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## COTTON TEXTILE INDUSTRY IN PAKISTAN

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### Historical Background

*From earliest times to 17th century—period of handicraft.* The art of spinning and weaving cotton in Pakistan is very old and can be traced back to the Indus Valley Civilization (3,000 B.C.) as discovered by excavations in Mohenjodaro and Harappa. A number of household goods unearthed from these places were found to be covered in cotton cloth. Similarly the Egyptian mummies are known to have been wrapped in muslin from this sub-continent. Accounts of travellers like Bernier and Tavernier testify to the well-organized and flourishing condition of the cotton industry during the best days of the Mughul rule. Availability of plenty of material and long warm weather over a greater part of the country and a large population contributed to the establishment of the industry at numerous centres spread over a wide area. Cotton goods were one of the principal articles of export in the medieval times. The first place among the cotton piece-goods was given to Dacca muslin of East Bengal known as *Ab-i-Rawan* (running water) *Baft-i-Hawa* (woven air) and *Shab-i-nam* (dew). The industry was organized on a handicraft basis, as was the case in other countries at this stage.

*18th century—decline of the handicraft industry.* The invention of textile machinery in England and the use of power made a revolution in the art of spinning and weaving. The supply of superior cotton by U. S. A. were instrumental in turning out cheap and fine cotton-goods on a large scale, which increasingly flowed into the market of the sub-continent and other countries of Asia and Africa. It was also the time when the political control of the British on the sub-continent also grew, leading to the formation of the Indian Empire. While the British goods moved freely into the sub-continent, the imports of cotton goods from it were restricted in the interest of Lancashire. The increasing imports of cheap English piece-goods led to the great decline of the handicraft industry in the sub-continent. The industry got a set-back not only in the home market but it also lost its foreign markets in competition with cheap British goods. Consequently the exports

of cotton goods declined and the sub-continent became increasingly dependent on the import of cotton goods from England, as is shown by the following figures.

TRADE IN TEXTILES\* 1814-15 TO 1829-30  
(Figures are in Lakhs of Rupees)

Year					Export of cotton goods from the sub- continent	Import of cotton goods into the sub-continent
1814-15	..	..	..	..	84.9	0.45
1819-20	..	..	..	..	90.3	15.82
1824-25	..	..	..	..	60.2	52.96
1829-30	..	..	..	..	1.3	52.16

*Transformation from handicraft to factory.* While the transformation of the industry from handicraft to factory was a quick process in the case of England which had plenty of machinery and power, in the case of the Indo-Pakistan sub-continent there was a hiatus between the handicraft and the factory stages for want of both of these factors. There were no railways and even metalled roads were few. The first regular working of coal mine was started by Messrs Alexander & Co. as late as 1820 and the first section of East Indian railway was opened in 1854.

*19th century.* The establishment of the factory industry in the sub-continent dates back to the middle of the nineteenth century. The first cotton mill was started in 1830 in Bengal and twenty years later in 1851 a spinning mill was erected in Bombay which started working in 1854.

The characteristics of the first phase of the industry which lasted till the end of the last century were the extreme concentration of the industry in the city and island of Bombay and the predominance of spinning over weaving.

Towards the end of the century there began the tendency towards decentralization and mills began to be opened in the interior of the sub-continent near the markets to eliminate the cost of transport. These centres were located either in or near cotton growing areas like Amritsar or Delhi or near the source of power like Calcutta. The Punjab region, in spite of its cotton resources and big market, could not develop a good industry owing to lack of coal or other motive power. The emphasis in this part appeared to be on the development of agriculture rather than on industry and on the absorption of man power in the army and not in the labour corps of a mill.

*20th century.* The phase of decentralization which started in the 19th century continued in the 20th century. The growth of weaving industry and increasing attention to the production of higher counts of yarn are other important features of the century.

\*Vakil, Bose, and Deolalkar, Growth of Trade and Industry in Modern India, Longman 1931, pp. 99.

With minor fluctuations due to the two wars and intervening periods of depression the industry showed a steady progress which was considerably helped by the Swadeshi movement, till we come to the partition of the sub-continent.

*Since Independence.* The parts of the sub-continent at the time of the independence which now constitute the two wings of Pakistan were devoted mainly to agriculture and the production of raw materials. Most of the industrial development which had taken place during the British rule was essentially confined to what now constitutes Bharat or India.

In 1947 there were only 17 factories, 7 in West Pakistan and 10 in East Pakistan. Those in West Pakistan were located in Karachi, Lahore, Lyallpur, Multan, Okara and Hyderabad, while those in East Pakistan were located in Narayanganj, Dacca and Khulna. They had in total 1.77 lakh spindles (West Pakistan 79,000, E. Pakistan 98,000) and only 4.8 thousand looms. These could produce only 74,000 tons of yarn and cloth which could hardly fulfil 3 per cent. of the needs of the 76 million estimated population at that time. Eighty-eight million yards of cloth produced in 1948 provided just about one yard per head of population. In addition, Pakistan had to arrange for the clothing of the refugees, in constant influx from India. While the local production was meagre the supplies from India, in spite of several agreements, were irregular and there was almost a complete suspension of trade with it on the non-devaluation of the Pakistani rupee in September 1949.

The control on cloth and yarn, imposed in 1945, had to be continued after independence and was lifted in August, 1949 to enable the growth of the industry which was considered to be difficult under restrictive conditions.

In the early days of independence, the people were greatly interested in building up quick capital through foreign trade and paid little attention to industry. Export of cotton and other commodities earned a large amount of foreign exchange which could be utilized for the development of the indigenous cotton industry for which a target of 1.5 million spindles was fixed in the first phase of development.

Huge profits were earned by the export of cotton as a result of the Korean War of 1951. The earnings of foreign exchange from it amounted to 96.2 and 80.4 crores of rupees in 1951 and 1952 respectively. Thus a large amount of capital was available not only for the import of cotton yarn and piece-goods but also for the development of the textile industry in which investment was apparently safe. The number of spindles increased to 630,000 and looms to 9,000 in 1952.

The value of imported yarn and cloth since independence progressively increased to as much as Rs. 83.7 million in 1951-52. It was a great drain on the foreign exchange and emphasised the need for the more speedy development of the textile industry for

which raw material was available within the country and there was an increasing demand for clothing for the growing population. Therefore along with the imports of cotton goods the government encouraged the development of the indigenous cotton textile industry. There were as many as 41 units, comprising 7.93 lakh spindles and 12,000 looms in 1953 meeting about 50 per cent. of the requirement of the population.

At the end of 1952, the import policy was revised and Open General License was withdrawn. Severe restrictions were imposed on all imports. On account of the consequent fall in imports and insufficient indigenous production, prices rose and price control on textile was reimposed in April, 1953.

In 1952, the Tariff Commission, on a summary enquiry recommended an effective rate of duty (45 per cent. to 50 per cent.) on imports of certain goods and abolition of 5 per cent. excise duty on the production of power looms.

Under the impact of the shortage of goods and the protection granted, the industry continued to grow. Deferred payment agreement for the import of machinery first with Japan in 1953 and then with the United Kingdom accelerated the development of the industry so that by the end of 1955 there were 74 units, comprising 16.83 lakh spindles and 26,000 looms, which produced about 6.86 lakh bales of yarn and cloth. The out-put, after meeting the requirements of auxiliary industries like hosiery, was sufficient to give about 12 yards of cloth per capita for a population of over 80 million people. Pakistan thus, for the time being became self-sufficient in the coarse and medium varieties, while shortage still existed in fine and super-fine qualities.

As a measure of further encouragement the control on indigenous yarn was removed in November, 1954 and on cotton cloth in March, 1955.

*First-five Year Plan.* The first 5-year plan (1955-60) provided for the installation of additional spindles (mainly for fine counts of yarn) to bring the total to 2.2 million, and of additional looms to raise the total to 33,000. The total productive capacity for mill-made cloth, assuming an average spindle usage of 2½ shifts per day, was expected to be about 11.50 yards per year by 1960 and of handloom cloth 385 million yards. The consumption of cloth in the country was expected to rise from 11.5 yards to 14 yards per person with surplus yarn and cloth available for export. The target fixed for the First five year plan could not be achieved.

### **Beginnings of Export**

The year 1955 marks another milestone in the development of the industry. Until the middle of the year, the exports of the cotton textiles from

Pakistan were almost negligible both in quantity and value. Since then a steady progress has been maintained. It was strengthened by the devaluation of the Pakistan rupee in 1955. The exports of cotton manufactures rose from 7 million rupees in 1954 to 8.1 million rupees in 1956. The bulk of these exports consisted of yarn. During 1956 piece-goods accounted for 20 per cent of the total value of exports of cotton manufactures. Pakistani yarn has been in great demand in East and South-East-Asia specially Hong Kong. United Kingdom is the principal buyer of our cotton piece-goods but a quota with a ceiling of 7,500 tons of cotton textiles and yarn has been asked for before Britain joins the European common market. Other buyers include Aden, Burma, Saudi Arabia and U. S. A.

### **Reduction and Stamping of Prices**

On account of the export of textiles and the rise in the price of cotton, the price of cloth showed a sharp rise in the beginning of 1957. On the recommendation of a Committee appointed by the Government in April, 1957 the ex-mill price (April 1957 as the base) was to be stamped on all cloth. The control was lifted in February, 1958 but as the prices rose again the stamping on cloth of ex-factory price on the basis of those prevailing in April, 1957, was reimposed.

The Revolutionary Government, as an export incentive, introduced the Export Bonus Scheme in January 1959 according to which the cotton textile exporters were entitled to 20% bonus on their foreign exchange earnings. As a result the export of yarn and cotton cloth rose from Rs. 123.15 lakh and Rs. 30.44 lakh in 1958 to Rs. 137.80 lakh and Rs. 533.41 lakh respectively in 1960.

*The Second Five-Year Plan.* As mentioned above the average per capita consumption of indigenous cloth, exclusive of locally woven artificial silk cloth and imported textiles was 12 yards during the first plan period. To maintain domestic supplies at this rate as well as textile exports at the current rate, the Second five-year plan proposed a target of 2.5 million spindles by 1965.

Taking into account the yarn demands on spindles by existing power looms, handlooms (estimated at 500,000), hosiery etc., and the need for expanding the production of mill-made cloth, particularly for export, the Plan proposed a target of 37,000 looms, or the installation of 7,000 additional power looms by 1965. The target was subsequently revised and raised to 41,000 looms.

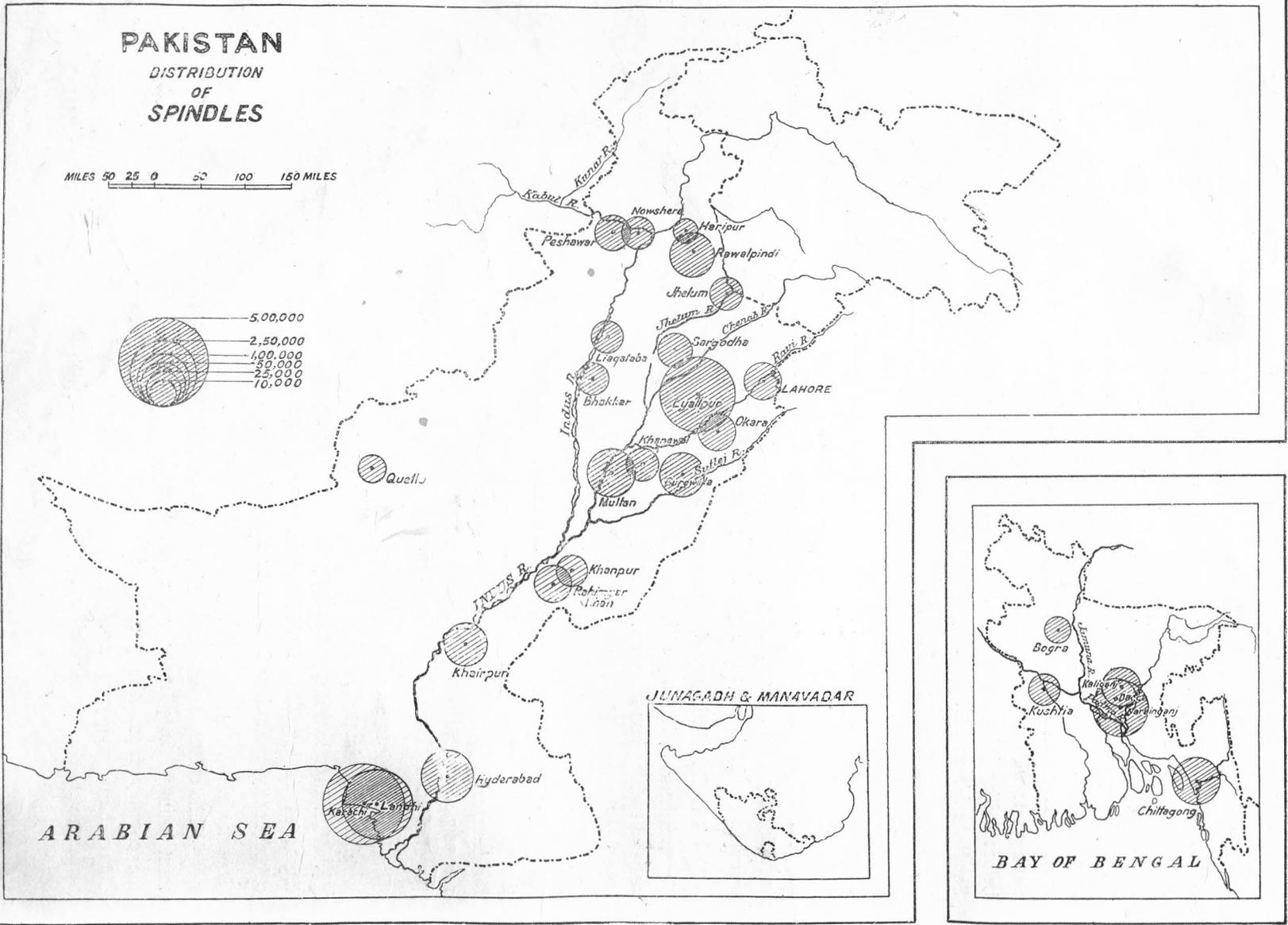
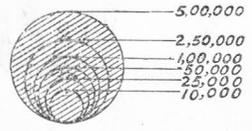
### **Growth of Industry**

The cotton textile industry, since independence has rapidly grown from almost scratch into the premier manufacturing industry of the country. It has turned the country from the position of almost complete dependence upon imported cotton cloth and yarn, not only to one of almost self sufficiency in coarse and medium varieties, but also of developing a good surplus for export. According to the

# PAKISTAN

## DISTRIBUTION OF SPINDLES

MILES 50 25 0 50 100 150 MILES



### JUNAGADH & MANAVADAR

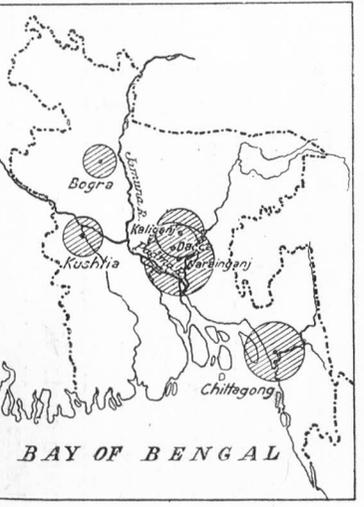
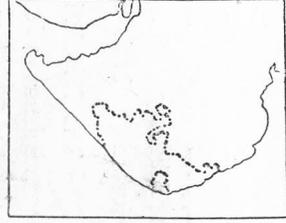


Fig. 1

Census of Manufacturing Industries 1958, cotton textiles contributed 25.14 per cent of the total production and 37.81 per cent of the total employment.)

The development in the field of cotton textiles has been primarily due to the abundance of raw material and a stable market at home which involved no risk in investment. It also required comparatively low capital and had the advantage of easy availability of automatic machines, which reduced its dependence on skilled labour which was scarce at that time. It also provided scope for large employment and rehabilitation of refugees. On account of its potentialities, it received utmost assistance from the government in the shape of tariff protection, revision of imperial preference, reduction of excise duties on the production of indigenous cloth and virtual stoppage of imports.)

The soundness and potentiality of the cotton textile industry is further reflected by the fact that capital is not only easily available within the country but also that it has attracted the largest amount of foreign investment on non-repatriable basis.

The progress of the industry from 1948 to 1961, is given in table No. 1. The spindleage has increased from 17,70,000 in 1947 to 19,98,000 spindles in 1961 or by 1,100 per cent and the loomage from 4,800 to 30,000 or about by 600 per cent.)

Figure 1 shows the distribution of spindles in the two wings. In West Pakistan the greatest concentration is in Karachi-Landhi region which contains about one-third of the total, followed by Lyallpur and then Multan and Hyderabad. These four centres have more than 50 per cent. of the spindleage. In East Pakistan Narayanganj is the main centre followed by Dacca and Chittagong.

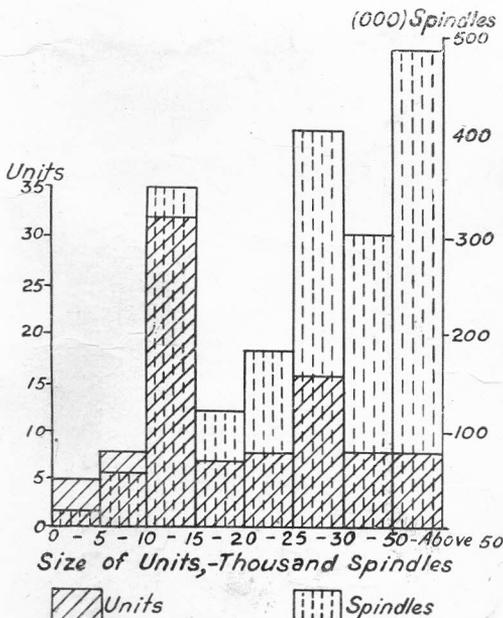


Fig No. 2

Figure 2 gives the break up of the spindleage according to the size of units. The largest spindleage is in units having (a) more than 50,000 spindles and (b) 25 to 30 thousand spindles.

Figure 3 shows the distribution of looms. In West Pakistan Karachi-Landhi has the highest number 9,910 or 34 per cent of the total followed by Lyallpur 18½ per cent. In East Pakistan again Narayanganj occupies the leading position, 2,387 looms or 8 per cent of the total.

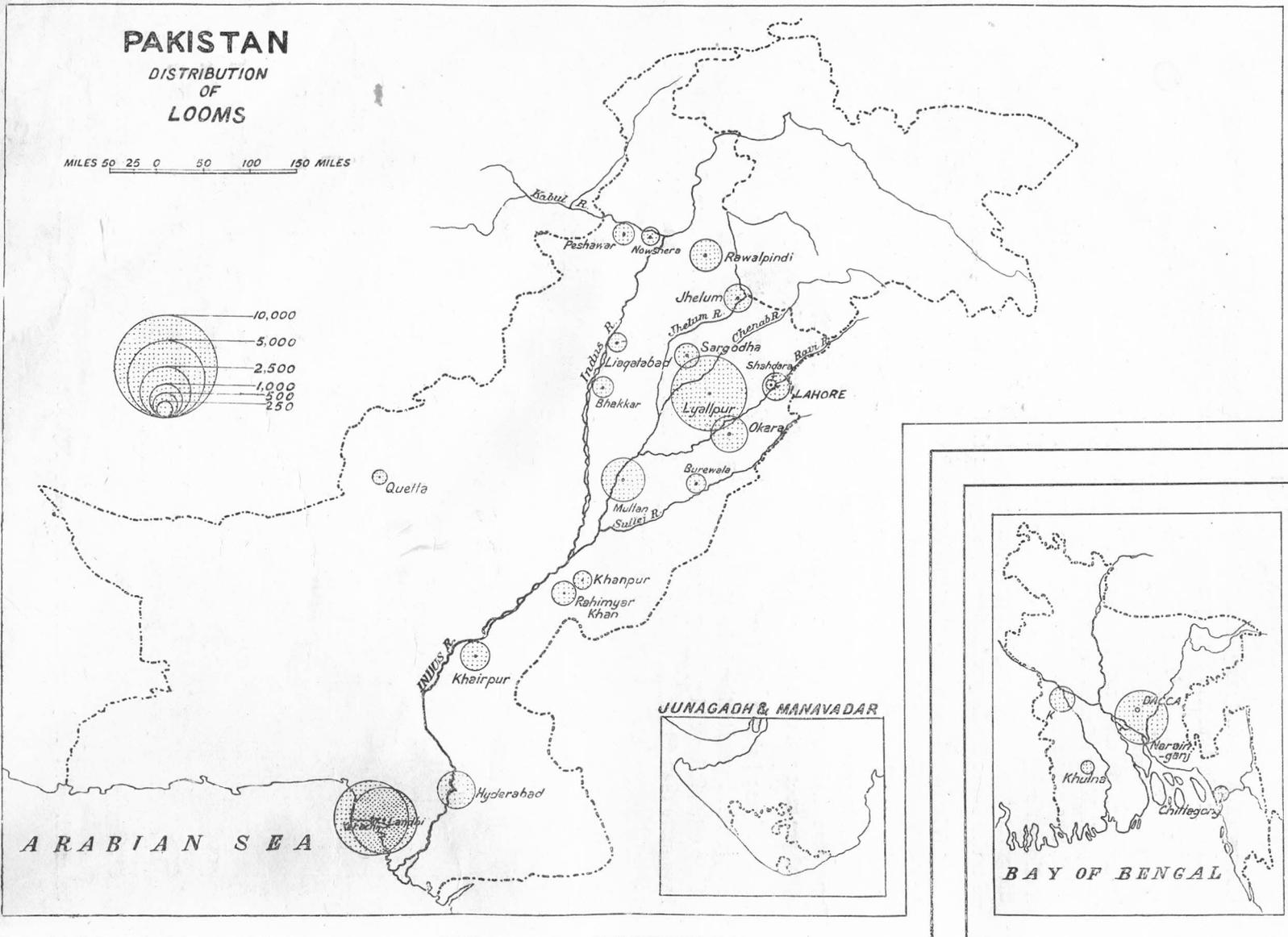
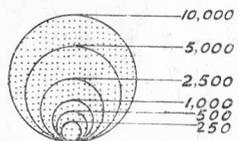
Figure 4 gives the break-up of loomage according to size of units. The largest number of looms is in the category of 250 to 500 looms.

A unit with 25,000 spindles and 5,000 looms is considered to be economically balanced. The largest number of units have 10,000 to 15,000 spindles. Units having

# PAKISTAN

## DISTRIBUTION OF LOOMS

MILES 50 25 0 50 100 150 MILES



JUNAGADH & MANAVADAR



Fig. 3

fewer than 25,000 spindles or 5,000 looms impose a great burden on national economy because they are not able to produce yarn or cloth at the same prices as larger mills can. It is, therefore abundantly clear that practically all our weaving factories are uneconomic from this standard. For the same reason on the recommendation of the Textile Enquiry Commission the Government is trying to provide additional spindles where the units are uneconomic.

Figure 5 gives the distribution of industry in Pakistan and the relation between spindleage and looms at each centre. There is a great excess of spindles over looms in Karachi and Hyderabad. In East Pakistan Chittagong and Dacca have an excess.

Practically all the mills, with the exception of only a few, have a surplus of yarn which is utilized by the handlooms. East Pakistan which has 75 per cent of 500,000 handlooms of the country has much greater surplus in yarn than West Pakistan.

The quantity of surplus yarn is shown in figure 6. The surplus is gradually diminishing which needs attention as it has a great bearing on hand-loom industry.

**Important Centres of Industry**

*Karachi* has grown to be the most important centre of the cotton manufacturing industry. All this development has taken place since independence. In 1947 it had only one spinning mill with 1,500 spindles while today there are 22 mills with more than 400,000 spindles and about six thousand looms and in addition to these there are more than 200,000 spindles and 4,000 looms at Landhi nearby.

When Pakistan came into existence, with practically all the cotton textile centres left in India, Karachi rapidly grew as the main centre of the industry for reasons which were very similar to those which were responsible for the growth of Bombay as a textile centre during the last century. It had the advantage of the availability of capital, banking facilities,

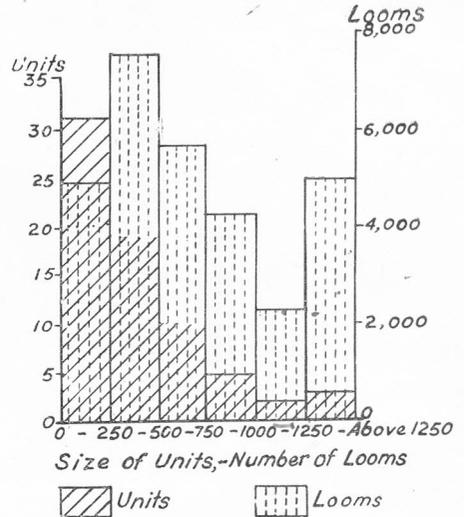


Fig. No. 4

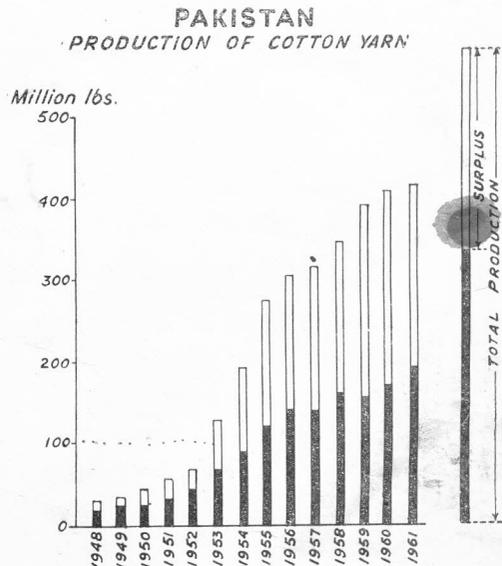


Fig No. 6

entrepreneurial ability and facilities for

# PAKISTAN

## DISTRIBUTION OF SPINDLES AND LOOMS

MILES 50 25 0 50 100 150 MILES

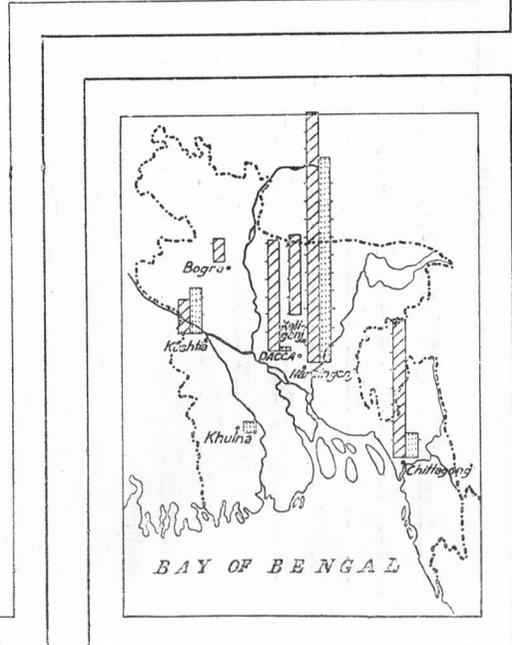
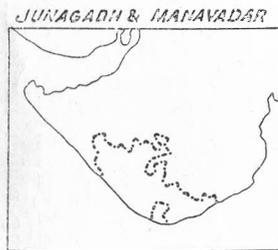
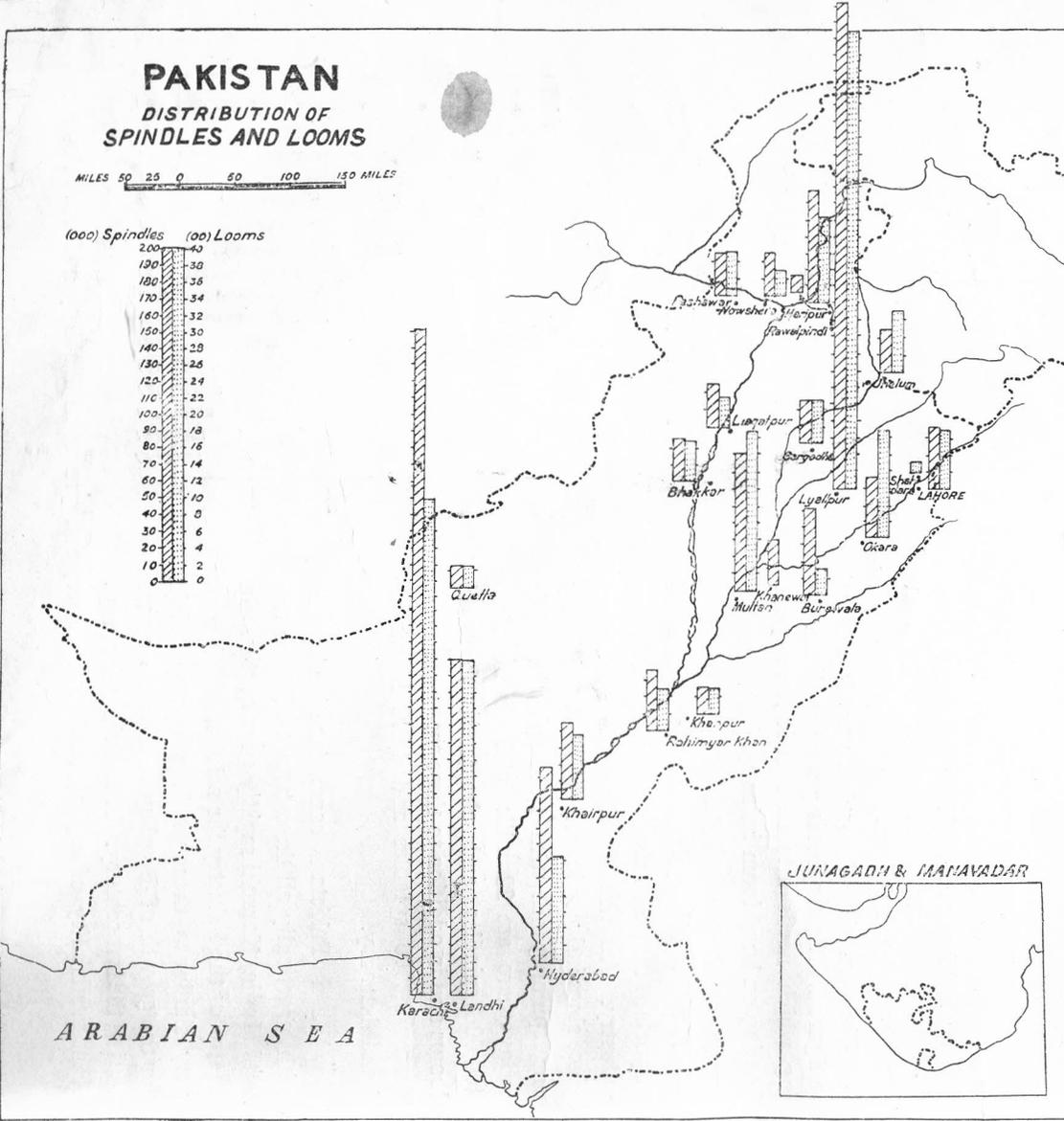
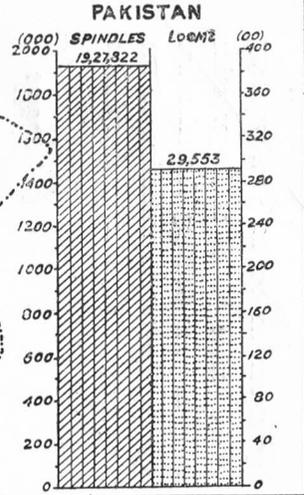
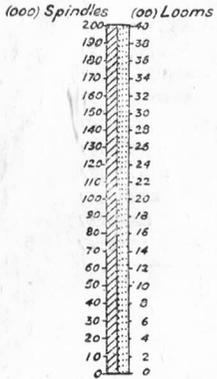


Fig. 5

import of machinery. The Parsis, Khojas, Memons and Bohras who lived in the city or had migrated there from Bombay, not only could invest but also attract capital. They had a large share in foreign trade and were familiar with methods of finance and industrial organization. The city had also the advantage of being the greatest commercial centre of the country, besides being the capital. Cotton produced in large quantities in the canal-irrigated districts of its hinterland naturally flowed into it for export. It was connected by rail with the cotton-growing area and the principal markets. Humidity of the climate in an otherwise arid country was an additional advantage.

*Lyallpur* is an old manufacturing centre in the midst of canal colony area of the Punjab region where plenty of American cotton is grown. It had also a good advantage of its geographical location in the centre of the plain to function as a distributing centre. *Multan* and *Hyderabad* have in their districts the largest acreage under cotton in the Punjab and Sind regions respectively and the cities are located on the main line to Karachi. Factories were set up in the old states of *Bahawalpur* and *Khairpur* on account of the facilities offered by them. Factories at *Liaquatabad* and *Bhakkar* are part of the development of the Thal region.

*Narayanganj-Dacca* is the chief industrial region of East Pakistan. It has the advantage of cheap water transport and availability of trained labour. Dacca is also connected by rail and road with different parts of the province to serve as a distributing centre. Chittagong the second important centre in East Pakistan has the advantage of being a port where cotton can be easily had from Karachi. Humid climate has always been an advantage for cotton industry in East Pakistan.

With an initial concentration in Karachi there has been a tendency towards the dispersal of the industry in later years, to be located away from the big cities and nearer the markets where cheap labour and land is also available. This dispersal has also been encouraged by the government by allocating large shares of spindlage and looms to other parts. The object is not only to make the yarn and cloth easily available nearby but also to promote industrial development in the backward areas. This will also reduce regional disparities in the economic growth of various parts of the country.

### Present Position

In August, 1959, the Government appointed the Textile Enquiry Commission which submitted its report in April, 1960. According to it 82 per cent of the industry was located in West Pakistan including (31 per cent in Karachi) and 18 per cent in East Pakistan. East Pakistan with its long summers and mild winters and high density of population makes a bigger market for the cotton goods.

Lack of infrastructure of textile industry including raw-material, shortage of power, and poor means of communication have been the main reason for lesser investment in textiles in East Pakistan. The capital has been proverbially shy in this wing. In 1949 the Central Government, after passing the development of Industries (Federal

Control) Act took over the entire planning and control of 27 industries including the cotton textile industry and allotted 2,000,000 spindles to the whole of Pakistan of which the share of East Pakistan was 300,000. Even this small allotment to East Pakistan remained unutilized for a long time. The Pakistan Industrial Development Corporation came to the rescue and built the Muslim Cotton Mill Kaliganj (Dacca). In the early days of independence, East Pakistan was allowed only one loom for every 100 spindles against 50 in west Pakistan which distinction has now been removed.

The gap in the industry between the two wings is narrowing down and will be considerably decreased when the new units allotted will go into production. It is hoped that the availability of Sylhet gas and Karnaphuli electricity, the financial assistance by the Pakistan Industrial Credit and Investment Corporation, and the Industrial Bank of Pakistan, the I.C.A. help in improving the communications, and the credit facilities from Japan, Germany, U. K. and the IBRD (International Banks for Reconstruction and Development) would help the province in tiding over its handicaps.

The cotton textiles have shown the greatest progress in the industrial sector since independence. The Second Five-year Plan target of 2.5 million spindles and 37,000 (revised 41,000) looms will have been overfilled by the end of the current year. The overall position at that time is expected to be 2,691,178 spindles and 42,768 loom compared with the present installed capacity of 1,959,000 spindles and 30,000 looms. Thirty-eight new mills will go into production by the end of this year—24 in East Pakistan and 14 in west Pakistan. It will greatly improve the position of East Pakistan. By the end of the year it will have 42 mills with an aggregate capacity of 689,658 spindles and 9,619 looms. Of the new mills an undetermined number will be set up in Dacca and Chittagong, two each in the districts of Mymensingh and Commilla and one each in the district of Pabna, Noakhali, Jessore and Dinajpur.

Of the new units allocated to West Pakistan one will go to Tank (North Waziristan) one to Kohat, one to Mardan and the remaining 13 will be spread over in different parts of the province. This is in line with the general policy of decentralization, though it may not be economically feasible on some areas.

The new units when established will draw off the surplus population of the rural areas.

West Pakistan by the end of 1962 will have 86 mills with a capacity of 2,001,520 spindles and 33,129 looms.

### **Production of Yarn**

Table No. 2 gives the production of yarn and surplus yarn available since independence.

The total production of yarn as well as surplus yarn has shown a continuous and steady rise over the production in 1948. According to the present installed capacity

of spindles, the production of yarn is about ten lakh bales of 400 lbs. each. The mills own requirement is a little over four lakh bales per annum leaving six lakh bales as surplus to be used in allied industries and handlooms.

**Production of Cloth**

The production of cloth is given in table No. 2 and figure No. 7. There is continuous increase in the production of cloth since 1948, much more so since 1953 following the abolition of Open General License. By 1961 the production increased by more than 780 per cent.

**Production & Consumption of Cotton**

The production and consumption of cotton from 1948 to 1961 have been given in table No. 3 and figure No. 8. While the consumption of cotton has been steadily growing, the production of cotton has been, more or less stable at about 1.7 million bales, leaving a smaller and smaller margin for export. The target of cotton production at the end of second 5-year plan in 1964-65 is 2.3 million bales. In view of the rapid pace at which the textile industry has grown this target may have to be substantially revised. But it will be necessary to increase the production of fine qualities of cloth

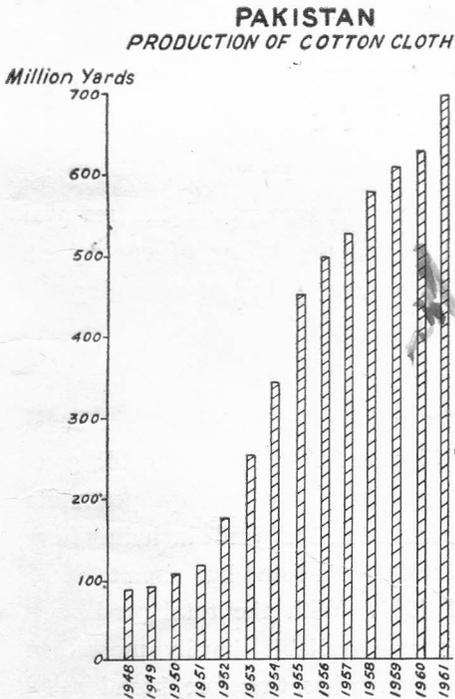


Fig. No. 7

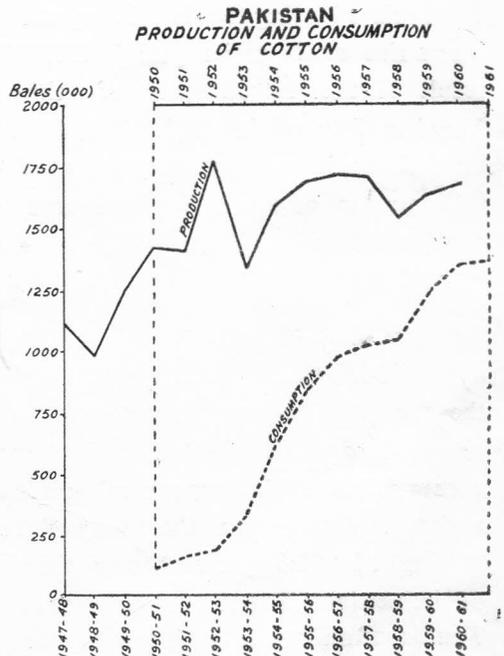


Fig. No. 8

and also to produce cotton with a staple length of  $1\frac{1}{4}$  inches which is in heavy demand in domestic and international markets.

To increase the production of cotton, a cotton zone has been created in the Gudu Barrage area. Such zones may be extended to Ghulam Muhammad Barrage and other lands.

### Imports & Exports of Yarn and Cloth

The imports and exports of yarn and manufactures have been shown in table No. 4 and figure No. 9. In the early years of independence when the textile industry was in its infancy there was almost complete dependence on import of yarn and cloth to supply the handlooms and the local and immigrant population. But since the imposition of control in 1952-53, the imports of yarn and manufactures has been very small falling to a minimum in 1958-59.

The exports of both yarn and cloth, started in 1954-55 and went on rising till 1956-57 after which there was a fall. The rise in exports had its impact and there was a shortage of cloth with the consequent rise in local prices leading to a fall in export. There was a rise again to its peak in 1959-60 as a result of the introduction of the Bonus Voucher Scheme in 1959. But the exports have fallen in subsequent years as the local prices rose on account of the removal of control in prices (1959-60) imposed by Martial Law and the lifting of control on yarn and cloth in January, 1961, in conformity with the general policy of enlarging the area of free market.

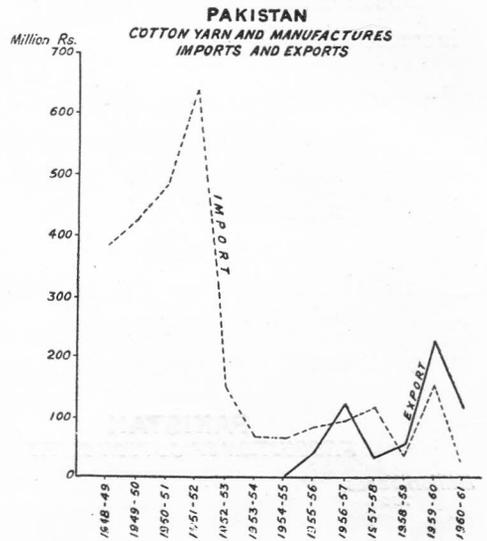


Fig No. 9

### Future of the Industry

Although the cotton textile industry has the unique distinction of exceeding the Second Five-year plan target in the first 15 months yet it has still great scope of expansion in future. In the second Five year plan the average per capita consumption of indigenous mill-made cloth was estimated at 14.5 yards including finer varieties. According to the census of 1961 the population of Pakistan has risen to 93.85 million or by 23.8 per cent over the population of 1951. With the total production of cloth estimated at 699 million tons in 1951, there is now available hardly more than 7 yards of mill-made cloth per capita. The supply of cloth has, therefore, been lagging behind the demand for it. And there is not only a high rate of increase in the population but also a rise in the purchasing power of a section of population brought about by the development process.

Although the industry has made considerable progress in coarse and medium varieties, the production of fine and super fine varieties, though rising, is still very inadequate and represents only about ten per cent of the total production against 30 per cent estimated in the Second Five Year Plan. Arrangement has been made for the import of 50,000 bales of American cotton this year to boost up the production of finer quality of cloth.

Apart from meeting the domestic demand, the industry should grow enough to compensate the loss, current and future, of the country's earnings from the export of raw cotton and has thus to step up its export at competitive prices.

Encouragement is being given to produce more cloth than yarn for export as it earns more foreign exchange. More and more looms are therefore to be installed. The government have already announced their plans for assistance in speeding up the transformation from hand looms to power looms. It may be done through a network of weavers co-operative societies likely to be set up under the auspices of Small Industries Corporations. Greater availability of power and the manufacture of looms within the country will greatly help in this mechanization of the handlooms which are working at present.

In addition to the setting up of the new units attempt is being made to replace the old machinery and modernize the existing industry and remove the imbalance of mills in spindles and looms where it exists.

The future of the industry mainly lies not merely in catering for the home country but in increasing our exports. But in the markets of the world Pakistan is faced with the competition from a number of countries primarily from United Kingdom, Japan and India. These countries have long experience in the manufacturing and the marketing of cotton piece-goods. They have skilled and efficient labour which is also cheap in the case of Japan and India. Japan and United Kingdom have also the advantages of good textile machinery and the spare-parts can be immediately replaced when necessary. In Pakistan imports of machinery and spare-parts are difficult on account of limitations of foreign exchange. And on the other hand the spare-parts in plants are to be replaced at a higher rate than in these countries because of the lack of suitable technicians and proper handling of the machines. Although cotton is available here at cheap rates, other raw materials like dyes or chemicals are costly and off-set the advantage of the cheapness of cotton. Under the circumstances maximum production from the installed capacity, the lowering of cost of production through vertical integration, reorganization of the industry into more economic units and proper humidification in the spinning department will be some of the measures required for capturing Asian, African and European markets. Maximum use should be made by the mills of cotton waste. It could be utilized for the spinning of coarse yarn for the production of durries and cheap blankets etc. Training facilities should be provided

for skilled and unskilled labour. Higher yielding varieties of cotton should be developed suitable for the production of higher counts of yarn. The abuses in the distribution of the products within the country could be eliminated by the setting up of cooperative stores and fixing quotas for each mill for export.

TABLE No. 1

PROGRESS OF THE INDUSTRY  
1947—1961

Year	No. of mills	Installed Capacity	
		No. of Spindles (000)	No. of Looms (000)
1948	—	177	5
1949	—	236	5
1950	—	290	5
1951	—	333	6
1952	—	630	9
1953	41	793	12
1954	60	1,316	18
1955	74	1,683	26
1956	78	1,801	27
1957	81	1,844	28
1958	85	1,889	29
1959	87	1,928	30
1960	90	1,941	30
1961	93	1,998	30

TABLE No. 2

PRODUCTION OF YARN, SURPLUS  
YARN AND CLOTH SINCE INDEPENDENCE.

Year	Total Yarn Produced During the Period (000 Lbs)	Surplus Yarn During the Period (000 Lbs)	Production of Cloth (000 yds)
1948	29,684	6,203	88,059
1949	33,913	9,260	92,445
1950	43,054	14,877	106,295
1951	53,419	19,375	127,666
1952	69,699	22,416	174,160
1953	120,570	53,470	251,576
1954	192,364	100,299	345,247
1955	274,517	153,654	453,247
1956	300,710	167,275	500,384
1957	315,873	173,685	527,048
1958	345,140	188,703	576,225
1959	392,096	231,884	618,534
1960	408,709	237,495	628,795
1961	412,603	22,508	699,035

TABLE No. 3

PRODUCTION AND CONSUMPTION OF  
COTTON IN PAKISTAN

1947-48 to 1960-61

(In thousand bales of 392 lbs. each)

Year	Production	Year	Consumption
1947-48	1,120	1948	..
1948-49	982	1949	..
1949-50	1,255	1950	130
1950-51	1,424	1951	150
1951-52	1,415	1952	188
1952-53	1,801	1953	331
1953-54	1,442	1954	627
1954-55	1,600	1955	846
1955-56	1,693	1956	961
1956-57	1,725	1957	1,020
1957-58	1,722	1958	1,054
1958-59	1,547	1959	1,240
1959-60	1,640	1960	1,296
1960-61	1,691	1961	1,312

TABLE No. 4

FOREIGN TRADE OF COTTON YARN  
AND MANUFACTURES

1947-48 to 1960-61

(Million Rupees)

Years	Imports	Exports
1948-49	381.9	..
1949-50	423.6	..
1950-51	481.9	..
1951-52	637.3	..
1952-53	146.2	..
1953-54	67.2	..
1954-55	68.6	1.2
1955-56	83.4	35.7
1956-57	92.1	122.2
1957-58	11.5	33.3
1958-59	3.6	5.40
1959-60	15.4	222.0
1960-61	24.3	118.2

## THE INDO-PAKISTANIS IMPORTANCE FOR THE URBANIZATION OF KENYA

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### Urban areas before European colonization

Only sixty years ago town life as a form of living was almost unknown for the majority of the inhabitants of Kenya. No urban area in its real sense existed in the whole of the inner part of the country, but at the coast there were some fishing villages and trading posts such as Mombasa and Kilwa. Old ruins indicate that there once seems to have existed an African culture with strong Indian and Arabic influence.

It is true that large villages once existed in the Nyanza region round the shores of Lake Victoria but these villages did not have any urban characteristics—the huts were scattered and most of them were only used periodically. There was no city nucleus, no permanent population or any specialization of trade other than a sporadic form of fishing.

The excavations at Kilwa show however that this old trading town had certain differentiations between trading centre and residential areas. A comparative study of other coastal towns round the Indian Ocean shows that the city structure of Kilwa was not indigenous to the Swahili people of Kenya but had strong similarities with trading posts on the coast in, for instance, Arabia and India.

Tse-tse belts, malaria regions, the rugged landscape and the warlike tribes hampered cultural contacts from the coasts to the inner part of the country. As compared with Tanganyika with its well marked slave routes in Kenya there only existed sporadic slave raids and a few ivory hunters. Another factor was that the inland of Kenya on the whole was sparsely populated. Many of the Africans were living as nomads or semi-nomads; no form of urban area existed simply because there was no need for this way of living.

In the fertile Uganda area there existed on the other hand urban regions. Buganda kings had enforced a strong supervision of the conquered tribes. The area round Lake Victoria was more densely populated than the Highlands of Kenya and here some larger villages were crystallized round the Kabaka and his family. These villages often functioned as military camps. The urban characteristics of these villages have been described by Speke, Burton and Stanley.

THE INDO-PAKISTAN GROUPS AND SUB-GROUPS IN KENYA. THEIR MAIN CENTRES AND DISTRIBUTION IN PERCENTAGE.

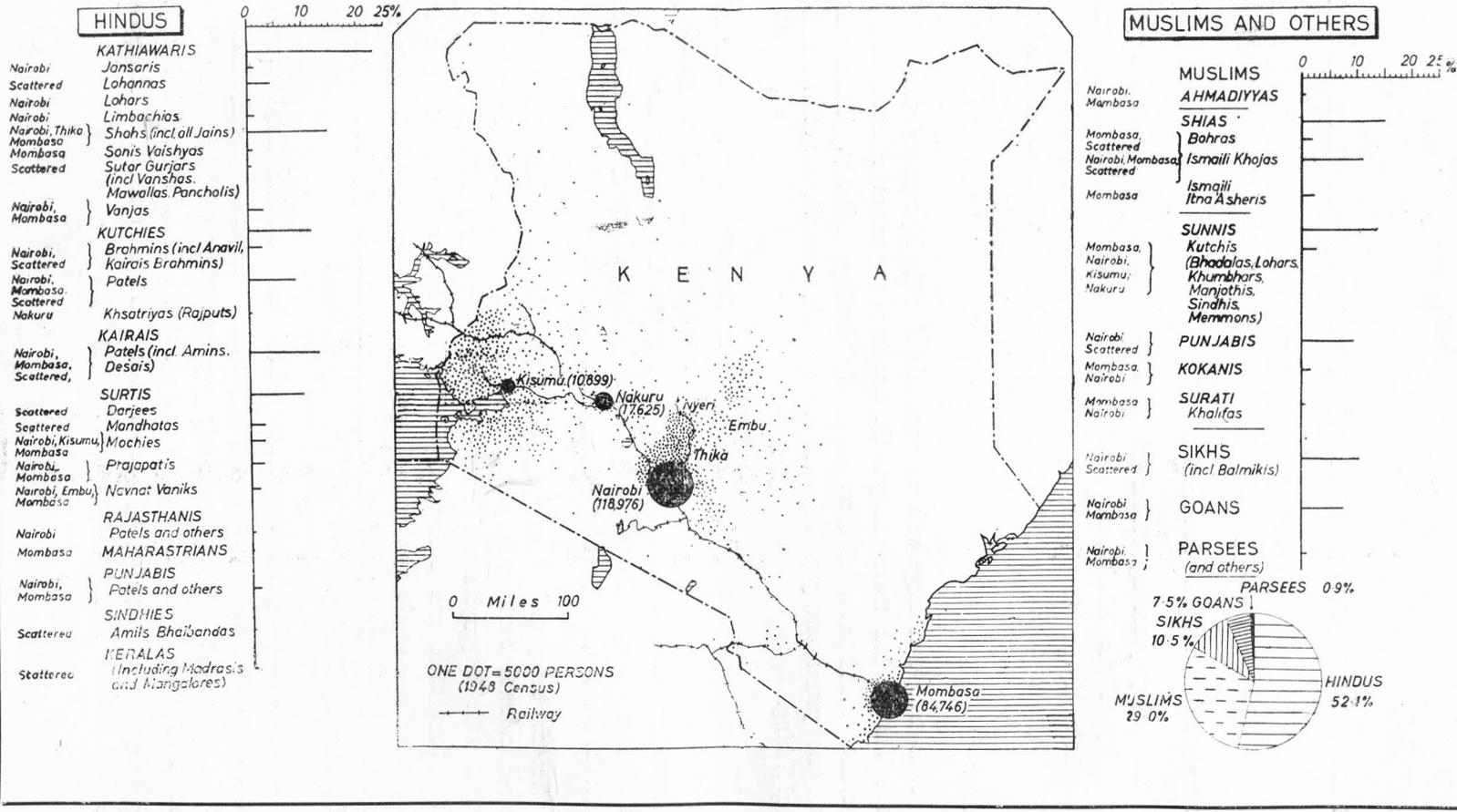


Fig. No. 1

Figures 1, 2 and 3 are based on field studies by the author in 1961 in Kenya and are drawn by Alan Hodgkiss, Department of Geography, University of Liverpool.

The now abandoned Buganda capital, Kibuga, seems to have had permanent population of several thousand people. Its network of streets and its size is evident from the map of Apolo Kagawa, which is reproduced in Roscoe's "The Baganda", but it should be added that even these larger villages should be characterized rather as temporary dwelling places than permanent built up urban areas. Every new Kabaka erected a new town in a different place to that of his predecessor and the former village was burnt down and abandoned.

### White Exploitation

Without too much exaggeration it can be said that urbanization in its true sense was introduced into Kenya with the coming of the Europeans. Even the fishing villages on the coast of the Indian Ocean changed in character and their old centres were given new functions.

It should be added that the establishment of Indo-Pakistani trading posts on the coast of Kenya is very old just as the presence of the Arabs; but their number was small and had very little or no effect on the living conditions of the majority of the people. The main numbers of Indo-Pakistanis started to come to Kenya after the railway had been built, but it should be stressed that they are not necessarily descendents of the contracted labourers that built the railway of which only a few stayed on (see Figs 1—3 for the areas of emigration and their present distribution in Kenya).

When Kenya came to be administered by British colonization the administrative officers had virtually to go out into the bush and erect urban areas from where administration could be carried out. At this stage the Indo-Pakistani *duka-wallahs* (general traders) played an important role. As a result of an early localization policy the Indian business men were not allowed to trade, except to a very limited extent, outside the trading centres which were under European administrative control. A practice very soon became established and an account of this is rendered by an early British administrator. When a District Officer decided where his Administrative

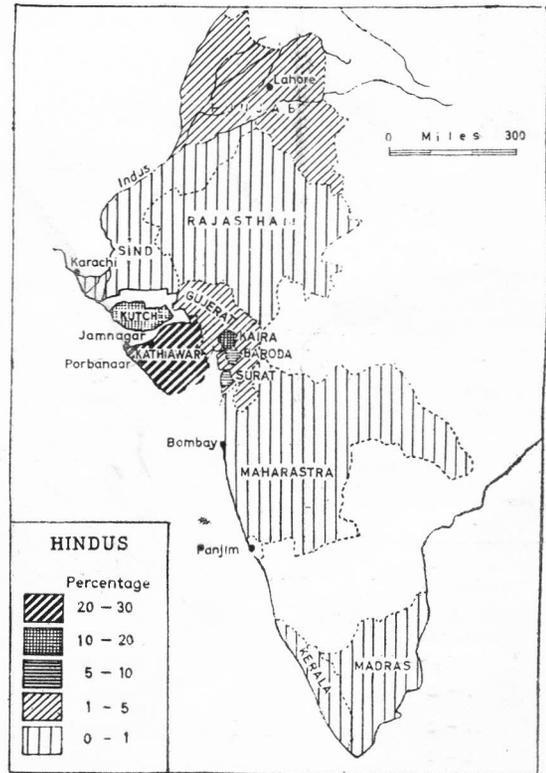


Fig. No. 2. Place of origin of the *duka-Wallahs* (the Shop-keepers) in Kenya of Hindu-faith

Centre should be situated he asked one or more Indian tradesmen to open a *duka* (shop) at the same place as the administration office. The District Officer gave security and the *duka-wallahs* provided the administrators and surrounding African population with necessities. This way of creating administrative urban areas is no older than a life span and the author had, during his research among Indo-Pakistani *duka-wallahs* in Kenya, many possibilities to confirm how this practice had been repeated again and again in order to create many of the small places which today are important urban areas.

When deciding where the administrative centre should be situated the District Commissioner took into consideration such features as water supply, the chief's hut, the *baraza* (for instance a tree under which courts were held and decisions made), traditional market place and the existence of natural routeways.

The most important factor for localization of almost all Kenya's large urban

areas was the railway. The urban centres of varying size are situated at almost equal intervals of approximately 20 miles along the railway. Here stations were created and repair shops established, before the next stage of the work continued. Many of the *duka-wallahs* who had come to the newly created town-nucleus stayed on to become permanent settlers while the "coolies" penetrated the vast wilderness.

During this initial stage it sometimes happened that Europeans tried to compete with the Indo-Pakistanis in trade but most of them did not succeed. In an official report from Machakos—the planned capital of Kenya—it is said in 1909: "Trade in the district is carried out by Indians, Swahilis and a few members of African tribes. There are 18 shops, in Machakos of which three are European, two of these are on farms and the owners are not dependent on the shops. The other shop, I regret to say, was put up by a European on another man's land. The owner was dependent on

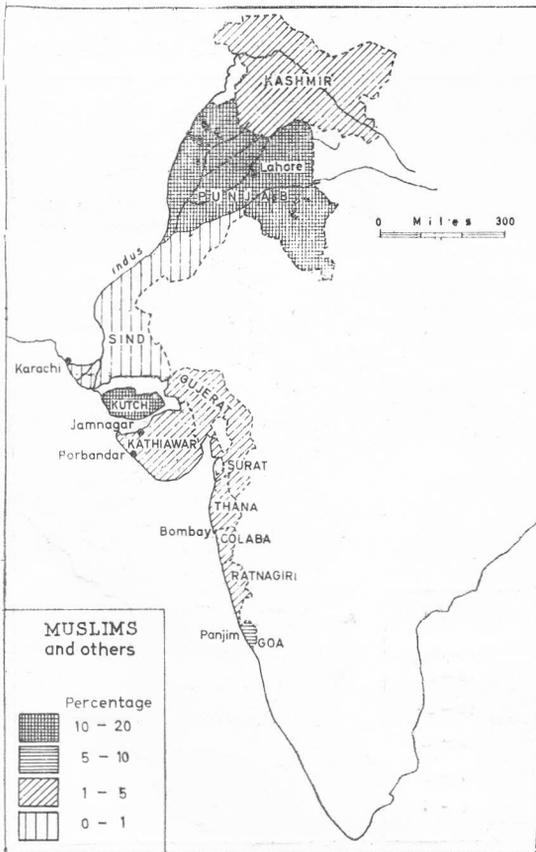


Fig No. 3. Place of origin of the *duka-Wallahs* (the Shop-keepers) in Kenya of Non-Hindu-faith.

was put up by a European on another man's land. The owner was dependent on

the shop and could not make a profit and is leaving the country". (Annual Reports District Commissioner Machakos, 1909).

The trading dominance of the Indo-Pakistanis was almost complete during the initial stage, but it was not without danger even when the *duka-wallahs* put up their shops under British protection close to the railway. This is illustrated by the following words from an official annual report:

"In 1922, six plots have been granted at Athi River Station, the original plot builder was raided in February and his shop-gutted and burned. Massis were alleged to be the culprits". (Annual Reports, District Commissioner, Machakos, 1923).

In areas where urbanization grew freely without any previous town planning the Bazaar area formed a distinct unit with strong Indo-Pakistani characteristics. Early photographs of a bazaar in Nairobi in the early part of this century have striking similarities with trading districts in Kathiawar or the Punjab from which so many of the *duka-wallahs* of Kenya originate. Even after the plots were marked out and the town system of Hippodamus enforced by the European administration, the business centres of Kenya have maintained a special Indo-Pakistani style which assimilated European features but maintained the traditional peninsularian architecture. This same form of development has occurred, for instance, in the Southern States of America (Colonial Style) or in South Africa (Cape Dutch), where the architecture of the motherland has been retained to a certain degree.

Besides the urban areas along the railway and the administrative areas a third category arose; the trading centres or as they have been called, *duka* towns. This third type of urban settlement was formed after the Colonial administration had grown strong in the country. The supply of water, natural communications etc. were less important; the final position was finally in the hands of Colonial Central Administration. From a table in Mombasa, or latter Nairobi, trading centres for the African population of Kenya were mapped. Indo-Pakistani *duka-wallahs* who were interested had then to travel out to that area which had been fixed on the map and from there start to trade. The policy for this form of legislation was "to limit the trading activities of the non-African in order to protect the way of life, land and trade of the indigenous people" (The Township Ordinance as quoted in E. A. Royal Commission Report 1953—1955, Page 201). In this way the model of urban areas was created in the whole of East Africa before 1925. For Kenya more than 1/3rd of the urban areas of 1948 had been officially declared before 1914. The regulation that once created the urban areas of the country has now outlived itself.

Even before politics began to influence the picture the Indo-Pakistani businessmen could not freely trade in the rural areas, because of hampering regulations. In

many cases they have been forced to stay in a Bazaar in an urban area which is already over-traded. The legislation of Kenya has certain parallels in South Africa, but there are many more restrictions regarding the Indo-Pakistani population and its settlements.

Another feature which has attributed to the urbanization of the Indo-Pakistani population in Kenya is their ability to work under very hard conditions. There were no markets in the European sense when the *duka-wallahs* started to trade. The result was shown perhaps first after one or two trading generations. It is the Indo-Pakistanis that made the transformation of Kenya possible from a country without any urban areas to a varied form of settlement. Without the Indo-Pakistanis the European administrators would have had to cope with almost impossible conditions. The policy of the English colonial rule underlined the need that the African rural way of life should be maintained and developed rather than an urban "black elite" should be created. This policy of indirect rule meant that Africans as much as possible were kept outside urban areas which instead numerically were dominated by Indo-Pakistanis. Not before the industrialization became an important factor in Kenya, and this happened only during and after the Second World War—did the African urban population become numerically important. Up to that time the urban areas were looked upon as centres for administrative and commercial activities.

The urban areas of East Africa were created as 'healthy islands' surrounded by an ocean of illnesses and diseases. Water, drainage and electricity, hospital treatment and control by the military were factors necessary for the European administration. The Colonial town in Kenya therefore consists of the following parts :

(1) *The Central Part* with broad avenues, illuminated by electricity, and with parks. This part of the town has full amenities, electricity, water and drainage. This is the centre for the administration, telegraph and European offices.

(2) *The Bazaar*, which is outside No. 1 and consists of a conglomeration of *duka-wallahs*, which together form one or two main streets with small lanes in between. Sometimes the *duka* is used as living quarters when there is more than one storey.

(3) *European living quarters* of villas, bungalows, with well kept gardens, which forms the district which to a certain extent is similar to an English garden city, with the exception that the African servants live in a small shack always separated from the European living accommodation.

(4) *The Indian living areas*. These are a cheaper copy of No. 3 but with a specific Indian character of architecture and colour scheme.

(5) *The African Living quarters*. The contrast between this area and Nos. 3 and 4 is very obvious. There are concrete huts, very often without electricity or

drainage system which is far from adequate. One water tap and one latrine serve four or more concrete huts. The huts have numbers on the walls instead of names and this underlines the character of the inhabitants who are not permanent town dwellers. The houses are often overcrowded.

(6) *The Green Area* with parks and clubs, swimming baths, golf courses, and tennis courts. Until the end of 1950 the clubs were only for Europeans but since then the restrictions have eased and they are now open for all races but economic segregation still exists.

The character and rigid patterns described above are gradually changing with the disappearance of colonial rule and new African dwelling areas with more modern amenities are now growing up.

Long before the Africans started to come into the towns on a large scale as industrial workers a new group of emigrants came from Europe. The Indo-Pakistani population had settled within the areas which were allocated as Indian urban areas already during the initial process of the urbanization of Kenya. The Indo-Pakistani group is the numerically largest part of the non-African town population of the country. According to official statistics there is no urban area where the number of Europeans is larger than the Indo-Pakistanis and the number of Africans has become of importance only during the last two decades in the area outside Nairobi and Mombasa.

Because of political uncertainty and the restrictions over immigrants the Indo-Pakistani population in Kenya does not grow as quickly as during the first stage of the urban development but still the Indians are a dominant part of the town picture of Kenya. When the segregation disappears and free settlement in urban areas of Kenya is allowed it still will take a long time before the picture changes, mainly because of the economic conditions.

During the first part of 1960 important changes in the urban settlement pattern started in Kenya with the building of new areas integrating all races. In the capital Nairobi, in the suburbs South B and South C, Indians, Europeans and Africans are now living in the same urban area. Some well-to-do Indians have moved to the outer parts of the European residential areas and the same trend can be seen between the Indian and African areas.

The importance of Indo-Pakistanis for the urbanization of Kenya is still very marked. They own or rent most of the business areas in almost all large urban areas in the whole of Kenya. This picture is not likely to change very quickly, unless the Indo-Pakistanis are subjected to strong economic and political illtreatment.

The Indo-Pakistanis are facing a new era. Numerically they are the biggest non-African group in the towns of Kenya and they still maintain economic dominance over the retail and wholesale trade.

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## TIBET TODAY

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Tibet whose inhabited nucleus was originally called 'Po' in Tibetan language, is a region whose physical landscape is dominated by mountains, cultural landscape by monasteries, population by monks and political destiny by the most numerous of Asians—the Chinese. It was considered a sealed book and a mysterious land of the Lamas even upto the beginning of the present century. Today this mountainous state is neither a sealed book nor a mysterious land. Not only its isolation has been obliterated but it has also become important in several ways in the affairs of Asia. The aim of this paper is to describe the place and role of Tibet in Asia along with a brief back-ground of her geographical features and the social and economic conditions that prevailed or still prevail in Tibet.

### **The Geographical Setting**

Such epithets as "Roof of the World" or "Dead Heart of Asia" reveal to a very great extent the geographical personality of Tibet. In an area of approximately 470,000 sq. miles the lofty plateau of Tibet has remained nestled for centuries in a mass of tangled mountains having steep gradients, narrow valleys, deep ravines and all such features that foster isolation per se. The initial upheavals of Himalaya have formed an axis from west to east which roughly corresponds with the rim of the northern waterparting of the Indian hydrographic basin. Two glaciations have left their mark on the Tibetan landscape in the shape of numerous lakes. The hydrographic note of Asia also appears to be centred on Tibet since the mighty rivers of Asia such as Indus, Hwang Ho, Yang Tse Kiang, Brahmaputra, Mekong and Salween—all start their journey towards the ocean from the territory of Tibet.

Tibet is not only a land of sprawling mountains but its main regions are also dominated by several outstanding features. In the north are the plains, known as Chang Tang, with an average elevation of 16,000 ft. It is, in fact, a mass of treeless plains and valleys where continuous desiccation has left on the surface numerous salt lakes or a crust of salt. The lakes vary in size from one hundred square miles to one thousand square miles. Tengri Nor represents a salt lake of big size. Mansarower and Raksa Tal are sacred lakes near the source of Sutlej. The entire area is semi-arid and infertile and as such this intensely cold, wind swept, storm beaten and inhospitable patch of Asiatic world is very sparsely populated by the nomads from Mongolia.

Southern Tibet consists of the valleys of the upper Indus and the Sutlej in the west and of the great valley of Brahmaputra which is known as Tsangpo in Tibet,

Southern Tibet as defined here is known as 'Po' and contains in its fold the main inhabited area of Tibet. Here also the lowest plains occur at an altitude of 12,000 ft. Terraces have developed in this area due to the alluvial deposits. Cultivation on a small scale has, therefore, become possible in this part of the country. Eastern Tibet or the province of Kham falls between Chang Tang (Northern Plains) and the Chinese border. This province consists of mountains and valleys that run in north-south direction as an effective barrier against Western China. It, however, contains abundant grazings and extensive forests.<sup>1</sup>



Fig. 1. The Geographical Setting of Tibet.

In short the mountainous surface as well as the rigours of climate particularly the heavy snowfall, ice and blizzards have always remained a great obstacle in the development of surface communication in Tibet. This fact is fundamental to the understanding of the political geography of Tibet, for the absence of communication lines and lack of strength on the part of China to overcome the great physical obstacles explain to a very great extent the temporary and intermittent hold of China on Tibet in the past. Since China has now acquired enough strength and resources to surmount such obstacles, Chinese efforts in irredentism have also acquired a compelling strength.

(1) See also "Tibet as a Grazing Land" by F. Kingdon Ward in *Geographical Journal*, January 1948 pp. 69-75. In this paper the author distinguishes six sub-regions in Tibet (i) Interior plateau 260,000 sq. miles, mainly desert; (ii) Outer Plateau, 400,000 sq. miles, mainly grazing with population on the outer fringes, (iii) Rainy gorge region, 46,000 sq. miles, largely forest, (iv) Arid gorge region, 30,000 sq. miles, largely semi desert but forested at higher slopes (v) Tsaidam, 37,000 sq. miles, mainly grazing and (vi) Chinese Tibet, 92,000 sq. miles, grazings and forest with some cultivation and a relatively large population.

### The Resources and Economy of Tibet

The topographic texture of Tibet not only explains the major cause of her exclusiveness but it also determines in association with climate the potential as well as the effectively utilised agricultural, pastoral and mineral wealth of her territory.

Successful sedentary agriculture is of some significance in Central and Eastern Tibet only because these areas enjoy a relatively fertile soil, a better supply of moisture—averaging approximately 40 inches per annum and a longer growing season than any other part of Tibet. Elsewhere i.e., in Northern Plains and Western Tibet agriculture is seriously hampered by semi-desert surface conditions and a short growing season. In all such areas including the upland of Central and Eastern Tibet, nomadic activity is more important and sheep and goat constitute the chief wealth. The dominance of pastoral activities in these areas, in fact, represents a normal human response to circumstances produced by high altitude, interior location and unfavourable surface and climatic conditions. Maize and barley are the common crops. But barley occupies the status of a staple crop as four fifths of Tibet's population lives on it. The cultivation of rice and wheat is very limited on account of unfavourable conditions of growth for these cereals. Onion, known as '*tsang*' is the only vegetable that grows in Tibet in large quantity. Nuts locally known as '*starka*' occupy the first place among the fruits. Due to a general scarcity of rain, irrigation is practised wherever it is possible. Scarcity of food is, however, a characteristic feature even in the relatively fertile south and east on account of the limited and primitive nature of agriculture. Famine and food shortages also created difficult problems for maintaining a large body of troops in these areas. In 1951 food shortage was, therefore, a problem of great magnitude for the Chinese forces beside the difficulties of communication.

Like his counterpart in areas of similarly poor productivity and unblest circumstances, a Tibetan farmer is obliged to combine animal husbandry and some other indigenous activities with his schedule of farming activities. Carpet weaving and cloth weaving are most important occupations beside tilling the land and tending the animals.

Mineral wealth of Tibet has remained unexploited not only due to her remoteness but also on account of the lack of means and incentive among Tibetans to exploit their mineral wealth. An accurate survey of Tibet's mineral wealth is not available but it is believed that gold occupies an important place on account of its universal occurrence in the alluvial sand spread by Tibetan streams. Iron mostly in the form of pyrite occurs in Eastern Tibet. Soda, potash, salt and borax are also obtained in good quantity from the saline lakes of Western Tibet. Eastern Tibet is not only blessed with some cultivable land, abundant grazings and extensive forests but it is believed to be richly endowed with minerals also. Such a synopsis of the mineral wealth of Tibet makes it clear that while the agricultural and pastoral wealth of Tibet is limited, the real limits of her mineral resources are yet to be ascertained through a systematic search for precious items.

The economy and polity of Tibet is explained to a very great extent by her trade and commerce. The volume and composition of trade betrays the actual living condition and the level of prosperity of the native population. The value and direction of trade reveals the nature and extent of Tibet's association with her immediate neighbours.

The principal items that enter the channel of trade are wool, yak tail, furs, musk, borax, salt, herbs, gold, silver, silk, brocades, knives and a few other small articles. Kalimpong is the largest centre of Tibetan wool for almost half of the trade of Tibet and India passes through this place. Periodical fairs are held at small places in order to keep the stream of commercial activities flowing. In such fairs nomads come down from higher places in order to exchange their products—mainly butter and wool with salt, tea and other necessities of life.

Main trade of Tibet has been, at all times channelled towards China. While Sikhs and Moghuls attempted only in vain to establish firm economic ties with Tibet, China swept over the area with better results. Gold has been carried to Peking over a distance of about three thousand miles from the Western goldfields but it has never been carried to Leh which is situated only three hundred miles towards the west of these goldfields. Such a situation has existed, it appears, for two reasons. First, the nomadic population of Tibet occasionally congregates in the permanently settled and more populous parts of Southern and Eastern Tibet for commercial transactions specially for trade by barter on account of the linguistic and cultural affinity with the people of those areas<sup>1</sup>. Second, there has been in the past more frequent contacts between Eastern Tibet and western China largely on account of armed incursions by Chinese and Tibetans in each others territory. Such a unique relationship has been responsible in the past history of Tibet for the several waves of political penetrations between China and Tibet in addition to cultural and economic influences that criss-crossed the two territories. This significant historical development has been aided by the old trade routes. For example, there is a trade route from Lhasa to Chamdo. From Chamdo two routes approach Tachien'u which is situated on the ethnographic border between Tibet and China and which is the chief entrepot of trade along this sector. Here the Tibetan wool is exchanged for Chinese tea. It is through this area that Chinese silk and tea reach Lhasa via Kham in exchange of medicinal herbs, gold, furs, skins and the incense of Central Tibet.

Until disturbed by Chinese advance in 1951, Tibet was importing only cotton goods, corals, precious stones, tobacco, rice, sugar and hardware from India. The customary trade between Tibet and India was, however, restored after a brief period of inactivity by a Sino-Indian agreement in April, 1954. At present Tibetan export to

(1) There are 42 Minority Administrative Units in Communist China. Presence of Tibetan minorities in Tien-Chu Tibetan Autonomous Area, Hai-Yen Tibetan Autonomous Area, Tun-Te Autonomous Area, P'ing Wu Tibetan Autonomous Area, Lu-ting Democratic Coalition Area, and Mu-Li Autonomous is specially noteworthy. All these areas fall in Chinghai and Sikang-parts of North-West and South-West Administrative area according to the set up drawn in China between 1949 and 1954.

India consists of woolen clothes and yarn, carpets and other home-made goods of various description. For the year ending 30th June, 1945, Tibetan imports from India via Sikkim stood at about Rupees twenty lakhs. The total value of trade between the two countries rose to Rupees one crore in 1948. Even at present the annual trade averages Rs. 3.3 crores.<sup>1</sup> The total value of trade, however, experiences considerable fluctuations from year to year, mainly on account of uncertain production and lack of facilities for utilising trade opportunities on an organized basis.

### People, their Religion and Society

The total population of Tibet is estimated to be six million persons, 1.4 million of whom live in Eastern Tibet in Kham, Bolok, Amdo, Sartha and Minyak areas.<sup>2</sup> The Bod-pa, the Dru-pa and the Tanguts are the Major representative groups that differ from each other on the basis of their mode of living and cultural attainments. The Bod-pa group is now considered to have moved out of tribal state and as such it constitutes a more cultured and dominant population.<sup>3</sup> This group is largely concentrated in southern provinces. It is predominantly an urban community. The semi nomadic tribes living in tents in the central table-land are known as Dru-pas. The restless and warring tribes of north-eastern borderlands are mostly Tanguts who move in the wilderness of north-eastern and eastern mountains. Ethnic and religious affinity bring all these groups closer to Chinese particularly the Chinese Buddhists, Nepalese, Bhutanese and the hill people of Garhwal and Ladakh. Lt. Col. Eldred Pottinger maintains that people of Eastern Tibet credit China for giving them works of Arts and Mathematics. Some peculiarities of dress and architectural designs among the frontier tribes shows an influence of Han Dynasty.<sup>4</sup>

The social stratification is, however, of greater significance. Tibetan society consists of four classes, *viz.* (a) The nobility, (b) The traders, (c) The peasants and (d) The herdsmen. A Tibetan family differs from the rest of Asia due to peculiar matrimonial practices that prevail in Tibet. In polyandrous families which are often found in almost all groups of Tibet, several brothers share a common wife. On this point Tibetans comment that "...the wives of brothers make trouble if made to share the common mess and thus the best way to keep the family together is to have all share one wife."<sup>5</sup> But this practice is common more amongst the nomads and wandering tribes.

(1) Statesman Year book 1960, p. 1427.

(2) Ibid p. 1427.

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(4) Pottinger, Lt. Col. Eldred; "Houses in Eastern Tibet", Geographical Review, July 1926, p. 286-80.

See also Stevenson, Paul Huston; Chinese Tibetan Borderland, Geographical Review, Vol. 22, 1932, pp. 599-616.

(5) Hutheesingh, Raja; ed.; Tibet Fights For Freedom; a white book; Longman, 1960; p.11.

Their religious set up Lamaism, without which Tibet of past or present can neither be described nor understood, has been described as a "priestly mixture of Shamanist cult, tantric mysticism, devil worship, Indo Tibetan Demonolatory touched here and there by the brighter teachings of Buddha,"<sup>1</sup> The principles of Buddhism, which provided the base for this new cult in the beginning, experienced such a profound change in Tibet that there finally emerged in its place not a variant but an entirely new version of Buddhism. It is this aspect of Tibetan life that offsets the balance of ethnic and linguistic affinities between Tibet and China. Tibetan Buddhism or Lamaism covered the whole of Tibet when eventually the Lamas secured political power and subdued all those who opposed the new faith. At a later date, however, Lamaism found itself divided into two sects, viz. (a) Ge-Lu-Pa or Yellow Hats and (b) Duk-Pa or Red Hats. Tsong-Ka-Pa who was responsible for introducing the Yellow Hat in the old Lamaism, became famous as second Buddha. The status of Dalai Lama was created in order to pacify the Red Hats who opposed the authority of king Lamas of Sakya. This new and highest office allowed the Dalai Lama to fulfil the role of a God, head of the church and head of the state.

Tibetan clergy has not only unquestioned religious authority but it has also enviable territorial wealth and many financial and commercial advantages. According to the tradition of the country, two out of five male children often used to become priests. As a result of large entry in this class, there are more than 30,000 monasteries and Drepung with a force of 10,000 monks is probably the largest and the most powerful of such centres. The prestige and the power of Lamas has, it appears, suffered rapid decline since the arrival of Chinese in large numbers in 1951. This decline has not only disturbed the peace inside Tibet, but the reported 'Budho-Marxism' also seems to be in the making due to fast changes in Tibet<sup>2</sup>.

### Historical Background

*Rise of Lamas and their kingdom in Tibet*: Tibet became a powerful kingdom in 7th century A. D. All political developments are, in fact, closely connected with the rise of political authority of Lamaist clergy since the appearance of such a kingdom in the country. In the beginning, Tibet benefited immensely from the illustrious rule of Song-Tsen Gampo (7th century) for it was he who introduced Buddhism in Tibet for the first time. He was succeeded by other Lama rulers who gave tremendous strength to Lamaism between seventh century and fourteenth century A.D. Lobsang Gyasto who is also known as the Great Fifth, governed Tibet firmly till his death which occurred in 1860. He was possibly the first strong ruler who was

(1) McDonald, David; Tibet; Oxford University Pamphlet; 1946; p. 19.

(2) With the arrival of the Chinese the privileged status of the Lamas is unlikely to survive. Political observers believe that monastic organization of Tibet is bound to collapse and that such process shall be accelerated in the present circumstances. It is also believed that the under privileged clergy may soon break with aristocrats and give Tibetan Buddhism a new shade viz., Budho-Marxism. See also Tibet and the Tibetans, op. cit. p. 64.

recognized as an independent sovereign by the Chinese emperor of his time. The fifth Dalai Lama created the post of Panchan Lama who acquired only spiritual powers. While Lhasa was made the seat of Dalai Lama, Shigatse became the seat of Panchan Lama.

*Chinese conquests and other incursions into Tibet* : When the sixth Dalai Lama was deposed due to internal strife, Lobsang Kesang became the seventh Dalai Lama. During his time (possibly between 1860-70) the Tibetans invited Chinese help in order to repulse an invasion by Tartars. Chinese help came but it also brought means and methods to establish Chinese suzerainty over Tibet. It is alleged that Chinese residents (ambans) in Tibet prevented all Dalai Lamas upto the twelfth from reaching the age of majority by poisoning them before that time<sup>1</sup>.

Between 1785 and 1855 Gurkhas of Nepal also organized attacks against Tibet. A treaty after their attack in 1855 secured for them extra territorial rights and an opportunity to establish an agency at Lhasa. Gurkhas also secured an annual subsidy of approximately Rs. 10,000 along with a right of trade with Tibet.

### **Political Evolution Since 1900**

*British advance into Tibet* : Tibetans as well as Chinese continued to keep British influence away from Tibet till an armed mission known as Younghusband Mission reached Lhasa in 1904, and concluded a treaty with the Dalai Lama though Chinese upheld their claim on Tibet. Chinese were, however, alarmed at this development. They despatched, therefore, a military expedition to Tibet. Dalai Lama escaped and took shelter in Darjeeling where British authorities won his goodwill and friendship. This phase of power struggle in Tibet ended when a treaty was signed by China and Great Britain in order to regulate the relation between two powers on a formal basis. Great Britain never offered de jure recognition to Tibetan independence but in practice she treated Tibet as an Independent state.

*Tibet between 1911 and 1950* : The year 1911-12 witnessed the fall of Manchus in China and the emergence of Tibet as a defacto independent state. It was at this time that the Dalai Lama assumed control of political power in Tibet and the Chinese were expelled from the country. A year later McMahon Line was defined as the boundary between India and Tibet in the Simla Convention of 1913 which was attended by British, Tibetan and Chinese representatives. The boundary was, however, not demarcated. A treaty which was the result of a prolonged deliberations, was signed and later ratified only by Tibetans and not by the Chinese. With the dissolution of Tibetan sovereignty, Chinese refused to accept the legality of this arrangement which was negotiated at the convention. Indian case is in fact, extremely weak due to the absence of any ratification of the treaty by China.

After regaining the political power, Dalai Lama ruled Tibet with the help of monks and monasteries. Though for a period of about four decades Tibet was distinctly

(1) Huthesingh, Raja; ed. op. cit. p. 4.

drawn into the vortex of modern history in some respects yet it remained neutral and maintained a balance between British India on one hand and China on the other hand. In 1934 as well as in 1940, Chinese attempted without success to persuade the Tibetan government to accept Chinese suzerainty. During this period, however, Tibet never made a formal effort to secure recognition for her sovereignty. Tibet's defacto independence as recognized by Great Britain in practice was also accepted by U. S. A. It was for the first time in 1948 that a Tibetan Trade Mission travelled to Europe and America on Tibetan passports. This was done under loud protests from Chinese quarters.

*Tibet after 1950* : The defacto independence of Tibet ended in 1950 when the Chinese advanced into the country with new aims and new seriousness of purpose. In the last week of October 1950, the reconquest of Tibet was completed by the Chinese Army. While many countries called it an invasion, Chinese regarded it as their domestic problem.

It appears that Sino-Tibetan relations were never happy after the occupation of Tibet by Chinese on account of various reasons. According to Tibetan complaints, new political reforms have been introduced ruthlessly aiming at and causing in many cases the complete destruction of deep rooted social customs and religious practices of Tibetans. The Chinese, however, did not dissolve the Tibetan government headed by Dalai Lama until the last week of March, 1959, when Chinese decided to introduce land reforms in Tibet. Two major revolts in 1956 and 1957 resulted in serious losses to Tibetans and the exodus of Tibetan refugees towards India. The Chinese suppressed the rebellion each time rather ruthlessly by using considerable force. The uprising in Lhasa which culminated in the flight of Dalai Lama from Tibet to India, broke out in the second week of March, 1959. These events remind us of similar events of 1910 when armed Chinese advance compelled the Dalai Lama to seek asylum in India. But there occurred a revolution in China in 1912 which helped the restoration of autonomy in Tibet and the return of the Dalai Lama to his homeland. The present situation appears to be different and it is doubtful if the Tibetans can now regain autonomy on their own terms.

*Some other developments since 1950* : China regained full control of Tibet in 1951. A Preparatory Committee for the Tibet Autonomous Region was constituted in 1955. The local administration was carried on with the help of Dalai Lama. But reports have also revealed that Sino-Tibetan relations were, from the outset, characterized by discord in many spheres. This discord developed into unrest and revolt mainly because the Chinese alienated Tibetan leaders, i.e., Lamas by introducing reforms that aimed at the dissolution of Tibet's social and religious institutions.

Construction of several roads, in difficult terrain and despite numerous odds, is considered to be the most important fact of a far reaching significance that has

occurred in Tibet since 1951. With the help of women conscripts, six roads are said to have been completed between Lhasa and frontiers of Tibet. A motorable road now runs between Lhasa and Gartok via Shigatse, Saka and Tradom. This road is being extended, it is reported, upto Kashmir in order to connect Ladakh, Leh, Gulmarga and Srinagar. This new road has been laid roughly parallel to the northern border of India specially in the vicinity of Nepal. Lhasa is now also connected with Gangtok in Sikkim via Gyantse. The two major highways, connecting Tibet with China, were completed in 1955 inspite of the hostile activities of Tibetan tribes and numerous difficulties produced by weather and terrain. The road between Lhasa and Taklakot is, in fact, a continuation of the road running from Chungkiang to Lhasa via Chamdo. It is reported that airfields and air strips good for the use of military aircrafts have been constructed along all new roads<sup>1</sup>. There is also under construction, beside all weather roads, a single track railway line. The new railway line will run upto Yatung via Ka-erh-mu Heiho and Lhasa<sup>2</sup>. An air service between Central Tibet and China was inaugurated in 1957.

### **Role of Tibet in Asia**

Tibet existed in the past almost as a vast void between Soviet Union, South Asia and China. Due to her pacifist population and large area that was also difficult, Tibet remained an ideal buffer state between more powerful territories. It was considered a sealed book or a mysterious land because it kept itself in isolation at all times except when the war lords of western China advanced upto Lhasa. The role of Tibet was determined in the past by two main factors; first, her high altitude and difficult topography which fostered isolation and second, the internal political conditions of the neighbouring countries. In the past Tibet not only remained strictly neutral but inspite of her defacto independence of about forty years, she made no serious effort to get her independent nationhood recognized by other countries of the world. In the years that have passed away, she only maintained a balance between a relatively strong South Asia and a weak China.

At present Tibet has unveiled new elements of geo-political significance due to the Chinese advance upto southern and western margins of her territory. While it is possible for China to use Tibet for strategic purposes in order to deal with South Asia, it is not possible for South Asia to depend upon it and accept it as a neutral area. The boundary between China and South Asia does not consist of a void any more but now it has become a razor's edge like any other boundary which does not enjoy the blessings of a frontier. This has happened at a time when mountainous areas have acquired immense strategic significance and when the neighbouring countries of Tibet have acquired great strength and new ambitions. In short, when possibilities of

(1) Hutheesingh, Raja; ed., op. cit.

(2) Chung, Kuei-Sheng; *The Changing Railroad Pattern in China*, Geographical Review, Vol. II, October, 1961, pp. 534—548.

clash of interest were limited, Tibet existed as a quiet buffer state between more powerful neighbours. In the context of present political situation an independent and relatively isolated Tibet could have maintained the same balance which it did in the past. But her occupation by a country like China, whose modern build up is described as tremendously strong in all fields, has it appears, disturbed the balance thoroughly in this part of Asia. Tibetan population is so small that like Mongols and Manchus, Tibetans can also be outnumbered by the Chinese at any time. This possibility makes the existing situation more irksome. In the light of these facts it can be stated here that Tibet's role in the past was simple since as a large mountainous void she kept the larger neighbouring territories at great distances. At present her role has been compounded by such factors as immense demographic increase and economic build up in the neighbouring territories, vileness of expansion, technological developments, annihilation of distance, upsurge of communism and effective occupation of Tibet by China. Her future role would now depend upon the political and economic strength of China and her foreign policy. Thus while in the past, role of Tibet was the result of agreement between Great Britain and China, her role at present and future would be the product of China's policies alone. Even now China has a stiff attitude towards India inspite of India's conciliatory attitude towards her.

### Some Interpretations

Chinese activities in Tibet have caused considerable apprehension outside China since 1951. India is rudely awakened as she would be more seriously affected by whatever may happen in Tibet now or in future. It has also become apparent that China neither wants to accept the result of Simla Convention of 1913 nor she would accept the McMahon Line as the correct boundary between India and Tibet. Furthermore, it is believed that military occupation of Tibet by China has accomplished the following results :—

- (a) It has added more territory which gives a greater depth to the mainland of China. In this way it has also consolidated the national defenses of western China as claimed in the Peking announcement.
- (b) China has secured a firm hold on an area which is unexplored with respect to mineral wealth and which is considered to contain, 'the most considerable water reservoir in the world'.
- (c) It has rendered South Asia vulnerable due to new communication network and fortifications that have been established by China up to Kashmir, Bhutan and Sikkim.

It has also been observed that road construction in Tibet during less than last ten years has been far in excess of the requirements of maintaining only peace in Tibet. In this connection some well known facts have much more to suggest. First, the construction of these roads was carried out with the help of women conscripts and it was given top priority after the 'liberation of Tibet' inspite of extremely adverse topographical and weather conditions. Second, these roads have no commercial significance. Instead they possess high military value and give China from her bases in Tibet direct access to Kashmir and India. Third, airfields and air strips capable of handling fighters and bombers have also been built at all suitable locations. In addition to these air bases, there are also strong garrisons and fortifications. For example, the western

terminus is said to have a Chinese garrison of 4,000 persons. Taklakot has an equally strong garrison. Chinese fortifications on Bhutan and Sikkim border have also been strengthened. Fourth, the recent Chinese maps show Bhutan as a part which was in addition to Sikkim, considered a part of China in the past. Fifth, remapping of border areas and reported espionage work by China continues in the border area while interior parts of Tibet are undergoing radical reforms. Sixth, Wang Tsan, Head of the Chinese Army is reported to have said that "Between Peking and Delhi there are no large rivers. We can approach Delhi easily through Kashmir." China may not actually approach Delhi but in the light of these facts, it appears highly probable that China has long term plans for more territorial annexations and for a test of strength with India. In the context of such a situation Tibet can be helpful to China in occupying the border states under the umbrella of Chinese Air Force. In fact Chinese fortifications and air bases in Tibet are so located that they can cause maximum harassment to major cities of India and at the same time render retaliatory action rather difficult. (See Fig. 2) A desire for the leadership of Asia can only give more incentive to China

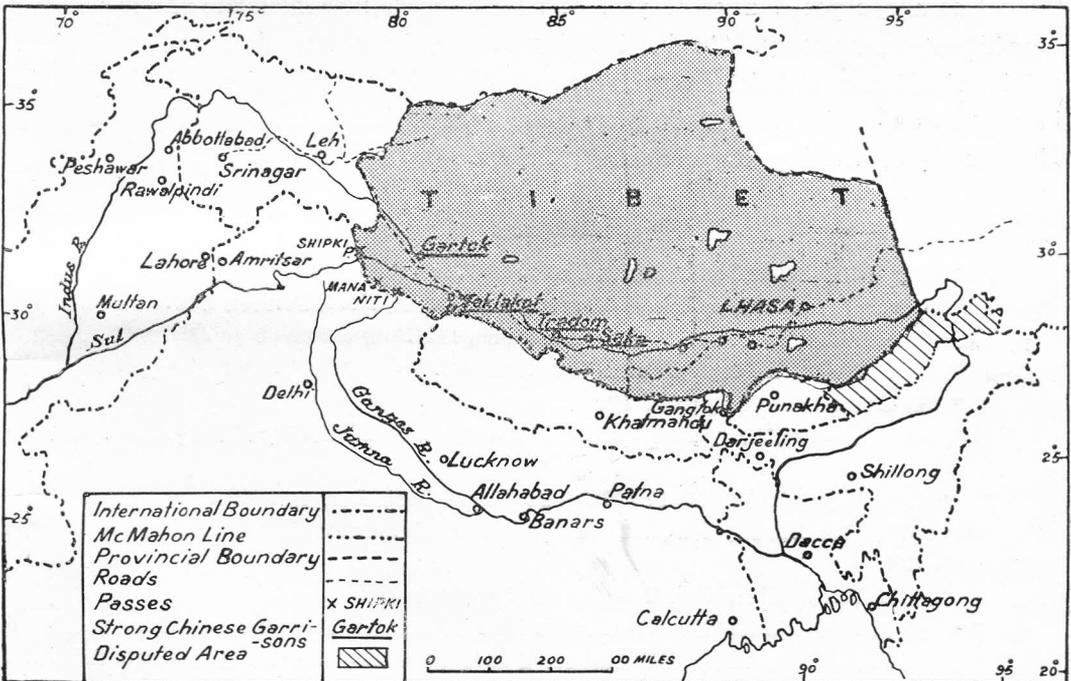


Fig. 2. MacMahon line and its vicinity. Though the area between Taklakot and Leh (including the area north of Leh) is relatively quite yet controversial Sino-Indian claims for places in Indian Sector are of a disturbing type.

in giving effect to her designs at opportune moments. This kind of skepticism is substantiated by the present Chinese attitude against India. China has on the one hand refused to recognize the legality of McMahon Line as the boundary between India and Tibet but on the other hand she has accepted McMahon Line where it defines the frontier between Burma and China even though the Burmese frontier by this arrangement reaches closer to the heart of China. She is at peace with Nepal but the disputed

(1) See the Army quarterly and Defense Journal, London, Vol. LXXIX, No. 1, October, 1951, pp. 93-101.

area in the North Eastern Frontier Region of India amounts to approximately 40,000 sq. miles. (See Fig. 2). Chinese not only challenge the claim of Indians in the six disputed passes along Punjab U. P. sector, but in their argument is also found an emphasis on the element of ethnic composition of people of the Himalayan states<sup>1</sup>. Furthermore, China's refusal to accept the legality of McMahon Line means that India's northern border west of Nepal is also unsettled. Today the major scene of dispute appears to be localised in the north eastern frontiers but the future is cloudy with respect to McMahon Line that falls in Punjab and U. P. sector. As a matter of fact, Chinese aims have acquired an element of mystery in this manner.

India, however, continues to ignore or underestimate the viability of China. From the trend of events inside Tibet, it appears that within four to five years time new events may take place involving not only Tibet but India also. In fact, Tibet has, in the last decade, exposed a great part of Asia to such new interstate dealings which were hitherto unnecessary. The inevitability of new inter-state dealings has acquired striking significance and also a crucial nature because it involves China and South Asia in general and China and India in particular—in each case the opposing sides being identified by contrasting viewpoints and attitudes.

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(1) India claims that the southern end of Shipki La, Mana, Niti Kungri Bingri, Darma and Lipu Lekh passes—all in Punjab U.P. sector, fall in India. Chinese, However, maintain that people south of these passes are of Tibetan stock and have paid taxes to Lhasa. See also 'The Geography and Ethnics of Indias Northern Frontiers' by Sir Olaf Caroe in *Geographical Journal*, Journal Vol. 126, pp. 208—309.

## GOMAL RIVER PROJECT

The Plains of Dera Israil Khan District on the Gomal Zam and its tributaries, consisting of rich alluvial soils, depend upon the flood waters of the Gomal Zam and other torrents for its irrigation. The flood waters are diverted by means of small earthen bunds into dyked fields which after the water has soaked through are sown to crops. In a year of manageable floods occurring at suitable intervals, a rich crop of wheat and oil seeds is obtained with little effort beyond the initial preparation of fields, bunds, and dykes. In recent years, however, the uncontrolled flash run-off from the vast catchment which the Gomal Zam drains, has started causing severe damage to fields, standing crops, communications, canals and buildings. In 1956, Kulachi town, a tehsil head quarter was razed to the ground to the last house. What is still more alarming is the insidious threat which the present situation holds to the agriculture of the district. Not only is good agricultural land being eroded by each flood, but the flood torrents have started cutting deep ravines which are deepening with each succeeding flood. Thus making diversions to fields by means of earthen bunds build with manual labour increasingly difficult. The result is that the area under agriculture is steadily on the decline and a once prosperous district has in the life time of the present generation turned into one of the poorest in the province. The Gomal Zam ultimately joins the Indus and when the latter river is also in spate, as frequently happens, the former contributes substantially to the flood hazard of the latter. Impounding the Gomal and the Zhob at Adam Kot will absolutely control the floods and provide a store of water for agriculture.

### The Scheme :

With these ends in view, in 1951-52, a scheme was initiated by the Public Works Department of the former North Western Frontier Province. Later a proposal was considered by Irrigation Department of West Pakistan for a dam at Gulkatch to harness the Gomal River in Dera Ismail Khan district for the purposes of flood control and irrigation. After its transfer to WAPDA the project was again reviewed

to assure optimum development of Gomal River waters. The whole of the Gomal river Valley was investigated and it was found that by constructing a dam about 5 miles down-stream of the confluence of Zhob, Gomal and Wana Toi complete control over flood waters could be achieved and that this water could be utilized to irrigate roughly 164,000 crop acres annually and to generate 73,000 K. W. of hydro-electric power. By utilizing the natural slope available between Khajuri Katch and Mian Noor another 37,000 K. W. could be added to the scheme. After detailed examination it has been decided that for the present only a dam at Khajuri Katch with a power plant of 73,000 K.W. installed capacity and balancing reservoir at Mian Noor with irrigation outlet and canals should be constructed.

### Salient Features :

Downstream of its confluence with the Zhob and Wana Toi, the Gomal River cuts through a narrow gorge in good competent limestone strata. The gorge is only 80 ft. wide at the bottom and about 600 ft. wide at the top and is ideally suited for a 500 ft. high multiple radius thin arch dam. Upstream of the gorge the wide plains of Khajuri Katch forms a beautiful reservoir of 2.5 million acre ft. gross capacity. The Gomal River brings in huge quantities of sediment and, therefore, it is proposed to allocate roughly 1.5 million acre ft. of storage for silt deposit. The ultimate useable storage is just over a million acre ft., which is almost double the normal annual run off in the river. This gives one hundred percent control over the Gomal river waters and makes it a carry over reservoir. A spillway to cater for maximum probable flood of 271,000 cusecs inflowing into a full reservoir, has been provided in the centre of the dam.

A low dam about 1,515 ft. long and its deepest point roughly 73 ft. high is to be built across a saddle on the left bank. This is planned to be a gravity type dam built of either stone masonry or concrete.

The power plant incorporated in the Khajuri Katch Scheme consists of two units of 36.5 mega-

watt each which will be supplied with water through a 19,700 ft. long tunnel of 13 ft. diameter. The gross head across the power plant is 800 ft.

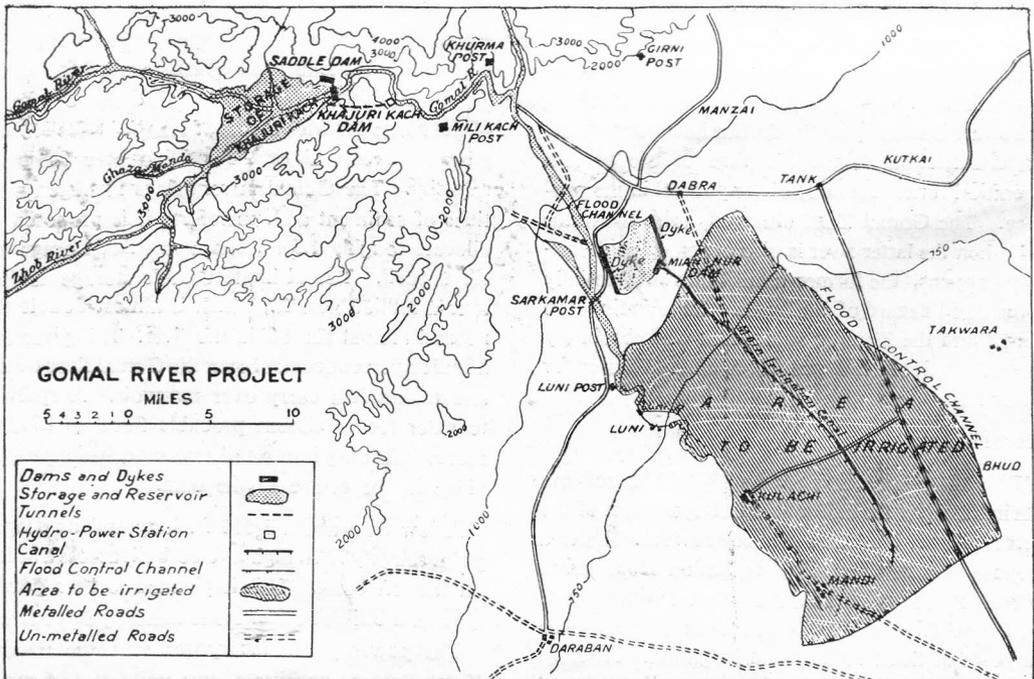
Water from the power plant at Khajuri Katch is let down the Gomal river into a balancing reservoir on Kot Azam Nullah which is the main channel through which the Gomal River flows after it debouches from the hills into the plains at Kot Murtaza. This reservoir is created by putting an earth dam in a gorge approximately 3,000 ft. wide on Kot Azam Nullah channel. The controlled releases from Khajuri Katch Dam are diverted into this reservoir which has a storage capacity of about 104,000 acre ft. This reservoir acts as a yearly balancing reservoir and assure uninterrupted irrigation supplies independent of the power generation requirements at the Khajuri Katch Power station. The maximum over-all height of Mian Noor Dam is 77 ft. with its crest length of nearly 3,460 ft.

The irrigation supplies from Mian Nur reservoir are released through an outlet located at the right flank of the dam. Two dykes, one on each flank have also been provided to contain this reservoir. The one on right known as Kot Azam dyke is rough-

ly 10,135 ft. long and 16.5 ft. high, and that on left bank named Kaur Dyke is 10,000 ft. long and 23 ft. high. A regulator to lead water from Gomal river into this reservoir on Kot Azam-Nala also forms a part of Mian Nur Dam.

Water from Mian Noor reservoir would be led through series of main canals and distributaries, the total length of which shall be 25 miles and 135 miles respectively. All the canals and distributaries are proposed to be lined in order to cut down the seepage losses and obtain maximum irrigation facilities from the available resources. A system of drainage channels has also been incorporated in the Project as a precautionary measure against water-logging and salinity.

In order to protect the irrigated areas from sheet flow and Nullah floods two flood channels have also been provided. One channel runs along the northern boundary of irrigated area and collects waters from Tank Zam and other torrents situated in South and East of Manzai. This runs partly through an excavated channel and partly through an existing Nullah and carries the flood waters into the river Indus.



## KARNAPHULI DAM

The Karnaphuli Dam was inaugurated by President Field Marshal Muhammad Ayub Khan on March 31, 1962.

The huge multipurpose dam project, costing Rs. 49 crores and taking 10 years to complete has a span of 2000 ft. across the Karnaphuli river and is located at Kaptai, 40 miles upstream from Chittagong. It will provide economical power for East Pakistan with additional benefits of flood control, improved navigation and economic expansion in the fields of forestry agriculture and fishing.

The Karnaphuli river rises in the Lushai hills and following a most tortuous route in a general South Westerly strike debouches into the bay of Bengal 11 miles below Chittagong.

In order to provide a potential head for the generation of electric power it was required to dam the river. The site at Kaptai was chosen where the river cuts through a series of northwesterly- southeasterly folded hills and where foundation and structural conditions are adequate for the construction of an earth fill dam and appurtenant structures.

The geology of the site which is characteristic of the Chittagong Hill tracts, essentially consists

of Karnaphuli Alluvium overlying Tipan Sandstone and Surma Shale. This characteristics guided the decision to construct the main embankment as an impervious earth fill structure of materials found at the site. The height of the dam and other features has been controlled by the requirement of creating a reservoir level which would not inundate lands in India to any greater extent than flooding by natural large flows in the river. The low operating head created by this reservoir dictated the choice of generating units of Kaplan type turbines connected to vertical shaft slow speed generators.

### Benefits

#### 1. Power.

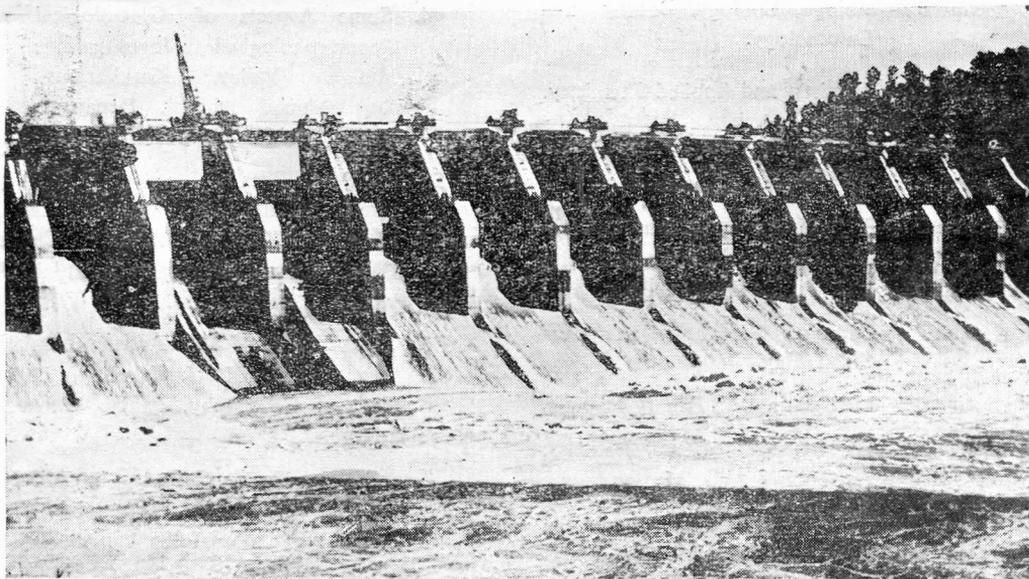
The Project will provide power for the acceleration of the industrial growth of East Pakistan and will save the foreign exchange which would otherwise be required to produce power by thermal generation.

#### 2. Forestry.

The economic expansion of the forest industry due to ease of access to extensive stands of virgin timbers in the reservoir area.

#### 3. Fish industry.

The reservoir can be kept stocked with fish and



*Water rushing over the 754 foot long concrete spillway of the Karnaphuli dam. Maximum flood Capacity of the dam is 570, 200 cusecs.*

profitably and developed for commercial fishing, especially as the demand exceeds the supply of platable fish in the country.

#### 4. Flood control.

The storage capacity of the reservoir and the controlled release of water will absorb the peak of the majority of the river floods. This will represent a monetary saving in the elimination

of much of the present extensive damage caused by flooding.

#### 5. Navigation.

It will greatly improve navigation of the river. It will provide water access for heavy craft to the interior of the Chittagong hill tract throughout the reservoir area.

### THE 14th ANNUAL ALL PAKISTAN SCIENCE CONFERENCE, UNIVERSITY OF PESHAWAR. MARCH, 29—APRIL, 1962

The 14th All Pakistan Science Conference was held at the University of Peshawar from 29th March to 4th April, 1962. The opening ceremony was held in the University Hall on 29th under the presidency of Dr. A. G. Asghar. Field Marshal Mohammad Ayub Khan President of Pakistan, delivered the opening address. Dr. A. G. Asghar, the General President read the general presidential address on Land and Water Use Projects in Pakistan.

On the following day the conference was split in the following sections :—

*Section A* :—Agriculture, Animal Husbandry and Forestry.

*Section B* :—Biology, Zoology, Botany and Entomology.

*Section C* :—Chemistry and Applied Chemistry.

*Section D* :—Education, Sociology and Psychology.

*Section E* :—Engineering, Irrigation, Hydraulics, Communication, Electricity and Public Health.

*Section F* :—Geology, Geography and Anthropology.

*Section G* :—Medicine and Veterinary Sciences.

*Section H* :—Physics, Mathematics, Statistics, Astronomy and Meteorology.

The section of Geology, Geography and anthropology was presided by Professor M. Ashraf Khan Durrani of Islamia College Peshawar. Mr. A. H. Kazmi, Deputy Director of Geological Survey of Pakistan, Quetta, acted as secretary.

The following papers were contributed :—

1. Geology of the Mansehra Area, Hazara district, West Pakistan, by F. A. Shams, Department of Geology, Panjab University, Lahore.
2. Reactions in and Around a Sedimentary Inclusion in the Swat Granite, Gae's; Mingora, Swat. By F. A. Shams, Department of Geology, Panjab University, Lahore.
3. Hydromagnesite from Hindubagh, Zhob Valley, By F. A. Shams, Department of Geology, Panjab University, Lahore.
4. Some Aspects of Glaciological and Geomorphological Investigations in Minapin Valley, Karakoram By Anis Ahmad Abbasi, Department of Geography, Panjab University, Lahore.
5. The Possibilities of Increase of Yield per acre of Cotton in West Pakistan By Muhammad Naseer Ahmad Cheema, Department of Geography, Panjab University, Lahore.
6. Urbanization of West Pakistan in relation to aridity By K. U. Kurzishy, Department of Geography, Panjab University, Lahore.
7. "Cotton Textile Industry in Pakistan" By K. S. Ahmad Geography Department, University of the Panjab, Lahore.
8. Shifting Cultivation in Southern Asia, By Najma Rizvi, Department of Geography, Eden Girls' College, Dacca.

9. Land Use in Makahati Village By Rafiq-ud-Din Ahmad, Lecturer in Geography, Government College, Rajshahi.
  10. "Char Kamrangi"—A Study in Landuse. By (Miss) Ferdousi Chowdhury, Department of Geography, Eden Girls' College, Dacca.
  11. A Sociological Study of the St. Martin's Island By Ziller Rahman Khan, Department of Sociology, Dacca College, Dacca.
  12. Morphometrical Analysis of the Monu River—A tributary of the Surma in East Pakistan By I. Choudury, Dacca College, Dacca.
  13. (N1) Cycle Incised Meandering of the Nagar in East Pakistan By M. I. Chaudhury, Dacca College, Dacca.
  14. A Morphological Analysis of the St. Martin's Island East Pakistan By M. I. Choudhury, Dacca College, Dacca.
  15. A Geographical Study of the St. Martin's Island in the Bay of Bengal By Mohammad Munir-uz-Zaman, Department of Geography, Jagan Nath College, Dacca.
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## STATISTICAL SUPPLEMENT

**Electric Power Statistics 1959 and 1960.**

Electric power statistics was compiled by the Central Statistical office for the year 1959 and 1960 and the data in the following tables were mainly collected from WAPDA, East and West Pakistan and Chief Electric Inspector of Dacca, Lahore and Karachi by personal visits of officials.

In 1960 the total generation by all public electricity supply undertakings in Pakistan was 1449·894 million KWh as compared to 1301·610 million KWh in 1959, representing an increase of 11·4 per cent. over 1959. Of 1449·894 million KWh, 762·206 million KWh were produced by Steam Power Stations, 148·986 million KWh, by Diesel power stations and 538·702 million KWh by Hydro Electric Stations.

Some un-economic power stations were closed down and big power stations such as Warsak, Multan, etc. were established during the year 1960. Additional generating capacity installed in the public supply system in Pakistan during the year 1960 was 320,726 KW, raising the total installed capacity from 335,104 KW in 1959 to 655,830 KW in 1960 *i.e.* an increase of 95·7 per cent. over 1959. Table No. 1, shows the relative proportion of installed capacity and energy generated from Hydro-electric, Steam and Diesel Generating Plants during the years 1959 and 1960.

The data are restricted to public utilities only and exclude the energy generated by Industry-owned power plants, due to non-availability of data by the reporting agencies.

The Power out put in the country is still very low as compared to the population though it is growing steadily. This is supported by the fact that generation per capita rose from 15·0 in 1959 to 16·5 in 1960. It is expected that the out put will further increase on the completion of new power development projects which are at present under execution in the country.

TABLE No. 1  
ELECTRIC POWER STATISTICS AT A GLANCE  
1959

Zones	Installed capacity (K.W.)	Maximum demand (K.W.)	Units produced (million K.W.H.)	Units sold out (million K.W.H.)
West Pakistan	170,804	140,859	850,451	679,313
East Pakistan	107,160	43,509	175,821	138,169
Karachi	5,140	49,100	275,338	227,550
ALL PAKISTAN	335,104	233,468	1,301,610	1,045,032
<b>1960</b>				
West Pakistan	484,832	279,435	910,368	724,936
East Pakistan	108,658	53,025	228,714	177,663
Karachi	62,340	49,100	310,812	251,320
ALL PAKISTAN	655,830	381,560	1,449,894	1,153,919

INSTALLED CAPACITY AND PRODUCTION BY TYPE OF PLANT-1959

Zones	INSTALLED CAPACITY (K.W.)				PRODUCTION (MILLION KWH)			
	Steam	Diesel	Hydel	Total	Steam	Diesel	Hydel	Total
<i>West Pakistan</i>								
Southern Zone ..	5,300	13,264	..	18,564	19·800	30·309	..	50·109
Central Zone ..	46,220	18,740	14,325	79,285	191·865	61·062	52·490	305·417
Northern Zone ..	6,780	4,575	61,600	72,955	27·879	8·306	458·740	494·925
Total ..	58,300	36,579	75,925	170,804	239·544	99·677	511·230	850·451
East Pakistan ..	61,160	46,000	..	107,160	73·820	102·001	..	175·821
Karachi ..	49,000	8,140	..	57,140	262·260	13·078	..	275·338
ALL PAKISTAN ..	168,460	90,719	75,725	335,104	575·624	214·756	511·230	1,301·610

INSTALLED CAPACITY AND PRODUCTION BY TYPE OF PLANT-1960

Zones	INSTALLED CAPACITY (K.W.)				PRODUCTION (MILLION KWH.)			
	Steam	Diesel	Hydel	Total	Steam	Diesel	Hydel	Total
<i>West Pakistan</i>								
Southern Zone ..	10,300	13,264	..	23,564	10·090	30·601	..	49·691
Central Zone ..	181,920	17,378	14,325	213,623	273·495	21·899	66·420	361·814
Northern Zone ..	6,780	2,065	238,800	247,645	24·726	1·855	472·282	498·863
Total ..	199,000	32,707	253,125	484,832	317·311	54·355	538·702	910·368
East Pakistan ..	61,160	47,498	..	108,658	148·776	79·938	..	228·714
Karachi ..	54,200	8,140	..	62,340	296·119	14·693	..	310·812
ALL PAKISTAN ..	314,360	88,345	253,125	655,380	762·206	148·986	538·207	1,449·894

## BOOK REVIEWS

**RACE FOR THE NORTH POLE :** John Edward Weems 240 pp., ill., bibliogr. Index, Heinemann London, 1961.

Man's eyes are oriented spaceward for stirring events in the mid twentieth century but, at the turn of the century, most of the physical goals to be attained were locked in the ice boxes of the world.

The most magnetic, long-sought of the goals lay in the treacherous fastness of the Arctic Ocean: The North Pole. Many lives and much treasure had been spent, beginning with the early days of Northern European sea borne explorations.

In 1909 the world was treated to the kind of controversy which is not only good news copy, but which keeps barbers and scientists occupied expounding theories and making calculations.

Two men claimed to be the discoverers of 90° north latitude, Commander Robert E. Peary, United States Navy, and Dr. Frederick Albert Cook. The author attempts to present both sides of the case but it is obvious that he considers Peary to be the man who really reached the pole, while the evidence presented belies the claims of Cook.

For those of us who have an urge to explore the unknown, actually or in fancy, and who enjoy a good controversy, the book is an exciting journey over icy Arctic pressure ridges and into the pressures of press fed controversy.—JOHN. E. PRIEST.

**HOW PEOPLE LIVE—EAST PAKISTAN :** B.L.C. Johnson, 100 pp. Index and glossary, The Educational Supply Association Ltd., London, 1961.

This book "How People Live—East Pakistan" gives a good introduction of the regional geography of East Pakistan to the junior students. The book contains three sections. Section one gives a clear picture of a family who live in her natural environments; the other deals with the typical modern family and the third with the life in a town. Great effort has been made by the author in selecting samples which really represent typical East Pakistan life. On the whole it gives a good impression of how people live in East Pakistan. The author has spent adequate time in the country to acquaint himself of the habits of the people, their social structure and customs, their likes and dislikes and their beliefs. He has shown the knowledge of their fields, the crops they raise in different seasons, the rivers that form means of communications and transportation, the forests which supply timber and fuel wood, and their helplessness in face of natural calamities in the form of floods and famines.

The approach is excellent and appealing and is designed particularly to meet the needs of children whose interest in geography is very often based on curiosity about the way other people live.

The book covers a number of topics which the teacher can select to pursue further. There are many photographs, large scale maps, and plans of actual farms houses and villages. These details helps the student to understand the text better.

At present there is no good book for children on the geography of East Pakistan. It fills an important gap. It is bound to creat interest in the children.—TUFAIL BUTT.

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