
Gharo : BSM.; Karachi.
Fl. April.

619. ***Polygonum glabrum*** Willd., F.B.I. V : 34.
Common on the canal banks.
Fl. Feb.-June.

620. ***Polygonum barbatum*** Linn., F.B.I. V : 37.
Common in Sind.
Fl. September.

621. **Polygonum salicornioides** Jaub. & Spach., F.B.I. V: 26.
Common in Sind.
Fl. April-Sept.

316. **Pteroporum** Jaub. & Spach.

622. **Pteroporum Olivieri** Jaub. & Spach., F.B.I.V: 23.
Common in Sind and Karachi.

317. **Rumex** Linn.

623. **Rumex dentatus** Linn., F.B.I.V: 59.
Common in Karachi.
Fl. March-April.

624. **Rumex vesicarius** Linn., F.B.I. V: 63.
Common in Sind and Karachi.
Fl. March-April.

LXXIV. ARISTOLOCHIACEAE.

318. **Aristolochia** Linn.

625. **Aristolochia bracteata** Retz., F.B.I. V: 75.
Gharo, Thatta: BSM.: Karachi.
Fl. Sept. Dec.

626. **Aristolochia Indica** Linn., F.B.I. V: 75.
Common in canal areas.
Fl. Sept.-Oct.

LXXV. EUPHORBIACEAE.

319. **Acalypha** Linn.

627. ***Acalypha hispida** Burm. f., F.B.I. V: 417.
Syn. **Caturus spiciflorus** Linn.
Fl. September.

628. ***Acalypha Wilkesiana** Muell., Arg. D.C. Prod. XV. ii 817.
Fl. Aug.-Sept.

320. **Andrachne** Linn.

629. **Andrachne aspera** Spreng., F.B.I.V: 284.
Thatta, Hyderabad, Landhi, Drigh Road, Dalmia Nagar
Mungopeer.
Fl. July-Spt.

321. *Chrozophora* Neck.

630. *Chrozophora obliqua* Juss., F.B.I.V: 409.
Karachi, Malir.
Fl. May-July.
631. *Chrozophora prostrata* Dalzell., F.B.I. V: 410.
Common in Sind.
Fl. May-July.
632. *Chrozophora tinctoria* Juss., F.B.I. V: 410.
Malir.
Fl. May.

322. *Codiaeum* Juss.

633. **Codiaeum variegatum* Blume., F.B.I. V.: 399.
Fl. Oct.-Dec.

323. *Euphorbia* Linn.

634. *Euphorbia caducifolia* Haines., F.B.I. V: 255.
Syn. *E. neriifolia* Linn.
Common in Sind and Karachi.
Fl. July-Oct.
635. *Euphorbia hypericifolia* Linn., F.B.I. V: 249.
Syn., *E. parviflora* Linn.
Common in waste places in Sind and Karachi.
Fl. July-Aug.
636. *Euphorbia hirta* Linn., F.B.I. V: 251.
Syn. *E. pilulifera* Linn.
Very Common in Sind and Karachi.
Fl. September.
637. *Euphorbia thymifolia* Burm., F.B.I. V: 252.
Common in Sind and Karachi.
Fl. Aug.-Oct.
638. **Euphorbia tirucalli* Linn., F.B.I. V: 254.
Fl. May-July.

639. **Euphorbia Jodhpurensis** Blatt. & Hall. in Journ. Bom. Nat. Hist. Soc. XXVI (1920.) 969.
Gharo, Mirpur Sakro : BSM.
Fl. June-July.
640. **Euphorbia nivulia** Ham; F.B.I. V: 255.
Common in Sind.
Fl. All the year round.
641. **Euphorbia granulata** Forsk., F. B.I. V : 252.
Common in Sind and Karachi.
Fl. March-April.
642. **Euphorbia clarkeana** Hook. f. F.,B.I. V : 253.
Common in Sind and Karachi.
Fl. All the year round.
643. ***Euphorbia heterophylla** Linn. Sp. Pl. (1753). 452.
Fl. May-Sept.
644. ***Euphorbia Pulcherrima** Willd. Var. alba Hart; Klotzsch, in Otta and Dietr. Allg. Gartenz. II (1834) 27.
Fl. During Winter.
645. **Euphorbia prostrata** Ait; F.B.I. V.: 266.
Common in Karachi.
Fl. All the year round.
646. ***Euphorbia Bojeri** Hook. f. Bot. Mag. t. 3527.
Syn. E. splendens Cooke.
Fl. All the year round.
324. **Flueggea** Willd.
647. **Flueggea leucopyrus** Willd; F.B.I. V: 328.
Common in Sind -Sabnis.
325. **Jatropha** Linn
648. **Jatropha panduræfolia** Andr. Bot. Rep. t. 267.
Fl. September.

326. *Mallotus* Lour.

649. *Mallotus philippinensis* Muell., F.B.I. V : 432.
Common in Sind.

327. *Manihot* Adans.

650. **Manihot esculenta* Crantz., Baiely Manu. Cult. Pl. p. 621.
Syn. *M. utilissima* Pohl.
Fl. Aug.-Sept.

328. *Phyllanthus* Linn.

651. **Phyllanthus acidus* Skeel., Baiely Manu. Cult. Pl. p. 619.
Syn. *P. distichus* Muell.
Fl. Aug.-Sept.
652. *Phyllanthus reticulatus* Poir., F.B.I. V : 288.
Thatta, Gharo, Malir, Karachi.
Fl. All the year round.
653. *Phyllanthus Niruri* Linn., F.B.I. V : 298.
Gharo, Mirpur Sakro, Bohara, Gholam, Thatta, Kullam Kote;
BSM.,; Common in Karachi and Sind.
Fl. Nov.-Dec.
654. *Phyllanthus emblica* Linn., F.B.I. V : 289.
Malir, Karachi, Nazimabad, Bund Murad Khan.
Fl. Sept.-Jan.
655. *Phyllanthus maderaspatensis* Linn., F.B.I. V : 292.
Common in Sind.
Fl. During winter.
656. *Phyllanthus carolinensis* Walt. Fl. Carol. 288. (1788).
Karachi, Lyari River : Rizvi.
657. *Phyllanthus scabrifolius* Hook, f., F.B.I. V : 299.
Karachi, Malir, Thatta.
Fl. Aug.
658. *Phyllanthus debilis* Ham., F.B.I. V : 299.
Karachi.
Fl. May-July.

329. Putranjiva Wall.

659. **Putranjiva Roxburghii** Wall., F.B.I. V : 336.
Karachi.
Fl. All the year round.

330. Ricinus Linn.

660. ***Ricinus communis** Linn., F.B.I. V : 457.
Fl. All the year round.

LXXVI MORACEAE.

331. Morus Linn.

661. ***Morus alba** Linn., F.B.I. V : 492.
Fl. March-May.
652. ***Morus indica** Linn., F.B.I. V : 492.
Fl. Feb.-April.

LXXVII. URTICACEAE.

332. Ficus Linn.

663. ***Ficus bengalensis** Linn., F.B.I. V : 499.
Fl. June.-Sept.
664. ***Ficus religiosa** Linn., F.B.I. V : 513.
Fl. June-Sept.
665. ***Ficus Tsiela** Roxb., F.B.I. V : 515.
Fl. April-May.
666. ***Ficus racemosa** Linn., F.B.I. V : 535.
Syn. **F. glomerata** Roxb.
Fl. Sept.
667. ***Ficus carica** Linn., F.B.I. V : 530.
Fl. Aug.-Sept.
668. ***Ficus Lacor** Buch.-Ham., F.B.I. V : 515.
Syn. **F. infectoria** Roxb.
Fl. July-Sept.
669. ***Ficus Tjakela** Burm., F.B.I. V : 514.
Fl. July-Sept.

670. ***Ficus retusa** Linn., F.B.I. V : 511.
Fl. July-Oct.

333. *Forskahlea* Linn.

671. **Forskahlea tenacissima** Linn., F.B.I. V : 593.
Common in Sind.
Fl. April-May.

LXXVIII. CASUARINACEAE.

334. *Casuarina* Forst.

672. ***Casuarina equisetifolia** Forst., F.B.I. V : 598.
Fl. April-June.

LXXIX. SALICACEAE.

335. *Populus* Linn.

673. **Populus euphratica** Oliv., F.B.I. V : 638.
Common in Sind and Karachi.
Fl. Dec.-Feb.

MONOCOTYLEDONS.

LXXX. HYDROCHARITACEAE.

336. *Hydrilla* Rich.

674. **Hydrilla verticillata** Casp., F.B.I. V : 659.
Common in tanks.
Fl. Dec.

337. *Vallisneria* Linn.

675. **Vallisneria spiralis** Linn., F.B.I. V : 660.
Thatta, Hub-river, Bund Murad Khan, Karachi.
Fl. Nov.-March.

LXXXI. MUSACEAE.

338. *Musa* Linn.

676. ***Musa sapientum** Linn., F.B.I. VI : 262.
Fl. Sept.-Dec.

LXXXII. ZINGIBERACEAE.

339. *Zingiber* Adans.

677. **Zingiber officinale* Roscoe., F.B.I. VI : 246.
Fl. Sept.-Oct.

LXXXIII. CANNACEAE.

340. *Canna* Linn.

678. **Canna indica* Linn., F.B.I. VI : 260.
Fl. All the year round.

LXXXIV. AMARYLLIDACEAE.

341. *Crinum* Linn.

679. **Crinum asiaticum* Linn., F.B.I. VI : 280.
Fl. Sept.-Jan.

LXXXV. LILIACEAE.

342. *Asparagus* Linn.

680. *Asparagus gharoensis* Blatter Flora of Indus Delta p. 30. 1929
Common in Lower Sind.
Fl. Sept.-Oct.

681. *Asparagus dumosus* Baker., F.B.I. VI : 315.
Gholam : BSM.
Fl. April-Sept.

682. *Asparagus deltae* Blatter Flora of Indus Delta p. 30. 1929.
Common in Indus Delta : BSM.
Fl. Sept.-Oct.

683. **Asparagus gonoclados* Baker., F.B.I. VI : 318.
Fl. Sept.-April.

684. *Asparagus racemosus* Willd., F.B.I. VI: 316.
Common in Sind and Karachi.
Fl. Oct.-March.

343. *Allium* Linn.

685. **Allium cepa* Linn., F.B.I. VI : 337.
Fl. Oct.-Dec.

686. **Allium sativum* Linn., F.B.I. VI : 337.
Fl. Sept.

344. *Asphodeline* Reich.

687. **Asphodeline tenuifolius* Cav., F.B.I. VI : 332.
Fl. Nov.-Feb.

345. *Aloe* Linn.

688. **Aloe barbadensis* Mill., F.B.I. VI : 264.
Syn. *A. vera* Linn.
Fl. June-Sept.

346. *Dipcadi* Medic.

689. *Dipcadi erythraeum* W. & B. Phyt. Canar. iii 341.
Common in Sind and Karachi.

347. *Scilla* Linn.

690. *Scilla indica* Baker., F.B.I. VI : 348.
Common in Sind.
Fl. Feb.-March.

348. *Smilax* Linn.

691. **Smilax macrophylla* Roxb., F.B.I. VI : 310.
Fl. Sept.-Dec.

692. **Smilax aspera* Linn., F.B.I. VI : 306.
Fl. Sept.-Jan.

LXXXVI. COMMELINACEAE.

349. *Commelina* Linn.

693. *Commelina albescens* Hassk., F.B.I. VI : 373.
Kullan Kote lake, Thatta : BSM.; Sukkar, Karachi.
Fl. June-Sept.

694. *Commelina obliqua* Ham, F.B.I. VI:372.
Common in Sind and Karachi.
Fl. Dec.

695. *Commelina benghalensis* Linn. F.B.I. VI:370.
Malir, Bund Murad Khan, Karachi.

350. *Rhoeo* Hance.

696. **Rhoeo discolor* Hance, Bailey Manue. Cult.Plants p.199.
Syn. *Tradescantia discolor* L. Her.
Fl. June-Jan.

LXXXVII. PALMAE.

351. *Cocos* Linn.

697. **Cocos nucifera* Linn. F.B.I. VI:482.
Fl. Sept.-Nov.

352. *Nannorhops* H. W.

698. **Nannorhops Ritchieana* H. W. F.B.I. VI, 429.
Fl. March- June.

353. *Phoenix* Linn.

699. *Phoenix dactylifera* Linn., F.B.I. VI. 424.
Common in Sind and Karachi.
Fl. Sept.-Oct.

700. *Phoenix sylvestris* Roxb., F.B.I. VI. 425.
Common in Sind and Karachi.
Fl. During hot months.

354. *Roystonea* = *Cook-Oreodoxa* Wild.

701. **Roystonea regia* Cook, Bailey Manu. Cult. p. 173.
Syn. *Oreodoxa regia* HBK.
Fl. During the Summer.

LXXXVIII. PANDANACEAE.

355. *Pandanu* Linn f.

702. *Pandanus tectorius* Soland.ex. Parkinson. Jour. Voy. H.M.S.
Endevour (1773). 46.
Keti Bunder:BSM., Sea Coast.
Fl. June-Sept.

703. **Pandanus fascicularis* Lam. F.B.I. VI-485.
Fl. Aug.-Sept.

LXXXIX. TYPHACEAE.

356. *Typha* Linn.

704. *Typha angustata* Chaub. & Bory., F.B.I. VI:489.
Mirpur Sakro, Bohara:BSM: Karachi.
Fl. June-Sept.
705. *Typha elephantina* Roxb., F.B.I. VI:489.
Common on the bank of Indus.
Fl. July-Aug.
706. *Typha latifolia* Linn., F.B.I. VI: 489.
Karachi.
Fl. All the year round.

XC. ARACEAE.

357. *Colocasia* Schott.

707. **Colocasia esculenta* Schott., F.B.I. VI:523.
Syn. *C. antiquorum* Schott.
Fl. Feb.-March.

358. *Pothos* Linn.

708. **Pothos scandes* Linn, F.B.I. VI:551.
Fl. The authors have not seen any flowering plant.

XCI. LEMNACEAE.

359. *Lemna* Linn.

709. *Lemna minor* Linn, F.B.I. VI:556.
Common in the ponds.
Fl. Sept.-Nov.

XCII. ALISMACEAE.

360. *Sagittaria* Linn.

710. *Sagittaria sagittifolia* Linn., F.B.I. VI-561.
Bughar on the Indus river, BSM; Karachi.
Fl. Oct.-Jan.

XCIII. NAJADACEAE.

361. *Aponogeton* Linn.

711. *Aponogeton monostachyon* Linn. f., F.B.I. VI, 561.
Mirpur Sakro: BSM.
Fl. Nov.-May.

362. *Najas* Linn.

712. *Najas minor* All., F.B.I. VI: 569.
Thatta lakes: BSM.

363. *Potamogeton* Linn.

713. *Potamogeton indicus* Roxb., F.B.I. VI: 565.
In ponds and tanks.
Fl. Oct.-April.

714. *Potamogeton perfoliatus* Linn., F.B.I. VI: 566.
Common in ponds and lakes.
Fl. Nov.-March.

715. *Potamogeton pectinatus* Linn., F.B.I. VI: 467.
Common in ponds and tanks.
Fl. Oct.-April.

364. *Zannichellia* Linn.

716. *Zannichellia palustris* Linn., F.B.I. VI: 568.
Thatta: B.S.M.
Fl. Sept.-Oct.

XCIV. GRAMINACEAE.

365. *Aeluropus* Trin.

717. *Aeluropus villosus* Trin ex Linn., F.B.I. VII: 334.
Gharo, Mirpur Sakro, Salt marshes in Indus delta: BM,;Salt
creeks, Thatta, Lakhi, Sehwan, Sanghar, Karachi, Bund
Murad Khan.
Fl. July-Dec.

366. *Agrostis* Linn.

718. *Agrostis micrantha* Steaud., F.B.I. VII: 256.
Common in Sind and Karachi.
Fl. July-Sept.

719. *Agrostis verticillata* Vill., F.B.I. VII: 254.
Hawks Bay-Karachi.
Fl. Nov. Dec.
367. *Aristida* Linn.
720. *Aristida adscensionis* Linn., F.B.I. VII: 224.
Kullan Kote Lake, Thatta: BSM,; Laki, Sehwan, Umarkot
BM.
Fl. July-Oct.
721. *Aristida funiculata* Trin., F.B.I. VII: 226.
Gharo, Gholam, Thatta, Karachi, Malir, Mipur Khas,
Jamshero.
Fl. Sept.-Oct.
722. *Aristida hirtigluma* Steud., F.B.I. VII: 227.
Bholari, Sehwan, Laki, Thanu Bula Khan: BM.; Karachi,
Hyderabad.
Fl. April.
723. *Aristida nutabilis* Trin., F.B.I. VII: 226.
Sehwan, Laki: BM.
724. *Aristida pogonoptila* Boiss., F.B.I. VII: 228.
Common in Sind.
725. *Aristida hystricula* Edgew., F.B.I. VII: 227
Laki, Bholari Camp, Hyderabad, Landhi, Malir, Karachi,
Bund Murad Khan.
Fl. April-Sept.
368. *Arthraxon* Beauv.
726. *Arthraxon serrulatus* Hochst. Blatter, McCann and Bhide,
Bombry grasses t, 46 (1935).
Common in Sind.
727. *Arthraxon lanceolatus* Hochst., F.B.I. VII: 143.
Common in Sind and Karachi.
369. *Arundo* Linn.
728. **Arundo donax* Linn., F.B.I. VII: 302.
Fl. Feb.
370. *Avena* Linn.
729. **Avena sativa* Linn., F.B.I. VII: 225.
Fl. Sept.

371. *Brachiaria* Griseb.

730. *Brachiaria cruciformis* Griseb., F.B.I. VII : 28.
Syn. *B. isachne* Stap.
Common in Sind.
731. *Brachiaria ramosa* Linn., F.B.I. VII : 36.
Syn. *Panicum ramosum* Linn.
Hyderabad, Sukkar, Karachi, Malir, Bund Murad Khan.
Fl. Sept.-Oct.
732. *Brachiaria reptans* (Linn.) Gard. ;& Hubb., F.B.I. VII: 33,34.
Syn. *Panicum prostratum* Lamk.
Common in Sind and Karachi.
Fl. July-Nov.

372. *Cenchrus* Linn.

733. *Cenchrus biflorus* Roxb., F.B.I. VII : 89.
Syn. *C. catharticus* Del.
Karachi, Landhi, Mirpur Sakro, Thatta, Gharo, Malir,
Jamesabad, Mirpur Khas, Drigh Road.
Fl. Oct.
734. *Cenchrus pennisetiformis* Hoschst., F.B.I. VII : 88,89.
Karachi, Malir, Drigh Road, Thatta, Gharo, Gholam,
Bughar, BSM.
Fl. July-Oct.
735. *Cenchrus setigerus* Vahl., F.B.I. VII : 89.
Syn. *C. biflorus* Roxb.
Thar-parkar, Thatta, Karachi, Malir, Landhi, Gharo.
Fl. May-Oct.

373. *Chloris* Sw.

736. *Chloris quinquesetica* Bhide. in Journ. & Proc. As. Soc.
Beng. 1912, n. s. viii, 311.
Common in Sind and Karachi.
Fl. Sept.-Oct.
737. *Chloris barbata* Sw., F.B.I. VII : 292.
Bughar river, Thatta, Mirpur Sakro : BSM.; Karachi,
Landhi, Malir.
738. *Chloris tenella* Roxb., F.B.I. VII : 290.
Landhi, Karachi.
Fl. Sept.-Oct.

739. **Chloris villosa** Pers., F.B.I. VII : 291.
Gharo : BSM.; Thatta, Mirpur Sakro: BM.; Karachi.
Fl. Oct.

740. **Chloris virgata** Sw., F.B.I. VII : 291.
Rahim-ka-bazar : Y.R.R.

374. **Chrysopogon** Trin.

741. **Chrysopogon aucheri** Stapf. in Kew. Bull. 1907,211.
Gizri, Landhi, Karachi.

375. **Coix** Linn.

742. **Coix lachryma-Jobi** Linn., VII : 421.
Umarkot, Mirpur Sakro, Gharo : M.
Fl. Sept.-Oct.

376. **Cymbopogon** Trin.

743. **Cymbopogon Iwarancusa** Schult., F.B.I. VII : 203.
Syn. **Andropogon Iwarancusa** Jones.
Gharo, Karachi, Bhulhari, Shikarpur, Khairpur, Thatta,
Hub-river, Clifton, Dilawar.
Fl. July-Oct.

744. **Cymbopogon schoenanthus** Spreng. Pugill. ii. 384.
Landhi, Malir, Karachi, Hub-ki-Chouki.
Fl. August.

377. **Cynodon** Pers.

745. **Cynodon dactylon** Pers., F.B.I. VII : 288.
Gholam, Thatta, Mirpur Sakro : BSM.; Umarkot, Mirpur-
Khas, Hyderabad, Sukkar, Sanghar, Malir, Karachi, Bund
Murad Khan.
Fl. During rains.

378. **Dactyloctenium** Willd.

746. **Dactyloctenium aegyptiacum** Beauv., F.B.I. VII : 296.
Syn. **Eleusine aegyptiaca** Desf.
Thatta, Haleji Lake, Gharo rest house, Hyderabad, Kot
Sukkur, Sanghar, Malir, Karachi, Hub-river, Bughar.
Fl. Sept.-Nov.

747. **Dactyloctenium scindicum** Boiss., F.B.I. VII: 296.
Syn. **Eleusine artistata** Ehrenb.
Karachi, Sanghar, Khaipur, Thatta, Mirpur Sakro, Haleji,
Bund Murad Khan, Hawks Bay, Sui gas pipe line near
Karachi Civil Air-port.
Fl. Sept.-December.

379. **Dendrocalamus** Nees.

748. **Dendrocalamus strictus** Nees., F.B.I. VII: 404.
Junnar Hills: BM.
Fl. October.

380. **Desmostachya** Stapf.

749. **Desmostachya bipinnata** Stapf., F.B.I. VII: 324.
Syn. **Eragrostis cynosuroides** Beauv.
Jamesabad, Hyderabad, Sukkur, Sehwan, Laki: BM.; Khair-
pur, Landhi, Thatta, Padidan gas line, Karachi, Nazimabad.
750. **Desmostachya cynosuroides** Stapf., Haines Bot. Bihar and
Orissa., Gholam, Ghara, Mirpur Sakro, Thatta: BSM.;
Karachi.
Fl. Sept.-Oct.

381. **Dichanthium** Willem.

751. **Dichanthium annulatum** Stapf. Fl. Trop. Afr. IX, 178.
Syn. **Andropogon annulatus** Forsk.
Jamesabad, Mirpur Sakro, Hyderabad, Padidan, Larkana,
Naserpur, Thatta: BM.

Gul Hayat Institute

382. **Digitaria** Rich.

752. **Digitaria pinnata** Chiov. Result. Scient. Miss. Stefanini Paoli.
I, 183.
Thatta, Landhi, Karachi, Hub-river.
Fl. Oct.
753. **Digitaria sanguinalis** Scop., F.B.I. VII: 14.
Syn. **D. marginata** Link. Var. **fimbricata** Stapf., **D. adscendens**
Hene.
Gholam, Bughar, Mirpur Sakro, Thatta, Sanghar: BM.;
Mirpur Khas, Karachi, Hyderabad.
Fl. Oct.

383. *Diplachne* Beauv.

754. ***Diplachne fusca*** Beauv., F.B.I. VII: 329.
Thatta, Kullan Kote Lake BSM.; Karachi.
Fl. July-Sept.

384. *Echinochloa* Beauv.

755. ***Echinochloa colona*** Link., Hort. Berol. 2:209. 1833.
Syn. ***Panicum colonum*** Linn.
Karachi, Mirpur Khas, Kotri, Larkana, Sanghar, Naserpur,
Khairpur, Shikarpur, Chor, Thatta, Padidan, Malir,
Hub-river.
Fl. All the year round.

756. ***Echinochloa crus-gali*** Beauv., F.B.I. VII: 31.
Syn. ***Panicum crus-galli*** Linn.
Keti, Mirpur Khas, Karachi, Thatta, Haleji Lake.
Fl. July-Oct.

757. ***Echinochloa stagnina*** Beauv., F.B.I. VII: 31.
Gholam, Thatta, Gharo, Mirpur Sakro.
Fl. Sept.-Nov.

385. *Eleusine* Gaertn.

758. ***Eleusine artistata*** Ehrenb., F.B.I. VII: 296.
Gharo, Mirpur Sakro, Gholam, : BSM.
Fl. Sept.-Oct.

759. ***Eleusine coracana*** Gaertn., F.B.I. VII: 294.
Thatta, Gharo, Gholam: BSM.
Fl. Sept.-Nov.

760. ***Eleusine indica*** Gaertn., F.B.I. VII: 293.
Malir, Bund Murad Khan, Hyderabad, Sukkur, Karachi.
Fl. Aug.-Oct.

386. *Elionurus*. H. & B.

761. ***Elionurus hirsutus*** Munro., F.B.I. VII: 162.
See ***Lasiurus hirsutus*** Boiss.

762. **Elionurus Royleanus** Nees., 'F.B.I. VII:161.
Common in Sind.
Fl. July-Sept.
387. **Enneapogon Desv. ex Beauv.**
763. **Enneapogon elegans** Stapf. in Kew. Bull. 1907, 224.
Common in Sind.
Fl. July-Sept.
388. **Eragrostis Beauv.**
764. **Eragrostis amabilis** W. & A., F.B.I. VII:315.
Syn. **E. plumosa** Link.
Common in Sind and Karachi.
Fl. Aug-Oct.
765. **Eragrostis cilianensis** Link. ex Lutati, F.B.I. VII: 320.
Syn. **E. major** Host.
Common in Sind and Karachi.
Fl. July.
766. **Eragrostis** Beauv. Agrost. Expl. Planch. 10, t. 14.
1812. Sanghar, Mirpur Khas: BM.
Fl. Oct.
767. **Eragrostis popposa** Steud, F.B.I. VII:322.
Common in Sind.
Fl. Sept.-Oct.
768. **Eragrostis poaeoides** Beauv, F.B.I. VII:321.
Syn. **E. minor** Hot.
Jamesabad, Pad Idan, Larkana Sanghar: BM, Karachi,
Malir, Bund Murad Khan.
Fl. July.
769. **Eragrostis tenella** Benth., F.B.I. VII:315.
Mirpur Khas :BM
Fl. July-Aug.
770. **Eragrostis unioides** (Retz.) Nees., F.B.I. VII:317.
Mirpur Sakro:BM.
Fl. Sept.-Oct.

771. **Eragrostis ciliaris** Link. Var. **brachystachya** Boiss., F.B.I. VII: 314.
Jamesabad, Sanghar, Thatta, BSM: Mirpur Khas, Landhi, Karachi .
Fl. Aug.-Oct.

772. **Eragrostis interrupta** Beauv., F.B.I. VII-316.
Syn., **E.diplachnoides** Steud.
Pad Idan, Mirpur Khas, Jamesabad, Ganja Hills, Bughar, Hyderabad, Kotri, BM.
Fl. Aug.-Jan.

389. **Eremopogon** Stapf.

773. **Eremopogon foveolatus** Stapf., in Prain, F.I Trop. Afr. ix.182. (1917)
Syn. **Andropogon foveolatus** Del.
Sehwan, Laki. BM. Drigh Road, Karachi, Malir.

390. **Erianthus** Michx.

774. **Erianthus ravennae** (Linn). Beauv., F.B.I. VII:121.
Syn. **Saccharum ravennae** Linn.
Karachi, Malir, Hub-river: Thatta, Hyderabad, Mirpur Khas, Sukkur, Larkana :BM.
Fl. Sept.-Oct.

391. **Eriochloa** HBK.

775. **Eriochloa procera** (Retz). C.E. Hubb. Kew. Bull. Misc. Inf. 1230. 256, 1930.
Syn. **E.ramosa** Kuntz.: **E. polystachya** HBK.
Thatta, Gharo, Umarmkot, Gholam, Bughar, Jamesabad:BM. Karachi.
Fl. Sept.-Oct.

392. **Gracilea** Koen.

776. **Gracilea Royleana** Hook, f., F.B.I. VII:284.
Karachi, Landhi, Malir, Common in Sind.
Fl. October.

393. **Halopyrum** Stapf.

777. **Halopyrum mucronatum** Stapf., F.B.I. VII:328.
Karachi, Clifton, Manora, Keamari , Dilawar.
Fl. All the year round.

394. *Heleochloa* Host ex Roemer.

778. *Heleochloa dura* Boiss., F.B.I. VII:236.

Common in Salt-water creeks.

Zl. During Summer.

779. *Heleochloa schoenoides* (Linn.) Host., F.B.I. VII: 235.

Bhubak Y.R.R.

Fl. During Summer.

395. *Hemarthria* R. Br.

780. *Hemarthria compressa* Kunth., F.B.I. VII: 153.

Thatta, Bughar, Gharo: BSM.

Fl. July.-Sept.

781. *Hemarthria glabra* Blatt. & M'Cann in Journ. Bom.

Nat. Hist. Soc xxxii, 27, 1927.

Mirpur Sakro, Bughar: B.M.

Fl. July-Oct.

396. *Hordeum* Linn.

782. **Hordeum vulgare* Linn., F.B.I. VII 371.

Fl. Sept.

397 *Imperata* Cyrill.

783. *Imperata cylindrica* (Linn..) Beauv., F.B.I. VII: 106.

Syn. *I arundinacea* Cyrill.

Common in Sind.

Fl. April-Sept.

398. *Lasiurus*.

784. *Lasiurus hirsutus* Boiss., F.B.I. VII: 162.

Umarkot, Laki : BM., Karachi, Hub-river, Malir, Landhi,
Chachro.

Y.R.R.

Syn. *Elionurus hirsutus* Munro.

Fl. April-August.

399. *Latipes* Kunth.

785. *Latipes senegalensis* Kunth., F.B.I. VII : 97.

Karachi, Malir, Drigh Road, Mungopeer, Landhi.

Fl. Sept.-Oct.

400 *Lolium* Linn.

786. ***Lolium temulentum*** Linn., F.B.I. VII : 364.
Malir.
Fl. Sept.

401. *Oryza* Linn.

787. ***Oryza coarctata*** Roxb., F.B.I. VII : 93.
Mouth of Indus, Karachi, Ket, Shikarpur.
Fl. September.
788. ****Oryza sativa*** Linn., F.B.I. VII : 93.
Fl. September.

402. *Panicum* Linn.

789. ***Panicum antidotale*** Retz., F.B.I. VII, 52.
Thatta, Mirpur Sakro, Ghulam, Gharo, Sukkur : B.M.
Karachi, Malir, Landhi, Bund Murad Khan.
Fl. July-Sept.
790. ***Panicum fluitans*** Retz., F.B.I. VII, 29
Common in Sind and Karachi.
Fl. July-Sept.
791. ***Panicum geminatum*** Forsk. Fl. Aegypt. Arab 18.1775
Syn. ***Paspallidum geminatum*** Stapf.
Manchar Lake, Thatta.
Fl. July-Sept.
792. ***Panicum flavidum*** Retz., F.B.I. VII : 28.
Syn. ***Paspallium flavidum*** A. Camus.
Sanghar : BM.
Fl. July-Sept.
793. ***Panicum interruptum*** Willd., F.B.I. VII, 40.
Common in Sind and Karachi.
Fl. Sept -Oct.
794. ***Panicum miliaceum*** Linn., F.B.I. VII : 45.
Shoran : B.M.
Fl. Aug.-Sept.
795. ***Panicum miliare*** Lamk., F.B.I. VII 46.
Khairpur : Y. R. R.
Fl. Sept.-Oct

796. ***Panicum maximum** Jaoq., F.B.I. VII: 42.
Fl. Sept.-Oct.

797. **Panicum turgidum** Forsk., F.B.I. VII: 44.
Sehwan: BM.
Fl. Aug.-Sept.

798. **Panicum Villosum** Lamk., F.B.I. VII : 34.
Common in Sind
Fl. Aug.-Nov.

403. **Paspalum** Linn.

799. **Paspalum dilatatum** Poir. in Lam. Encycl. 5 : 35.
Common in Sind.
Fl. Sept.-Oct.

800. **Paspalum distichum** Linn., F.B.I. VII : 12.
Lyari-river Karachi.
Fl. Aug.-Oct.

801. **Paspalum scrobiculatum** Linn., F.B.I. VII : 10.
Jamesabad, Bohara : BM. ; Karachi.
Fl. Aug.

404. **Pennisetum** L. Rich.

802. **Pennisetum cenchroides** Rich., F.B.I. VII : 88.
Thatta, Gharo, Gholam, Bughar: BSM.; Karachi, Hub-river
Fl. Aug.-Sept.

803. **Pennisetum ciliare** Link., F.B.I. VII: 88'.
Mirpurkhas, Jacobabad Sanghar, Thatta : BM.; Karachi,
Landhi, Malir. Clifton.
Fl. Sept.-Oct.

804. **Pennisetum dichotomum** Del., F.B.I. VII : 85.
Common in Lower Sind and in Karachi.
Fl. July-Sept.

805. **Pennisetum elopecurus** Nees.
Common in Sind.
Fl. July-Aug.

806. *Pennisetum glaucum* R. Br., F.B.I. VII : 79.
Syn. *P. americanum* Linn.; *P. typhoideum* Rich.; *P. spicatum* R. & S. Cultivated all over Karachi and Sind.
807. *Pennisetum orientale* Rich., F.B.I. VII : 86.
Hyderabad, Mirpur khas : BM.
Fl. April-May.
808. **Pennisetum Purpureum* Schum. Beskr. Guin. Pl. 64. 1827.
Fl. July-Sept.
809. *Penisetum setosum* Rich., F.B.I. VII : 87.
Hyderabad, Kotri : BM.
Fl. July-Oct.

405 *Phalaris* Linn.

810. *Phalaris minor* Retz., F.B.I. VII : 221.
Karachi, Malir, Hyderabad, Larkana, Sukkur, Mirpurkhas.
Fl. Feb.-March.

406. *Phragmites* Trin.

811. *Phragmites karaka* Trin., F.B.I. VII : 304.
Keti, Thatta : BM.
Fl. Sept-Oct.

407. *Polypogon* Desf.

812. *Polypogon monspeliensis* (Linn) Desf., F.B.I. VII : 245.
Sukkur, Shikarpur, Khairpur, Karachi, Hub-river.
Fl. Sept.-Oct.

Gul Hayat Institute

408. *Rottboellia* Linn. f.

813. *Rottboellia compressa* Linn. f., F.B.I. VII : 153.
Rare in Sind.
Fl. Sept.-Nov.

409. *Saccharum* Linn.

814. *Saccharum griffithii* Munro., B.F.I. VII : 120.
Thatta, Laki, Khairpur, Sehwan, Sukkur, Larkana, Mirpurkhas, Karachi.
Fl. Sept.-Nov.

815. ***Saccharum munja** Roxb., F.B.I. VII:119.
Syn. *S. arundinaceum* Retz.
Fl. Oct.
816. ***Saccharum officinarum** Linn. F.B.I. VII:118.
Fl. July-Sept.
817. **Saccharum spontaneum** Linn., F.B.I. VII:118.
Thatta, Gharo, Shikarpur, Mirpur Sakro: BSM.; Malir, Karachi Hub-river.,
Fl. Sept.-Nov.

410. *Setaria Beauv.*

818. **Setaria verticillata** (Linn.) Beauv., F.B.I. VII:80.
Umarkot Sanghar, Mirpur Khas, Bughar, Gholam: BSM
Karachi, Hub-river.
Fl. May-July.
819. **Setaria intermedia** Roem. & Sch, F.B.I. VII:79.
Karachi, Malir, Landhi, Drigh Road.
Fl. May-Sept.

411. *Sorghum Linn.*

820. ***Sorghum vulgare** Pers, F.B.I. VII:187.
Fl. Sept.

412. *Sacciolepis Nash.*

821. **Sacciolepis interrupta** Stapf. in Prain, Fl. Trop. Afr. ix. 757
(1920) Common in Sind.

413. *Spinifex Linn.*

822. **Spinifex squarrosus** Kunth., F.B.I. VII:63.
On the sandy coast of Sind and Karachi.
Fl. Aug.-Oct.

414. *Sporobolus R. Br.*

823. **Sporobolus coromandelianus** Kunth, F.B.I. VII:252.
Landhi, Malir, Hub-river, Gharo, Karachi,
Fl. September.

824. **Sporobolus diander** Beauv, F.B.I. VII: 247.
Common in Karachi.
Fl. Sept. -Nov.
825. **Sporobolus helvola** (Trin), T.D. F.B.I. VII-250.
Syn. **S. glaucifolius** Hochst.
Mirpur Khas, Jacobabad:BM.; Karachi, Mungopeer, Bund
Murad Khan.
Fl. Sept. -Dec.
826. **Sporobolus ioclados** Nees., F.B.I. VII:249.
Common in Sind.
Fl. Sept.-Oct.
827. **Sporobolus pallidus** Boiss., F.B.I. VII:252.
Syn. **S. arabicus** Boiss.
Laki, Mirpur Sakro, Gharo, Thatta, Bugar, Gholam:BM.,
Karachi, Landhi, Mungopeer, Clifton.
Fl. Aug.-Dec.
828. **Sporobolus indicus** Stapf.
Jamesabad:BM.; Karachi, Clifton, Dilawar.
Fl. July-Oct.
415. **Stapfiola Kuntze**—**Desmostachya** Stapf.
829. **Stapfiola bipinnata** ,Kuntz in Post and Kuntz, Lexic.532 (190)
See **Desmostachya bipinnata** Stapf.
416. **Tragus** Haller.
830. **Tragus biflorus** Schult., F.B.I. VII:97.
Syn. **Tragus racemosus** Scop.; **Nazia racemosa** Kuntz.
Thatta, Bugar, Gharo, Gholam:BM.; Landhi, Karachi.
Fl. May-Aug.
417. **Tristachya** Nees.
831. **Tristachya barbata** Nees., F.B.I. VII:272.
Rare in Sind.
Fl. July-Oct.
418. **Tricholaena** Serad.
832. **Tricholaena teneriffae** Parle., F.B.I. VII:65.
Laki, Thanu Bula Khan; Cooke.

419. *Triticum* Linn.

833. **Triticum aestivum* Linn., F.B.I. VII : 367.
Syn. *T. vulgare* Vill.
Fl. Feb.-March.

834. **Triticum sphaerococcum* Pereiv. Wheat Pl. Monogr. 157,
321. f. 202. 1921.

A relic species occasionally cultivated in North Sind.

420. *Urochloa* Beauv.

835. *Urochloa setigera* Stapf., F.B.I. VII : 36.
Syn. *Panicum setigerum* Retz.
Mirpur Sakro : BSM.; Gharo BM.
Fl. October.

421. *Vetiveria* Thon.

836. *Vetiveria zizanioides* (Linn.) Stpf., F.B.I. VII : 186.
Common in Indus delta, and in Karachi.
Fl. Aug.-Sept.

422. *Zea* Linn.

837. **Zea mays* Linn., F.B.I. VII : 102.
Fl. Aug.-Sept.

CYPERACEAE.

423. *Bulbostylis* Kunth.

838. *Bulbostylis barbata* Kunth., F.B.I. VII : 651.
Grows all over Sind during monsoon period, prefers sandy
soils near water.
Fl. July-Dec.

424. *Carex* Linn

839. *Carex breviculmis* R. Br., F.B.I. VI : 746.
Sind ! Pinwill ex Clarke.
Fl. April-June.

840. *Carex brunnea* Thumb., F.B.I. VI : 705.
Common in Sind.
Fl. May-June.

841. *Carex cruciata* Wahl., F.B.I. VI : 715
Common in Sind.

842. **Carex filicina** Nees., F.B.I. VI : 715.
 Var. **meiogyna** Strac. Cat. Pl. Kumaon (1854) 73.
 Var. **minor** Boott. Illusrt. iii (1862), 106, t. 317-18.
 Common in Sind.
 Fl. July.
843. **Carex foliosa** D. Don. in Trans. Linn. Soc. xiv (1825) 227.
 Sind ! Pinwill ex Clarke.
844. **Carex glauca** Murr. Prodr. Stirp. Gotting. (1770) 76.
 Var. **cuspidata** (Host.) Ashers, et. Graebner Synops.
 Mittleurop. Fl. ii, 2 (1902, 1903) 138.
 Common in Sind.
845. **Carex Halleriana** Asso Synops. 745.
 Sind ! Pinwill ex Clarke ; Common in Sind.
846. **Carex nubigena** D. Don., F.B.I. VI : 702.
 Sind ! Pinwill ex Clarke.
847. **Carex setigera** D. Don in Trans. Linn. Soc. xiv, 330 and
 Prodr. 43. var. **schlagintweitiana** (Boek) Kunth. in Engl.
 Phanzenr. iv, 20 (1909) 419.
 Sind ! Pinwill ex Clarke.
 Fl. May-June.
425. **Cyperus** Linn.
848. **Cyperus arenarius** Retz., F.B. Pres. II : 864.
 Common on the sea coast of Karachi, Gharo, Haleji Lake,
 Drigh Road, Malir.
 Fl. All the year round.
849. **Cyperus Atkinsoni** C.B. Clarke., F.B. Pres. II : 865.
 Common in Karachi.
 Fl. August.
850. **Cyperus bulbosus** Vahl., F.B. Pres. II : 871.
 Syn. **C. geminicum** Retz.
 Mirpur Sakro, Ghulam, Hyderabad : BM.; Sandy shore
 of Karachi.
 Fl. Jan.-Oct.
851. **Cyperus compressus** Linn., F.B. Pres. II : 866.
 Common in Sind and Karachi, abundant during monsoon
 period.
 Fl. July-Sept.

852. **Cyperus conglomeratus** Rottb., F.B. Pres. 865.
Syn. **C. pungens** Boeck.
Karachi, Malir, Hub-river, Mungopeer.
Fl. July-Sept.
853. **Cyperus corymbosus** Rottb., F.B. Pres. II : 870.
Syn. **C. tagetum** Roxb.
Marshy grounds in Lower Sind, Thatta, Gharo, Karachi.
Fl. March-August.
854. **Cyperus eleusinoides** Kunth., F.B. Pres. II : 868.
Common on the bank of rivers, streams and tanks.
Fl. March-Sept.
855. **Cyperus esculentus** Linn., Sp. Pl. (1753) 67.
Sind ! Sabnis.
856. **Cyperus exaltatus** Retz., F.B. II : 872.
Var. **dives** C.B. Clarke., F.B. Pres. II : 873.
Marshy banks of rivers in Karachi and Thatta.
Fl. July-Dec.
857. **Cyperus glaber** Linn. Mantiss (1771) 179.
Common in Sind.
858. **Cyperus haspan** Linn., F.B. Pres. II : 863.
Thatta : BM.; Mirpur Sakro, Gharo : B.N. Vakil.
Fl. All the year round.
859. **Cyperus irla** Linn., F.B. Pres. II : 867.
Karachi : extracted from a birds crop and grown in a pot:
BM.
Fl. All the year round.
860. **Cyperus malaccensis** Lam., F.B. Pres. II : 869.
Thatta, Ketī : BM.; Mouth of Indus.
Fl. Sept.-Oct.
861. **Cyperus niveus** Retz., F.B. Pres. II : 864.
In the sandy tracts of Lower Sind, and on the sand dunes
around Karachi.
Fl. July-Aug.

862. *Cyperus pulcherrimus* Willd., F.B. Pres. II : 863.
Common in Sind.
Fl. Aug.-Oct.
863. *Cyperus effusus* Rottb., F.B.I. VI : 603.
Common in Sind.
864. *Cyperus rotundus* Linn., F.B. Pres. II : 871.
Mirpur Sakro, Bohara, Ghulam, Kullam Kote Lake, Thatta,
Bubak, Chunar : BM.; Karachi, Keamari.
Fl. All the year round.
865. *Cyperus stoloniferus* Retz. Obs. IV, 10.
Mouth of Indus, on the sandy sea shore, among rocks and
gravel.
Fl. March-Sept.
866. *Cyperus uncinatus* Poir., F.B. Pres. II : 862.
Syn. *C. cuspidatus* HBK.
Common in Sind.
426. *Eleocharis* R. Br.
867. *Eleocharis capitata* R. Br., F.B. Pres. II : 889.
Jamadar ka Landha, Karachi : Cooke.
Fl. All the year round.
868. *Eleocharis dulcis* (Burn. f.) Trin ex Hesc. F.B. Pres. II : 888.
Syn. *E. plantaginea* R. Br.
Common in Sind growing in lakes and ponds.
Fl. March-Oct.
869. *Eleocharis palustris* R. Br., F.B. Pres. II : 890.
Hyderabad : Woodrow ; Common in Sind.
Fl. May-June.
870. *Eleocharis atropurpurea* Kunth., F.B. Pres. II : 889.
Thatta, Bughar, Mirpur Sakro ; BSM.: Karachi.
Fl. All the year round.

427. *Eriophorum* Linn.

871. *Eriophorum cosmosum* Wall., F.B. Pres. II : 896.
Common on the banks of rivers and streams.
Fl. March-May.

428. *Fimbristylis* Vahl.

872. *Fimbristylis annua* Rcer. & Sch. var. *diphylla* Kuken., F.B. Pres. II : 882.

On the banks of river and tanks, also in the rice fields.
Fl. Nov.-March.

873. *Fimbristylis complanata* Linn., F.B. Pres. II : 886.

Sind ! Pinwill ex Cooke.
Fl. Sept.-Feb.

874. *Fimbristylis dichotoma* Vahl., F.B. Pres. II : 880.

Thatta, Hyderabad : BM.
Fl. All the year round.

875. *Fimbristylis ferruginea* Vahl., F.B. Pres. II : 881.

Thatta, Bugar river, Kullian Kate Lake, Malir, and all over
Sind where there is sufficient water.
Fl. All the year round.

876. *Fimbristylis junciformis* Kunt., F.B. Pres. II : 886.

Common in canal areas.
Fl. May-Aug.

877. *Fimbristylis miliacea* Vahl., F.B. Pres. II : 883.

Commonly found near water throughout the year.
Fl. Jan.-Nov.

878. *Fimbristylis monostachya* Hassk., F.B. Pres. II : 885.

Commonly grows in open fields during monsoon period,
Fl. July-Sept.

879. *Fimbristylis quinquangularis* Kunth., F.B. Pres. II : 883.

Chunar, Indus river : BM.; Malir-river, Hub-river.
Fl. All the year round.

880. *Fimbristylis schoenoides* Vahl., F.B. Pres. II : 880.

Common in Sind growing in open land.
Fl. July-Oct.

881. *Fimbristylis spathacea* Roth., F.B. Pres. II : 882.

Mirpur Sakro, Landhi : BM.; Karachi, Malir river.
Fl. Jan.-Oct.

429. *Juncellus* C.B. Clarke.

882. *Juncellus alopecuroides* C.B., Clarke., F.B.I. VI : 595.
Syn. *Cyperus alopecuroides* Rottb.
Kullan Kote Lake, Thatta : BM.; Mungopeer, Hub-river
Fl. All the year round.

883. *Juncellus laevigatus* C.B. Clarke., F.B.I. VII : 596.
Sandy river beds and marshes.
Fl. July-Oct.

430. *Kyllinga* Rottb.

884. *Kyllinga triceps* Rottb., F.B. Pres. II : 877.
Sandy places, and sand dunes all over Sind and Karachi.
Fl. September.

431. *Mariscus* Vahl.

885. *Mariscus compactus* Druc., F.B. Pres. II : 875.
Syn. *Cyperus dilutus* Vahl.
Common during the monsoon period in marshes, wet places
and ditches.
Fl. Sept.-Oct.

432. *Pycerus* Beauv.

886. *Pycerus odoratus* Urban Symb., F.B.I. VI : 592.
Syn. *P. polystachyus* Beauv. ; *Cyperus odoratus* Linn.
Near the coast of Karachi and Sind.
Fl. Aug.-Oct.

887. *Pycerus pumilus* Dom., F.B.I. VI : 591.
Syn. *Cyperus pumilus* Linn.; *Pycerus nitens* Nees.
Sandy and stony beds of rivers and streams, grows during
the monsoon period.
Fl. July-Oct.

888. *Pycerus sanguinolentus* Nees., F.B.I. VI : 590.
Syn. *Cyperus sanguinolentus* Vahl.
In marshy piacess and open grasslands.
Fl. Sept.-Oct.

433. *Scirpus* Linn.

889. *Scirpus quinquefarius* Ham., F.B. Pres. II : 892.
Rhubak, Ghulam, Thatta, Bugar : BM.; Common in Sind.
Fl. October.
890. *Scirpus articulatus* Linn., F.B. Press. II : 891.
Common in Sind and Karachi during monsoon period
Fl. Sept.-Jan.
891. *Scirpus corymbosus* Heyne ex Rottb., F.B. Pres. II : 892.
Shallow pools and lakes.
Fl. Sept.-Dec.
892. *Scirpus grossus* Linn., F.B. Pres. II : 893.
A marsh sedge appearing during monsoon, common in
soft and stiky soils.
Fl. Sept.-Jan.
893. *Scirpus Holoschoenus* Linn., F.B.I. VI : 655.
Common in Sind.
Fl. Sept.-Dec.
894. *Scirpus littoralis* Schrad., F.B. Pres. II : 894.
Thatta : BM.; Common in Sind and Malir Landhi area.
Fl. Aug.-Dec.
895. *Scirpus maritimus* Linn., F.B. Pres. II : 893.
Thatta, Mirpur Sakro : BSM.; Karachi, Hub-river.
Fl. Dec.-Jan.
896. *Scirpus squarrosus* Linn., F.B. Pres. II : 894.
Sind ! Pinwill ex Clarke; Common in Sind.
Fl. March-Aug.
897. *Scirpus supinus* Linn., F.B. Pres. II : 892.
Partially aquatic, grows in marshy places.
Fl. Oct.-Jan.
898. *Scirpus triqueter* Linn., F.B.I. VI : 658.
Common in marshy and wet places.
Fl. Sept.-Dec.

434. *Schoenus* Linn.

899. *Schoenus nigricans* Linn., F.B.I. VI : 673.
Sind ! Pinwill ex Clarke ; Common in Sind.
Fl. Sept.-Jan.

GNETACEAE.

435. *Ephedra* Linn.

900. *Ephedra foliata* Boiss., F.B.I. V : 641.
Common in Indus delta, Upper Sind and Karachi.

901. *Ephedra distachya* Linn., F.B.I. V : 640.
Syn. *E. vulgaris* Rich.
Rare in Sind.



Gul Hayat Institute

APPENDIX IV

“List of the Birds of former Sind and Khairpur”

(Revised and brought up-to-date to June, 1954).

By K. R. Eates, formerly Deputy Inspector General of Police in Sind region.

No.	Name	Sindhi	Remarks
1.	Sindhi Raven <i>Corvus corax laurencii</i>	.. ‘Rodh Kang’.	Breeding migrant
2.	Brown-necked Raven <i>Corvus corax ruficollis</i>	.. ‘Takru Kang’	Resident in Khair- thar Hills
3.	Indian Jungle Crow <i>Corvus coronoides leuicanti</i>	.. ‘Wado Karo Kang’	Resident Eastern Boundary
4.	Sind House Crow <i>Corvus splendens zugmayeri</i>	.. ‘Kang’	Resident
5.	Sind-Tree-Pie <i>Dendrocitta vagabunda pallida</i>	‘Malang-Mata’	Resident
6.	Penduline Tit <i>Remiz coronatus</i>	None recorded	Migrant
7.	Striated Babbler <i>Argya earlii</i>	‘Lelo’	Resident
8.	Common Babbler <i>Argya caudata cau tata</i>	‘Hero’	Resident
9.	Afghan Babbler <i>Argya caudata huttoni</i>	‘Hero’	Resident in Khirthar
10.	Large Grey Babbler <i>Argya malcomi</i>	‘Sath-bhai’	Resident
11.	Sind Jungle Babbler <i>Turdoides terriclor indianus</i>	‘Sath-bhai’	Resident
12.	White-eyed Babbler <i>Pycnorhis sinensis hypoleucus</i>	None recorded	Resident
13.	Sind Grass Babbler <i>Pycnorhis altilostris scindicus</i>	None recorded	Resident
14.	Grey Hypocolius <i>Hypocolius ampelinus</i>	None recorded	Migrant
15.	White-eared Bulbul <i>Pycnonotus leucotis leucotis</i>	‘Bul-bul’	Resident
16.	Red-vented Bulbul <i>Pycnonotus haemorrhous pallidus</i>	‘Thari Bul-bul’	Resident
17.	Nuthatch <i>Sitta castaneiventris</i>	None recorded	Straggler
18.	Drougo <i>Dicrurus macrocercus</i>	‘Karo Kainch’	Resident
19.	Grey-backed Warbler <i>Agrocorates galactodes familiaris</i>	None recorded	Migrant

No.	Name	Sindhi	Remarks
20.	Turkestan Grasshopper Warbler <i>Locustella naevia straminea</i>	None recorded	Migrant
21.	Eastern Clamorous Reed-Warbler <i>Acrocephalus stentoreus brunescens</i>	'Chat-Chir'	Resident
22.	Blyth's Reed-Warbler <i>Acrocephalus dumetorum</i>	None recorded	Migrant
23.	Paddy-field Warbler <i>Acrocephalus agricola</i>	None recorded	Migrant
24.	Tailor-bird <i>Orthotomus sutorius</i>	None recorded	Resident
25.	Moustached Sedge-Warbler <i>Lasciniola melanopogon mimica</i>	None recorded	Migrant
26.	Fan-tailed Warbler <i>Cisticola juncidis cursitans</i>	None recorded	Resident
27.	Rufous-fronted Wren-Warbler <i>Franklinia buehneri</i>	'Chiho'	Resident
28.	Burne's Grass-Warbler <i>Laticilla burnesi</i>	'Sar-chiho'	Resident
29.	Bristle-faced Grass-Warbler <i>Chaetornis locustelloides</i>	None recorded	Migrant
30.	Sykes' Tree-Warbler <i>Hippolais rama</i>	None recorded	Resident
31.	Booted Tree-Warbler <i>Hippolais scita</i>	None recorded	Migrant
32.	Eastern Common Whitethroat <i>Sylvia communis icterops</i>	None recorded	Migrant
33.	Eastern Orphean Warbler <i>Sylvia hortensis crassirostris</i>	None recorded	Migrant
34.	Desert Warbler <i>Sylvia nana</i>	None recorded	Migrant
35.	Hume's Whitethroat <i>Sylvia althaea</i>	None recorded	Migrant
36.	Indian Lesser Whitethroat <i>Sylvia curruca affinis</i>	None recorded	Migrant
37.	Hume's Lesser Whitethroat <i>Sylvia curruca minula</i>	None recorded	Migrant
38.	Siberian Chiffchaff <i>Phylloscopus collybita tristis</i>	None recorded	Migrant
39.	Sind Willow-Warbler <i>Phylloscopus collybita sindianus</i>	None recorded	Migrant
40.	Sain Willow-Wren <i>Phylloscopus neglectus</i>	None recorded	Migrant

No.	Name	Sindhi	Remarks
41.	Green Willow-Warbler <i>Phylloscopus niti us</i>	None recorded	Migrant
42.	Streaked Scrub-Warbler <i>Scotocerca inquieta Striata</i>	None recorded	Resident
43.	Eastern Cetti's Warbler <i>Cettia cetti cettioies</i>	None recorded	Migrant
44.	Long-tailed oill-Warbler <i>Suya crinigera striauala</i>	None recorded	Resident
45.	Streaked Wren-Warbler <i>Prinia gracilis lepida</i>	None recorded	Resident
46.	Yellow-vented Wren-Warbler <i>Prinia flaviventris sindiana</i>	None recorded	Resident
47.	Indian Wren-Warbler <i>Prinia inornata</i> <i>Prinia inornata</i>	None recorded	Resident
48.	Great Gery Shrike <i>Lanius excubitor lahtorah</i>	'Wado Boro'	Resident
49.	Allied Grey Shrike <i>Lanius excubitor palii. irostris</i>	None recorded	Migrant
50.	Bay-backed Shrike <i>Lanius vittatus</i>	'Boro'	Resident
51.	Rufous-backed Shrike <i>Lanius schach erythronotus</i>	'Nando Boro'	Resident
52.	Red-backed Shrike <i>Lanius collurio</i>	'Boro'	Migrant
53.	Rufous Shrike <i>Lanius cristatus phenicuroides</i>	'Boro'	Migrant
54.	Pale Brown Shrike <i>Lanius isahellinus</i>	'Mul-halo'	Migrant
55.	Sind Wood-Shrike <i>Tephrodornis pondiceiranus</i> <i>pallidus</i>	'Bori'	Resident
56.	Short-billed Minivet <i>Pericrocotus brevirostris</i>	None recorded	Migrant
57.	Rosy Minvet <i>Pericrocotus roseus</i>	None recorded	Straggler
58.	Sind Wandering Minivet <i>Pericrocotus perigrinus pallidus</i>	None recorded	Resident
59.	White-breasted Oinivet <i>Pericrocotus erythrophygius</i>	None recorded	Straggler
60.	Large Cuckoo-Shrike <i>Graucalus macei</i>	None recorded	Straggler
61.	European Goden Oriole <i>Oriolus</i>	None recorded	Migrant

No.	Name.	Sindhi.	Remarks.
62.	Oriole <i>oriolus Kundoo</i>	None recorded	Migrant
63.	Rosy Pastor <i>Pastor roseus</i>	'Kabro Wahayo' 'Tilliar'	Migrant
64.	Finsch's Starling ; <i>Sturnus vulgaris pottaratskii</i> ;	'Karo Wahayo'	Migrant
65.	Common Starling <i>Sturnus vulgaris nobilior</i>	'Karo Wahayo'	Migrant
66.	Dresser's Starling <i>Sturnus vulgaris dresseri</i>	'Karo Wahayo'	Migrant
67.	Central Asian Starling ; <i>Sturnus vulgaris porphyronotus</i>	'Karo Wahayo'	Migrant
68.	Hume's Starling; <i>Sturnus vulgaris humei</i>	'Karo Wahayo'	Migrant
69.	Sind Starling <i>Sturnus vulgaris minor</i>	'Karo Wahayo'	Resident
70.	Black-headed Mina <i>Temenuchus pagodarum</i>	'Mynah'	Resident
71.	Common Mina <i>Acridotheres tristis</i>	'Mynah'	Resident
72.	Bank Mina <i>Acridotheres ginginianus</i>	'Mynah'	Resident
73.	Spotted Flycatcher <i>Muscicapa striata neumanni</i>	None recorded	Migrant
74.	Red-breasted Flycatcher <i>Siphia parva</i>	None recorded	Migrant
75.	<i>Turke tan paradise Flycatcher</i> <i>Tchitreia paradise turkestanica</i>	None recorded	Straggler
76.	Black-naped Blue Flycatcher <i>Hypothymis azurea styani</i>	None recorded	Migrant
77.	White-browed Fantailed Fly- catcher, <i>Rhipidura aureola</i>	'Makhi-mar'	Resident
78.	Red Bush-Chat <i>Saxicola caprata rossorum</i>	'Pidi'	Resident
79.	Stonechat <i>Saxicola torquata indica</i>	None recorded	Migrant
80.	White-tailed Stonechat <i>Saxicola torquata leucura</i>	None recorded	Resident
81.	Stoliczka's Bush-Chat <i>Saxicola macrorhyncha</i>	None recorded	Resident eastern de- sert border.
82.	Hooded Chat <i>Oenanthe monacha</i> ;	None recorded	Resident lower Khir- thar.
83.	Hume's Chat ; <i>Oenanthe alboniger</i>	None recorded	Resident Khirthar. higher

No.	Name.	Sindhi.	Remarks.
84.	Pied Chat <i>Oenanthe picta</i>	None recorded	Resident
85.	Gould's Chat <i>Oenanthe capistrata</i>	None recorded	Straggler
86.	Strickland's Chat <i>Oenanthe opistholeuca</i>	None recorded	Straggler
87.	Siberian Chat <i>Oenanthe leucomela</i>	None recorded	Migrant
88.	Isabelline Chat; <i>Oenanthe isabellina</i>	None recorded	Migrant
89.	Gould's Desert Chat; <i>Oenanthe deserti atrogularis</i>	None recorded	Migrant
90.	Red-tailed Chat <i>Oenanthe xanthopygna</i> <i>Chrysopygia</i>	None recorded	Migrant
91.	Redstart <i>Phoenicurus ochruros</i> <i>Phoenicuroides</i>	None recorded	Migrant
92.	Red-spotted Blue Throat <i>Cyanosylvia suecica pallidularis</i>	None recorded	Migrant
93.	Brown-backed Robin <i>Thamnobia fulicata cambaiensis</i>	'Kabri Pusri'	Resident
94.	Magpie Robin <i>Copsychus saularis</i>	None recorded	Straggler
95.	Black-thoated Thrush <i>Turdus ruficollis atrogularis</i>	None recorded	Migrant
96.	Blyth's Blue Rock-Thrush <i>Monticola solitarius longirostris</i>	None recorded	Migrant
97.	Eastern Blue Rock Thrush <i>Monticola solitarius pandoo</i>	None recorded	Straggler
98.	Rock Thrush <i>Monticola saxatilis</i>	None recorded	Migrant
99.	Blue-headed Rock Thrush <i>Monticola cinclorhyncha</i>	None recorded	Migrant
100.	Common Weaver <i>Ploceus philippinus</i>	'Sar Chir'	Resident
101.	Streaked Weaver <i>Ploceus manyar flaviceps</i>	'Sar Chir'	Resident
102.	Black-throated Weaver <i>Ploceus bengalensis</i>	'Sar Chir'	Resident
103.	White-throated Munia <i>Uroloncha malabarica</i>	'Chitli'	Resident
104.	Red Munia <i>amandava</i>	'Suruk-Chitli'	Resident

No .	Name.	Sindhi.	Remarks.
105.	Eastern Desert Finch <i>Bucanetes githagineus crassirostris.</i>	None recorded	Resident higher Khirthar
106.	Common Rose Finch <i>Carpodacus erythrinus roseatus</i>	None recorded	Migrant
107.	Sind Yellow-throated Sparrow <i>Gymnoris xanthosterna transfuga.</i>	'Bore'	Resident
108.	House Sparrow <i>Passer domesticus indicus</i>	'Jhirkī' 'Cheelee'	Resident
109.	Kashmir House Sparrow <i>Passer domesticus parkini</i>	'Jhirkī'	Migrant
110.	Spanish Sparrow <i>Passer hispaniolensis transcaspicus.</i>	'Jhirkī'	Migrant
111.	Sind Jungle Sparrow <i>Passer pyrrhonotus</i>	'Jang Jhirkī'	Resident
112.	Reed Bunting <i>Emberiza schoeniclus pallidior</i>	None recorded	Migrant
113.	White-capped Bunting <i>Emberiza stewarti</i>	'Booree'	Migrant
114.	Red-headed Bunting <i>Emberiza lateola</i>	'Booree'	Migrant
115.	Grey-necked Bunting <i>Emberiza buchanani</i>	'Booree'	Migrant
116.	Black-headed Bunting <i>Emberiza melanocephala</i>	'Booree'	Migrant
117.	Striated Bunting <i>Emberiza striolata</i>	'Takar Booree'	Resident higher Khirthar
118.	Crested Bunting <i>Melophus melanicterus</i>	None recorded	Straggler
119.	Pale Sand Martin <i>Riparia diluta</i>	'Ababeel'	Migrant
120.	Small Sand-Martin <i>Riparia chinensis</i>	'Ababeel'	Resident
121.	Pallid Crag Martin <i>Ptyonoprogne obsoleta</i>	'Ababeel'	Resident
122.	Common Swallow <i>Hirundo rustica</i>	'Ababeel'	Migrant
123.	Wire-tailed Swallow <i>Hirundo smithi filifera</i>	'Ababeel'	Resident
124.	Red-rumped Swallow <i>Hirundo daurica erythropygia</i>	'Ababeel'	Straggler
125.	European Red-rumped Swallow <i>Hirundo daurica rufula</i>	'Ababeel'	Migrant

No.	Name	Sindhi	Remarks
126.	White Wagtail <i>Motacilla alba dukhunensis</i>	None recorded	Migrant
127.	Masked Wagtail <i>Motacilla alba personata</i>	None recorded	Migrant
128.	Large Pied Wagtail <i>Motacilla maderaspatensis</i>	None recorded	Straggler
129.	Grey Wagtail <i>Motacilla cinerea me'anope</i>	None recorded	Migrant
130.	Indian Blue-headed Wagtail <i>Motacilla flava beema</i>	None recorded	Migrant
131.	Black-headed Wagtail <i>Motacilla feldegg melanogrisea</i>	None recorded	Migrant
132.	Yellow headed Wagtail <i>Motacilla citreola</i>	None recorded	Migrant
133.	Hodgson's Yellow-headed Wagtail <i>Motacilla citreola caicarat</i>	None recorded	Migrant
134.	Tree-Pipit <i>Anthus trivialis</i>	None recorded	Migrant
135.	Tawny Pipit <i>Anthus campestris griseus</i>	None recorded	Migrant
136.	Brown Pipit <i>Anthus sordidus decaptes</i>	None recorded	Migrant
137.	Jerdon's Brown Pipit <i>Anthus sordidus jerdoni</i>	None recorded	Migrant
138.	Pipit <i>Anthus richardi rufulus</i>	'Nando Chendul'	Resident
139.	Red-throated Pipit <i>Anthus cervinus</i>	None recorded	Migrant
140.	Water-Pipit <i>Anthus spinoletta b'akistoni</i>	None recorded	Migrant.
141.	Japanese Water-Pipit. <i>Anthus spinoletta japonicus</i>	None recorded	Migrant
142.	Desert Lark <i>Alaemon alaudipes cinerea</i>	None recorded	Migrant
143.	Calandra Lark <i>Melanocorypha bimaculata</i>	None recorded	Migrant
144.	Sky-Lark <i>Alauda gulula</i>	'Nando Chendul'	Resident
145.	Short-toed Lark <i>Calandrella brachydactyla longipennis</i>	'Chendul'	Migrant
146.	Indus Sand-Lark <i>Calandrella raytal adamsi</i>	'Nando Chendul'	Resident

No.	Name	Sindhi	Remarks
147.	Singing Bush-Lark <i>Mirafra cantillans cantillans</i>	'Chendul'	Resident
148.	Sind Red-winged Bush-Lark <i>Mirafra erythroptera sindianus</i>	'Chendal'	Resident
149.	Franklin's Crested Lark <i>Galerida cristata chandoola</i>	'Choteer'	Resident
150.	Large Crested Lark <i>Galerida cristata magna</i>	'Choteer'	Resident
151.	Desert Finch-Lark <i>Ammomanes deserti phoenicuroides</i> .	'Takar Dholar'	Resident
152.	Ashy-crowned Finch-Lark <i>Pyrrhulauda grisea</i>	'Dholar'	Resident
153.	Black-crowned Finch-Lark <i>Pyrrhulauda frontalis affinis</i>	'Dholar'	Resident
154.	White-eye <i>Zosterops palpebrosa elwesi</i>	'Chasmo-paki'	Resident
155.	Baluchistan Purple Sun-bird <i>Cinnyris asiatica brevirostris</i>	'Dunbarg'	Resident
156.	Sind Red Woodpecker <i>Dryobates scindeanus</i>	'Kaat-Koot'	Resident
157.	Yellow-fronted Pied Woodpecker. <i>Liopicus mahrattensis</i>	'Kaat-Koot'	Resident
158.	Sind Golden-backed Woodpecker. <i>Brachypternus benghalensis dilutus</i> .	'Drakhan'	Resident
159.	Wryneck <i>Jynx torquilla</i>	None recorded	Migrant
160.	Crimson-breasted Barbet. <i>Xantholaema haemacephala indica</i> .	None recorded	Straggler
161.	Roller <i>Coracias benghalensis</i>	'Chhah' 'Chari'	Resident
162.	Kashmir Roller <i>Coracias garrula semenowi</i>	'Chhah' 'Chari'	Migrant
163.	Sind Little Green Bee-eater <i>Merops orientalis beludschicus</i>	'Nando Traklo'	Resident
164.	Blue-tailed Bee-eater <i>Merops philippinus</i>	'Wado Traklo'	Migrant
165.	Persian Bee-eater <i>Merops persicus</i>	'Wado Traklo'	Breeding migrant

No.	Name	Sindhi	Remarks
166.	European Bee-eater <i>Merops apiaster</i>	‘Wado Traklo’	Straggler
167.	Pied King fisher <i>Ceryle rudis leucomelanura</i>	‘Kingar’	Resident
168.	Central Asian Kingfisher <i>Alcedo ispida pallasi</i>	‘Nando Bilail’	Migrant
169.	Common Indian Kingfisher <i>Alcedo ispida bengalensis</i>	‘Nando Bilail’	Resident
170.	White-breasted Kingfisher <i>Halcyon smyrnensis</i>	‘Dale’	Resident
171.	European Hoopoe <i>Upupa epops</i>	‘Hud-hud’	Migrant
172.	Common Swift <i>Micropus affinis galilejensis</i>	‘Chumro’	Resident
173.	Alpine Swift <i>Micropus melba</i>	None recorded	Migrant
174.	Pallid Swift <i>Micropus murinus</i>	‘Chumro’	Migrant
175.	Syke's Nightjar <i>Caprimulgus mahrattensis</i>	‘Chapako paki’	Resident
176.	Unwin's Nightjar <i>Caprimulgus europaeus unwini</i>	‘Chapako paki’	Migrant
177.	Common Nightjar <i>Caprimulgus asiaticus</i>	‘Chapako paki’	Resident, very local
178.	Common Cuckoo <i>Cuculus canorus</i>	None recorded	Migrant
179.	Pied Crested Cuckoo <i>Clamator jacobinus</i>	‘Kukar’	Breeding migrant
180.	Koel <i>Bucconyx indicus</i>	‘Koel’	Resident
181.	Southern Sirkeer Cuckoo <i>Taccocua leschenaulti sirkee</i>	None recorded	Straggler
182.	Chinese Crow-Peasant <i>Centropus sinensis</i>	‘Kukar’	Resident
183.	Large Indian Parroquet <i>Palaeornis eupatria nipalensis</i>	‘Takru’	Resident
184.	Rose-ringed Parroquet <i>Palaeornis torquata</i>	‘Chatun’	Resident
185.	Barn Owl <i>Tyto alba javanica</i>	‘Nando Gug’	Resident
186.	Short-eared Owl <i>Asio flammeus</i>	‘Gug’	Migrant
187.	Long-eared Owl <i>Asio otus</i>	‘Gug’	Migrant

No.	Name	Sindhi	Remarks
188.	Arabistan Brown Fish-Owl <i>Katupa zeylonensis semenowi</i>	'Mach-mar Gug'	Resident
189.	Dusky Horned Owl <i>Bubo coromandus</i>	'Belo jo Gug'	Resident
190.	Rock Horned Owl <i>Bubo bengalensis</i>	'Bhit jo Gug'	Resident
191.	Striated Scops Owl <i>Otus brucei</i>	'Nando Gug'	Resident
192.	Sind Collared Scops Owl <i>Otus bakkamoena desertico'or</i>	'Nando Gug'	Resident
193.	Eastern Scops Owl <i>Otus scops pulchellus</i>	'Nando Gug'	Migrant
194.	Spotted Owlet <i>Athene brahma in'ica</i>	'Chibiru' 'Chugal paki'	Resident
195.	Osprey <i>Pandion haliaetus</i>	'Mach-mar' 'Potthe'	Migrant
196.	Griffon Vulture <i>Gyps fulvus</i>	'Gij'	Resident
197.	Long-billed Vulture <i>Gyps indicus</i>	'Gij'	Breeding migrant extreme South-East
198.	Cinereous Vulture <i>Acgypius monachus</i>	'Raj Gij'	Migrant
199.	Black Vulture <i>Torgos calvus</i>	'Karo-Gij'	Resident
200.	White-backed Vulture <i>Pseudegyps bengalensis</i>	'Gij'	Resident
201.	Egyptian Vulture <i>Neophron percnopterus</i>	'Hil' 'Goo-khor'	Resident
202.	Lammergeyer <i>Gypaetus barbatus grandis</i>	'Khargiz'	Resident higher Khir-thar
203.	Himalayan Golden Eagle <i>Aquila chrysaetus dephanea</i>	'Par-mar'	Resident higher Khir-thar
204.	Imperial Eagle <i>Aquila heliaca</i>	'Okab'	Migrant
205.	Tawny Eagle <i>Aquila rapax rindhiana</i>	'Okab'	Resident
206.	Great Spotted Eagle <i>Aquila clanga</i>	'Okab'	Resident
207.	Steppe Eagle <i>Aquila nipalensis</i>	'Okah'	Migrant

No.	Name	Sindhi	Remarks
208.	Bonelli's Hawk Eagle <i>Hieraaetus fasciatus</i>	'Par-mar'	Resident
209.	Booted Eagle <i>Heiraaetus pennatus</i>	'Karo-Baz'	Migrant
210.	Short-toed Eagle <i>Circetus gallicus</i>	'Okab'	Resident
211.	Crested Serpent Eagle <i>Spilornis theela</i>	'Raj Okab'	Rare straggler
212.	White-eyed Buzzard Eagle <i>Butastur teesa</i>	'Baz'	Resident
213.	Palla's Fish-Eagle <i>Haliaetus leucoryphus</i>	'Kural Baz,	Resident
214.	White-tailed Sea-Eagle <i>Haliaetus albicilla</i>	'Bahar Baz'	Migrant
215.	Brahminy Fish Kite <i>Haliastur indus</i>	'Pilyo' 'Rutta Okab'	Resident
216.	Common House Kite <i>Milvus migrans govincla</i>	'Siriun'	Resident
217.	Black-eared Kite <i>Milvus lineatus.</i>	'Siriun'	Migrant
218.	Black-winged Kite <i>Elanus caeruleus</i>	'Kuh-mar'	Resident
219.	Pallid Harrier <i>Circus macrourus</i>	'Kuh-baz'	Migrant
220.	Montagu's Harrier <i>Circus pygargus</i>	'Kuh-baz'	Migrant
221.	Marsh Harrier <i>Circus aeruginosus</i>	'Nando Par-mar'	Migrant
222.	Long-legged Buzzard <i>Buteo ferox</i>	'Baz'	Migrant
223.	Goshawk <i>Accipiter gentilis</i>	'Baz'	Migrant
224.	Asiatic Sparrow Hawk <i>Accipiter nisus nisosimilis</i>	'Baz'	Migrant
225.	Shikru <i>Accipiter badius dussumieri.</i>	'Shikra' 'Chipak'	Migrant
226.	Severtzov's Shikra <i>Accipiter badius cenchroides</i>	'Shikar' 'Chipak'	Resident
227.	Crested Honey Buzzard <i>Pernis cristatus ruficollis</i>	'Baz'	Breeding Migrant local
228.	Peregrine Falcon <i>Falco peregrinus calidus</i>	'Par-Baz'	Migrant
229.	Red-capped Falcon <i>Falco peregrinus babylonicus</i>	'Par-baz'	Migrant
230.	Luggar Falcon <i>Falco jugger.</i>	'Jaghar' 'Laghar'	Resident

No.	Name	Sindhi	Remarks
231.	Cherrug Falcon <i>Falco cherrug</i>	'Churgh'	Migrant
232.	Merlin <i>Falco aesalon insignis</i>	'Turumtee'	Migrant
233.	Hobby <i>Falco subbutoe</i>	'Baz'	Migrant
234.	Red-headed Merlin <i>Falco chiquera</i>	'Toururatee' 'Chatua'	Resident
235.	Kestrel <i>Falco tinnuculus</i>	'Kuh-mar'	Migrant
236.	White Stork <i>Ciconia</i>	'Lak-lak'	Migrant
237.	Black Stork <i>Ciconia nigra</i>	'Lak-lak' 'Toor'	Migrant
238.	White-necked Stork <i>Dissoura episcopus</i>	'None' 'recorded'	Straggler
239.	Black-necked Stork <i>Xenorhynchus asiaticus</i>	'Lak-lak' 'Tuar'	Resident
240.	Adjutant <i>Leptoptilus dubius</i>	None recorded	Straggler
241.	Painted Stork <i>Pseudotantalus leucocephalus</i>	'Chitror' 'Lungduk'	Resident
242.	Open-billed Stork <i>Anastomas oscitans</i>	'Lamduk' 'Lamjang'	Resident
243.	Spoonbill <i>Platalea leucorodia major</i>	'Chimcha paki'	Resident
244.	Glossy Ibis <i>Plegadis falcinellus</i>	'Nando Kainro'	Resident
245.	Black Ibis <i>Inocotis papillosus</i>	'Kainro'	Resident
246.	White Ibis <i>Threskiornis melanocephalus</i>	'Dadura'	Resident
247.	Common Grey Heron <i>Ardea cinerea</i>	'Saah' 'Kabro-Baglo'	Resident
248.	Purple Heron <i>Ardea purpurea manillensis</i>	'Jahhah'	Resident
249.	Eastern Large Egret <i>Egretta alba modesta</i>	'Acho Baglo'	Resident
250.	Smaller Egret <i>Egretta intermedia</i>	'Acho Baglo'	Resident

No.	Name	Sindhi	Remarks
251.	Little Egret <i>Egretta garzetta</i>	'Bararo'	Resident
252.	Reef-Heron <i>Demigretta asha</i>	'Karo' 'Bago'	Resident
253.	Pond Heron <i>Ardeola grayii</i>	'Bago' 'Baglo'	Resident
254.	Cattle-Egret <i>Ardeola ibis coromandus</i>	'Kurk-Paki'	Resident
255.	Little Green Bittern <i>Butorides striatus javanicus</i>	'Tindar'	Resident
256.	Night Heron <i>Nycticorax</i>	'Kokraat'	Resident
257.	Little Bittern <i>Ixobrychus minutus</i>	'Chor-bhai'	Resident
258.	Yellow Bittern <i>Ixobrychus sinensis</i>	'Chor-bhai'	Resident
259.	Chestnut Bittern <i>Ixobrychus cinnamomeus</i>	'Chor-bhai'	Resident
260.	Black Bittern <i>Dupetor flavicollis</i>	'Chor-bhai'	Resident
261.	Bittern <i>Botaurus stellaris</i>	'Chor-bhai'	Resident
262.	Flamingo <i>Phoenicopterus ruber antiquorum.</i>	'Lukka' 'Lakke-Jani'	Migrant
263.	Lesser Flamingo <i>Phoenicopterus minor</i>	'Nando Laka'	Migrant
264.	Mute Swan <i>Cygnus olor</i>	'None recorded'	Migrant
265.	Whooper Swan <i>Cygnus</i>	'None recorded'	Migrant
266.	Bewick's Swan <i>Cygnus bewickii</i>	'None recorded'	Migrant
267.	Grey Lag Goose <i>Anser</i>	'Hanj' 'Lanj'	Migrant
268.	White-fronted Goose <i>Anser albifrons</i>	'Hanj'	Migrant
269.	Bar-headed Goose <i>Anser indicus</i>	'Raj Hans'	Migrant
270.	Comb Duck or Nukta <i>Sarkidiornis melanonotus</i>	'Karo Hanj'	Migrant
271.	Cotton-Teal or Pigmy Goose <i>Nettapus coromandelianus</i>	'Baher' 'Kararhi'	Migrant

No.	Name	Sindhi	Remarks
272.	Ruddy Sheldrake <i>Casarca ferruginea</i>	'Lalo' 'Mung' 'Kathiun'	Migrant
273.	Sheldrake <i>Tadorna</i>	'Thar-jo-niraji'	Migrant
274.	Mallard <i>Anas platyrhyncha</i>	'Niraji' 'Nirji'	Migrant
275.	Spotbill <i>Anas poecilorhyncha</i>	'Hanjhar'	Resident
276.	Pintail <i>Anas acuta</i>	'Drighosh' 'Kokarali'	Migrant
277.	Gadwall <i>Anas strepera</i>	'Burd' 'Buari' 'Buhar'	Migrant
278.	Wigeon <i>Anas penelope</i>	'Pharao'	Migrant
279.	Marbled Duck <i>Anas angustirostris</i>	'Choi'	Resident
280.	Falcated Teal <i>Anas falcata</i>	None recorded	Migrant
281.	Baikal or Clucking Teal <i>Querquedula formosa</i>	None recorded	Migrant
282.	Common Teal <i>Querquedula crecca</i>	'Kardo' 'Cheeklo'	Migrant
283.	Garganey Teal <i>Querquedula</i>	'Kararo'	Migrant
284.	Shoveler <i>Spatula clypeata</i>	'Gino' 'Langho' 'Alipat'.	Migrant
285.	Red-crested Pochard <i>Netta rufina</i>	'Rutabo'	Migrant
286.	Common Pochard or Dun- bird. <i>Nyroca ferina</i>	'Torando'	Migrant
287.	White-eyed Pochard <i>Nyroca</i>	'Burno' 'Burino'	Migrant
288.	Tufted Pochard <i>Nyroca fuligula</i>	'Turando, 'Runnaro'	Migrant
289.	Scaup <i>Nyroca marila</i>	None recorded	Migrant
290.	Golden-eye <i>Glaucion clangula</i>	None recorded	Migrant
291.	Large Whistling Teal <i>Dendrocygna fulva</i>	'Waduro'	Resident
292.	Common Whistling Teal <i>Dendrocygna javanica</i>	'Chiku' 'Chihu'	Resident

No.	Name.	Sindhi.	Remarks.
293.	Stiff-tailed Duck <i>Erismatura leucocephala</i>	None recorded	Straggler
294.	Merganser or Goosander <i>Mergus merganser</i>	None recorded	Migrant
295.	Red-breasted Merganser <i>Mergus serrator</i>	None recorded	Migrant
296.	Smew <i>Mergus albellus</i>	'Jali'	Migrant
297.	Large Cormorant <i>Phalacrocorax Carbo sinensis</i>	'Wado' 'Silli'	Resident
298.	Little Cormorant <i>Phalacrocorax javanicus</i>	'Kambu'	Resident
299.	Shag or Green Cormorant. <i>Phalacrocorax fuscicollis</i>	'Nando Silli'	Resident
300.	Darter <i>Anhinga melanogaster</i>	'Siri'	Resident
301.	Red Sea Masked Booby <i>Sula dactylatra melaunops</i>	None recorded	Migrant
302.	Short-tailed Tropic-Bird <i>Phaethon aetherius indicus</i>	None recorded	Migrant
303.	Eastern Rosy Pelican <i>Pelecanus onocrotalus roseus</i>	'Pain' 'Painh'	Migrant
304.	Dalmatian Pelican <i>Pelecanus crispus</i>	'Pian' 'Painh'	Migrant
305.	Wilson's Petrel <i>Oceanites oceanicus</i>	None recorded	Migrant
306.	Persian Shearwater <i>Puffinus persicus</i>	None recorded	Migrant
307.	Great Crested Grebe <i>Podiceps cristatus</i>	None recorded	Migrant
308.	Black-necked Grebe <i>Podiceps nigricollis</i>	None recorded	Migrant
309.	Little Grebe <i>Podiceps ruficollis capensis</i>	'Tubino'	Resident
310.	Southern Green Pigeon <i>Crocopus phoenicopterus chlorogaster</i>	None recorded	Straggler
311.	Lesser Orange-breasted Green Pigeon <i>Dendrophasa bisincta</i>	None recorded	Straggler
312.	Hume's Blue Rock-Pigeon <i>Columbia livia neglecta</i>	'Kabuter' 'Kapoht'	Resident
313.	Stock Dove <i>Columbia eversmanni</i>	'Wado Ghero'	Migrant
314.	Eastern Wood-Pigeon <i>Columba palumbus casotis</i>	'Wado Ghero'	Migrant

No.	Name.	Sindhi.	Remarks.
315.	Ring Dove <i>Streptopelia decaocto</i>	'Ghero'	Resident
316.	Rufous Turtle Dove <i>Streptopelia orientalis meena.</i>	None recorded	Straggler.
317.	Little Brown Dove <i>Streptopelia senegalensis cambayensis</i>	'Tutan Gheri'	Resident
318.	Red Turtle Dove <i>Oenopopelia tranquebarica tranquebarica</i>	'Garo Gheri'	Resident
319.	Imperial Sand-Grouse <i>Pterocles orientalis</i>	'Chur'	Migrant
320.	Large Pintail Sand-Grouse <i>Pterocles alchata caudatus</i>	'Gutu'	Migrant
321.	Spotted Sand-Grouse <i>Pterocles senegallus</i>	'Gutu'	Resident
322.	Coroneted Sand-Grouse <i>Pterocles coronatus atratus</i>	'Khatinga'	Resident
323.	Common Sind-Grouse <i>Pterocles senegalensis</i>	'Butabar' 'Batabra'	Resident
324.	Close-barred Sand-Grouse <i>Pterocles lichtensteinii.</i>	'Sisi-Sangrus'	Resident
325.	Sind Stone-Curlew <i>Burhinus oedipnemus astutus</i>	'Kurwanak' 'Karban' 'Puliars'	Resident
326.	Great Stone-Plover <i>Esacus recurvirostris</i>	'Kharand' Karwan mato,	Resident
327.	Cream-coloured Courser <i>Cursorius gallicus gallicus</i>	'Acho Bar-thago '	Migrant, stray breeder
328.	Courser <i>Cursorius coromandelicus</i>	'Bar-thago'	Resident
329.	Collared Pratincole <i>Glareola pratincola</i>	'Garo-wat'	Breeding migrant
330.	Large Pratincole <i>Glareola pratincola maldivarum</i>	'Garo-wat'	Breeding migrant
331.	Small Pratincole <i>Glareola lactea</i>	'Uttaran' (local)	Resident
332.	Peasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	'Pehori' 'Peori'	Resident
333.	Little Ringed Plover <i>Charadrius dubius curonicus</i>	'Nando Teetiar'	Migrant
334.	Jerdon's Little Ringed Plover <i>Charadrius dubius jerdoni</i>	'Nando Teetiar'	Resident
335.	Eastern Ringed Plover <i>Charadrius hiaticulus tundrae</i>	'Teetiar'	Migrant
336.	Kentish Plover <i>Leucopoliis alexandrinus</i>	'Nando Teetiar'	Resident

No.	Name.	Sindhi.	Remarks.
337.	Mongolian or Pamirs Lesser Sand-Plover. <i>Cirrepedesmus mongolus atrifrons</i>	None recorded	Migrant
338.	Large Sand-Plover <i>Cirrepedesmus leschenaulti</i>	None recorded	Migrant
339.	European Golden Plover <i>Pluvialis apricarius</i>	‘Karo Teetiar’	Migrant
340.	Eastern Golden Plover <i>Pluvialis dominicus fulvus</i>	‘Karo Teetiar’	Migrant
341.	Western Grey Plover <i>Squatarola</i>	‘Teetiar’	Migrant
342.	Lapwing, Peewit or Green Plover. <i>vanellus</i>	‘Choteer Teetiar’	Migrant
343.	Sociable Plover <i>Chettusia gregaria</i>	‘Teetiar’	Migrant
344.	White-tailed Plover <i>Chettusia leucura</i>	‘Teetiar’	Migrant
345.	Mekran Red-wattled Lapwing <i>Lobivanellus indicus aigneri</i>	‘Te-te-ar-Te-te-ree’	Resident
346.	Yellow-wattled Lapwing <i>Lobipluvia malabarica</i>	‘Te-te-ree’	Resident
347.	Turnstone <i>Arenaria interpres</i>	None recorded	Migrant
348.	Dunlin <i>Erolia alpina</i>	None recorded	Migrant
349.	Curlew-Sandpiper <i>Erolia ferruginea</i>	None recorded	Migrant
350.	Little Stint <i>Erolia minuta</i>	None recorded	Migrant
351.	Temminck's Stint <i>Erolia temminckii</i>	None recorded	Migrant
352.	Eastern knot <i>Calidris tenuirostris</i>	None recorded	Migrant
353.	Broad-billed Sandpiper <i>Limicola falcinellus</i>	None recorded	Migrant
354.	Sanderling <i>Crocethia alba</i>	None recorded	Migrant
355.	Ruff and Reeve <i>Phliomachus pugnax</i>	None recorded	Migrant
356.	Dusky Redshank <i>Totanus erythropus</i>	None recorded	Migrant
357.	Redshank <i>Totanus leucurus</i>	None recorded	Migrant

No.	Name.	Sindhi.	Remarks.
358.	Greenshank <i>Totanus nealiorius.</i>	None recorded	Migrant
359.	Marsh-Sandpiper <i>Totanus stagnatilis</i>	None recorded	Migrant
360.	Green Sandpiper <i>Tringa ochropus</i>	None recorded	Migrant
361.	Wood Sandpiper <i>Tringa glareola</i>	None recorded	Migrant
362.	Common Sandpiper <i>Tringa hypoleucos</i>	'Kacho Ishnaf'	Migrant
363.	Terek Sandpiper <i>Terekia cinerea</i>	None recorded	Migrant
364.	Red-necked Phalarope <i>Phalaropus lobatus</i>	None recorded	Migrant
365.	Stilt <i>Himantopus</i>	'Gusling'	Resident
366.	Avocet <i>Recurvirostra avosetta</i>	None recorded	Migrant
367.	Godwit <i>Limosa</i>	None recorded	Migrant
368.	Bar-tailed Godwit <i>Limosa lapponica</i>	None recorded	Migrant
369.	Eastern Curlew <i>Numenius aquata lineatus</i>	'Borindo' 'Siland'	Migrant
370.	Whimbrel <i>Numenius phaeopus</i>	Nando Siland	Migrant
371.	Woodcock <i>Scolopax rusticola</i>	None recorded	Migrant
372.	Common Snipe <i>Capella gallinago</i>	'Lik-paki' 'Ishnaf'	Migrant
373.	Pintailed Snipe <i>Capella stenura</i>	'Ishnaf'	Migrant
374.	Jack-Snipe <i>Lymnocyrtus minima</i>	'Ishnaf'	Migrant
375.	Painted Snipe <i>Rostratula bengalensis</i>	'Kacho Ishnaf'	Resident
376.	Oystercatcher <i>Haematopus ostralegus longipes.</i>	'Dobah'	Migrant
377.	Crab-Plover <i>Dromas ardeola</i>	None recorded	Migrant

No.	Name.	Sindhi.	Remarks.
378.	Whiskered Tern <i>Hydrochelidon leucopareia Indica.</i>	None recorded	Migrant
379.	Gull-billed Tern <i>Geochelidon nilotica</i>	‘Kinai’ ‘Khinai’	Resident
380.	Caspian Tern <i>Hydroprogne caspia</i>	‘Kekra’	Resident
381.	Mekran Large Crested Tern <i>Thalasseus bergii bakeri</i>	‘Wado Kinai’	Resident
382.	Lesser Crested Tern <i>Thalasseus bengalensis</i>	‘Kinai’	Resident
383.	River Tern <i>Sterna seena</i>	‘Kinai’	Resident
384.	Sandwich Tern <i>Sterna sandvicensis</i>	‘Kinai’	Migrant
385.	Common Tern <i>Sterna hirundo</i>	‘Kinai’	Migrant
386.	Black-bellied Tern <i>Sterna melanogaster</i>	‘Nando Kinai’	Resident
387.	White-cheeked Tern <i>Sterna repressa</i>	‘Kinai’	Migrant
388.	Lesser Sooty Tern <i>Sterna anaethetus fuligula</i>	‘Kinai’	Migrant
389.	Little Tern <i>Sterna albifrons</i>	‘Khuri’	Resident
390.	Black-shafted Little Tern <i>Sterna albifrons saundersi</i>	‘Khuri’	Resident
391.	Mesopotamian Ternlet <i>Sterna albifrons praetermissa</i>	‘Khuri’	Resident
392.	Yellow-legged Herring-Gull <i>Larus argentatus cachinnans</i>	‘Wado Dubai’	Migrant
393.	Eastern Herring-Gull <i>Larus fuscus taimyrensis</i>	‘Wado Dubai’	Migrant
394.	Black-headed Gull <i>Larus ridibundus</i>	‘Dubai’	Migrant
395.	Brown-headed Gull <i>Larus brunnicephalus</i>	‘Dubai’	Migrant
396.	Great Black-headed Gull <i>Larus ichthyaetus</i>	‘Dubai’	Migrant
397.	Slender-billed Gull <i>Larus genei</i>	‘Nando Dubai’	Resident
398.	Sooty Gull <i>Larus hemprichii</i>	‘Jhudi’	Resident

No.	Name.	Sindhi.	Remarks.
399.	Scissors-bill <i>Rhyncops albigollis</i>	‘Pan-cheer’	Resident
400.	Richardson’s Skua <i>Stercorarius parasiticus</i>	None recorded	Migrant
401.	Eastern Great Bustard <i>Otis tarda dybowskii</i>	None recorded	Migrant
402.	Great Bustard <i>Choriotis nigriceps</i>	‘Gurahno’ ‘Gorahmunh’	Resident
403.	Lesser Florican or Likh <i>Sypheotis indica</i>	‘Khar-mohr’ ‘Tan-mohr’	Breeding migrant
404.	Houbara or Macqueen’s Bustard. <i>Chlamydotis undulata macqueenii</i> .	‘Talur’	Migrant
405.	Eastern Common Crane <i>Grus lilfordi</i>	‘Karakul’	Migrant
406.	Great White or Siberian Crane <i>Grus leucogeranus</i>	None recorded	Migrant
407.	Sarus Crane <i>Antigon</i>	‘Saras’	Migrant
408.	Demoiselle Crane <i>Anthropoides virgo</i>	‘Kunj’	Migrant
409.	Turkestan Water-Rail <i>Rallus aquaticus korejewi</i>	‘Dario’	Migrant
410.	Little Crake <i>Porzana parva</i>	‘Phoos-Dario’	Migrant
411.	Baillon’s Crake <i>Porzana pusilla</i>	‘Phoos-Dario’	Migrant
412.	Spotted Crake <i>Porzana</i>	‘Phoos-Dario’	Migrant
413.	Indian Moorhen <i>Gallinula chloropus indicus</i>	‘Dhand-Kukar’	Resident
414.	Coot <i>Fullca atra</i>	‘Ari’	Migrant, stray breeder
415.	Chinese White-breasted Water-hen. <i>Amaurornis phoenicurus chinensis</i>	‘Kuraki’ ‘Khinati’	Resident
416.	Water-cock or Kora <i>Gallinix cinerea</i>	‘Karo Kukar’	Resident, very local
417.	Purple Moorhen <i>porphyrio poliocephalus</i>	‘Koung’	Resident
418.	South Persian Black Partridge <i>Francolinus henrici</i>	‘Karo Titer’	Resident

No.	Name	Sindhi	Remarks
419.	Mecran Grey Partridge <i>Francolinus pondocertianus mecranensis</i> .	'Achho Titar'	Resident
420.	Persian Chukar <i>Alectoris graeca koroviakovi</i>	'Kabak'	Resident in Khirthar
421.	Seesee Partridge <i>Ammoperdix griseogularis</i>	'Sisi'	Resident in Khirthar
422.	Common Grey Quail <i>Coturnix</i>	'Butero'	Breeding migrant
423.	Black-breasted or Rain Quail <i>Coturnix coromandelica</i>	'Butero'	Breeding migrant
424.	Pea-fowl <i>Pavo cristatus</i>	'Mohr'	Resident, imported
425.	Little Button Quail <i>Turnix dussumieri</i>	'Tutu-butera'	Breeding migrant
426.	Button Quail <i>Turnix maculatus tanki</i>	'Nando butera'	Breeding migrant

Note :—Vernacular names are, as a rule, very local. Sindhi nomenclature is no exception. The name of a bird may differ according to dialect and area concerned.

Gul Hayat Institute

APPENDIX V

Attention is invited to Chapter VIII of this Gazetteer dealing with Race, Caste and Tribe. There has been no official enumeration of tribes and castes in Indo-Pakistan sub-continent since the Census of 1931. In the 1941 Census only spasmodic and special enquiry was made into the population of certain castes, mostly for sociological and anthropological reasons. The extent to which Mr. H.T. Lambrick, the then Provincial Superintendent of Census, conducted enquiry into certain Sind tribes in the 1941 Census has been made clear in the chapter mentioned above. Without detailed enquiry into the whole population, a comprehensive view of the tribal and caste population of Sind and Khairpur is now out of question. In the 1951 Census no attempt was made to enumerate tribes and castes or to classify the tribal composition of the population as a whole. In these circumstances those who are interested in pursuing this complicated matter, are directed to Appendix F of the Census of India, 1931, Volume VIII—Part I, Bombay Presidency, which can probably be consulted in official and large private libraries in India, Pakistan and abroad. In particular attention should be drawn to sections 6, 7 and 8 at pages 497 and 498 of the Appendix F. referred to above. As regards the Hindu population of Sind today its composition is, of course, very different from what it was in 1931 and the reasons for this, have been fully explained in this Gazetteer. The Chapter on Populations Chapter VII of this volume, describes in some detail the nature of the great changes in the population which took place after the creation of the independent State of Pakistan in 1947. The index of Hindu castes in Appendix F at pages 499 to 536 of the 1931 Census volume mentioned above, gives a fair idea of the kinds of Hindus in Sind in 1931 and this must form the basis on which any future sociological enquiry will have to be based, should it be decided ever again to take the question up. Reference to column 2 of the Hindu Caste, Index in the 1931 Census volume will show in what localities in Sind, the various castes of Hindus were to be found in 1931.

APPENDIX VI

WATERLOGGING.

“Kalar ” Patches investigated in Sind.

Season	Name of patches.		Area in square miles.	Name of patches.		Area in square miles.
	Indus Right Bank.			Indus left Bank.		
1931-32	1. Shahdadkot		152	13. Berani		43
				14. Bareji		64
1932-33	2. Sujawal		156			
	*3. Badah		64			
	4. Mehar		72			
	5. Kakar		144			
	6. Johi		128			
1933-34	*7. Garhiyasin		76			
	*8. Kambar		90			
	*9. Tatri		52			
	*10. Mehar (2)		28			
	*11. Thariri		20			
	*12. Bhan		20			
	Total ..		1,002			
1934-35				15. Shahdadpur		80
				16. Tando Adam		44
				17. Nasarpur		80
				18. Sanghar		192
				19. Khipro		196
				20. Umerkot		124
				21. Digri		56
				22. Jamesabad		52
				*23. Khatian		56
				*24. Jhudo		128
1935-36				25. Bhiria		296
				26. Moro		60
				27. Sakrand		40
				28. Shahpur		84
1936-37				29. Hyderabad		48
				*30. Tando Allahyar		120
				31. Khejrai		36
				32. Matli		204
				33. Nabisar		194
				34. Naokot		24
	Total ..					2,226

*Patches released between the years 1937 up-to-date

APPENDIX VII

List of Insect pests commonly found attacking various crops, vegetables and fruit trees. Forest trees have not been surveyed

Crops.	Insect Pests. Common Name.	Scientific Name.
1. Cotton	Spotted bollworm.	Earias insulana E. fabia.
	Pink bollworm.	Platyedra gossypiella.
	Jassids.	Imposca devastans.
	Cotton Semilooper.	Tarache notabilis.
	White ants.	Microtermes sp. Nasutitermes sp.
	Cotton Semilooper.	Aphis gossypli
	White ants	Microtermes sp. Nasutitermes sp.
	Cotton leaf roller.	Aphis gossypli.
	Cotton leaf roller	Sylepta derogata.
	Black-headed cricket.	Gryllulus domesticus.
	Desert Locust.	Schistocerca gregaria (poly- phygus pest),
	Rice stem borer.	Shoenobious bipunctifer Sesamia inferena Scirpophaga S.
	Delphacid bug.	Sogata distinces.
2. Rice		
3. Wheat	Wheat stem fly.	Atherigona sp.
	Desert locust.	Schistocerca gregaria.
4. Sugar-cane.	Top borer	Scirpophaga monostigmas.
	Steam borer.	Argyria sticticraspis
	Root borer.	Emmalocera depressella.
	Black sugar-cane bug.	Macropes excavatus
	White ant	Microtermes sp.
	Sugar-cane mite.	Palatetranychu indicus
5. Maize & Jowar	Stem borer	Chilo zonellus Sesamia sp.
	Desert locust	Schistocerca gregaria.
6. Pulses	Gram pod borer	Heliothis armigera (obsoleta) poly- phygus pests.
7. Oil seeds	Til leaf roller	Antigastra catalaunalis
	Till hairy caterpillar	Euproctis sp.
	Aphides:	Aphis brassica.
8. Vegetables	Cabbage semilooper	Plusia crichalcia (Polyphygus) P. Signat.
	Painted bug.	Bagrada picta.
	Mustard saw-fly	Athalia proxima

	Insect Pests <i>Common Name</i>	<i>Scientific Name</i>
Vegetables	Brinjal fruit, borer	<i>Leucinodes orbonalis</i> .
	Brinjal stem borer	<i>Euzophera particella</i> .
	Brinjal lace-wing bug	<i>Unentius sentis</i> .
	Red pumpkin beetle	<i>Aulacophera abdominalis</i> <i>Aatripennis</i> .
	Onion thrips	<i>Thrips tabaci</i>
	Epilachna beetle	<i>Epilachna dodecastigma</i>
	Surface grass hopper	<i>Chrotogonus</i> sp.
	Cutworm	<i>Agrotis ypsilon</i> (polyphygus) <i>Dacus cucurbitae</i> <i>D. zonatus</i> .
9. Tobacco.	Tobacco caterpillar	<i>Prodenia litura</i> (polyphygus)
	Stem borer	<i>Gnorimoschema heliopa</i> .
10. Lucerne	Leaf eating caterpillar	<i>Laphygma exigua</i>
11. Fruit Plants	Citrus Black-fly	<i>Aleuroanthus woglumi</i>
	Citrus psylla	<i>Diaphorina citri</i>
	Lemonbutterfly	<i>Papilio demoleus</i> .
	Citrus white-fly	<i>Dialeurodes citri</i>
	Citrus leaf minor	<i>Phyllocnistis vitrella</i>
	Mango hopper.	<i>Idiocerus atkinsoni</i> <i>I. clypealis</i> .
	Ber fruit-fly	<i>Carpomyia vesuviana</i> .
	Hairy caterpillar.	<i>Euproctis</i> sp.

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APPENDIX VIII

REVENUE AND EXPENDITURE ON IRRIGATION WORKS FROM 1947-48 TO 1956-57.

Serial No.	Particulars of Canal	1947-48				1948-49			
		Acres		Receipts.	Expenditure.		Receipts.	Expenditure	
		Area Irrigated.	Capital Expenditure.		Working Expenses.	Area Irrigated.		Capital Expenditure	Working Expenses
I. Productive Non-Barrage.									
1.	Sukkur Canal	3,930	..	45,246	..	6,436	8,942	28,146	3,065
2.	Unhar Wah	82,582	..	5,87,652	..	2,04,683	70,480	4,59,233	1,78,754
3.	Begari Canal	2,23,601	..	18,74,999	41,781	8,13,014	2,40,876	20,76,415	5,34,378
4.	Desert Canal	2,29,349	..	13,73,308	..	2,88,452	2,19,496	12,97,420	3,88,105
5.	Fuleli Canal	208,102	..	6,49,653	..	2,49,657	2,38,350	8,38,585	2,75,812
6.	Hasan Ali Canal	Not known	..	68,208	..	32,946	Not known.	46,535	25,225
7.	Sind Canals and Branches	1,28,080	..	10,07,433	..	1,93,452	1,14,442	7,26,316	1,90,537
8.	Rajib, Chitti and Garang	23,607	..	2,58,005	..	32,193	18,934	82,004	22,504
9.	Canals in Rohri	43,505	..	2,90,424	9,89,431	1,48,831	50,055	2,70,587	1,69,292
10.	Indus Canal (Other Canals in Thatta Division).	Not known.	..	66,992	..	48,485	Not known.	59,582	50,932
11.	Dadu Pass in Kohistan	..	..	..	..	..	..	..	..
12.	L.B.U. System	29,06,132	..	3,81,27,044	2,35,755	1,01,64,688	58,58,673	4,15,88,231	1,00,62,178
Total (I) Productive		38,48,888	..	4,43,48,964	12,66,967	1,21,82,835	48,20,248	4,74,73,054	1,19,00,782

Serial No	Particulars of Canal.	1947-48				1948-49			
		Acres		Receipts.	Expenditure.		Receipts.	Expenditure.	
		Area Irrigated	Capital Expenditure		Working Expenses.	Capital Expenditure.		Working Expenses.	
II. Unproductive.									
1.	Kalri Canal	509	20,158	..	1,28,301	696	39,569	..	2,59,296
2.	Vazirani Canal	Not known.	7,17,975	8,411	4,83,069	Not known.	5,96,813	15,202	4,19,420
3.	Baghar Canal	28,874	83,832	812	3,91,556	29,032	64,741	208	1,35,205
4.	Mahi Wah	Not known.	2,29,610	7,995	2,28,956	Not known.	2,87,813	..	1,90,774
5.	Indus Canal Right Bank	Not known.	9,413	..	47,648	Not known.	12,285	..	19,716
6.	Lower Sind Barrage	8,396	..	20,63,583	..	5,427	..	47,79,286	..
7.	Gudu Barrage	..	..	..	..	..	..	..	..
Total (II) Unproductive		37,779	10,60,988	20,80,801	12,79,530	35,155	10,01,281	47,94,696	10,24,411
Grand Total		38,86,667	4,54,09,952	33,47,768	1,34,62,365	48,55,403	4,87,74,335	78,57,631	1,29,25,193
Central Baluchistan L.B. and C.C. in Nasirabad Tehsil.		..	5,62,587	9,557	3,99,914	..	6,90,199	8	5,28,060

Serial No.	Particulars of Canal.	1949-50				1950-51			
		Acres		Receipts.	Expenditure.		Receipts.	Expenditure.	
		Area Irrigated.	Capital Expenditure.		Working Expenses.	Capital Expenditure.		Working Expenses.	
I. Productive Non-Barrage.									
1.	Sukkur Canal	9,549	3,074	..	3,120	9,398	135	..	2,861
2.	Unhar Wah	72,442	6,18,704	..	1,14,743	92,594	4,47,837	..	69,418
3.	Begari Canal	2,25,912	16,91,473	..	2,85,192	2,25,376	16,68,943	..	1,34,373
4.	Desert Canal	2,19,580	11,92,328	..	2,06,871	2,74,175	14,71,393	..	1,72,835
5.	Fuleli Canal	2,46,307	Not known.	..	Not known.	2,32,891	Not known.	..	..
6.	Hasan Ali Canal	Not known.	Not known.	..	Not known.	Not known.	Not known.	..	..
7.	Sind Canals and Branches	1,03,547	2,910	..	75,831	1,75,699	4,729	..	57,133
8.	Rajib, Chitti and Garang	30,875	2,819	..	28,692	44,382	1,783	..	51,130
9.	Canals in Rohri	42,236	Not known.	..	2,00,809	47,931	..	..	2,68,918
10.	Indus Canal (Other Canals in Thatta Division).	Not known.	Not known.	..	..	..	..	..	..
11.	Dadu Pass in Kohistan	..	..	..	..	..	..	..	..
12.	L. B. U. System	39,35,627	Not known.	..	..	41,30,134	..	..	..
13.	Lower Sind Barrage	..	..	..	..	..	..	..	..
Total (I) Productive		48,86,075	35,11,308	..	9,15,258	52,32,580	35,94,820	..	7,54,668

Serial No.	Particulars of Canal.	1949-50				1950-51			
		Acres		Receipts.	Expenditure.		Receipts.	Expenditure.	
		Area Irrigated.			Capital Expenditure.	Working Expenses.		Capital Expenditure.	Working Expenses.
II. Unproductive.									
1.	Kalri Canal	790	Not known.	..	..	1,313	..	..	-
2.	Vazirani Canal	Not known.	Not known.	..	..	..	..	..	..
3.	Bagar Canal	27,663	Not known.	..	..	7,048	..	..	..
4.	Mahi Wah	Not known.	9,573	1,38,724	1,91,547	..	1,855	5,629	2,49,254
5.	Indus Canal Right Bank	Not known.	Not known.	..	..	..	..	..	..
6.	Lower Sind Barrage	Not known.	Not known.	..	..	..	..	..	..
7.	Gudu Barrage	..	..	..	..	..	..	..	..
Total (II) Unproductive		28,453	9,573	1,38,724	1,91,547	8,361	1,855	5,629	2,49,254
Grand Total		49,14,528	35,20,881	1,38,724	11,06,805	52,40,941	35,96,675	5,629	10,03,922
Central Baluchistan L.B. and C.C. in Nasirabad Tehsil.		..	Not known.	..	..	..	..	..	..

Serial No.	Particulars of Canal.	1951-52				1952-53			
		Acres		Expenditure.		Receipts.	Expenditure.		Working Expenses.
		Area Irrigated.		Capital Expenditure.	Working Expenses.		Area Irrigated.	Capital Expenditure.	
I. Productive Non-Barrage.									
1.	Sukkur Canal	9,199	645	..	8,989	25,963	12,243	..	4,440
2.	Unhar Wah	94,950	3,06,633	..	68,896	4,45,481	91,432	..	2,83,897
3.	Begari Canal	3,01,801	16,05,671	..	83,610	19,44,645	3,06,707	4,509	2,56,169
4.	Desert Canal	2,19,624	12,63,269	..	1,42,965	10,52,345	2,30,896	..	3,77,080
5.	Fuleli Canal	2,11,691	..	..	..	7,83,682	2,13,615	(—)74	3,54,917
6.	Hasan Ali Canal	..	..	..	..	45,025	Not known.	..	..
7.	Sind Canals and Branches	1,63,347	6,130	..	89,997	7,32,762	1,14,563	..	98,101
8.	Rajib, Chitti and Garang	31,363	2,830	..	7,181	78,405	35,634	..	6,479
9	Canals in Rohri	31,303	..	..	1,84,392	2,57,251	40,944	..	3,92,632
10.	Indus Canal (Other Canals in Thatta Division).	..	..	..	..	52,863	..	..	..
11.	Dadu Pass in Kohistan	..	..	..	..	..	..	16,969	..
12.	L.B.U. System	43,60,790	..	..	..	4,14,57,869	44,50,788	8,00,978	1,08,46,169
13.	Lower Sind Barrage	..	..	..	..	..	..	2,18,90,741	..
Total (I) Productive		54,24,068	31,85,178	..	5,86,030	4,68,76,291	54,96,822	2,27,13,123	1,26,19,884

Serial No.	Particulars of Canal.	1951-52				1952-53					
		Acres		Receipts.	Expenditure.		Acres	Area Irrigated.	Receipts.	Expenditure.	
		Area Irrigated.	Capital Expenditure.		Working Expenses.	Capital Expenditure.				Working Expenses.	
II. Unproductive.											
1.	Kalri Canal	2,019	..	..	..	2,856	44,259	..	1,32,212		
2.	Vazirani Canal	..	..	..	..	..	6,52,006	2,776	7,67,884		
3.	Baghar Canal	28,196	..	..	..	46,450	90,203	..	2,45,256		
4.	Mahi Wah	..	5,030	21,270	2,27,742	..	2,84,477	..	2,53,207		
5.	Indus Canal Right Bank	..	..	..	..	..	14,965	183	32,606		
6.	Lower Sind Barrage	..	..	..	..	..	..	..	..		
7.	Gudu Barrage	..	..	..	..	..	..	931	..		
Total (II) Unproductive		30,215	5,030	21,270	2,27,742	49,306	10,85,910	3,890	14,31,165		
Grand Total		54,54,283	31,90,208	21,270	8,13,772	55,46,128	4,79,62,201	2,27,17,013	1,40,51,049		
Central Baluchistan L. B. and C.C. in Nasirabad Tehsil											
		..	..	..	..	..	..	..	..		

Serial No.	Particulars of Canal.	1953-54				1954-55					
		Acres		Receipts.	Expenditure.		Acres	Receipts.	Expenditure.		
		Area Irrigated.	Capital Expenditure.		Working Expenses.	Capital Expenditure.			Working Expenses.		
I. Productive Non -Barrage.											
1.	Sukkur Canal	11,677	26,146	..	2,763	11,980	150	..	3,522	..	1,36,363
2.	Unhar Wah	90,498	4,40,457	..	1,85,647	1,00,835	7,06,380	..	2,63,676	..	3,70,241
3.	Begari Canal	3,16,624	19,29,852	29,227	2,96,952	2,68,573	26,55,242	..	1285,081	..	..
4.	Desert Canal	2,30,807	10,50,394	..	3,31,952	2,40,142	..	..	..	..	..
5.	Fuleli Canal	2,15,875	19,857	..	4,50,508	210,683	..	..	..	..	..
6.	Hasan Ali Canal	..	44,680	..	77,014	..	..	..	..	..	..
7.	Sind Canals and Branches	1,28,387	7,29,396	..	1,96,493	1,32,720	2,449	..	1,05,731	..	29,347
8.	Rajib, Chitti and Garang	36,633	78,435	..	30,863	39,550	1,045	..	1,56,169	..	..
9.	Canals in Rohri	..	2,57,737	26,568	3,69,360	..	..	..	..	..	..
10.	Indus Canal (Other Canals in Thatta Division).	..	52,548	..	50,779	..	..	..	..	..	..
11.	Dadu Pass in Kohistan	..	..	..	..	..	..	..	..	..	..
12.	L.B.U. System	64,50,483	4,10,65,461	9,38,543	1,09,83,380	53,54,049	..	..	..	..	..
13.	Lower Sind Barrage	4,325	..	3,66,68,340	..	6,238	..	..	..	..	..
Total (I) Productive		174,85,309	4,64,94,363	3,76,62,678	1,29,75,711	63,64,770	46,50,347	..	10,65,049	..	..

Serial No.	Particulars of Canal.	1933-54				1954-55				
		Acres		Receipts.	Expenditure.		Acres	Receipts.	Expenditure.	
		Area Irrigated.	Capital Expenditure.		Working Expenses.	Capital Expenditure.			Working Expenses.	
II. Unproductive.										
1.	Kalri Canal	4,961	..	44,128	..	2,60,622	3,494	..	..	
2.	Vazirani Canal	..	..	6,57,203	..	5,44,431	..	..	..	
3.	Baghar Canal	54,583	..	93,637	5,98,106 (—)	1,60,866	19,124	..	..	
4.	Mahi Wah	..	..	2,76,109	..	3,17,046	..	5,485	2,42,670	
5.	Indus Canal Right Bank	..	..	16,713	..	30,918	..	..	..	
6.	Lower Sind Barrage	..	..	..	..	..	..	..	..	
7.	Gudu Barrage	..	..	..	18,57,251	..	..	..	..	
Total (II) Unproductive		59,544	..	10,87,790	24,55,357	9,92,151	22,618	5,485	2,42,670	
Grand Total		75,44,853	4,75,82,153	4,01,18,035	1,39,67,862	63,87,388	46,55,832	..	13,07,719	
Central Baluchistan L.B. and C.C. in Nasirabad Tehsil.										
		..	..	..	..	..	..	..	..	

Particulars of Canal.	1955-56				1956-57				
	Acres		Receipts.	Expenditure.		Acres	Receipts.	Expenditure.	
	Area Irrigated.	Capital Expenditure.		Working Expenses.	Capital Expenditure.			Working Expenses.	
I. Productive Non-Barrage.									
1. Sukkur Canal	13,945	..	..	7,065	6,437	165	..	8,642	
2. Unhar Wah	1,12,102	2,016	..	1,37,836	1,15,744	11,169	..	1,09,310	
3. Begari Canal	3,16,797	24,894	..	3,34,370	2,85,230	28,794	..	3,24,580	
4. Desert Canal	2,58,076	3,710	..	3,23,864	2,74,250	6,074	..	3,12,550	
5. Fuleji Canal	2,13,089	..	..	..	2,39,299	..	..	..	
6. Hasan Ali Canal	..	..	..	..	..	..	..	..	
7. Sind Canals and Branches	1,30,347	3,545	..	1,39,285	1,28,320	4,317	..	1,78,987	
8. Rajib, Chitti and Garang	21,600	1,905	..	29,160	29,081	700	..	25,551	
9. Canals in Rohri	..	..	..	2,43,058	..	..	..	..	
10. Indus Canal (Other Canals in Thatta Division).	..	..	..	..	..	..	..	..	
11. Dadu Pass in Kohistan	..	..	..	..	..	..	..	..	
12. L.B.U. System	48,65,680	..	..	..	47,44,388	..	..	..	
13. Lower Sind Barrage	3,540	..	..	..	4,230	..	..	..	
Total (I) Productive	59,35,176	36,070	..	12,14,638	58,26,979	41,219	..	9,59,620	

Serial No.	Particulars of Canal.	1955-56				1956-57			
		Acres		Receipts.	Expenditure.		Receipts.	Expenditure.	
		Area Irrigated.	Capital Expenditure.		Working Expenses.	Capital Expenditure.		Working Expenses.	
									Area Irrigated.
II. Unproductive.									
1.	Katri Canal	3,818	..	..	..	..	..	..	..
2.	Vazirani Canal	..	..	..	..	..	..	..	..
3.	Baghar Canal	40,645	..	..	..	..	..	..	..
4.	Mahi Wah	..	71,690	..	6,72,590	..	6,560	..	14,66,959
5.	Indus Canal Right Bank	..	..	..	..	..	..	..	..
6.	Lower Sind Barrage	..	..	..	..	..	..	..	..
7.	Gudu Barrage	..	..	..	..	..	..	..	..
Total (II) Unproductive		44,463	71,690	..	6,72,590	40,886	6,560	..	14,68,959
Grand Total		59,79,639	1,07,760	..	18,87,228	58,67,865	47,779	..	24,26,579
Central Baluchistan L. B. and C.C. in Nasirabad Tehsil.									

APPENDIX IX

Commissioners in former Sind

Robert Keith Pringle.	Commissioner.	1847—1850
Sir H. Bartle E. Frere, Bart. (afterwards Governor of Bombay).	Commissioner.	1851—1859
General John Jacob.	Acting Commissioner,	1856—1857
Jonathan Duncan Inverarity,	Commissioner.	1859—1862
During Mr. Inverarity's Administration the powers of a Lieutenant Governor were conferred upon the Commissioners.		
Samuel Mansfield.	Commissioner.	1862—1867
Major General Sir William Lockyer Merewether	Commissioner.	1867—1877
William Henry Havelock, (during General Merewether's absence in Abyssinia)	Acting and Protem. Commissioner.	1867—1868
Francis Dawes Melvill,	Acting Commissioner.	1877—1878
Sir James Braithwaite Peile,	Acting Commissioner.	1878—1879
Henry Napier Bruce Erskine.	Acting Commissioner.	June, 1879 Oct, 1882-1887
Charles Bradley Pritchard.	Acting Commissioner.	April, 1887 August, 1888
Arthur Charles Trevor.	Acting Commissioner.	May, 1889
Mr. Henry Enab Murchison (afterwards Sir James	Commissioner,	1891—1900
Sir Charles Olliphant, Sir Andrew Wingate. Mr Robert Giles. }	Acting Commissioners.	
Mr. Robert Giles, M.A.	Commissioner,	1900—1902
Mr. A. Cumine.	Commissioner	1902—1903
Mr. John William Pitt Muir-Mackenzie.	Commissioner	1904—1905
Mr. Arthur Delanal Younghusband,	Commissioner	1905—1913
Mr. William Henry Lucas.	Commissioner	1913—1916
Mr. Reginald Pocock Barrow	Acting Commissioner.	1914—1916
Mr. Henry Stanley Lawrence.	Commissioner	1916—1920
Mr. Jean Louis Reiu.	Commissioner	1920—1925
Mr. P.R. Cadell	Commissioner	1925—1926
Mr. Walter Frank Hudson.	Commissioner	1926—1929
Mr. G.A. Thomas.	Commissioner	1929—1934
Mr. R.E. Gibson.	Commissioner	1936

GOVERNORS OF FORMER SIND

Lieut. General Sir Charles Napier, Governor 1843—47

In 1847 the former Province of Sind was made subject to the Government of the Bombay Presidency.

In 1936 the former Province of Sind was separated from the Bombay Presidency and raised to an independent Governor's Province

Sir Lancelot Graham. April 1936—41

Sir Hugh Dow. April 1941—46

Sir Francis Mudie. January 1946

Mr. Ghulam Hussain Hidayatullah 1947



Gul Hayat Institute

APPENDIX X

LIST OF RULERS OF FORMER KHAIRPUR STATE.

- | | |
|-----------------------------------|----------------------|
| 1. Mir Ali Murad Khan Talpur. | 1843—1894 |
| 2. Mir Faiz Muhammad Khan Talpur. | 1894—1909 |
| 3. Mir Imambux Khan Talpur | 1909—1921 |
| 4. Mir Ali Nawaz Khan Talpur | 1921—1935 |
| 5. Mir Faiz Muhammad Khan Talpur | April 1936—13-7-1947 |
| 6. Mir Ali Murad Khan Talpur | 24-7-1947—13-10-1955 |

LIST OF ADMINISTRATORS OF FORMER KHAIRPUR STATE.

Vaziers.

- | | |
|---------------------------------------|-----------|
| 1. Khan Bahadur Kadirdad Khan Pathan. | 1894—1903 |
| 2. Sardar Muhammad Yakoob Khan | 1903—1907 |
| 3. Shaikh Sadiq Ali Khan | 1907—1912 |
| 4. Khan Bahadur Muhammad Ibrahim Khan | 1912—1919 |
| 5. Shaikh Muhammad Kadir Khan. | 1920—1925 |
| 6. Muhammad Yaqoob Khan | 1925—1926 |

Presidents Executive Council

- | | |
|---|-----------|
| 1. Mr. Halifax, President and Finance Member and Chief Adviser to His Highness. | 1927—1927 |
| 2. Mr. I.H. Taunton, President and Finance Member. | 1927—1930 |

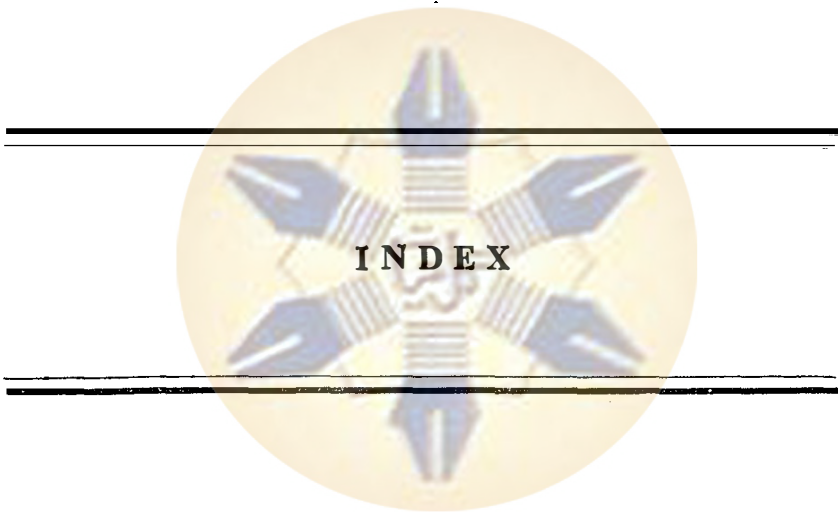
Ministers

- | | |
|--|-----------|
| 1. Mr. I.H. Taunton (later Sir Ivon Taunton) | 1930—1932 |
| 2. Mr. J.M. Sladen, | 1932—1937 |
| 3. S. Ijazali | 1937—1947 |

(with the advice of an Advisory Council from 1938-47).

Chief Minister.

- | | |
|--------------------------------|-----------|
| 1. Mr. Mumtaz Hasan Kizilbash. | 1947—1955 |
|--------------------------------|-----------|



Gul Hayat Institute



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INDEX

A	Pages.
Abbas (Kalhora claimed descent from Kalhora)	164
Abbasids	148, 151
Abbot	328, 344
Abdali, tribe	164
Abdullah, Saffah	148
Abdul Qayyum	(Foreword)
Abdus Sattar Pirzada	691
Adam Shah	164, 342
Afghanistan	35, 124,
	236, 590, 669
Afghan	381
Afghans	164,
	235, 271
Africa	192
Agha G.H.K.	794
Agha Khan	248
Agha Taj Muhammad K.B.	693
Agra	563
Agricultural	393
Ahmad Shah (Durrani or Abdali).	164, 166
Ain-i-Akbari	160, 282, 449
Aitken.	236, 558, 559
Ajmer	563
Akbar	160, 337, 345,
	449
Akhlaq Hussain	(Foreword)
Alauddin Khilji	344
Alexander the Great	126, 252
Ali s/o Hamid	280
Al-Hajj Hafiz Muhammad Inamul Haq Siddiqi	(Foreword)
Alor, Aror	239, 329, 447
Al-Idrisi	291, 329, 332
Ali Murad Khan Talpur	(cxliv)
Ali Nawaz Khan Talpur	(cxliv)
America	558
Amils	255
Andrew Wingate	(cxlii)
Appendices	811
Arthur Delanal Young- husband.	(cxiii)
Arab (Rule)	146
Arabic (Language)	266
Araim, Professor	541, 544, 547
Arghun Shah Beg	155, 345
Aroras	257
Arbuthnot, C.W.E.	793
Arthur Charles Trevor	(cxlii)
Asoka	325
Associate Cement Company	626
Attlee, C. R.	202
Auckland	177
Aurangzeb,	162, 327

B	Pages.
Babylon	312
Badayuni	344
Baden-Powell	363
Bahawalpur	2, 93
Baker, C.M.	473
Bakbar	451

B—concl'd.	Pages.
Baloch, Dr. N.B.	(c)
	158, 284-285
Baluchis	40, 154,
	166, 235
Baluchistan	35, 94, 111, 125,
	347, 448, 461, 507,
	508, 556, 570, 572
Bani Abbas	247
Baroda	440
Bernier	451
Battle of plassy	676
Bellasis	333, 334
Bengal	36, 200
Beqlar-nama	281
Bhils	235, 255
Bilu Khokhar	279
Bombay	108, 347, 362, 363, 372,
	404, 418, 435, 449,
	452, 456, 457, 469,
	471, 492, 561.
Brahmins	131, 239, 255
Brahui	273
Bramanabad	325, 331
British the	362, 493
Britain	538
British India	363
British, the annex- ation of Sind.	455
British rule	385, 529, 539, 540
	569, 570
Bubak	561
Bukkar	159, 167
Buddhism	256
Burns, Alexander	346, 449
Bu-Rihan-Al-Biruni	333
Burton, Sir Rich- hard.	275, 283, 304, 341

C	Pages.
Cabinet Mission	193
Cadell, P.R.	(cxlii)
Cadell, Sir Patric	668
Cambay	110
Canada	558
Ceylon	36, 37
Chach	239
Chachnama	(n), 238, 280, 327, 339
Chandooka pargana	154, 164, 361, 450
Chhachro	377
Charles Bradley Pritchard	(cxlii)
Charles Napier	(cxlii)
Charles Olliphant	(cxlii)
Charles, Pritchard	470
Chatfield G.E.	723
China	125, 329
Chingez Khan	155
Clements	282
Clerk, Sir George	362, 372
Compton, Miss	741
Cousens, Henry	321, 334, 347
Cowsji Jahangir Mental Hospital.	744
Cripps, Sir Staf- ford	197, 199
Cripps Mission	193

INDEX.

C—Concl'd		G—Concl'd	
	Pages.		Pages.
Cumine	(cxlii)	Gandhi, M.K.	192, 194, 195, 196, 198, 201
Cunningham, General A.	109, 110	Gazetteer	362, 366, 369, 420, 422, 431, 449, 459, 468, 469 499, 539, 553, 562, 588, 589, 610, 612
Cutch	11	Germany	568
Cutch, the Rann	461, 494, 559, 568	Ghaggar	447
D		Ghosh, A	112
Dadu	94, 387, 399, 404, 436, 439, 459, 461, 462, 489, 517, 529.	Ghotki floods	493
Dahar, Rai or Raja ..	328, 329	Ghazni	333
Dalzell, Captain ..	612	Ghulam Shah Khan ..	167
Dara Shikoh	339	Ghulam Hussain Hidayatullah	203, 678, 784
Dargahi Ali	338	(cxliii)	
Dalmia Salt Works ..	626	Ghulam Muhammad, Mr.	500
Dasai	614	Ghulam Murtaza Khan Bajwa (Foreword)	
Davy, M.V. (Miss) ..	(f)	Ghulam Nabi Kazi K. B.	685
Day, Dr.	596, 603, 604	Gibson, R. E.	786
Daudpoto, U.M. Dr. ..	(d), 158, 164, 794	(cxlii)	
Debal	145, 152	Gidwani, N. S.	(c)
Delhi	152, 200, 563	G.M. Barrage	378, 448, 461, 511, 512, 525, 610, 613,
Delhi, Emperors ..	373	Godbole Y. A.	793
Diplo	377	Greece	398
Dokri	429, 439	Greeks	118
Dow, Hugh	740	Gudu Barrage	404, 427, 448, 457, 459, 460, 500, 507, 508, 510, 525, 611
E		Gurbaxani, H. M. Dr. ..	279
East India Company ..	163, 175, 183, 287	H	
Eates, K.R.	(c)	Habb river	9, 601
Economy	525	Haig, Lt. Colonel ..	326, 334, 380
Egypt	110, 125, 316	Hakro, the	447, 448
Ellenborough,	177	Hala	2, 289, 290, 557,
Elliot	280	Haleji	93
Encyclopaedia Britannica	204	Halifax	(cxliv)
England	398, 420	Hamilton, Capt	345, 416, 451,
English	266, 407	Alexanader	676.
F		Hampton, H.V.	676, 793
Field Marshal Muhammad		Haque, S.I, S. PK. C.S.P.	(Foreword)
Ayub Khan, N. Pk., H. J. (Foreword)		Harappa	109, 117, 118, 124, 311, 448
Faiz Muhammad Khan Talpur (cxliv)		Hari	365, 370, 371, 378, 379, 537, 543.
(Mir)		Harun-Al-Rashid	148
Fateh Ali Talpur	454	Harrison, C.S.C	473
Fateh Nama	281	Hasan Ali Afendi ..	677
Faruqi, N. A.	(e)	Hasanain, S.Z. Dr.	(c)
Fedden	628	Hazrat Abu-Bakar Siddiq	247
Fida Hassan S.	(e)	Hazrat Ismail bin Imam Jafar	
Fife, R.E.	455, 456, 457, 463	Sadiq	248
Forest	611	Henry Enab Murchison (afterwards)	
Francis Dawes Melvil ..	(cxlii)	Sir James	(cxlii)
Francis Mudie	693	Henry Napier Bructe Erskine	(cxlii)
(cxliii)		Henry Stanley Lawrence	(cxlii)
Fere, Sir Bartle	187, 351, 382, 455	Himalaya	35, 105
(cxlii)		Hindus	528, 540, 541, 553, 559, 561, 633
Fuleli, the	451, 454, 462, 500, 503, 589	Hingorani, H.B. ..	793
G		Hitti, Philip K	312
Gabols	241	Holland, H. Sir. ..	739
Gambat	439	Hornell, James ..	602
		Hughes	369
		Hugh Clayton ..	793

INDEX

H—concl'd.

Pages.

Hugh Dow	.. (cxliii)
Humayun, Emperor ..	160,339
Hunter, Sir William ..	677
Hussain, Imam	246
Hyderabad	12,30,38,42,53,71,94, 346-373,377,380,394, 395,399,417,427, 431,436,448,450, 451,454,455,457, 458,462

I

Ibn Batuta	344
Ibn Haukel,	448
Ijaz Ali S.	.. (cxliv)
Ikram S.M.,S.I.Dr. ..	(Foreword)
Ikramulla Begum, ..	557,558
Imam Bux Talpur ..	.. (cxliv)
Imran Shah	(Foreword)
India	41,115,164,431,451, 456,471,473,568,570,669
Indus Gas Company ..	761
Indus	.. 11,42, 105,121, 342
Indus, the,	418,435,440,447,448, 449,450,451,454, 462,479,493,499, 517,589,590,591, 593,624
Irrigation	.. 447
Ismatullah	.. (f)

J

Jacobabad	.. 11,35, 94,242,382, 399,432,436,455,507
Jacob, General	426,455,669
Jafar Qasimi	(Foreword)
Jagirs	380,381-384,87, 455,507
Jaisalmer	342
Jama Masjid	347
James Braithwaite PEILE. ..	.. (cxlii)
Jameson, Lieutenant ..	366
Jats	235
Jawahar Lal Nehru, Pandit ..	204
Jean Louis Reiu	.. (cxlii)
Jehangir, Emperor	158
Jerruck	456
Jews	226
Jilani, Dr.	681
Jinnah, Q.A. Mu- hammad Ali	199,202
John Jacob General	242, (cxlii)
John Jacob, captian	179,
John William Pitt Muir-Mackenzie. ..	(cxlii)
Jonathan Duncan Inveravity ..	(cxlii)

K

Pages.

Kaafiristan	251
Kabul	166,168
Kachhi	4,242, 266
Kadirdad Khan Pathan K.B. ..	.. (cxliv)
Kalat	165, 302,570
Kalhtora-Kalhoru	346,451,452,454, 455
Kalichbeg Mirza	.. (d)
Karachi	4,30,37,38,42,53,71,94, 226,346,365,376, 394,395,399,416, 417,421,427,430, 433,439,454,456, 461,462,501,526
Karachi Gas Company	761
Karachi Municipal corporation ..	660
Kashmir	175
Kathiawar	96,252
Kazi, I.I. Allama	693
Kazi A.G.M.	546,548
Kennedy, R.H.	346
Khairpur	1,12,35,41,70,105, 280,292,357-358,370, 377,393,394,395, 396,397,398,399, 439,459,469,471, 482,484,485,489, 491,492,525,526, 530,531,532,533, 534,535
Khalifa Mamun	148
Khan M.H.	626
Khirtar	3,4, 19,51, 95,316 448
Khokhrapar	204
Khuhro M.A.	773
Kohistan	2,95, 365,376,397,440,616 624,625
Kori Creek	11
Kotri (Barrage)	376-378,404,448, 457,459,500,525.
Kramer	311
Kulli	319

L

Lahore	162,345,589.
Lailah	278
Lakhi	3,19,21, 93
Lal Shahbaz Qalandar	327
Lambrick, H.T.	53,236, 246
Lancelot Graham	(cxliii) 785
Larkana	11,35,94,167,370-373, 386,399,418,431, 448,450,456
Le Mesurier, Capt.	469

INDEX

L—concl'd.

	Pages.
Lloyed Barrage ..	193, 375, 377, 393, 401, 402, 404, 405, 456, 457, 458, 461, 467, 473, 484, 489, 498, 512
Lohana, the ..	561
London Bridge ..	484, 504
London Committee ..	472
Lord Mountbatten ..	202
Lord Radcliffe ..	203
Lord Wavell ..	202

M

Macaulay ..	676
Machhis ..	40
Madan, G. A. ..	793
Maharaja Ranjeet Singh ..	175
Mahars ..	158
Mahmud of Ghazni ..	141, 150
Majumdar, N. G. ..	100, 123, 315
Makhdam Ghulam Haider of Hala ..	690
Makli Hills ..	2, 36, 38, 40, 43, 153, 157, 344, 347, 562
Makran ..	46, 112, 158, 240
Malay ..	398
Malla ..	252
Malir ..	9, 246, 416
Mangho Pir ..	246
Manrique, Father. ..	345
Mansur-Al-Hallaj ..	278
Manucci ..	162, 163
Mansurah ..	326, 331, 448
Manzoor Illahi, S.Q.A., CSP. (Foreword) ..	556
Maple leaf Cement Factory ..	771
Masood M., C.S.P. ..	773
Maula Bukhsh Sumro ..	277
Mehar ..	469
Merryweather, Sir William. ..	115, 120, 125, 312, 589
Mesopotamia ..	497, 530, 708
Miani, Battle of ..	447, 448, 450
Mihran ..	195
Minto-Morley Reform ..	626
Mineral and Mining Development Maripur Salt Works ..	152, 155, 341
Mir Masum ..	786
Mir Sohrab Khan Talpur ..	428, 429, 433, 435, 436
Mirpur Khas ..	361, 449
Mirs ..	348
Mirza Jani Beg ..	274
Mirza Kalich Beg. ..	348
Mirza Ghazi Beg. ..	349
Mirza Tughral Beg. ..	349
Mirza Isa Khan ..	377
Mithi ..	142, 235, 449, 451
Moghul (Mughals) ..	40, 235, 607, 608, 609
Mohanas ..	93, 109, 110, 111, 115, 121, 448,
Moenojo-Daro ..	

M—concl'd.

	Pages
Montagu-Chelmsford Reforms ..	195
Mount Ford, K.G. ..	539
Muhammad Bin 146, 237, 280, 327, 328, Qasim. ..	329, 330, 333, 334
Muhammad Bin Tughlak ..	344
Muhammad Daim Siddiqui ..	793
Muhammad Moosa, H.Pk., H.J., H.Q.A. (Foreword) ..	(F)
Muhammad Akram ..	(cxliv)
Muhammad Yaqoob Khan ..	(cxliv)
Muhammad Ibrahim Khan, K.B. (cxliv) ..	
Muhammad Ismatul Haq Siddiqi (Foreword) ..	(Foreword)
Mujaddidi G.A. ..	455
Mulchand wah ..	157, 332, 561, 586
Multan ..	(cxliv)
Mumtaz Hassan Kizilbash ..	197
Muslim League ..	192, 528, 540, 562, 656.
Muslims ..	199
Mussulmans ..	472, 473, 474
Musto AA ..	

N

Nadar Shah ..	159, 164, 167
Nagar Parkar ..	11, 19, 29, 377, 401
Nai Kheti ..	279
Napier, Sir Charlis ..	51, 142, 178, 362, 372, 449, 455, 497, 530, 668, 669
Narayan Jagannath Natho ..	686
Nasarpur ..	333
Nasir Ali Gardezi (Foreword) ..	164
Nasiruddin Kabajah, Malik ..	42, 71, 94, 377, 399, 436, 448
Nawabshah ..	461
Nazimuddin, Khwaja. ..	447
Nile, the ..	685
N.E.D. Civil Engineering ..	(Foreword)
North Photo Service Lahore (Foreword) ..	535
Non Agriculture Labour force ..	469
Northbrook, Lord ..	123, 319
Nundhara ..	

O

Oriental Inland Steam Company ..	590
Orlich, Von ..	291
Outram, Major ..	179

P

Pakistan. ..	35, 115, 377, 385, 386, 393, 435, 441, 461, 463, 500, 501, 503, 504, 525, 445, 550, 556, 557, 558, 567, 569, 570, 573, 574, 576, 578, 580, 588, 589, 625, 629, 651, 667
Palla ..	610
Patrich Cadell ..	(d)
Pathans ..	235
Persia ..	120

INDEX

P—concl'd.

	Pages.
Persian	266
Piggot, Stewart. ..	112, 125, 313
Pir Ali Muham- mad Rashdi. ..	384, 772
Pir Pagaro	717
Population	213
Postans, Lieutenant. ..	449
Pottinger	295
Pottinger, Colonel ..	291, 316, 450
Preedy Captain	678
Pringle	362
Prophet, the Holy, Muhammad ..	247
Pryde A. W.	720
Punjab. .. 39, 110 423, 448, 471, 472, 512, 528, 590, 592, 606	

Q

Quad-i-Azam, M. A. Jinnah ..	197, 203
Quran, Holy. .. 298, 303, 304, 305, 306, 675	
Quetta	417

R

Rai, Mr.	601, 602
Rajasthan	2
Rajistan	35
Rajputana	3, 51, 110, 563, 568
Rajputs	153, 235, 255
Ranikot	19
Rann of Kuchh	10, 12, 19, 29
Rawlinson, H. L. ..	161, 231
Rathborne, Capt. ..	678
Reay, Lord	456
Refugee	751
Regnald Pocock Barrow ..	(cxlii)
Ridley, S.	385, 528, 537
Rifat Pasha Sheikh (Foreword)	
Rinds	240
Robert Giles M. A. ..	(cxlii)
Robert Keith Pringle ..	(cxlii)
Roger Thomas	549, 771
Rohri	5, 30, 39, 93, 247, 370, 373, 404, 450, 456, 457, 458, 459, 471, 472, 489, 491, 492, 493, 494, 499
Rolle, Richard	341
Ross, A.S.C.	119.

S

Sahtas	238
Sakas	251
Sakrand	428, 429, 612
Sammo	155, 238, 347
Samuel	(cxlii)
Samui	345, 347, 350
Sanskrit	336
Sanghar	387, 399, 431
Sayid Ahmad Khan ..	677
Sardar Muhammad Yaqoob Khan	(cxliv), 339

S—concl'd.

	Pages.
Sasui	392
Schlick, Dr.	
Scott, Lt. Colo-	428, 429, 612
nel, Walton	449, 452, 455
Sehwan .. 19, 28, 293, 301, 327, 448	
Shah Abdul Latif	273, 274, 281, 283
Shah Nawaz Khan Bhutto ..	793
Shah Jahan, Emperor	558, 339
Shah P.G.	793
Shahpur.	451
Shirazi (Syed Jamal)	280
Shikarpur.	370, 381, 404, 450
Shujrah	247
Scott, Lt. Col. W. Sohwan ..	452
Sikh	669
Sidney Ridley	528
Sind .. 1, 29, 35, 40, 44, 93, 105, 166, 345, 346, 347, 357, 362, 366, 369, 370, 374, 381, 393, 396, 397, 398, 400, 401, 402, 405, 408, 409, 418, 419, 422, 423, 427, 428, 429, 432, 433, 435, 436, 438, 439, 447, 448, 449, 450, 451, 452, 453, 454, 457, 458, 459, 461, 462, 467, 468, 471, 472, 493, 499, 507, 525, 526, 531, 532, 533, 534, 535, 536, 537	
Sind Adabi Board	(e), 692
Sind, Peoples and Progress ..	716
Sind Public Service Commission ..	793
Smyth, J.W.	321, 336
Sodhas	259
Sorley, H.T.	41, 339
Stein, Sir Aurel	125, 320
Stocks, Dr.	612
Suez Canal.	504
Sui Gas.	501, 504, 556
Sukkur	11, 13, 37, 38, 39, 42, 347, 370, 733, 763, 377, 381, 382, 384, 386, 399, 448, 455, 456, 457, 459, 461, 472, 473, 484, 488, 504, 507
Sukkur Barrage	152
Sumra	235
Summers, Dr.	471
Sunnis	239
Sur Asa	277
Sur Bilal	277
Sur Kalyan.	277
Sutlaj	93
Syed Jamil Hajder Shah, C.S.P. (Forword)	

Kalhor	266	Zoroastrians
167		

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The Reading Generation

انڌي ماءُ جڙيندي آهي اونڌا سونڌا ٻارَ
ايندڙ نسل سَمورو هوندو گونگا ٻوڙا ٻارَ

هر دور جي نوجوانن کي اُڏاس، لڙهندڙ، ڪڙهندڙ، ڪڙهندڙ، ٻرندڙ، چُرندڙ، ڪِرندڙ، اوسيئڙو ڪندڙ، پاڙي، ڪاڻو، پاڇوڪڙ، ڪاوڙيل ۽ وڙهندڙ نسلن سان منسوب ڪري سگهجي ٿو. پر اسان انهن سڀني وچان ”پڙهندڙ“ نسل جا ڳولائو آهيون. ڪتابن کي ڪاڳر تان ڪڍي ڪمپيوٽر جي دنيا ۾ آڻڻ، ٻين لفظن ۾ برقي ڪتاب يعني e-books ٺاهي ورهائڻ جي وسيلي پڙهندڙ نسل کي وَڌڻ، ويجهڻ ۽ هڪ ٻئي کي ڳولي سَهڪاري تحريڪ جي رستي تي آڻڻ جي آس رکون ٿا.

پڙهندڙ نسل (پڻ) ڪا به تنظيم ناهي. اُن جو ڪو به صدر، عهديدار يا پايو وجهندڙ نه آهي. جيڪڏهن ڪو به شخص اهڙي دعويٰ ڪري ٿو ته پڪڙ جاڻو ته اهو ڪوڙو آهي. نه ئي وري پڻ جي نالي ڪي پئسا گڏ ڪيا ويندا. جيڪڏهن ڪو اهڙي ڪوشش ڪري ٿو ته پڪڙ جاڻو ته اهو به ڪوڙو آهي.

جهڙيءَ طرح وٽن جا پَن ساوا، ڳاڙها، نيرا، پيلا يا ناسي هوندا آهن اهڙيءَ طرح پڙهندڙ نسل وارا پَن به مختلف آهن ۽ هوندا. اُهي ساڳئي ئي وقت اُداس ۽ پڙهندڙ، ٻرندڙ ۽ پڙهندڙ، سُست ۽ پڙهندڙ يا وڙهندڙ ۽ پڙهندڙ به ٿي سگهن ٿا. ٻين لفظن ۾ پَن کا خُصوصي ۽ تالي لڳل ڪَلب Exclusive Club نه آهي.

ڪوشش اها هوندي ته پَن جا سڀ ڪم ڪار سهڪاري ۽ رضاڪار بنيادن تي ٿين، پر ممڪن آهي ته ڪي ڪم اجرتي بنيادن تي به ٿين. اهڙي حالت ۾ پَن پاڻ هڪٻئي جي مدد ڪرڻ جي اصول هيٺ ڏي وٺ ڪندا ۽ غيرتجارتي non-commercial رهندا. پَن پاران ڪتابن کي ڊجيٽائيز digitize ڪرڻ جي عمل مان ڪو به مالي فائدو يا نفعو حاصل ڪرڻ جي ڪوشش نه ڪئي ويندي.

ڪتابن کي ڊجيٽائيز ڪرڻ کان پوءِ اهم مرحلو ورهائڻ distribution جو ٿيندو. اهو ڪم ڪرڻ وارن مان جيڪڏهن ڪو پيسا ڪمائي سگهي ٿو ته ڀلي ڪمائي، رڳو پَن سان ان جو ڪو به لاڳاپو نه هوندو.

پَن کي کليل اڪرن ۾ صلاح ڏجي ٿي ته هو وس پئانڊڙ وڌ کان وڌ ڪتاب خريد ڪري ڪتابن جي ليکڪن، ڇپائيندڙن ۽ ڇاپيندڙن کي همٿائين. پر ساڳئي وقت علم حاصل ڪرڻ ۽ ڄاڻ کي ڦهلائڻ جي ڪوشش دوران ڪنهن به رڪاوٽ کي نه مڃن.

شيخ اياز علم، ڄاڻ، سمجھ ۽ ڏاهپ کي گيت، بيت، سٺ، پُڪار سان
تَشْبِيه ڏيندي انهن سڀني کي بَمَن، گولين ۽ بارود جي مدِ مقابل بيهاريو
آهي. اياز چوي ٿو ته:

گيتَ به ڄڻ گوريلا آهن، جي ويريءَ تي وار ڪرڻ ٿا.

....

جئن جئن جاڙ وڌي ٿي جڳ ۾، هو ٻوليءَ جي آڙ ڇڻ ٿا؛
ريتيءَ تي راتاها ڪن ٿا، موتي منجهه پهڙ ڇڻ ٿا؛

....

ڪالهه هُيا جي سُرخ گلن جيئن، اڄڪلهه نيلا پيلا آهن؛
گيتَ به ڄڻ گوريلا آهن.....

.....

هي بيتُ آهي، هي بَمَ - گولو،
جيڪي به ڪٿين، جيڪي به ڪٿين!
مون لاءِ ٻنهي ۾ فَرَقُ نه آ، هي بيتُ به بَمَ جو ساٿي آ،
جنهن رڻ ۾ رات ڪيا راڙا، تنهن هڏ ۽ چَمَ جو ساٿي آ -

ان حساب سان اڻڄاڻائي کي پاڻ تي اهو سوچي مڙهڻ ته ”هاڻي ويڙهه ۽
عمل جو دور آهي، اُن ڪري پڙهڻ تي وقت نه وڃايو“ نادانيءَ جي نشاني
آهي.

Gul Hayat Institute

پڻ جو پڙهڻ عام ڪتابي ڪيڙن وانگر رڳو نصابي ڪتابن تائين
محدود نه هوندو. رڳو نصابي ڪتابن ۾ پاڻ کي قيد ڪري ڇڏڻ سان سماج
۽ سماجي حالتن تان نظر ڪڍي ويندي ۽ نتيجي طور سماجي ۽ حڪومتي
policies اڻڄاڻن ۽ نادانن جي هٿن ۾ رهنديون. پڻ نصابي ڪتابن
سان گڏوگڏ ادبي، تاريخي، سياسي، سماجي، اقتصادي، سائنسي ۽ ٻين

پڙهندڙ نسل . پ ن The Reading Generation

ڪتابن کي پڙهي سماجي حالتن کي بهتر بنائڻ جي ڪوشش ڪندا.

پڙهندڙ نسل جا پڻ سڀني کي **ڇو، ڇا، ۽ ڪيئن** جهڙن سوالن کي هر بيان تي لاڳو ڪرڻ جي ڪوٺ ڏين ٿا ۽ انهن تي ويچار ڪرڻ سان گڏ جواب ڳولڻ کي نه رڳو پنهنجو حق، پر فرض ۽ اڻٽر گهرج unavoidable necessity سمجهندي ڪتابن کي پاڻ پڙهڻ ۽ وڌ کان وڌ ماڻهن تائين پهچائڻ جي ڪوشش جديد ترين طريقن وسيلي ڪرڻ جو ويچار رکن ٿا.

توهان به پڙهڻ، پڙهائڻ ۽ ڦهلائڻ جي ان سهڪاري تحريڪ ۾ شامل ٿي سگهو ٿا، بس پنهنجي اوسي پاسي ۾ ڏسو، هر قسم جا ڳاڙها توڙي نيرا، ساوا توڙي پيلا پن ضرور نظر اچي ويندا.

وڻ وڻ کي مون پاڪي پائي چيو ته ”منهنجا پيءُ
پهتو منهنجي من ۾ تنهنجي پڻ پڻ جو پڙلاءُ.“
- اياز (ڪلهي پاتم ڪينرو)

Gul Hayat Institute

پڙهندڙ نسل . پڻ The Reading Generation