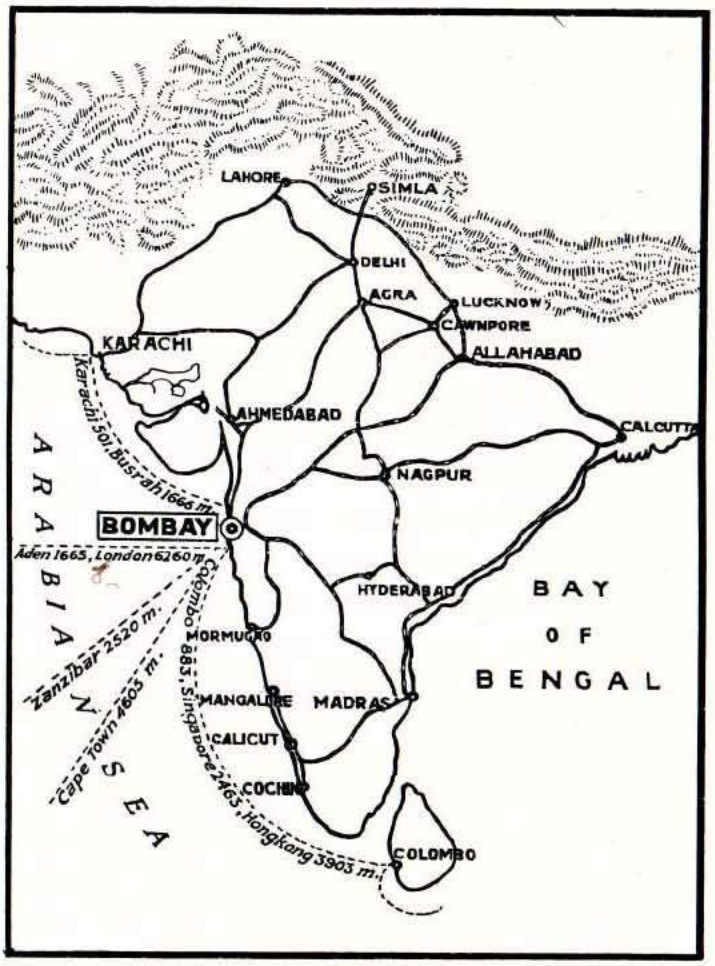
THE PORT OF BOMBAY

BOMBAY



The

Gateway of India

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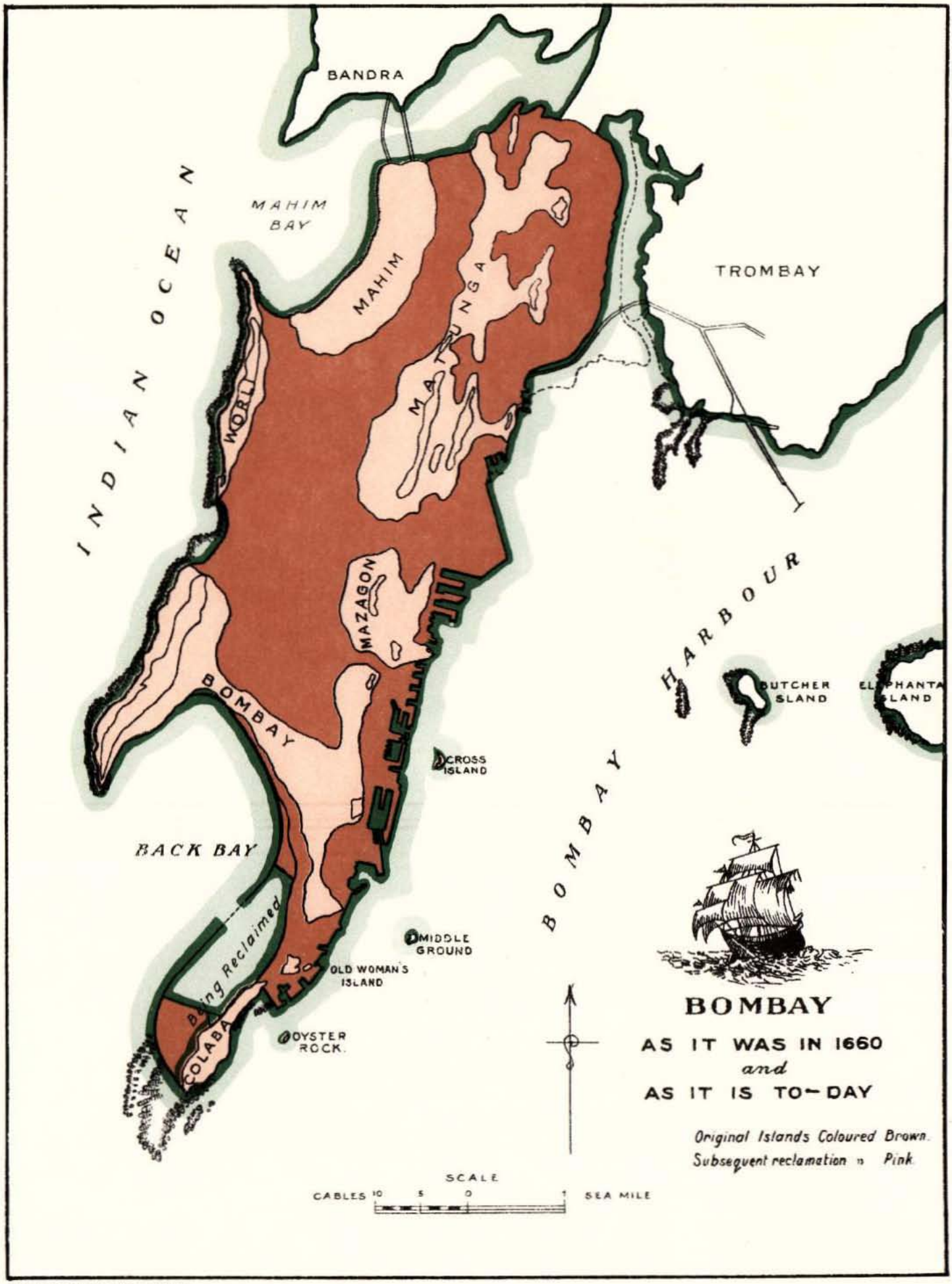


THE TIMES OF INDIA PRESS, BOMBAY.

BOMBAY—THE GATEWAY OF INDIA

I.

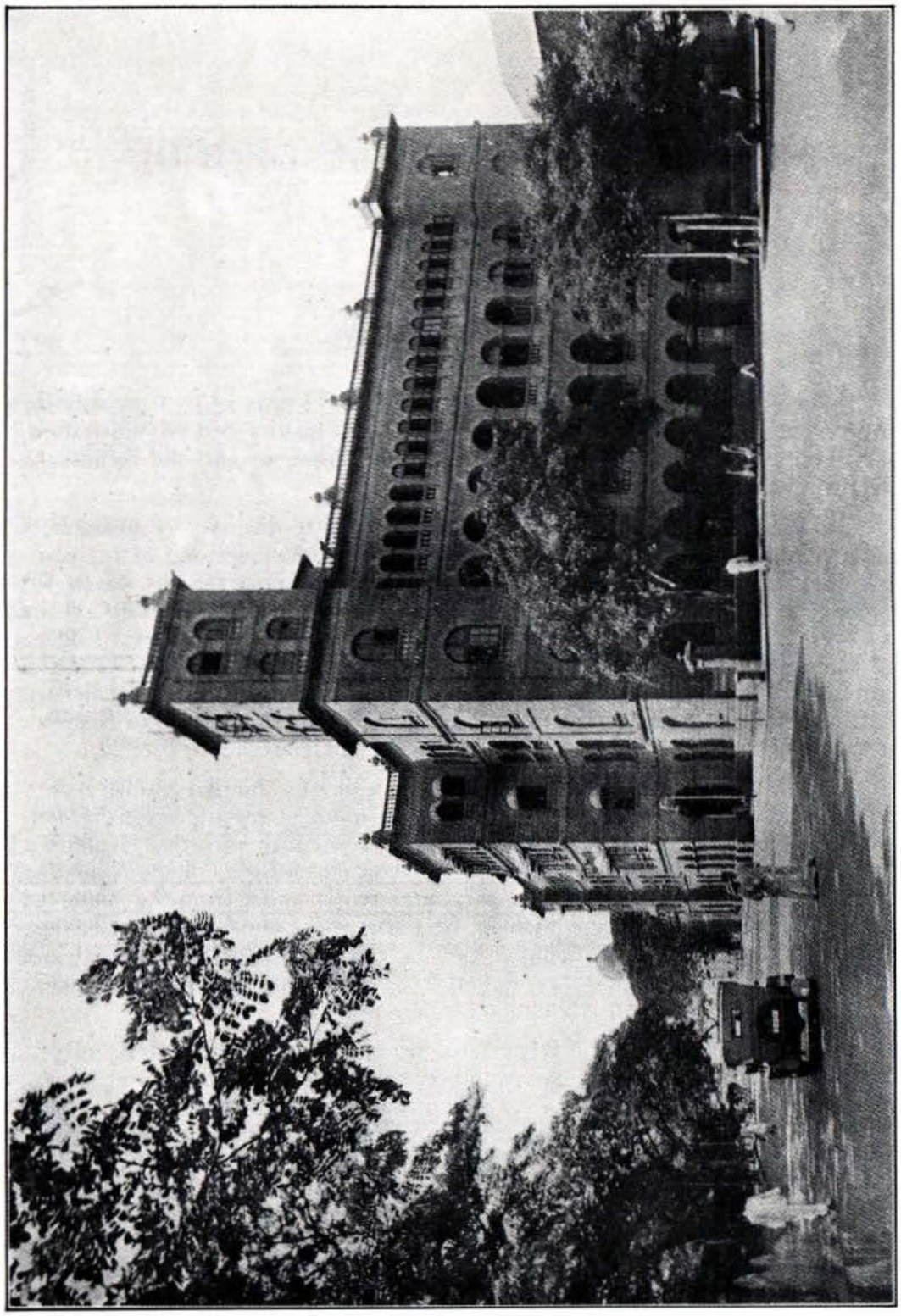
EARLY HISTORY

To visualise the commercial scope of a world port and its capacity for future expansion one should know something of its history and administration, the sources of its trade and their potential development and the facilities it offers for handling and distribution.

Although the Port of Bombay, as we know it to-day, is a comparatively modern creation, the magnificent harbour which is the keystone of its prosperity has from remote times held pride of place as the most famous haven for shipping on the Western sea-board of India. For the maritime nations of the East were skilled in the art of ocean navigation long before Western Europe had emerged from the elementary stage and there is proof that many centuries before the dawn of Christianity the sea-ports of Egypt, Arabia and the Persian Gulf had built up an extensive trade with the cities of the Northern Konkan, the strip of coastland off the centre of which lies the Harbour of Bombay.

The modern Island of Bombay, now welded by human industry into one consolidated unit some twenty-five square miles in extent, originally consisted of a cluster of seven islets, which historians identify with the Heptanesia of the Alexandrian scientist Ptolemy. Of volcanic origin, their formation indicates that in some prehistoric era they were rent asunder from the mainland by a series of titanic disturbances which, after alternating epochs of eruption and subsidence, determined the configuration of India's western sea-coast and bequeathed to Bombay the spacious harbour destined in after ages to shelter the argosies of the world's commerce.

For many centuries the Heptanesia, populated only by a handful of primitive fisher folk and husbandmen, slumbered undisturbed on the bosom of the Indian Ocean while the fame of neighbouring ports,—Broach, Sopara, Chaul, Janjira, Kalyan, Thana,—spread throughout the East and attracted merchant adventurers from near and far. We read that in the eighth century B.C. trading vessels plied between the great metropolis of Babylon and the Konkanese ports of Broach and Sopara and that four centuries later the port of Chaul (Chemula), a few miles to the south of Bombay, had become the most prosperous mart of Hindustan, carrying on a flourishing trade in ivory, precious stones, spices and cotton fabrics with Egypt, Mesopotamia and the further East.



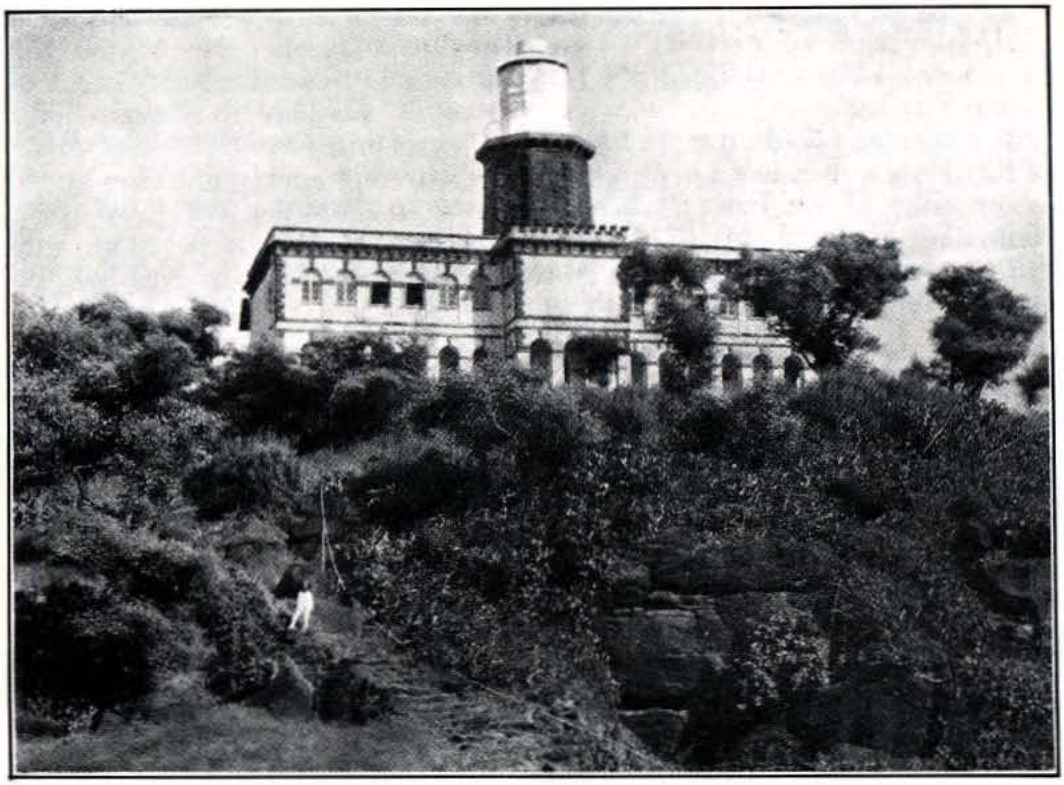
The Port Trust Offices.

Recent excavations on the site of the ancient city of Mohenjodaro in Sind,—the centre of a civilization placed by archæologists between 3500 and 2500 B.C.,—have established the fact that even in those dim ages the art of spinning and weaving in cotton was extensively practised in Western India and there is little doubt that the fine cotton fabrics prized by the wealthy classes of Babylonia and ancient Egypt were mostly woven in Sind from cotton grown in the valley of the Indus. There is evidence to show that the early Indus civilization extended over Cutch and Kathiawar; whether it penetrated still further south into Rajputana and Bombay still remains to be proved but this appears well within the bounds of probability.

In the third century B.C., the Northern Konkan, including the Heptanesia, was an outlying dependency,—the Aparanta of the early Sanskrit writers,—of the vast dominion governed by the mighty sovereign Asoka, who founded the dynasty of the Mauryas and whose famous rock-edicts proclaimed his wisdom and statecraft throughout the length and breadth of Hindustan. One such inscription, a fragment of the eighth edict, has been unearthed at Sopara in Salsette, a few miles to the north of Bombay.

As far as antiquarian research can enlighten us, the earliest inhabitants of the Bombay islands were the Kolis, a Dravidian race,—the aborigines of the Western India littoral,—who penetrated into the Northern Konkan in some prehistoric age long before the Christian era. The descendants of these primeval settlers flourish in Bombay to this day, an interesting community who keep themselves apart and have succeeded in preserving their racial characteristics to a remarkable degree, despite successive waves of foreign invasion. The fishing industry of Bombay is still mainly in the hands of these sturdy people and the nomenclature of various districts of modern Bombay,—Colaba, Kalbadevi, Sewri Koliwada,—still indicates the location of their original settlements. The name Bombay was for long thought to be derived from the Portuguese 'Buon bahia'=good harbour, but it is now generally accepted that the derivation goes back to much earlier times and is to be found in the name of the patron deity of the Koli settlers, 'Mumba Ai,' the consort of Shiva.

There is unfortunately little historical evidence on which to date the earliest trade connections between Bombay and its neighbours. Cut off as the Islands were from the mainland and offering little or no inducements to the overseas trader, it is but natural that for many centuries the Heptanesia should have attracted scant attention from the outer world, but the hardy seafarers of Egypt, Phœnicia and Babylonia must often have sought shelter in Bombay Harbour on their voyages to and from the wealthy ports of the Konkan. Excavations in Bombay City have brought to light coins and other relics which prove that in the early years of the Christian era the inhabitants of the Islands had dealings with the mainland ports of Thana and Kalyan. Words and names still current in the Koli dialect indicate that by the seventh century A.D. the inhabitants of the Heptanesia were in close touch with neighbouring civilizations. We read in old chronicles that in the tenth century the Western coast from Cambay to Chaul was thickly dotted with villages and largely cultivated for rice and other crops, while mangoes and cocoanuts grew in abundance. During the Silahara dominion of the North Konkan, which lasted from the beginning of the



Kennery Lighthouse.

ninth century to the middle of the thirteenth, the coast ports in the vicinity of Bombay continued to grow and flourish and colonisation proceeded apace. Chaul alone is said to have housed ten thousand Persian and Arab settlers and fleets from many lands, including China and the Far East, sought anchorage in Bombay Harbour, which even in those early days could justly have claimed the title of the Gateway of India.

During the rule of the Silahara monarchs, Bombay began to attract attention as a place of pilgrimage owing to the location near Malabar Point of the famous temple of Walkeshwar, the original of which is believed to have been constructed during the tenth century A.D. It was not, however, till the closing years of the thirteenth century that the Bombay Islands finally awakened from their birth-slumber and began to play an active part in history. About the year 1260 A.D.—the precise date is uncertain—the ruler of the North Konkan, Bhima Raja, retreating before the Moslem invasion from Delhi, stayed his steps on the island of Mahim,–the northernmost of the seven islands of Bombay,–established there a new capital and built himself a palace, with houses for his guests and retainers. This event heralded the colonization and development of Bombay. Bhima Raja's followers spread over the neighbouring islands, traded, throve and multiplied. By the middle of the following century, however, the Moslem influx had surged over the islands and the Mohammedan Sultans of Gujerat held undisputed sway until the coming of the Portuguese in 1534 A.D.

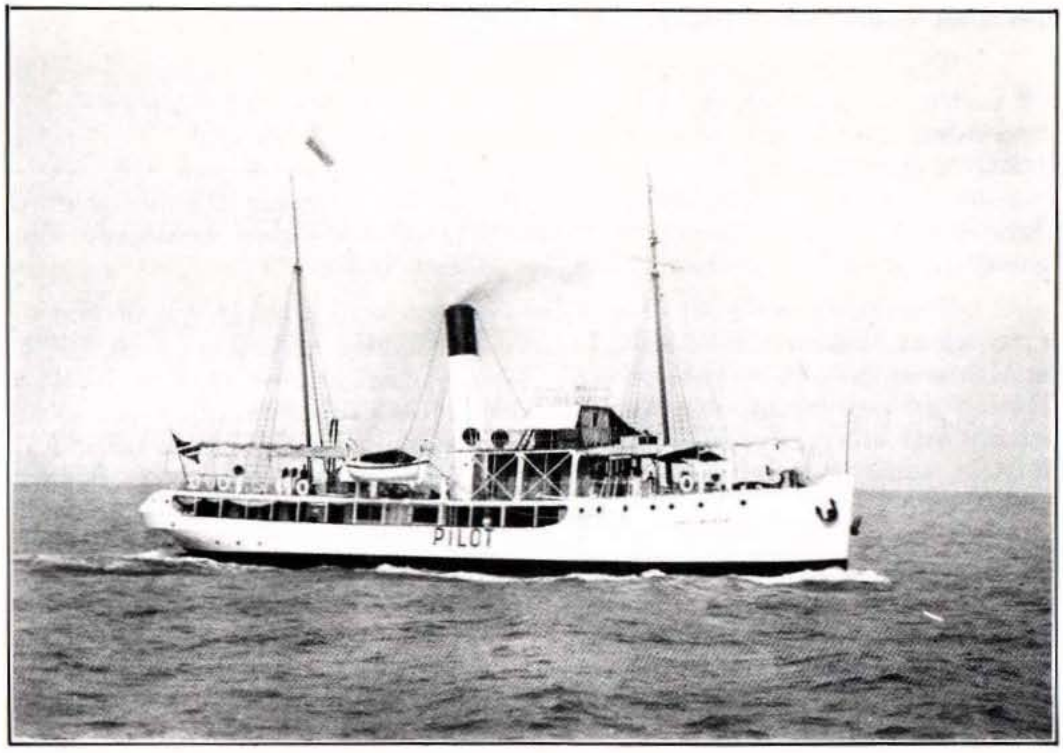
Bombay under the Portuguese, 1532-1665.

The first Portuguese expedition to India under Vasco da Gama cast anchor off Calicut on the 20th of May, 1498, and ten years later the Portuguese had established their capital at Goa, some 220 miles south of Bombay. For almost exactly a century they enjoyed a monopoly of Indian trade but they never possessed either the resources or the administrative capacity for the successful development of their colonies and their religious intolerance eventually compassed the downfall of their power in Western India.

The earliest recorded visit of the Portuguese to Bombay was in January 1509, when Francisco d'Almeida, the first Portuguese Viceroy of Goa, landed at Mahim *en route* from Cannanore to Diu to engage the fleet of Amir Hussein. During the next twenty-five years the Portuguese paid spasmodic visits to the Islands and in 1532 the Governor of Goa, Nuno da Cunha, seized the city of Bassein, some 28 miles north of Bombay, and made the Islands of Bombay and Mahim tributary to Portuguese suzerainty. On December 23rd, 1534, he concluded a treaty with Sultan Bahadur Shah of Gujerat under which Bassein, its territories, islands, seas and revenues were ceded to the King of Portugal and his heirs in perpetuity. The Bombay islands thus passed from Mohammedan to Portuguese rule and were divided by their new masters into manors or fiefs, which were parcelled out to the various religious orders or allotted at a nominal rental to deserving citizens in return for military assistance to the Portuguese Crown in case of need.

In 1538 Garcia da Orta, the celebrated physician and botanist, held the Island of Bombay on payment of an annual quit-rent equivalent to about £85 sterling, and from his memoirs we gather that the trade of the Island at this time was negligible and was confined to the sale of dried fish, salt and cocoanuts to the neighbouring coast towns. Bombay itself was still very sparsely populated; it is computed from the early records of the East India Company that at no time prior to the transfer of the Islands to the British did the population exceed 10,000, of whom only a handful were Portuguese of pure blood.

The keynote of the Portuguese policy in Western India is contained in the pronouncement of their first Viceroy, Vasco da Gama,—" Viemos buscar Christaos e especiaria,"—" We come to seek Christians and spices." The history of the Portuguese occupation is largely bound up with the foundation and aggrandisement of their religious orders. Towards the close of the sixteenth century the bulk of the landed property in and around Bombay had passed into the hands of the Church; the Jesuits owned practically all the northern parts of the Island including Mahim, Worli, Dadar, Sion, Sewri, Byculla and Parel. The zeal of proselytism eclipsed all other considerations and the cruelties perpetrated in the name of religion embittered the inhabitants and gave rise to savage feuds and reprisals which gradually undermined the supremacy of the Portuguese Government. In such an atmosphere it was impossible for trade to flourish; in 1629 the Archbishop of Goa averred in a despatch to the King of Portugal that " among all the enemies of Portugal from within, none probably do greater harm to the State of India than the Jesuits," while two years later we find the Viceroy of Goa bitterly complaining that the Jesuits had usurped

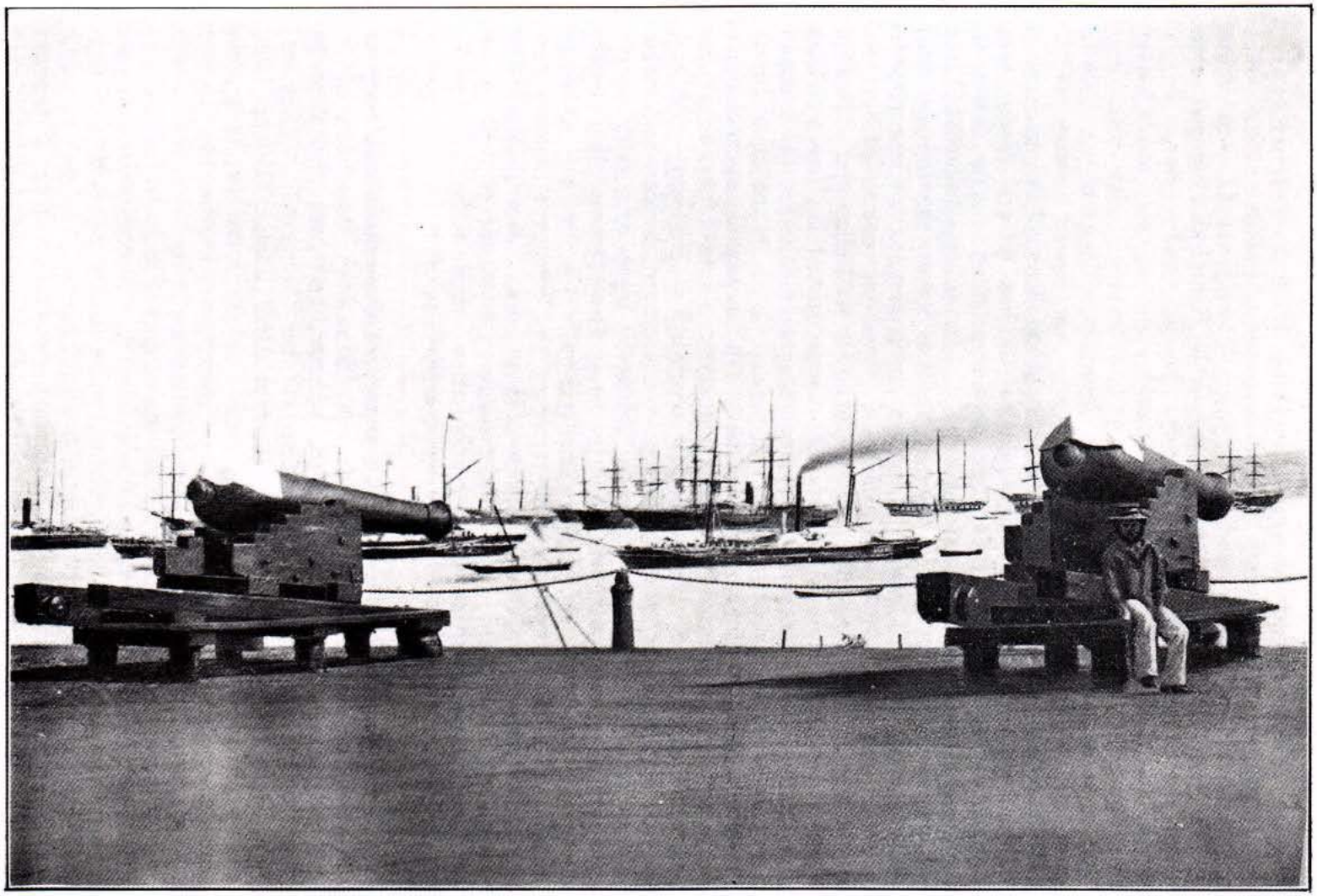


The Pilot Vessel, "Lady Wilson".

from the State the royal jurisdiction and revenues and openly intrigued against the Government.

These dissentions paved the way for the entry of other European powers who were attracted by the lucrative possibilities of Indian trade. In the year 1579 one Thomas Stephens, reputed to be the first Englishman to settle in India, arrived at Goa and entered the service of the Portuguese Government. Thence he despatched to his father, a London merchant, advices which prompted the mercantile community of London to enquire into the prospects of opening up trade with Western India. A memorial was presented to the Lords in Council, asking permission to trade with ports bordering on the Indian Ocean and the China Seas and preferring a request for the Queen's license "for three ships and three pinnaces to be equipped and protected in this trade." On the 10th of April, 1591, an expedition of three ships, the "Penelope," "Merchant Royal" and "Edward Bonaventure," sailed from Plymouth for India by the Cape route under the command of Captain George Raymond. This expedition met with no success and after heavy disasters at sea only a few survivors managed to struggle back to Falmouth in August 1594. The following year a Dutch expedition of four ships, under Cornelius Van Houtman, sailed from the Texel and after a successful and profitable sojourn in Indian waters, returned to Amsterdam in August, 1598.

On the 22nd of September, 1599, an Association of Merchant Adventurers was formed in London under the presidency of the Lord Mayor for the



Bombay Harbour in 1860, before the construction of the Wet Docks.

purpose of trading directly with India, the capital sum subscribed being £70,000. A Royal Charter was granted by Queen Elizabeth on December 31st, 1600, constituting the petitioners " a body corporate and politic, in deed and in name, by the title of The Governor and Company of Merchants of London trading unto the East Indies." Thus did the Honourable East India Company make its first appearance on the stage of history. On the 22nd of April, 1601, an expedition of five vessels sailed from Dartmouth under the command of Captain James Lancaster in the " Red Dragon," a vessel of 600 tons. After establishing a factory at Bantam in Java the expedition returned to England with valuable cargoes of pepper and spices. Encouraged by the financial success of this venture,—which is stated to have returned a profit of ninety-five per cent. to the promoters,—the same ships sailed again for the East on 25th March, 1604, returning to England in May, 1606, after another profitable voyage, despite the loss of one of the vessels. On 1st April, 1607, a further expedition sailed from the Downs and after voyaging in company as far as Socotra the ships separated, Captain Keeling in the " Dragon ", 600 tons, proceeding to Sumatra while the " Hector," 300 tons, under Captain Hawkins, shaped her course for Surat and was the first of the Company's ships to anchor in an Indian port. Hawkins journeyed in 1609 from Surat to Agra with a letter from King James of Great Britain to the Mogul Emperor Jehangir, requesting permission for the Company to establish a trading factory at Surat. Failing to obtain the promised firman, Hawkins returned to England in 1612 but in the meanwhile an expedition of three vessels had been fitted out by the Company at a cost of £82,000 and despatched in the spring of 1610, under the command of Sir Henry Middleton, who flew his flag on the " Trades Increase " of 1,100 tons burden—a leviathan for those days. After many vicissitudes Middleton anchored at Surat on 26th September, 1611, and found there a Portuguese squadron of seven ships awaiting him outside the roads and thirteen smaller ships inside the bar. Although England and Portugal were nominally at peace, the Portuguese Admiral summarily refused the right of the English to trade at Surat. After fruitless efforts to negotiate, Middleton—who had strict orders not to offer violence to the Portuguese unless openly attacked—was forced to weigh anchor and turn his attention to the possibilities of trade with the Red Sea ports.

The Directors of the East India Company, realising that if their trade was to make any headway in the teeth of the opposition of the Portuguese and the Dutch, force must be opposed by force, equipped their next expedition for fighting as well as trading. It consisted of the " Dragon," " Osiander," " James " and " Solomon," under the command of Captain Thomas Best. Arriving off Swally,—the roadstead of Surat—on 5th September, 1612, Best opened up communications with the local merchants. On the 28th October the Portuguese fleet, consisting of four galleons and twenty or more smaller vessels, appeared off the bar of Surat and was engaged the following morning by the English ships. The series of actions which followed during the next four months went greatly in favour of the English and so enhanced their reputation that they were granted a firman by the Emperor Jehangir, promising them full freedom to trade in his dominions, protection from Portuguese aggression and restriction of Customs duty on their imports to three and a

half per cent. Best established a factory at Surat and from this date the East India Company acquired a definite status as a trading Corporation recognised by the Great Mogul, instead of being regarded as mere interlopers, dependent on crumbs of commerce snatched under sufferance from their Portuguese rivals. Permission was soon afterwards obtained to establish other factories at Ahmedabad, Cambay and Gogo and the decisive defeat of the Portuguese fleet by Captain Nicholas Downton's squadron at the Battle of Swally in January, 1615, finally placed the Company in an unassailable position from which they slowly but steadily strengthened their hold on the trade of Western India.

Although the trade of the Bombay Islands was inconsiderable at this time, being restricted for the most part to the sale of dried fish and cocoanuts to neighbouring coast towns, the immense natural advantages of Bombay Harbour as a maritime base, isolated from land attacks, had come to be realised. In 1652 the Surat Council of the East India Company, who foresaw that Bombay, with its geographical advantages, was destined to become the key to India, urged its purchase from the Portuguese, a recommendation which the Directors of the Company in London submitted to Cromwell two years later. By this time the growing influence and aggressiveness of the Dutch and the disturbances which followed on the death of the Emperor Shah Jehan had convinced the Directors that the Company could not flourish unless it secured "fortified stations yielding a revenue equal to the charges of them" and capable of accommodating a naval and military force sufficient to render the Company independent of the internecine quarrels and intrigues of their neighbours. Their wish was gratified seven years later when, under the marriage treaty between Charles II of Great Britain and the Infanta Catherine of Portugal, signed at Whitehall on the 23rd June, 1661, the Port and Island of Bombay, "with all the rights, profits, territories and appurtenances whatsoever thereunto belonging" were transferred to the King of Great Britain, his heirs and successors.

In September, 1662, the Earl of Marlborough, followed by General Sir Abraham Shipman, the first Governor-designate of the new colony, arrived at Bombay with a fleet of five ships to take over the Island in pursuance of the terms of the treaty, but owing to innumerable difficulties and obstacles raised by the Portuguese authorities it was not until the 18th February, 1665, that the Island of Bombay, shorn of its dependencies, was formally handed over—on conditions very unfavourable to the English—to Mr. Humphrey Cooke, the Secretary and successor of Sir Abraham Shipman, who had died before the negotiations were concluded. The terms accepted by Cooke were subsequently repudiated by the British Crown as being contrary to the undertakings of the marriage Treaty and not until 1672 was the ownership of the lands in dispute finally settled by the Convention entered into by Governor Gerald Aungier with the Portuguese landowners.

Alexandra Dock, looking south to Colaba Point.

II.

THE DAYS OF THE HONOURABLE EAST INDIA COMPANY, 1668-1858.

On March 27th, 1668, the Port and Island of Bombay were transferred by Royal Charter from the Crown to the Honourable East India Company to be held " in free and common soccage, as of the manor of East Greenwich," at an annual rent of £10. In the three years that had elapsed since the Island was taken over from the Portuguese, Cooke and his successors, Sir Gervase Lucas and Captain Henry Gary, had done good work in enlarging the area of British jurisdiction in accordance with the terms of the treaty, improving the revenues of the colony and encouraging immigration. The reason for the transfer of the Islands from the Crown lay in the desire of the Surat Council of the Company to improve their relations with the neighbouring Indian powers, who regarded the Company as responsible for the high-handed actions of the Crown representatives in Bombay. Charles II, considering Bombay an unprofitable possession, raised no objection to the transfer and accordingly the Island was delivered over on 21st September, 1668, to Sir George Oxenden, President of the Surat Council, who took possession of it as Governor of Bombay on behalf of the Company.

Under the Company's rule measures for the encouragement of trade were forthwith promulgated. The construction of a Custom House, a warehouse and a mole capable of berthing small ships was put in hand and a shipwright was sent out from England to supervise the Company's ship-building operations.

In July, 1669, that able administrator, Gerald Aungier, succeeded Oxenden as President of the Surat Council and Governor of Bombay and under his far-sighted and beneficent rule the trade development of Bombay began to assume definite proportions. From the outset Aungier entertained a profound and unshakable confidence in the future of " the City which, by God's assistance, is intended to be built." His administration was characterised by justice, tolerance, freedom of trade and encouragement of indigenous industries. In 1672 he transferred his headquarters from Surat to Bombay. Up to this date the foreign trade of the port had been insignificant but by the end of the following year Aungier was able to record a considerable advance. " Before this time," he wrote to the Court of Directors, " the English trade was only in cocoanuts and cairo (coir). Now the country merchants derive a great trade with Surat, Broach, Cambay and Gogo and also to Dabull, Kelsey, Rajapore and Goa, to Mocha, Persia, Scinda, Bussora, in salt, cocoanuts, cairo, betelnut, rice, elephants' teeth (from Mozambique) broadcloth, lead, sword blades and some other Europe goods. Last year we disposed in Bombay of 600 pieces broadcloth, 3,000 maunds lead, all the perpetuanes and serges, and all the sword blades."

Alexandra Dock entrance and the Hughes Dry Dock.

Aungier's task was nevertheless beset with difficulties. "During my stay here," he wrote when handing over charge to the Deputy Governor, "I have found odd neighbours to deal with; the jealous and envious Portuguese have endeavoured all that lay in their power to obstruct our settlement; the Governor of Surat hath not been wanting also to use his policy to undermine us, and Sidi Sambal with his fleet hath been no small impediment. The Dutch with their powerful fleet designed to have swallowed us up; but blessed be God who hath preserved us and rendered all their evil designs advantageous."

Undismayed by difficulties and foregoing all personal honour and profit, Aungier held firmly to his task and when, after a lingering illness, he died at Surat on the 30th June, 1677, he had well and truly laid the foundations of the City which, in the fulness of time, was to bear on its escutcheon the proud title of *Urbs prima in Indis.*

Under Aungier's administration Bombay had become the established headquarters of the East India Company and such was the confidence engendered by his rule that traders of all communities came to settle in Bombay, attracted "by the fame of the Honourable Company's large commerce, upright dealing, justice and moderation to all persons that live under the shadow of their Government." These immigrants were the vanguard of that immense body of merchants of all castes and creeds who have settled in Bombay during the last two and a half centuries. Richly indeed did Gerald Aungier merit the modest eulogy

of the Surat Council, " amid a succession of difficulties he preserved the English trade for sixteen years."

It is of interest to record Aungier's description of such facilities as Bombay offered for shipping in his day—

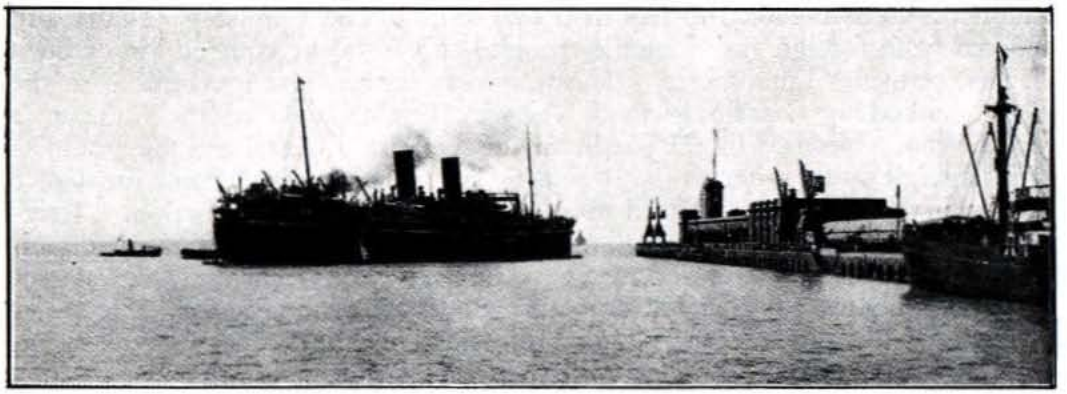
> " The great bay or port," he wrote, " is certainly the fairest, largest and securest in all these parts of India, where a hundred sail of tall ships may ride all the year safe with good anchorage. In the small bay to the north of the Castle ships of 400 tons have been haled ashore to repair, there being 15 feet of water at the springs : in the lesser bay to northward of the Fort, ships of 300 tons may be haled ashore ; at Mazagon, ships of 200 tons may be haled ashore ; also at a place called Drumgo there is an excellent bay where 50 sail of 200 tons each may winter and repair safely. For small frigates, gorals and other vessels there are very many places."

During the last quarter of the 17th century the prosperity of Bombay suffered a temporary set-back. Owing mainly to the lack of proper sanitation and medical relief, plague and pestilence became rampant and the number of English settlers dwindled to less than two score. The Company's affairs also suffered from foreign and domestic troubles and from the competition of illicit traders, termed " Interlopers." The year 1683 witnessed the rebellion on the Island headed by Captain Richard Keigwin, Commandant of the Company's forces, who,—incensed by the parsimony of the Surat Council and the weakness of its foreign policy,—seized the Island and held it in the King's name for twelve months in defiance of the Council and the Court of Directors in London. Keigwin, as a matter of fact, showed himself to be a determined and efficient administrator and his firmness in dealing with the Sidi Admiral and other obstreperous neighbours considerably restored the prestige of the English. He finally surrendered the Island to the King's representative, Sir Thomas Grantham, on 19th November, 1684, on the promise of a free pardon.

In the closing years of the 17th century the famous Mahratta pirate, Kanhoji Angria, made his appearance on the Malabar Coast and for 50 years he and his sons were the terror of the seas between Goa and Bombay. Their forces consisted of fast, light-draft sailing vessels of from 100 to 400 tons, mounting from ten to thirty guns each and supplemented by rowing galleys of forty or fifty oars. Their usual practice was to lie in wait in their fortified lairs along the coast, ready to pounce upon any unescorted trading ship that came within their reach. One of their strongholds was Kennery Island off the mouth of Bombay Harbour and only 14 miles distant from Bombay Castle. Various punitive expeditions were organised against these pirates but for the most part they were unsuccessful. Kanhoji Angria himself died about 1730 but his sons carried on his piratical enterprise and in 1733 we find the Council recording that " the Angrias are become too formidable to be kept in awe with the small sea force we have at present in our service." It was not until 1756 that the power of the Angrias was finally broken, when a strong naval expedition under Vice-Admiral Watson and Commodore William James, with a military force under Colonel Robert Clive—afterwards Lord Clive—invested Gheria, the principal stronghold of Toolajee Angria, some 170 miles south of Bombay, and destroyed the pirates' fleet and their citadel, which had hitherto been regarded as impregnable.

Toolajee and his entire force were taken prisoner and thenceforth the name of Angria disappeared from the political arena.

Bombay's commercial prosperity began to revive with the arrival of Governor Charles Boone in 1715 and throughout the remainder of the 18th century it continued to advance slowly but surely. The developments initiated by Aungier were energetically pushed on by Boone; the accommodation for goods and shipping was improved and a Marine Force established. Our frontispiece, which is reproduced by courtesy of the Secretary of State for India from a picture hanging in the India Office, depicts the Port of Bombay at this period. The large white building in the centre, with a high gateway surmounted by a coat of arms, is evidently the Company's warehouses. In front is a small jetty projecting into the harbour; on the right stands the Castle, with the Union Jack floating from the flagstaff bastion; on the left are a number of storage sheds. Prominent among the shipping in the foreground is an East Indiaman firing a salute and a country boat flying the Company's flag.



The R.M.S. "Mooltan," 20,000 tons, coming alongside the Ballard Pier.

The Directors of the Company had by this time determined to make Bombay the first port of India and their ships sailing to and from Madras and Bengal were advised to make Bombay a port of call. The value of the export trade—which consisted mainly of cotton goods, pepper, silk and precious stones—rose from £493,000 in 1708 to an average of £758,000 for the 20 years ending 1728. The Company also did everything possible to encourage immigration. Weavers and artisans from Surat and other mainland ports and cities were offered well paid employment, land on easy terms and financial assistance in developing their business. The security of life in Bombay was in itself a powerful inducement and it is not surprising to find that the population—which at the date of the cession of the island to Great Britain in 1660 was estimated at under 10,000—had risen eighty years later to 70,000 and by 1780 was returned as 113,000.

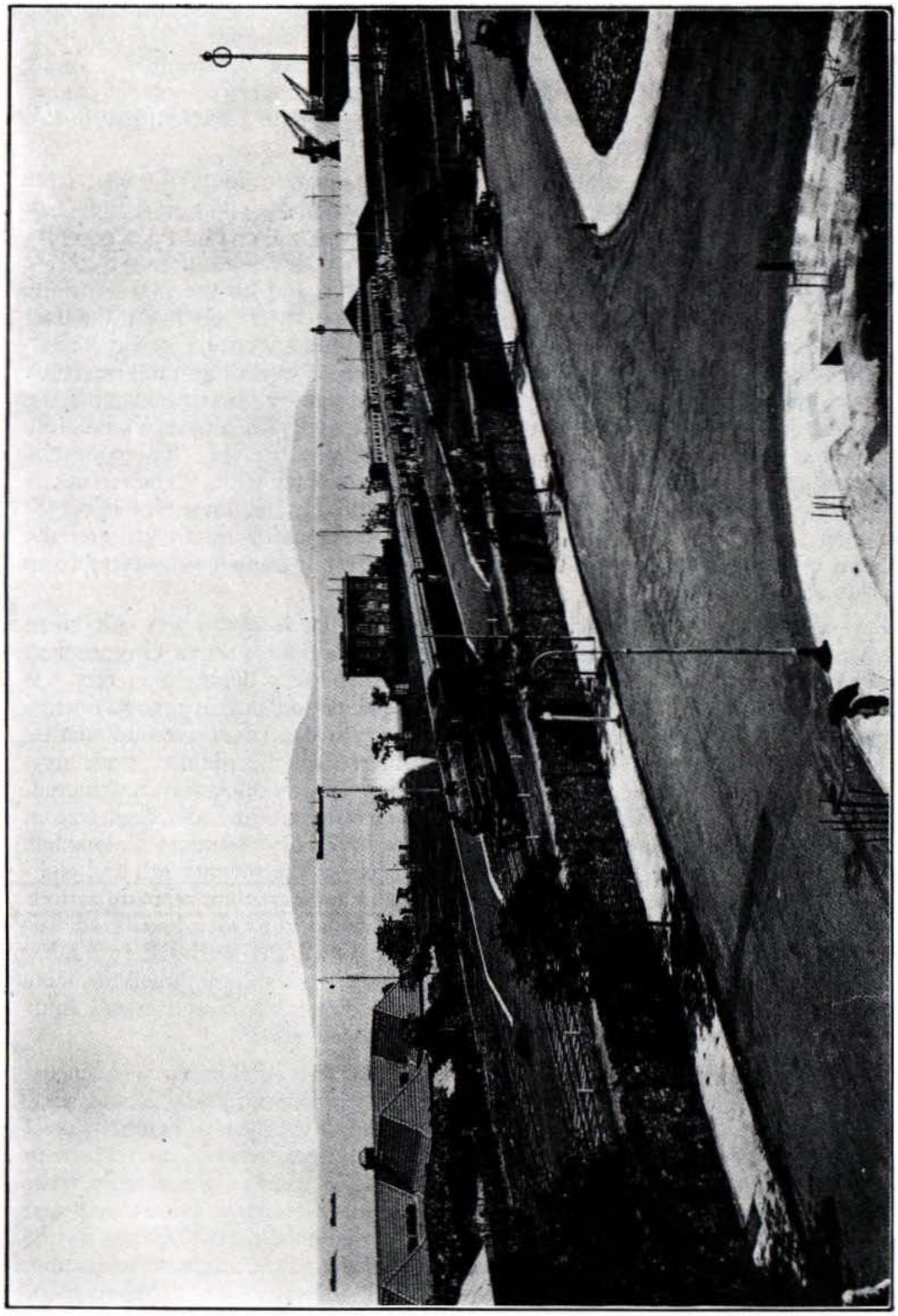
From 1735 till the coming of steam in the following century Bombay was famous as a ship-building centre, thanks mainly to the genius of the celebrated Wadia family, whose progenitor, Lowji Nusserwanji Wadia, emigrated from Surat in 1735. For over a century the Wadias were Master Ship-builders to the Bombay Marine and it was acknowledged that the ships turned out from

the Bombay yards were as staunch and well-finished as any that the ship-building yards of Europe could produce. The largest of the hundreds of tall ships launched in Bombay was the "Ganges," a frigate of 2,289 tons. Many famous ships were built in Bombay for the Company's service, notable among them being the "Scaleby Castle" launched in 1798, and the "Buckinghamshire" of 1,369 tons, built in 1816.

Early in the 18th century the East India Company adopted the practice of chartering outside ships for conveyance of their goods. The East Indiaman of those days was seldom larger than 500 tons—towards the end of 17th century the Company was employing eleven ships of 400 to 600 tons—but before the close of the next century the growth in size became rapid and by the year 1800 the Company had several ships of 1,200 tons under charter. In their day the East Indiamen were the largest, best-constructed and most powerfully armed vessels on the high seas, excepting only the biggest warships. One cannot but be struck with admiration at the skill and courage of their navigators, bearing in mind the fact that such charts as were available in the 17th and 18th centuries were very rough and incomplete and nautical instruments far from reliable. The country's enemies and pirates had also constantly to be reckoned with. The strenuous demands of the Cape route produced what was probably the finest type of cargo-carrying sailing ship ever designed and it is not surprising that even after the advent of steam many years elapsed before the East Indiaman was ousted from the sea routes to India.

Bombay's first dry dock—projected as far back as 1686—was not taken in hand till 1748. It was constructed on the site of the present Government Dockyard and was 209 feet long, 47 feet wide and had a depth of 15 feet. It proved such a success that within fifteen years after its opening in 1750 two more dry docks were laid down and completed. The question of wet dock accommodation does not appear to have been seriously considered till the middle of the next century and it was not till 1875 that the first enclosed wet dock was constructed. Prior to the latter date the bulk of the shipping used to load and discharge in the stream, though there were a few open wharves or "bunders" alongside which light-draft vessels could lie. The references in the seventeenth and eighteenth century records to dock extensions had more connection with fortifications than with trade facilities, as for instance in 1746, when "the Dock Pier Head was enlarged so as to mount nine guns in the face towards the road and two more for flanking the face of the Royal Bastion." In 1775 the shipping facilities were described as "two marine gates with a commodious wharf and cranes built out from each gate, besides a landing place for passengers only."

By the middle of the 18th century the merchants of Bombay had opened up regular trade communications with the principal sea-ports and inland trade centres of India, Arabia, Persia and East Africa and, in addition to being the chief emporium of Western India, Bombay possessed a larger share of the trade with England than either of the other Presidencies. Up to 1813 the foreign trade of Bombay was a close preserve of the East India Company, but in that year Lord Melville's Bill abolishing the Company's commercial monopoly was passed into law. This threw open the commerce of India to the merchants of other great seaports, such as Liverpool, Bristol and Glasgow, and a remarkable



Bombay Harbour to-day. The Frontier Mail about to leave Ballard Pier Station.
(By courtesy of the B. B. & C. I. Rly.).

expansion of trade set in. In 1814 the imports of manufactured cloth from Great Britain amounted to 817,000 yards; by 1832 the figure had risen to over 51 million yards. By 1835, when the last trace of the Company's commercial power had vanished, Bombay's foreign trade, excluding treasure, was valued at 700 lakhs of rupees; 25 years later it had risen to nearly four times this figure.

The age of steam dates from about 1815 and by 1823 campaigns had been simultaneously launched in England and India to open up a regular steam service. The first steam vessel despatched from England to India *via* the Cape was the "Enterprise," of some 500 tons burden, which sailed from Falmouth on 16th August, 1825, with 17 passengers. Owing mainly to the difficulty of fuel supply, this pioneer voyage was not an unqualified success. It was hoped that the voyage to Calcutta would be accomplished within two months, actually it took 113 days.

The first steamship to operate in Bombay waters was the "Hugh Lindsay" of 411 tons (named after the then Chairman of the East India Company), which was built in Bombay, launched in October, 1829, and sailed on her maiden voyage to Suez on March 20th, 1830. She took 33 days over the voyage—12 days being occupied in coaling—and the mails despatched by her reached England in 59 days, establishing a record. Her second voyage from Bombay to Suez was accomplished in 22 days. In 1838 regular monthly communication between Bombay and England by the overland route *via* Suez and Alexandria was established, the duration of the voyage being from 43 to 46 days. By 1843 Bombay had been brought within 30 days of London and two years later a fortnightly mail service was introduced, the route being alternately *via* Suez and *via* Colombo.

The year 1858 witnessed the passing of the East India Company. On August 2nd of that year the "Act for the better Government of India" was ratified by the British Parliament and after a memorable career of just over two and a half centuries the Honourable Company made its exit from the stage of history and Bombay once again became a Royal City. Sorely chastened in her infancy, scourged by war and pestilence and often in danger of veritable extinction, the indomitable courage and perseverance of her early citizens and merchants had enabled her to rise triumphant over all obstacles and although there were yet difficulties to be overcome, her position among the great sea-ports of the world was assured for all time.

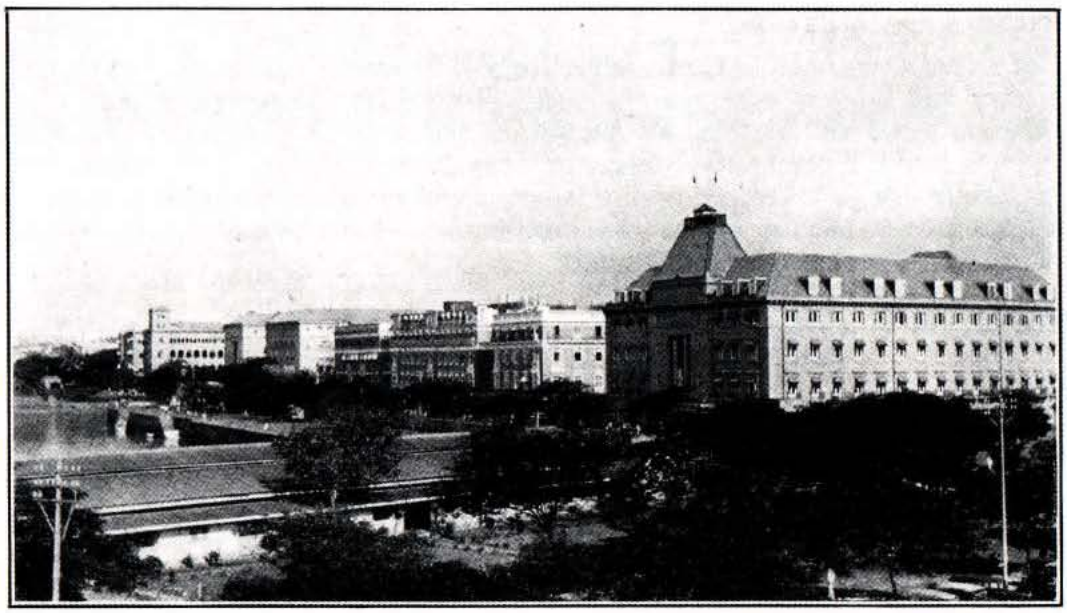
III.

THE CONSTITUTION OF THE BOMBAY PORT TRUST.

The history of Bombay from the middle to the end of the nineteenth century is a remarkable record of progress in every direction, interrupted solely,—and then only for a brief space,—by the financial crisis which followed the termination of the American Civil War in 1865. Railway communication with the interior was opened up in 1853; the first cotton mill commenced working in 1854 and six more mills were opened during the following five years. Steam coastal ferry services were inaugurated in 1866 and the opening of the Suez Canal to traffic in 1869 revolutionised the maritime trade of Bombay and largely converted her into the Imperial Port of India. Meanwhile the lack of proper dock accommodation was beginning to be severely felt. In 1860 the *Times of India* remarked :—

> "The want of wharfage and pier accommodation thrusts itself so prominently before us that the apathy of our merchants thereon is past belief. Every man who reclaims a foot of land or gives a new foot of pier room to Bombay deserves to be looked upon as a public benefactor."

The decision to constitute a Trust to administer the affairs of the Port of Bombay originated in the apprehension of Government that the interests of trade were becoming seriously endangered by the monopoly acquired by private companies

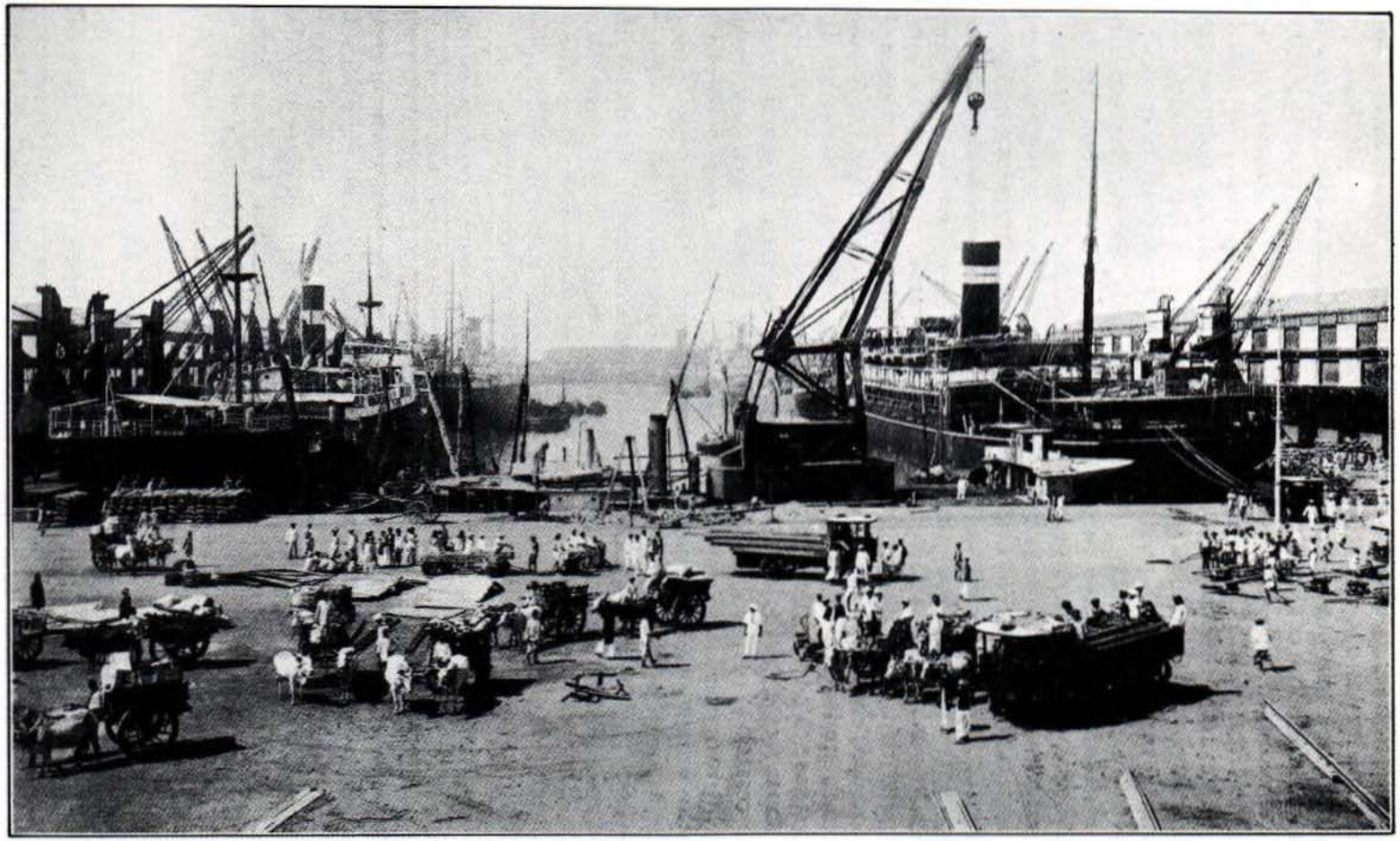


Ballard Estate, with the P. & O. and B. I. S. N. Co.'s offices in the foreground.

of the landing and shipping facilities of the Port. The chief of these concerns was the Elphinstone Land and Press Company, which was formed in 1858 and carried out during the next few years a series of extensive reclamations on the western foreshore of the Harbour. In 1862 the Company entered into an agreement with Government to provide a building area of 100 acres for the terminus of the Great Indian Peninsula Railway, receiving in return the right to reclaim 250 acres from the sea for their own purposes. At first sight this appeared an exceedingly favourable bargain for Government as they conceded what, in its natural state, was quite valueless and in return obtained land which had cost over £500,000 to reclaim. Politically, however, the bargain was a mistake as it enabled the Company to secure a monopoly of the harbour frontage, where the bulk of the country trade had been centred for years and where, owing to its proximity to the new railway terminus, they were in a position to subject the main trade of the Port to wharfage and other dues at their sole discretion. Shortly after the granting of this contract to the Company an unexampled tide of prosperity set in to Bombay owing to the American Civil War and the stimulus thereby given to Bombay's export trade in cotton. The surplus profits which accrued to the Bombay cotton trade from this source are computed to have amounted, during the five years 1861-65, to no less than eighty-one million pounds sterling. A mania of speculation followed; shares of all descriptions rose to unparalleled heights and at one period the stock of the Elphinstone Company reached the fabulous premium of eighteen thousand pounds. On the cessation of the American Civil War the bubble burst and, owing to the extent to which insane speculation had been carried, trade collapsed and for a space Bombay's finances were in a state of chaos. The property of the Company participated in the general depreciation and the shares fell to fifty per cent. discount. Meanwhile the Company, with remarkable skill and energy, had almost completed their agreement with Government but in doing so they had expended practically all their paid-up share capital and found themselves unable, owing to the abnormal financial situation, to call up the remaining million pounds with which to complete their reclamation and construction schemes.

It was at this juncture that the Government of Bombay strongly urged upon the Government of India the desirability of buying out the Company, thus regaining possession of the valuable harbour foreshore, and of vesting its administration in the hands of a public Trust. The final assent of the Secretary of State to these proposals was received in June, 1869, and the Company's rights were purchased at the par value of the paid-up capital, the price amounting to Rs. 1,85,91,597. Payment was made in 4 per cent. stock of the Government of India issued at 93 per cent. The Act constituting the Port Trust was not passed till 20th June, 1873; meanwhile the whole of the properties to be handed over were administered by a department of Government on behalf of the new Trust, which therefore dates in reality from 1st May, 1870.

The Bombay Port Trust Act of 1873 provided for the creation of a corporation under the name and style of the Trustees of the Port of Bombay, in whom was vested the management of the properties acquired by Government, with powers to levy dues, at rates previously sanctioned by Government, on all goods passed over their wharves. The Act consolidated the existing laws

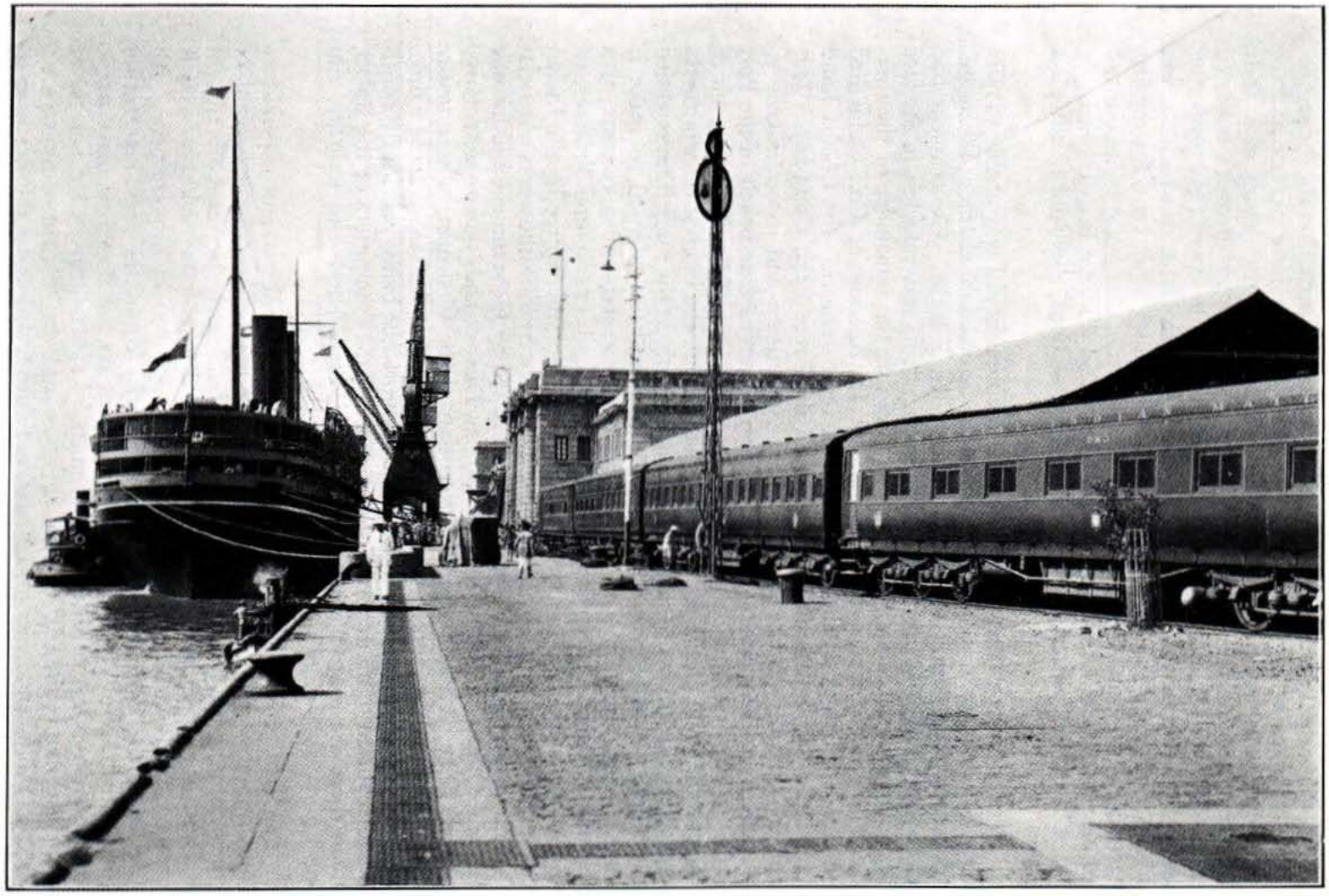


Shipping at the West and Jetty Wharves, Alexandra Dock, with the Port Trust 60-ton floating crane at work.

relating to the harbour and foreshore and made further provision for the regulation and improvement of the Port. The control of the Pilot Service and the conservancy and lighting of the harbour, previously in the hands of a body established in 1863 and designated the Harbour and Pilotage Board, was vested in the new Board of Trustees, which was debited with the cost of the properties purchased by Government, amounting to some Rs. 220 lakhs, of which Rs. 212 lakhs bore interest payable to Government at the rate of 4 per cent. for the first 10 years and 4½ per cent. thereafter. No capital charge was made on account of the properties transferred from the old Harbour and Pilotage Board, consisting chiefly of the then existing lighthouses, signal stations, lightships and pilot schooners.

For the first six years of its existence the new Board was unable to raise from its properties sufficient revenue to meet its capital debt charges ; the aggregate deficit for the period amounted to over Rs. 2 lakhs. Government had power to order the Board to increase its rates, but this was valueless in the face of the competition of private wharf owners holding the remainder of the foreshore. The chief competitors were Messrs. D. Sassoon & Co.,—who had built a small wet dock at the Colaba end of the foreshore,—the Colaba Land Company, the Mazagon Land Company and the Frere Land Company. This diversity of control was the source of much confusion and inconvenience to trade, and Government finally decided in 1879 to purchase on behalf of the Port Trust the private foreshore-owners' rights at a total cost of Rs. 75,42,800, which was met by the issue of a 4 per cent. Port Trust loan, the interest on which was guaranteed by Government. The Port Trust Act was at the same time amended and the Board,—which has since from time to time been enlarged to make it thoroughly representative of all the interests concerned,—now consists of a whole-time Chairman appointed by Government, and twenty-one Trustees, of whom five are elected by the Bombay Chamber of Commerce, five by the Indian Merchants' Chamber, two by the Municipality and one by the Millowners' Association. The remaining eight Trustees are nominated by Government and include the General Officer Commanding the Bombay District and one representative of Labour. The Trustees, with the exception of the Chairman, whose tenure of office is at the discretion of Government, hold office for two years at a time. The Board meets fortnightly, all matters of importance being previously considered and reported on in detail by one or other of the Committees of the Board, of which there are four—Finance and General, Staff, Land and Railway, and Marine.

The Act provides that detailed estimates of receipts and expenditure shall be submitted to Government for approval before the commencement of each financial year and the accounts are audited half-yearly by the Government Audit Department. Before any project estimated to cost two lakhs or over is commenced, plans and estimates have to be approved by Government. All loans raised by the Trustees for their capital works require the previous sanction of Government and the Act makes it incumbent on the Board to make ample provision year by year, either by retrenchment of expenditure or by increase of rates, for the due fulfilment of their liabilities and the efficient administration of the Act. All amendments of the rates and dues levied under the Act have to



The R.M.S. "Macedonia" berthed at the Ballard Pier, with the Imperial Indian Mail at the Station.
(By courtesy of the G. I. P. Rly.)

be submitted to Government and published in the *Government Gazette* before becoming effective. The Trustees have power to lease their land for any term not exceeding 50 years; longer leases and any sale of land require the previous sanction of Government. With the exception of the chief appointments, for which Government sanction is necessary, all vacancies on the Trustees staff are filled by the Chairman or the Board.

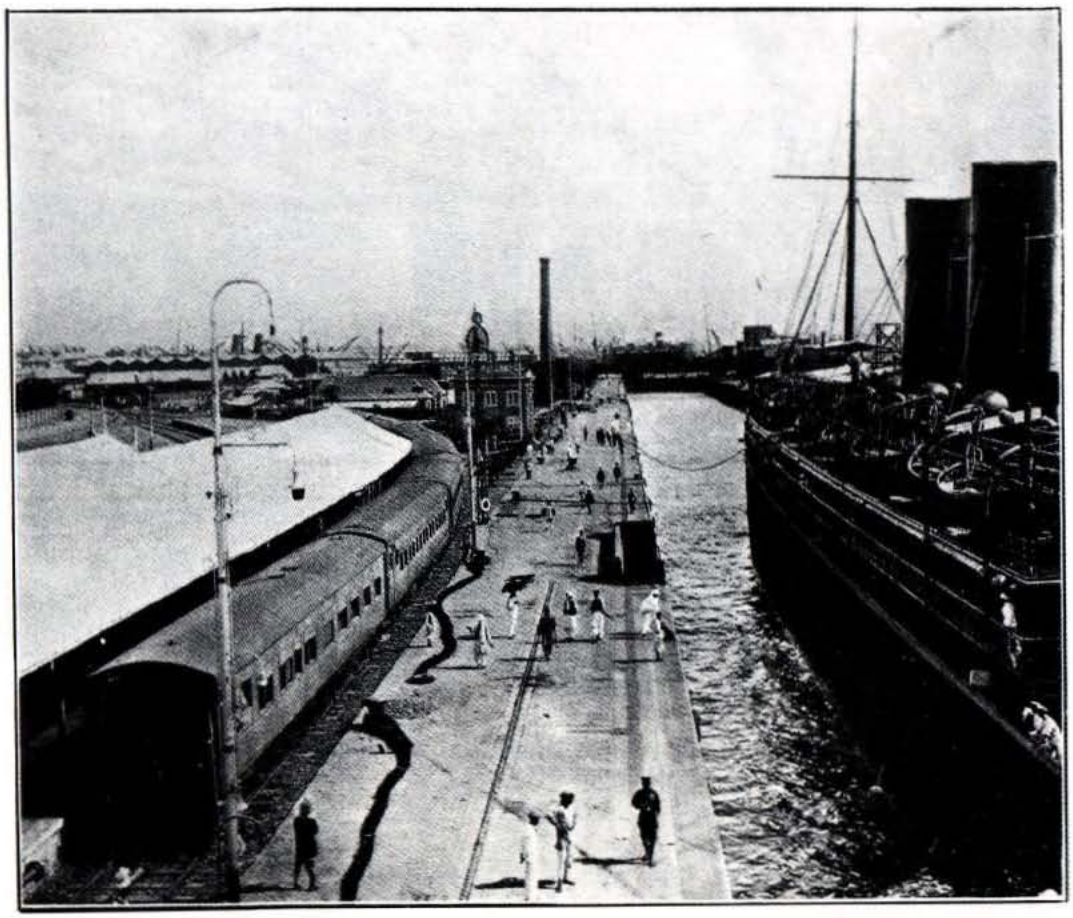
An upper floor interior, Alexandra Dock Warehouses.

IV.

THE HARBOUR

In the matter of natural facilities for shipping Bombay is one of the most fortunate of the world's great sea-ports. Situated almost midway down the Western Coast and possessing the only natural deep-water harbour on this side of India and one of the safest and most spacious in the world, Bombay's central position and accessibility by sea and land have made her the main gateway and distributing entrepot for the overseas trade of Western and Central India.

By a happy dispensation the Harbour of Bombay is as beautiful to the eye as it is admirably designed for the requirements of commerce. Some 70 square miles in extent, this magnificent haven provides secure and ample shelter

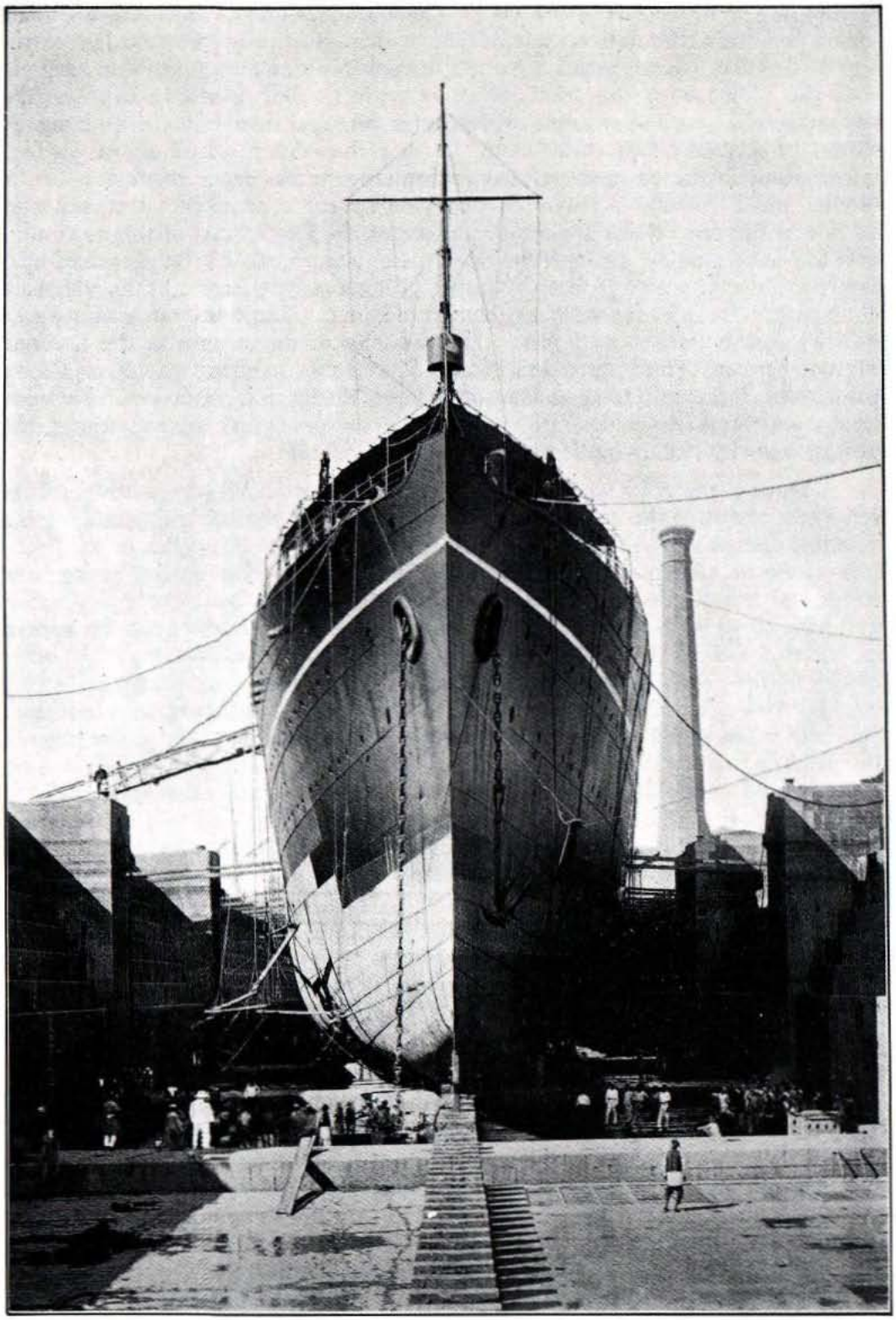


The entrance lock, Alexandra Dock.

for shipping at all seasons of the year. The entrance is from the south-west and Colaba peninsula, the narrow spit of land which constitutes the southern extremity of Bombay Island, forms a natural breakwater which protects the harbour from the violence of the south-west monsoon. The harbour runs north-east and south-west and is about twelve miles long and from four to six miles in width; its general depth varies from 22 to 40 feet with a minimum of 32 feet at low water in the entrance fairway, continuing in the main channel as far as Butcher and Elephanta Islands. A depth of 37 feet is available at all states of the tide in the deep water anchorage abreast of the Docks and as the maximum draft for ships passing through the Suez Canal is 32 feet,—to be increased ultimately to a maximum of 35 feet,—Bombay need have little fear as to the adequacy of her natural facilities for shipping in years to come. The mean range of greatest ordinary spring tides is 13·9 feet. The velocity of the stream at the harbour entrance between Thull Shoal and Prongs Reef is two to three knots on strong spring tides, increasing to as much as four knots during the monsoon. Between Prongs and Sunk Rock the rate varies from one and a half to two knots, the greatest velocity occurring at springs on the flood tide.

During the cold weather months, November to March, a smoky haze frequently obscures the coastline in the early hours of the morning, making the incoming passenger realise that he is approaching the Manchester of India. From June to September, while the south-west monsoon is in full swing, low clouds and heavy rain are usual. The best time to make the port at this season is an hour or so before sunrise, when Prongs and Kennery Lights can be picked up without difficulty; after sunrise the clouds lower considerably. At other seasons of the year the coastline is generally clear and the panorama which unfolds itself on approaching Bombay Harbour is unforgettably beautiful, especially when making the port at dawn, for it is then that the colouring of this majestic waterway is at its loveliest. The rays of the still invisible sun, rising behind encircling hills of cobalt and amethyst, clothe the eastern sky in a blaze of glory. As the coastline becomes more distinct, a tall, symmetrical lighthouse is seen on the port bow,—this marks the extremity of the treacherous Prongs Reef, which in olden days exacted a heavy toll of ships and mariners. Further to the north Malabar Hill rises into view, its wooded slopes dotted with bungalows and Government House marking its extreme seaward end. Colaba Point with its observatory,—formerly a lighthouse,—now catches the eye and the narrow projection of Colaba peninsula with its profusion of barracks, hospital buildings and churches, interspaced with flowering trees of many descriptions, widens out gradually into the main City and Island of Bombay,—the sea-girt gateway of the great Empire of India.

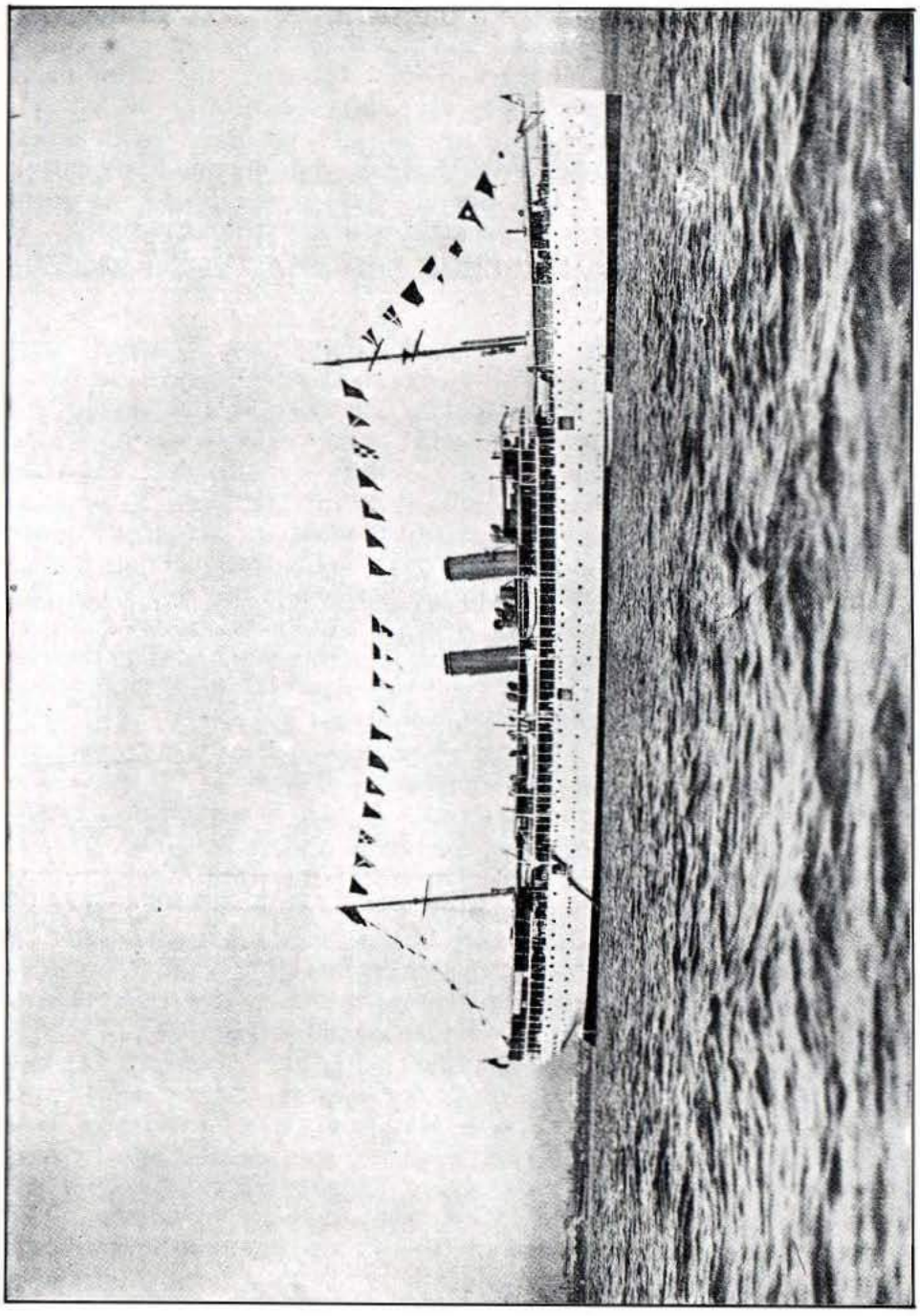
Away on the starboard beam and dominated by a white lighthouse is a small wooded island, set like an emerald in the sparkling waters. This is Kennery Island,—redolent with historic memories,—for was this not one of the chief strongholds of the famous Mahratta pirate Angria, whose forces for upwards of half a century harried and levied toll on the shipping of the Konkan. The old pirate fortifications are still in a fair state of preservation. The twin hills on the starboard bow are the Karanjas,—on the nearest can be discerned the ruins of an old church, a relic of the days of Portuguese dominion. Stretches



The R.M.S. "Rajputana" in the Hughes Dry Dock.

of silvery beach and green mangrove bushes on the eastern shore mark the entrances to picturesque creeks sheltering numerous little country ports which contribute their quota to the coastal trade of Bombay. In the background, framing the northern and eastern limits of the harbour, lies a fine broken country of hill and dale backed by the majestic outlines of the Western Ghats, while in the middle distance Elephanta Island, thickly wooded from shore to summit, rises abruptly from the bosom of the harbour. Here are the world-famous temples of Brahmin origin, dating back to the eighth century A.D. Close by are Hog and Butcher Islands,—both more picturesque than their names indicate. Hog Island was probably so called because of its shape while Butcher Island possibly owes its designation to the fact that in the early days of the British occupation the live stock for the Company's table was fattened and slaughtered here. The trio of small islands close inshore are Oyster Rock, Middle Ground and Cross Island, in the order named.

Approaching the Steam Pilot Vessel,—the "Lady Wilson,"—whose cruising ground lies a mile or two south-west of Sunk Rock Lighthouse, the ship slows down to take on board the pilot who will navigate her alongside the Ballard Pier or to the Dock gates. And now, as the vessel swings inshore, the city begins to assume more definite shape. Bombay is spread along the narrow strip of land which forms the Western bulwark of the harbour. Its prosperity is apparent from the handsome buildings which adorn the waterfront and the masts and funnels of the great ocean freighters working cargo at their berths in dock or alongside the Harbour Wall. In the foreground the Taj Mahal Hotel with its great dome, 282 feet in height, makes a striking landmark and just to the north, on a reclaimed frontage, stands an imposing stone landing-stage and archway of Byzantine design. This is the "Gateway of India," built to commemorate the visit of His Majesty the King-Emperor, George V, to his Indian Dominions in November, 1911, and used on official occasions such as the arrival or departure of the Viceroy or the Governor of Bombay. Adjoining is the Royal Bombay Yacht Club, its trim lawn emerald green in the morning sunlight and a fleet of graceful yachts swinging at their moorings close by. The Royal Indian Marine Dockyard, Bombay Castle and the Royal Mint are readily distinguishable as the vessel heads gently towards the Ballard Pier. Immediately in the background the Ballard Estate, with its magnificent new office buildings, demonstrates the continuous growth of this great city. The Port Trust docks, with a water area of 105 acres, lie immediately to the north,—Alexandra, Victoria and Prince's in the order named; beyond them extends a succession of Bunders or piers for the accommodation of coasting craft, the Mazagon Dockyard belonging to Messrs. Mackinnon, Mackenzie & Company, and the vast oil installations. On Trombay Island, at the northern extremity of the harbour, is the Bulk Oil Pier, where bulk cargoes of petrol and kerosene are discharged through five miles of pipe line into the installations at Wadala. Off the Mazagon Sewri Reclamation the Indian Mercantile Marine Training Ship "Dufferin" lies at her moorings. On board this fine vessel close on one hundred selected cadets from all parts of India are being trained in seamanship on the lines of the "Worcester" and "Conway". This interesting venture,—one of the many signs of the newly awakened aspirations of the Indian nation,—is proving a



The Indian Mercantile Marine Training Ship "Dufferin."

great success and is receiving every encouragement from mercantile and shipping interests.

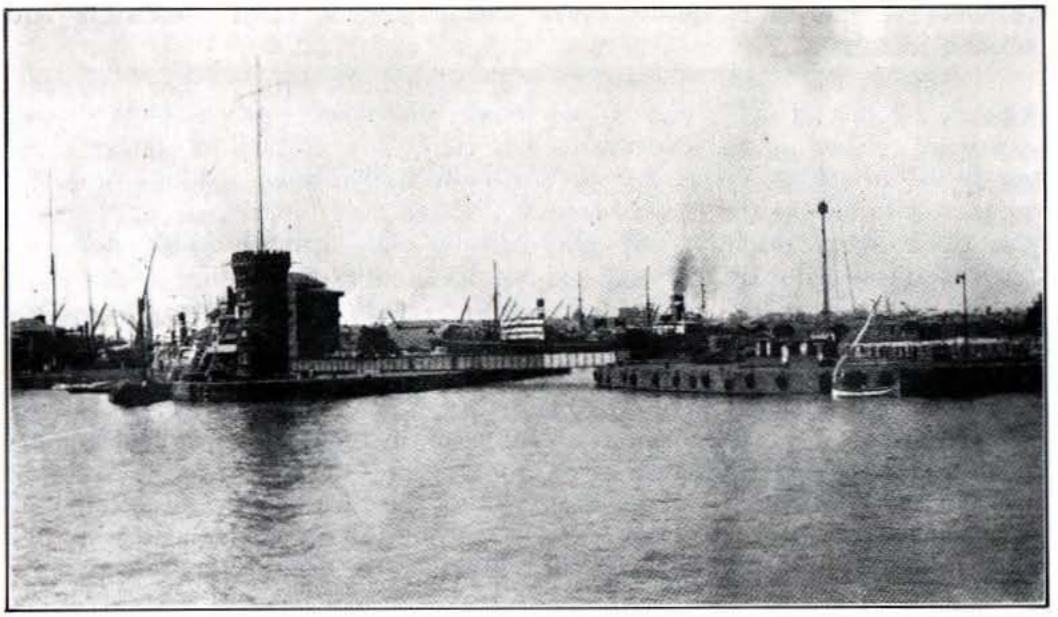
Just to the north of Cross Island, beyond the Prince's Dock entrance channel, a forest of masts and rigging marks the position of the country craft anchorage. Here in the fine season may be seen specimens of almost every description of sailing vessel that navigates the Indian seas,—baghlas from the Persian Gulf, khotias and dangies from Cutch and Sind, pattemars and battelas from the Konkan, machwas and other harbour craft,—all are represented here. Easily distinguishable by their size and peculiar stem heads are the baghlas, some of them magnificent sea boats running up to as much as 400 tons. These are the lineal descendants,—their design little altered by the passage of time,—of those vessels whose intrepid Hindu and Arab navigators braved the terrors of the Indian Ocean in the days of the Pharoahs. These country craft still provide cheap transport for an enormous quantity of merchandise between Bombay and the Malabar and Kathiawar ports, the Persian Gulf and even as far afield as Aden and Zanzibar. A closer inspection of the various types of sailing craft and their characteristics will amply repay anyone interested in those who "go down to the sea in ships and have their business in the deep waters."

Behind the imposing harbour frontage lies the crowded city extending over an area of 25 square miles and sheltering within its municipal boundaries a population of approximately a million and a quarter. The tall chimneys of many cotton mills stand out bravely against the sky, evidence of the great industry that plays the leading part in Bombay's commercial life. The industrial conditions and forced development of the last hundred years have left Bombay, in common with many other great seaports, an inevitable legacy of congestion which is rendered all the more acute by the restricted area of the island proper and the phenomenal growth of population within the last century. The problems arising out of this congestion are being tackled with determination. Vast development projects have been undertaken during the past decade and in addition to the reclamation of considerable areas on the western foreshore of the island, schemes for improving the housing conditions of the labouring classes and for opening up new suburbs to the north of the Island have been pushed forward with commendable energy by the public bodies concerned.

Lights and Navigation.

The port and its approaches are excellently lighted. The three principal entrance lights are Prongs Lighthouse to the northward, Kennery Lighthouse to the south and the unattended Floating Light Vessel moored in 40 feet at low water, ordinary spring tides, in the entrance to the harbour fairway in Lat. 18·50 N., Long. 72° 44′ 30″ E. The Light Vessel exhibits at night a white, group-flashing light, three flashes in quick succession every 24 seconds, from a masthead 32 feet above the water. This light is visible in clear weather from a distance of 11 miles.

Kennery Lighthouse is situated on the island of that name 8¾ miles 152° from the Light Vessel and marks the southern boundary of the port limits. The light is group-flashing, white, and shows groups of two flashes every 10 seconds; it is 154 feet above sea level and is visible for 18 miles in clear



The Prince's Dock entrance.

weather. A sector of the light shows red to southward between the bearings 336° through north to 001° from seaward.

Prongs Lighthouse marks the reef running southwards from Colaba Point; it is surrounded by reefs and dangerous ground extends for a distance of about one mile from it. The Lighthouse is 146 feet high and exhibits at night every 10 seconds a white flashing light visible for 17 miles from 232° through W. N. and E. to 171°. Prongs and Kennery are both connected by wireless with the Port Signal Station and the Pilot Vessel.

As a further guide to mariners there are two lighted buoys moored S.E. of Prongs Lighthouse; the South Entrance Buoy, conical in shape and coloured red, exhibits a red light flashing every 10 seconds and visible at a distance of 6 miles while the Prongs Reef Buoy, a large can buoy painted black, exhibits a white light flashing every second.

Vessels fitted with wireless may take advantage of the Direction Finding Station at Juhu Island in Lat. 19·04′ 55″ N., Long. 72° 49′ 54″ E. (call sign V.W.B.), which works on a 600 metre wavelength. A bearing from this station, taken in conjunction with a sounding, will give a position of sufficient accuracy to enable the navigator to shape his course to pick up the visual land marks. A project is at present under consideration to substitute for this station an unattended Wireless Beacon on Kennery Island.

From the ten fathom line incoming vessels should shape a course for the Light Vessel, after passing which they should steer to pass between the South Entrance Buoy and the Prongs Reef Buoy. Any ship making the port on a dangerous course is warned by the Prongs and Kennery lightkeepers by signals in the day time and rockets at night.

The docks and bunders looking north, with Mazagon-Sewree Reclamation in the middle distance

Immediately inside the South Entrance and Prongs Reef Buoys the Pilot Vessel will be found on her cruising ground S. E. of the Prongs Lighthouse and about two miles south-west of Sunk Rock Lighthouse. The latter is an unattended lighthouse, built on a patch of rock 2 miles E.N.E. of Prongs Lighthouse, awash at low tide and with deep water close in to the eastward. It is 94 feet high and shows a red light with white sectors, occulting every 5 seconds, the white light visible 14 miles shown over the fairway and the red sector visible 7 miles at either side.

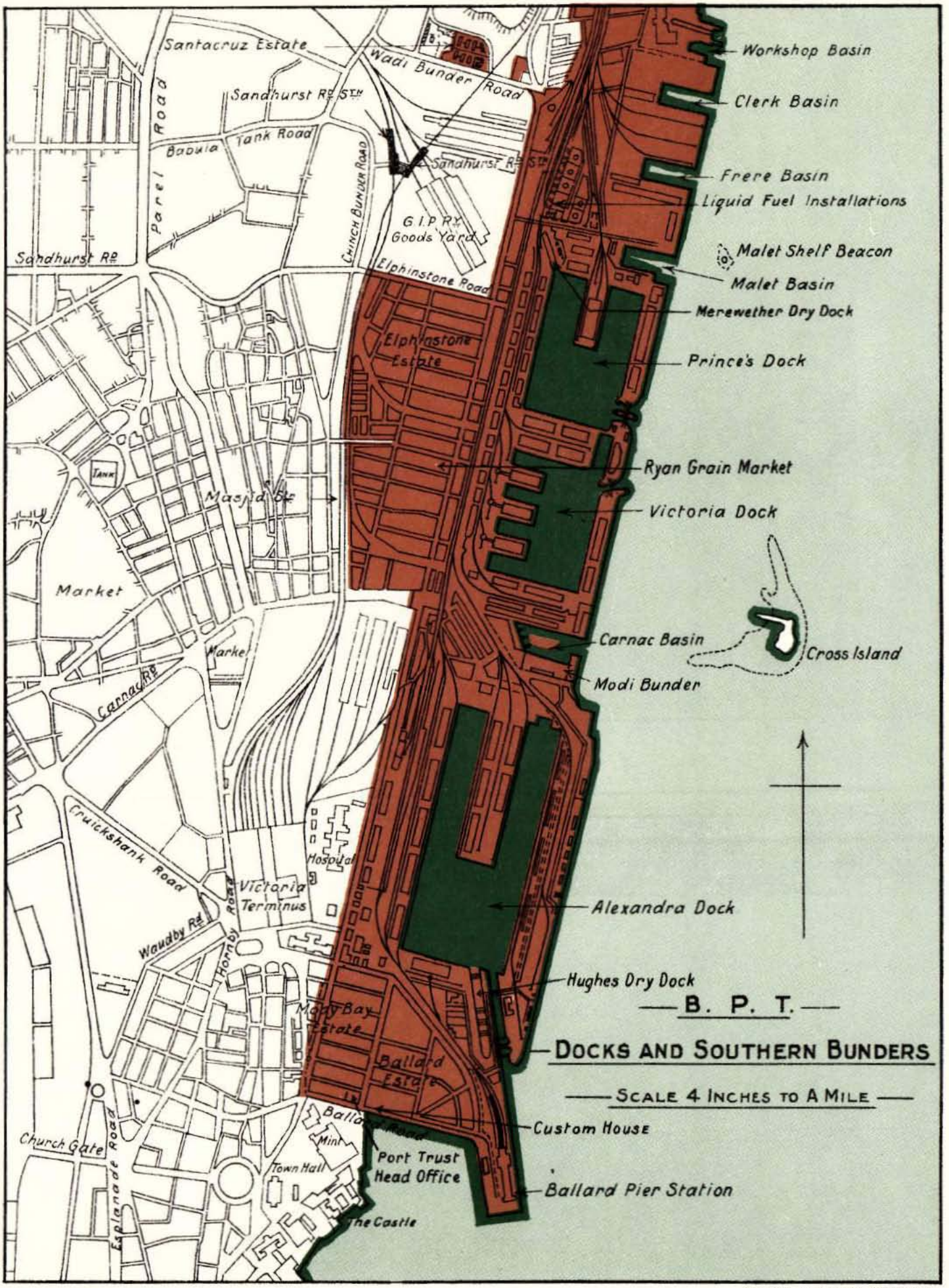
The Steam Pilot Vessel, the "Lady Wilson," is a two-masted steamer painted white, with a buff funnel having a black top; she is of trawler build and displays during the day the usual Pilot flag (red and white horizontal halves) hoisted at the main, and at night the lights prescribed for steam pilot vessels,—a bright white light at the masthead with a red light 8 feet below, visible 2 miles away. When off her station for overhaul her place is taken by a two-masted sailing schooner painted black, which will usually be found at anchor. Pilotage is compulsory except for His Majesty's Ships of War.

Of the subsidiary lights of the Harbour the principal are the Dolphin Rock Light, situated 1½ miles northward of Sunk Rock, showing a green light occulting every 4 seconds and visible 5 miles, with a white sector over Middle Ground Island, and Tucker Beacon Light, at the northern end of the Harbour, red with a white sector showing over the fairway, group flashing every 6 seconds.

The Port Signal Station, situated on the top of the tower at the Ballard Pier, repeats the numbers hoisted by ships entering the harbour and keeps a look-out for accidents and for ships requiring assistance. During unsettled weather the storm warnings received from the Meteorological office at Poona by telegraph are hoisted at the station by day or night immediately on their receipt.

Tidal Model of the Harbour.

In order to assist the Trustees in considering the many intricate problems arising out of new projects and development schemes connected with their dock and harbour works, the Chief Engineer of the Port Trust (Mr. J. McClure, M. Inst. C.E.), designed and constructed in 1921 what is believed to be the largest working harbour model in existence. It is modelled in concrete on a horizontal scale of 10 inches to the sea mile, with a vertical scale of 1/8th inch to 1 foot for depths and is a faithful reproduction in miniature of the natural formation of the Harbour and the tributary creeks and rivers, with electric tidal propagating machinery which produces a regular rotation of graduated spring and neap tides as they occur in nature, the period of each tide being 62 seconds. A two-inch thickness of the finest sand is used to overlie the harbour bottom and is moulded to the various depths as given by latest surveys. A series of exhaustive experiments have proved that the model gives results which agree almost exactly with the current observations made in connection with the Harbour surveys. The similarity of the model currents to those occurring in nature is continually checked by means of float buoys and the accuracy of the depths is tested after passing through several hundreds of tides in their natural sequence.



B. P. T.

DOCKS AND SOUTHERN BUNDERS

SCALE 4 INCHES TO A MILE

THE TIMES OF INDIA PRESS, BOMBAY.

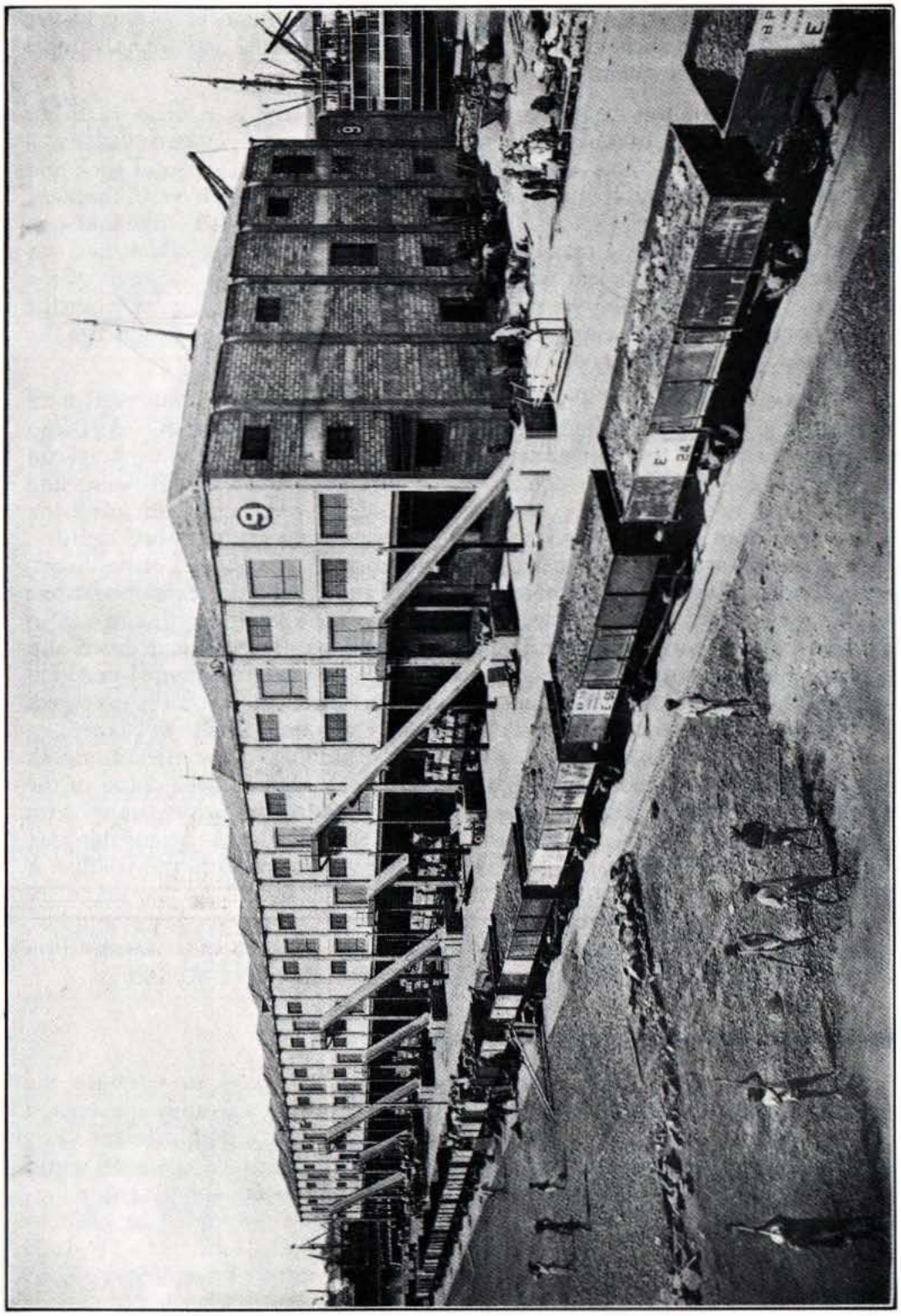
of 23 feet. There was also a small dry dock at Mazagon and two others were constructed there on behalf of the Peninsula and Oriental and British India Steam Navigation Companies between 1845 and 1867.

The need for wet dock accommodation was voiced as early as 1810 but it was not till 1875 that Bombay's first wet dock,—the Sassoon Dock at Colaba,—was opened to traffic. This was a small dock excavated out of solid rock and constructed by private enterprise. Judged by modern standards it was lilliputian; —it had a water area of 3½ acres, an effective depth of about 18 feet and was designed to accommodate a maximum of five ships of about 1,000 tons net. It was purchased by Government with other foreshore properties on behalf of the new Port Trust in 1879 and was for some time used as a trooping dock but for the past twenty years or more it has been out of commission except for the accommodation of fishing boats and country craft.

Immediately the new Trust was formed its administrators embarked with energy on the task of providing adequate wet dock accommodation. As cargo and passenger vessels grew in size and draft, so larger docks and more powerful equipment were added, with commendable forethought for the growing and ever-changing needs of trade. Bombay can indeed look back with pride on all that has been accomplished in this respect during the past half century. Three capacious wet docks have been constructed with a basin area of 105 acres, six lineal miles of quayage and ample transit shed and warehouse accommodation; two dry docks have been provided,—the largest 1,000 feet in length and 100 in width; a port railway with over 100 miles of sidings has been laid down and organised; a huge area of the Harbour shallows has been reclaimed and laid out for storage and industrial purposes, and a host of collateral works executed. The total expenditure on these works up to date amounts to Rs. 23½ crores,—equivalent at present exchange to £17½ million sterling. The present docks system and the facilities for handling and storing of goods are well ahead of the times and enable ships of all sizes to be discharged, loaded and turned round with ease and rapidity. Progressive increases in the dimensions of trans-oceanic shipping will not unduly strain the capacity of the existing works and until the volume of tonnage passing over the quays expands considerably it will not be necessary to build further docks. The striking developments of recent years indicate, however, that this expansion is within measurable distance and consideration is already being given to the location and design of future dock extensions.

Increase in dimensions of ships visiting the Port.

Looking back a hundred years, or even less, it is easy to visualise the enormous growth in the size of ocean liners but what is not so readily appreciated is the remarkable increase in dimensions that has taken place within recent years and the consequent expansion in the capital and maintenance costs of world ports which have to keep their facilities in line with trade and shipping developments. Taking as a standard the P. & O. mail vessels, we find that prior to 1910 the largest was about 8,000 tons gross with a draft of 26 feet. In 1910 the "Mantua" class was put into commission, their tonnage being about 11,000 gross and draft 28 feet. In 1913 the larger 'M' class followed with about



The latest type of dock transit shed, No. 9, Alexandra Dock (exterior).

13,000 gross tonnage and 30 feet draft, in 1920 the "Naldera" class of 16,000 tons and 29 feet draft appeared, followed shortly by the "Maloja" and "Mooltan" of 20,837 tons and 31 feet draft. Thus within the short space of twenty years the tonnage of the mail ships running to Bombay has more than doubled while their maximum draft has increased by over 5 feet. Their length has expanded from 500 to 600 feet and their beam from 54 to 76 feet.

Appendix 'A' shows the annual volume of shipping berthed at the Docks and Harbour Walls during the past 10 years and the increase in tonnage and draft as compared with pre-war dimensions.

General description, Wet and Dry Docks.

That the Port Trust has kept pace with the remarkable developments referred to above will be evident from a review of the dock extensions and improved equipment provided for trade and shipping from time to time. The Prince's Dock, opened in 1880, has a depth of 25 feet. The Victoria Dock, completed and opened in 1888, has a depth of 27 feet while the Alexandra Dock, the main construction of which was completed in 1914, has a depth over the inner sill of 35½ feet at mean high water. The bottom of the dock is two feet lower, affording a depth of 36¼ feet for vessels to load to during ordinary neap tides.

As regards dry dock accommodation, the Merewether Dock, opened in 1891, has a length of 525 feet, a width of 65½ feet and a depth on sill of 25¼ feet at high water ordinary neap tides. The Hughes Dry Dock, opened in 1914, is 1,000 feet in length (divisible into two compartments), 100 feet in width and has a depth of 33¼ feet below high water ordinary neap tides; in June 1914 the s.s. "City of Exeter", having struck a German mine outside the Harbour, was successfully dry-docked with a draft forward of 34 feet 4 inches.

When it is remembered that in addition to these facilities the extensive mercantile marine anchorage in the Harbour itself can accommodate ships drawing up to 37 feet at any state of the tide, it becomes evident that the advantages which Bombay offers to shipping are surpassed by few seaports in the world.

The main particulars of the three existing wet docks are as follows:—

Name and date of completion.	Width of entrance.	Maximum available depth.	Water area.	Lineal feet quayage.	Number of berths (including Harbour walls.)
Prince's Dock (1880)	66'-0"	27'-0"	30 Acres.	6,910	14
Victoria Dock (1888)	80'-0"	29'-0"	25 ,,	7,805	16
Alexandra Dock (1914)	100'-0"	36'-0"	49½ ,,	16,055	20 (plus 3 berths for ferry steamers).

Transit shed No. 9, Alexandra Dock (interior, 1st floor).

The two older docks are connected by a communication passage. The Alexandra Dock has a lock 750 feet in length which can be increased by means of caissons. Among the schemes under consideration in connection with future extensions is a project for remodelling the two older docks, enlarging the quay space and the shed accommodation and providing locks so as to impound the water to the level of ordinary High Water. This would give an effective depth of over 31 feet in Prince's Dock and about 33 feet in Victoria Dock, besides increasing the number of berths suitable for large ocean liners.

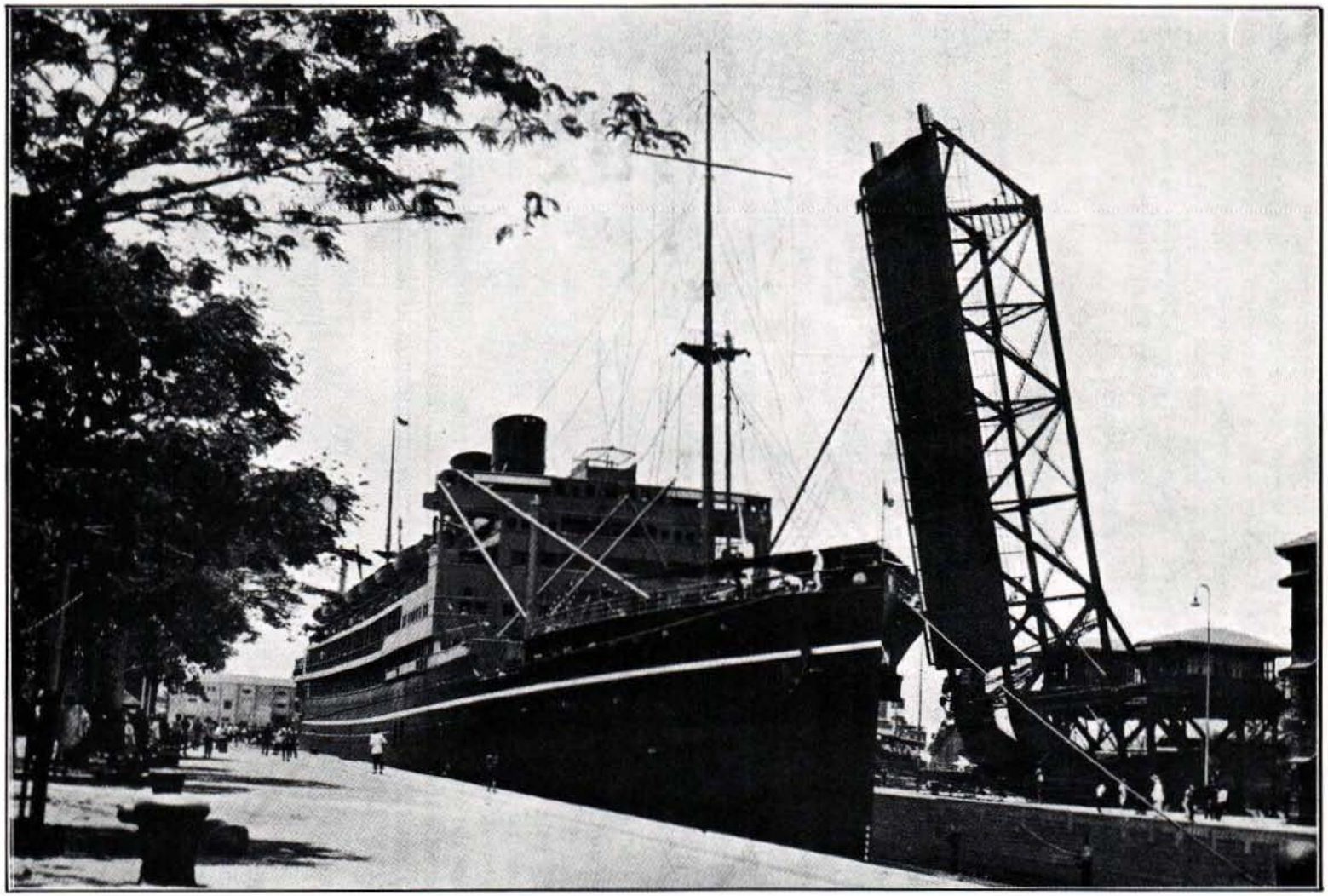
Dock equipment, transit sheds and warehouses.

Between five and six million tons of cargo are handled annually over the dock quays. Every berth in the docks, except two which are reserved as open berths for certain classes of bulk cargo, has its own enclosed transit shed, fully equipped with hydraulic cranes and hoists, shoots for discharge of bag cargo, lock-up pinjras for valuable goods, etc., the total floor area of these sheds being approximately 2,500,000 square feet. The latest type of transit shed, as for example that at No. 9 Berth, Alexandra Dock, completed in 1928, is three-storied, 396 feet long by 121 feet broad, with a total floor area of 129,000 square feet excluding the galleries, which run the whole length of the west side of the building and are used for the reception of goods unloaded by the hydraulic quay cranes. The building is a steel-framed structure with walls of pre-cast concrete blocks and floors constructed of steel troughing filled with concrete and designed to carry a super-imposed load of 4 cwt. per square foot.

In the older docks a few of the berths are not fully rail-served but in the Alexandra Dock all the sheds have rail sidings both on the quay front and at the rear, with large sorting yards on either side of the dock. The total number of movable hydraulic quay cranes of various capacities in all three docks is two hundred and nine. The two older docks are equipped with 30-cwt. cranes; those in the Alexandra Dock are mostly of 35-cwt lifting capacity and are a luffing type with a full outreach of 38 feet from the quay wall. There are also a number of five and six ton quay cranes, two fixed cranes of 30 tons and 100 tons respectively, and a 60-ton floating crane, in addition to several portable runabout cranes of varying capacity.

All the berths in the Alexandra Dock are provided with oil bunkering service pipes connecting with the liquid fuel installations and special berths are set aside at the Harbour Walls for discharge of bulk cargoes of liquid fuel, kerosene and lubricating oils. Bunkering and discharge can be carried out simultaneously as the service pipes have been duplicated. A specially equipped barge is provided for the reception of oil waste and bilge refuse.

In addition to the transit sheds each dock has an extensive range of warehouses where goods can be stored for any length of time. These warehouses front on the main roads behind the docks and are also served by rail, so that goods can be loaded direct into railway wagons for despatch to any destination up-country. The total floor area of the duty-paid and bonded warehouses is nearly one million square feet. The largest type are three-storied and a certain



The R.M.S. " Viceroy of India " leaving Alexandra Dock.

number—known as "protected" warehouses—are reserved for storage of special classes of cargo, chiefly piecegoods, which thereby enjoy the privilege of low insurance rates against fire. The normal stocks of piecegoods and twist and yarn stored in these protected warehouses is about 70,000 packages but on occasion as many as 160,000 packages have been accommodated.

In close proximity to the Alexandra Dock is a new Municipal Fire Brigade Station constructed and equipped specially to deal with fires in the docks area. The capital and maintenance cost is shared equally by the Municipality and the Port Trust.

Dock and Harbour Police.

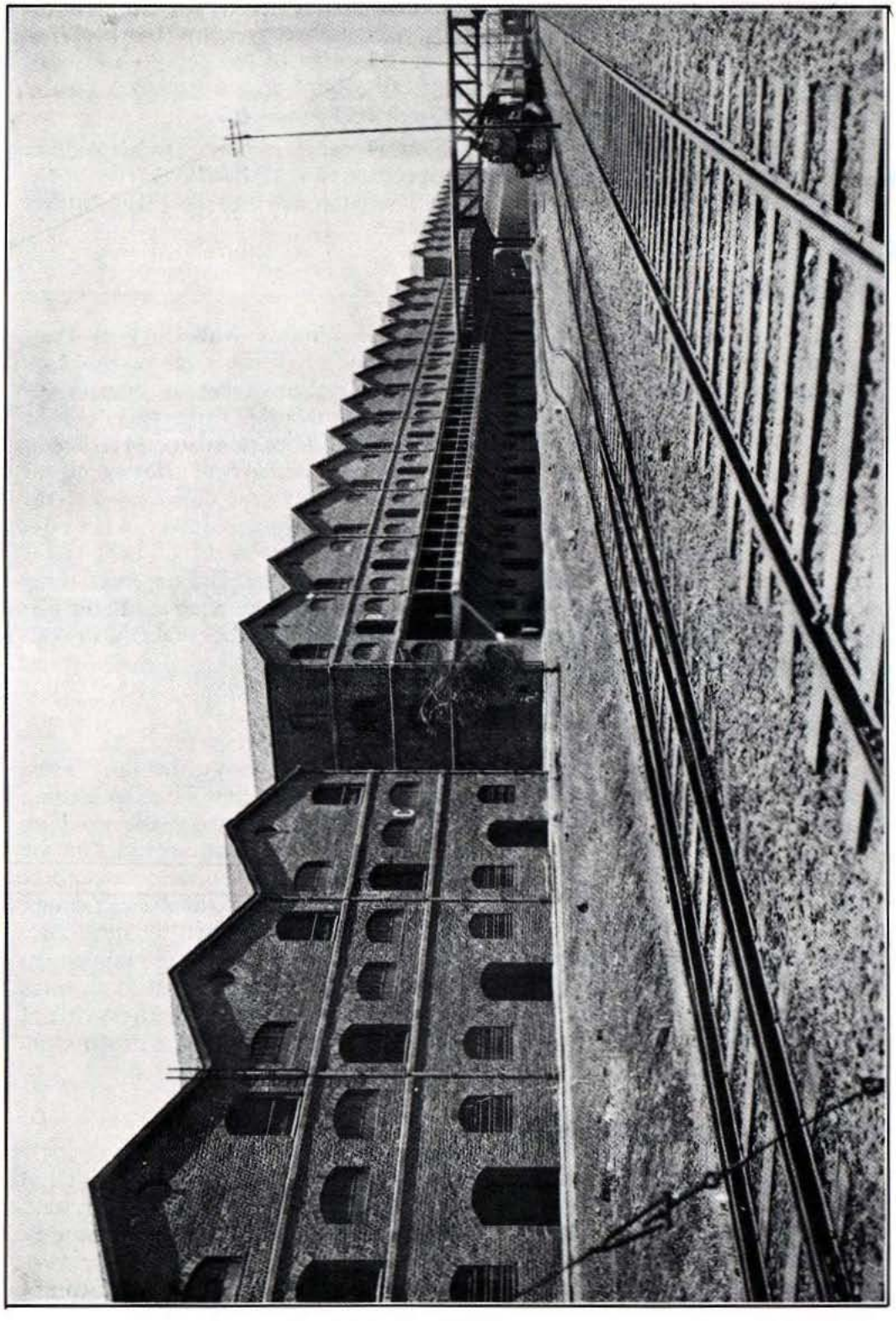
The protection of goods against theft and pilferage while in Port Trust charge is a matter which engages the close attention of the dock authorities. The Government crime reports show that the precautions taken are remarkably effective and that the good reputation enjoyed by Bombay in this respect is fully justified. The Docks Division of the Bombay City Police numbers 473 officers and men, of whom about half are employed on law and order duties and the remainder on watch and ward. The Port Trust defrays the entire cost of the latter and half the cost of the former staff and, in addition, maintains a Harbour Police Patrol whose duties are mainly concerned with control of boat traffic in the navigable channels and enforcement of lighting regulations and other Port rules. All the dock transit sheds and warehouses have been made burglar proof as far as possible and special lock-ups are provided for valuable goods awaiting clearance.

Services undertaken by the Port Trust.

In addition to providing the facilities referred to above the Port Trust undertakes the supply of all quay labour required in connection with the loading and discharge of cargo in the docks, including tallying, sorting and stacking in the transit sheds. The ordinary charges for such services are included in the scheduled wharfage rates which, in the case of import cargo, also cover five days free storage, calculated from the General Landing Date of the vessel's cargo. The labour required for handling the cargo on board is supplied by stevedores engaged and paid by the shipowners. The merchant makes his own arrangement for taking delivery of his goods from the transit sheds after payment of customs and wharfage charges but the Port Trust undertakes, if required, the work of loading into and unloading railway wagons, carts and lorries at a small extra charge.

Passenger Traffic and Facilities.

The trans-oceanic passenger traffic of the Port is mostly dealt with at the Ballard Pier, an extension of the west side of the Alexandra Dock entrance. The berth is dredged to 32 feet at low water and can accommodate the largest vessels visiting the Port. Immediately fronting the berth is a handsome, two-storied building divided internally into a Central Reception Hall, a Customs



The Alexandra Dock Warehouses, with the Port Trust Railway in foreground.

Examination Hall and a Railway Concourse which links the main building with the adjoining railway station. The upper floor is occupied by the foreign mail sorting office of the Postal Department, a restaurant and retiring rooms for passengers.

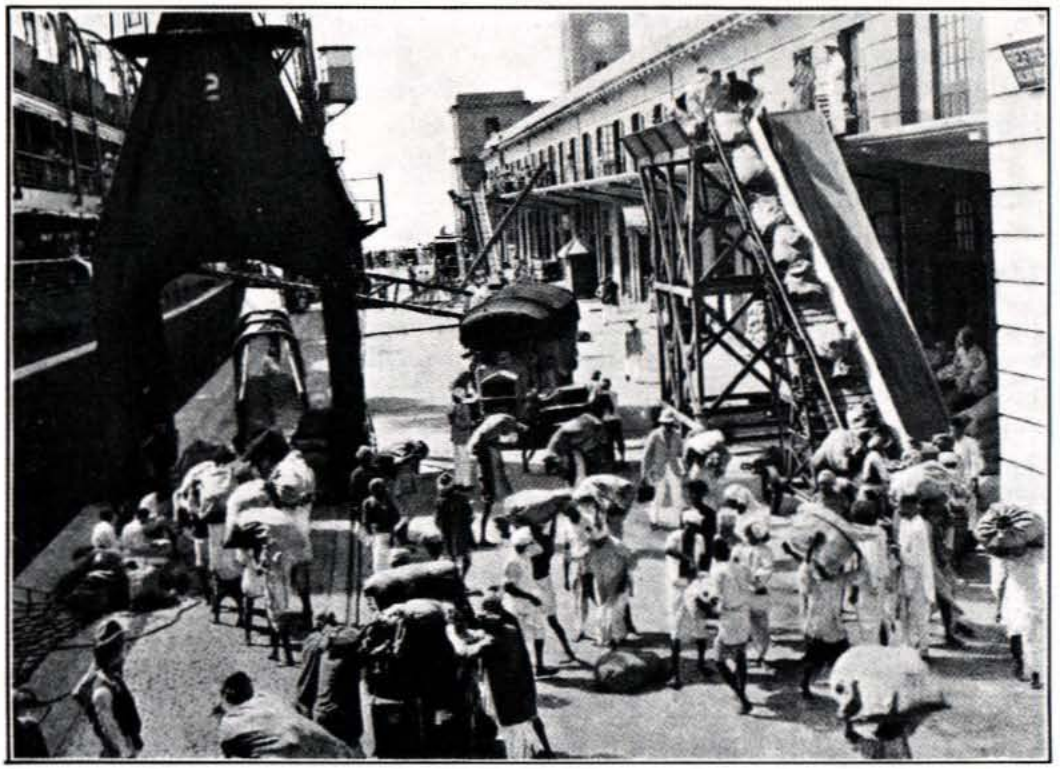
The arrangements at Ballard Pier for the arrival and departure of passengers are designed to provide the maximum of convenience and the minimum of delay in clearance and despatch of baggage. The incoming passenger, within an hour of the ship making fast alongside the pier, will find his luggage neatly piled on benches in the Examination Hall under the serial numbers previously allotted on board. Examination is expeditiously carried out by the large staff of Customs examiners deputed for this purpose; the declaration forms filled in on board the day prior to arrival are kept ready tabulated at the Customs counter and after payment of any duty which may be leviable, the form is countersigned and returned to its owner and his baggage is then initialled and passed out by the Customs Officer in charge.

For the convenience of passengers who prefer at a small extra charge to save themselves the trouble of handling their baggage, representatives of the principal firms of Passenger Agents attend on board immediately on arrival and they are also allotted office enclosures in the Examination Hall. These Agents undertake all services in connection with clearing, registering and forwarding of baggage, reservation of rail or hotel accommodation, etc.

In the case of homeward bound passengers, the vessel is usually berthed at the Pier the night before sailing and heavy advance luggage is loaded before the passenger embarks. Baggage accompanying passengers is taken over by the Shipping Company's representative in the Examination Hall, registered and placed on board, while the passenger passes through the medical examination by the Port Health authorities. The Medical Inspection Rooms for both sexes are located in the Central Hall, giving direct access to the quay.

The Railway Station adjoining the Pier has four covered platforms whence on mail days special through trains leave for and arrive from Calcutta, Delhi, Peshawar and most of the principal centres of India. Booking and Information Offices are situated in the Central Hall. The regular services on the arrival and departure days of the English Mail consist of the G. I. P. Railway Company's Imperial Indian Mail and the B. B. & C. I. Railway Company's Frontier Mail. These trains-de-luxe run between Bombay and Calcutta (*via* Allahabad) and between Bombay and Peshawar (*via* Baroda and Delhi) respectively. Their timings are conveniently arranged according to the arrival and departure of the Mail Ships and their connection with the Homeward Mail steamer is guaranteed. In addition to the regular train services,—which are duplicated in the busy passenger season,—special trains are frequently run from the Ballard Pier Station in connection with the arrival of large passenger and tourist liners.

There is a supplementary passenger and trooping berth at No. 18 Alexandra Dock Harbour Wall. The coasting passenger services are provided for at special berths on the Prince's and Victoria Dock Harbour Walls and the Ferry steamer services have six berths at the north end of the Alexandra Dock



Landing the English mails at Ballard Pier.

Wall, fully equipped with examination sheds, refreshment shops and waiting rooms.

The total number of overseas passengers embarking and disembarking at Bombay exceeds a quarter of a million annually and the total number carried by the coasting and ferry services is over a million.

The Foreign Mails.

The handling of the inward "All India" foreign mails at Ballard Pier is an interesting operation. Immediately the mail ship makes fast alongside, four hydraulic cranes discharge the mail bags,—averaging 5,000 to 6,000 in number,—on to the quay, whence they are hoisted by electrically driven elevators to the first floor, where a small army of sorters transfer the contents into bags labelled for all parts of India and Burma. Those for the Postal Specials waiting at the Station are trucked to the north end of the building and lowered by hydraulic hoists to their respective platforms. Mails for Karachi and the Persian Gulf are lowered from the Sorting Office by shoots and conveyed by tenders to the Karachi Mail steamer, which sails within a few hours of the arrival of the English Mail. The parcel mail is discharged as rapidly as the letters but its subsequent handling is of necessity slower on account of the checking and Customs examination.

The Bunders and Timber Ponds.

Besides the enclosed docks described above there are situated along the harbour front a number of " bunders," or open wharves and basins, where the traffic carried by coasting and country craft and the "overside" cargo from the docks and the stream is handled. These bunders, which provide an aggregate quayage of 30,000 lineal feet, are equipped with cranes, sheds and other facilities for loading, unloading and storing cargo but the labour for handling is not provided by the Port Trust and consequently the wharfage charges are much lower than—(approximately half)—those at the docks. The bunder traffic is an important item in the trade of the port; over a million and a quarter tons—or roughly one-fifth of the total tonnage of the port—are handled annually over the bunder wharves. The extensive Timber Ponds at Sewri, covering an area of over 60 acres, form a prominent feature of the bunders.

The principal cargo bunders in the vicinity of the docks are Carnac and Malet Bunders and Frere Basin. In the fair season these basins are generally crowded with country craft discharging and loading cargo of all descriptions. The chief items of coastal imports are cotton, grain and seeds, vegetables, fruit and cocoanuts, while among the principal re-exports are grain and seeds, sugar and iron.

The newer bunders are further north,—Lakri, Coal and Tank Bunder in the order named. Here the principal commodities handled are sea-borne coal, bricks, tiles and firewood. Between Coal Bunder and Tank Bunder there is a commodious Boat Hard for repairs to small craft. On the Mazagon-Sewri Reclamation various portions of the sea walls are set aside for the coal, brick and hay trades and for dried fish and on the north-eastern wall of the Reclamation is situated the extensive G. I. P. Ry. Stores Yard, which occupies some 36½ acres, and the American cotton fumigating depot. Still further to the north, beyond the Timber Ponds, are special bunders allocated to the export coasting trade in packed kerosene and petrol.

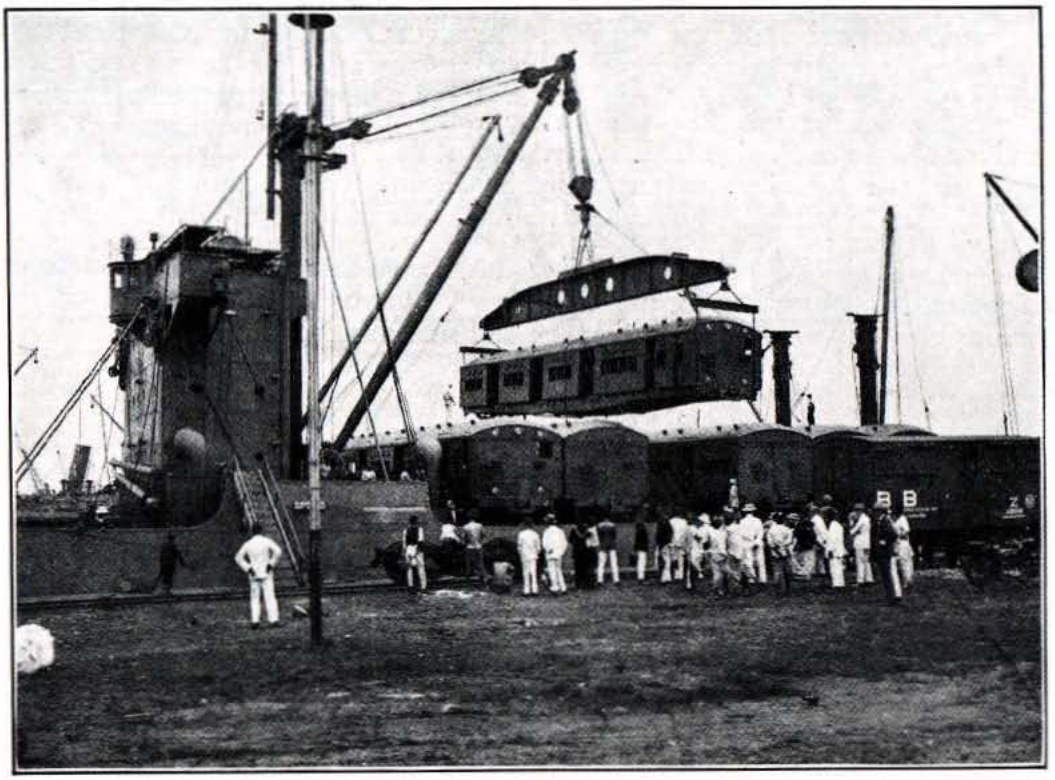
A visit to the principal bunders during the fair weather season affords an interesting impression of the diversity of Bombay's general trade and the various methods by which it is handled and transported.

VI.

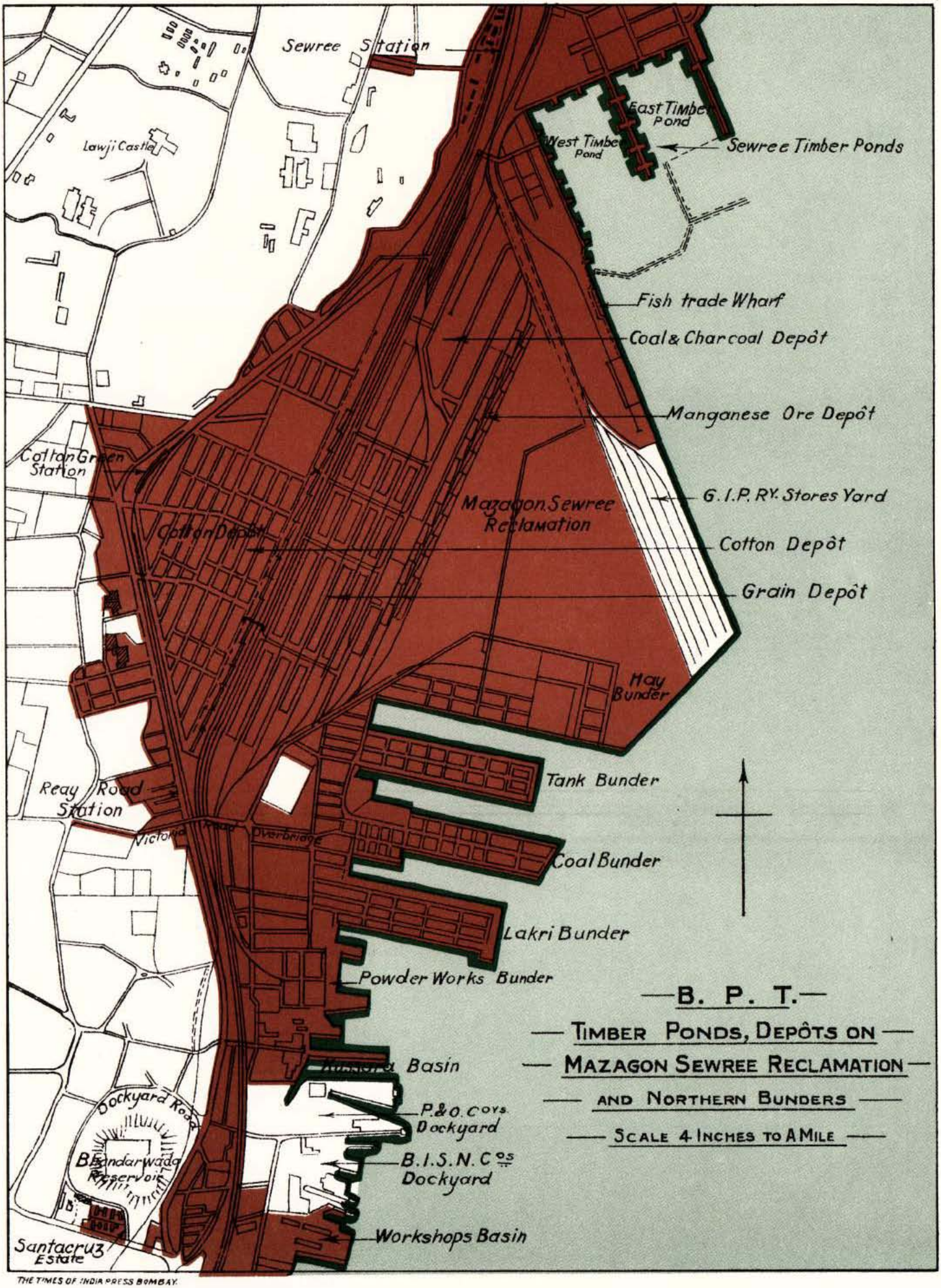
THE RECLAMATIONS, RAILWAY AND DEPOTS.

The Reclamations.

Bombay is largely a city of reclamations. Ever since the early years of the Portuguese occupation, when Simao Botelho advised the King of Portugal to encourage the development of the colony by the free gift of submerged land to those settlers willing to undertake its reclamation, Bombay has benefitted by public and private enterprise in this respect. The East India Company's officers continued the policy of their predecessors and it was due to their energy and determination in constructing the Hornby Vellard,—despite the reluctance of the Court of Directors to finance the undertaking,—that large tracts of swamp land in the centre of the island, previously inundated at high tide, were reclaimed and made available for building. It was not, however, till the latter half of the nineteenth century that any real effort was made to reclaim and regulate the harbour foreshore.



Unloading railway coaches, Alexandra Dock.



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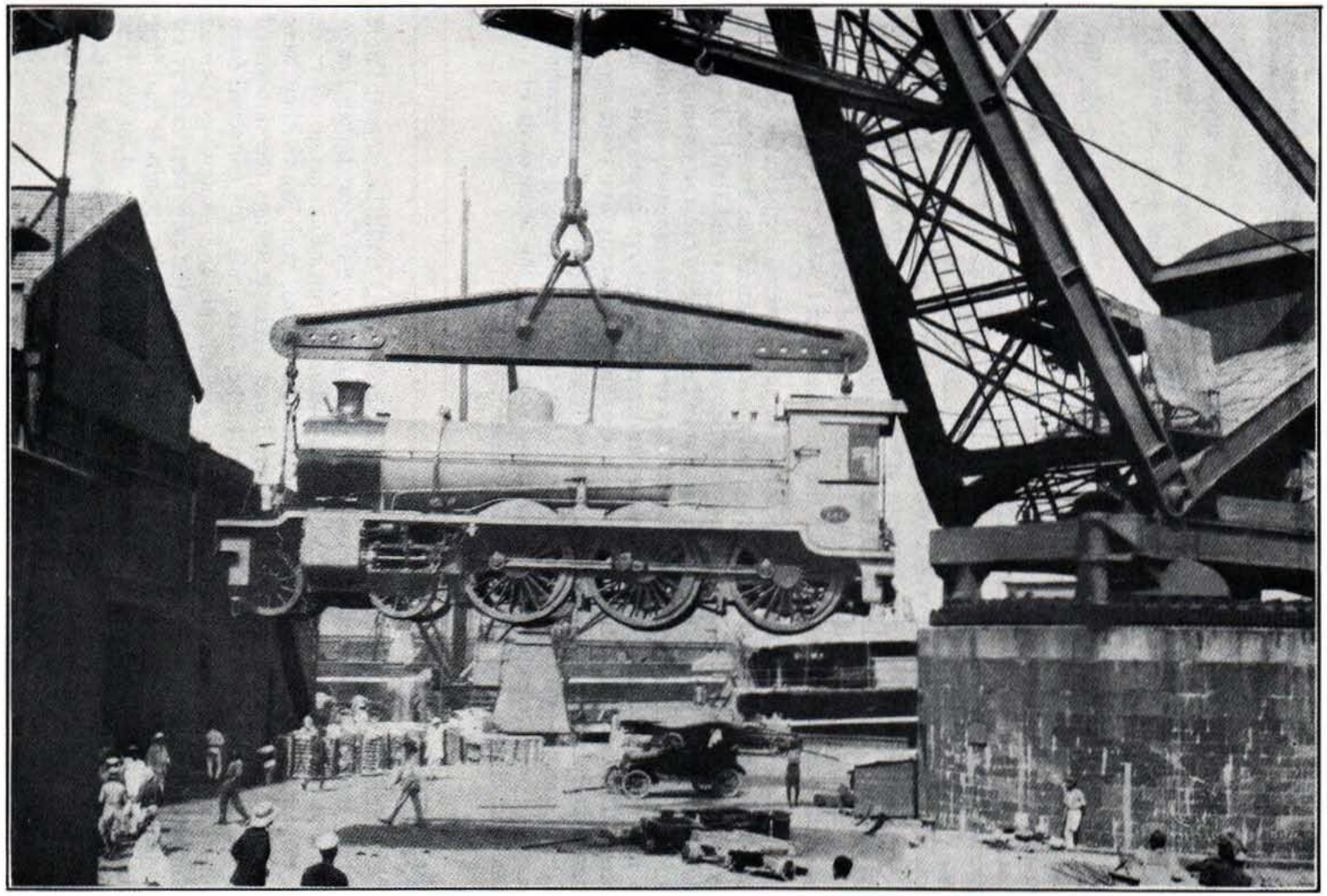
A glance at the map facing page 1 will show that practically the whole of the Port Trust docks and estates are on land reclaimed from the harbour. A considerable amount of this reclamation had been carried out by the Elphinstone Land Company and other smaller concerns—and to some extent by Government agency—prior to the constitution of the Port Trust in 1873. The whole area operated on by the Elphinstone Company was 386 acres but much of their gigantic scheme was still uncompleted when their properties were acquired by Government on behalf of the Port Trust.

The reclamations carried to completion by the Trust during the first thirty years of its existence comprised 167 acres of foreshore land from Sewri Bunder in the north to Apollo Reclamation and the Colaba Bunders in the south. In 1908 the Trust embarked on the great Mazagon-Sewri Reclamation scheme, which was completed in 1912 and added 583 acres to the area of Bombay. Subsequent filling and reclamation work at Wadala, Tank Bunder and Colaba provided a further 310 acres. The total area of the Port Trust estates at the present date is 1,880 acres, or approximately one-eighth of Bombay City and Island. The completion of these vast projects has rendered ample land available, in and about the vicinity of the docks and bunders, for storage and industrial purposes connected with the activities of the port.

The possession of these large estates is a very material factor in the development and prosperity of the port. Not only has it enabled the Trustees to meet the increasing needs of trade in the shape of storage depots and terminal railway facilities without having to acquire land at inflated prices, but the ground rents from the land estates form a permanent asset of great and increasing importance to the Trust. Most of the properties under reference have improved at least threefold in value since their original development. Twenty-five years ago the annual receipts from leaseholds and storage tenancies amounted to some fifteen lakhs of rupees,—to-day they total close on fifty lakhs (excluding dock warehouse rents). The advantageous effect of these accruals on the assessment of port rates and charges can be readily appreciated.

The Port Trust Railway.

Prior to 1914 the docks were not rail-served. As traffic between the port and the interior developed, the two main line railways, the Great Indian Peninsular and the Bombay, Baroda and Central India, laid out capacious goods yards in close proximity to the Prince's and Victoria Docks, with which they were connected by three sidings crossing Frere Road. These sidings accommodated only a fraction of the import and export traffic,—the bulk was conveyed from ship to rail and *vice versa* in bullock carts, a cumbrous and expensive method which continued until the completion and opening of the new port railway on 1st January, 1915. In planning the railway lay-out the designers had the advantage of ample unencumbered land, which enabled them to adopt the best alignments and the most modern principles of railway transportation without disturbing existing interests. In consequence the port to-day is exceptionally well equipped as regards terminal railway facilities.



Unloading locomotives by the 100-ton crane, Victoria Dock.

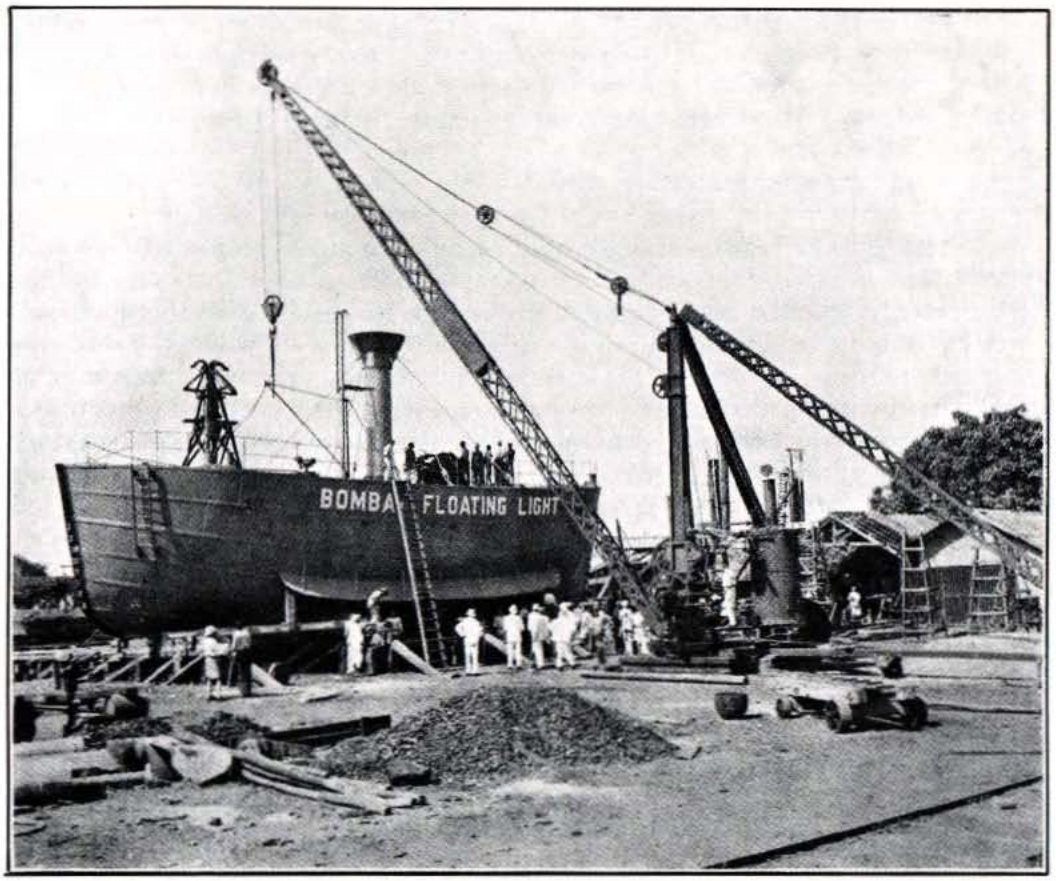
The Port Trust Railway handles nearly fifty per cent of the total rail-borne goods traffic of Bombay. Its yearly inward and outward foreign traffic amounts to over 2,000,000 tons and its local station to station traffic is approximately the same in volume. It collects every year in freight charges for the trunk railways upwards of three and a half crores, or say two and a half millions sterling. The principal traffic commodities are cotton, grain and seeds, oil cake, manganese ore, sugar, kerosene and other bulk oils, coal, charcoal and china clay.

The Railway system, though only 7½ miles in actual length from Wadala Junction to Ballard Pier, comprises over 110 miles of main lines and sidings, which may be divided into five sections, all directly linked with the docks and wharves,—(1) the receiving and despatching yard at Wadala where the link with the trunk railways is formed, (2) the bulk oil depots, (3) the Mazagon-Sewri Reclamation with its depots for cotton, grain, manganese, coal and other trades, (4) the Prince's and Victoria Docks and (5) the Alexandra Dock and Ballard Pier.

The Wadala Sorting Yard covers an area over a mile long. It comprises two divisions, one of which receives the inward goods traffic from the trunk railways and sorts out the wagons for despatch to various destinations on the Port Trust Railway, while the other receives the outward wagons from all over the port area and makes them up into trains for the main line railways. The fact that there are over two hundred delivery points on the Port Trust Railway indicates the elaborate care taken to adapt it to the varied requirements of the many trades it serves. The wagon sorting at Wadala Yard is carried out by the gravity hump method,—trains on entering the yard are shunted up one side of a long, gradated embankment or "hump," at the top of which the wagons are released one by one and gravitate down the opposite slope, being diverted on the run into their proper sidings where they are made up into rakes for despatch to destination.

The Bulk Oil Depots.

The great bulk oil installations, some 83 acres in extent, are divided into three groups,—(*a*) the Liquid Fuel and Lubricating Oil Depots at Malet Bunder immediately north of the docks, (*b*) the Kerosene Oil Installations at Sewri and (*c*) the Petrol Installations still further to the north on the Wadala Reclamation. The total capacity of all the various oil depots is about 45 million gallons. The installations, which are all on land leased from the Port Trust, are connected with the Port Trust Railway by private sidings at which bulk oil is filled direct into tank wagons for up-country distribution, and they have pipe line connections aggregating 20 miles in length to the several discharge berths on the Harbour Walls and at Pir Pao. The former are equipped for the discharge of bulk kerosene and liquid fuel, while petrol and high grade kerosene are handled at the special bulk oil berth at Pir Pao, on the island of Trombay at the north end of the Harbour. The Pir Pao oil pier is provided with one 8-inch and one 10-inch discharge pipe (with a boosting pump about half a mile from the pier head) leading to the storage tanks at Sewri and Wadala, 5½ miles away. The pumping capacity of the two pipes is 140 and 180 tons per hour respectively. The rapid expansion of the oil trade of Western India,—of which Bombay is the headquarters,— may be gauged by the fact that within seven years the imports of petrol have increased from half a million gallons to twenty millions.



The new Bombay unattended Lightship under erection at the Port Trust Workshops.

Cotton Depot.

The most important of the several great storage depots served by the Port Trust Railway is the Cotton Depot, which is situated on the western portion of the Mazagon-Sewri Reclamation. It was constructed by the Port Trust at a cost over of £1,000,000 and was opened in 1923, when the old Colaba Cotton Green was closed down. Extending over an area of 127 acres, the depot is the largest and most up-to-date of its kind in existence. It comprises 178 ferro-concrete godowns, each 104 feet by 40 feet, providing accommodation for one million bales, and 230 raised plinths (of which eleven have covered monsoon protection) accommodating a like number. On the east side of the depot are 20 receiving and despatching stations in echelon, each 250 feet long, and a railway yard with 8 miles of track. All the godowns are equipped with Grinnell Sprinklers, which operate automatically in case of fire, and the depot has its own Fire Brigade and Salvage Corps Stations, dispensaries, restaurants, etc.

Near the north entrance on Reay Road is the East India Cotton Association's magnificent Exchange, which was erected at a cost of some twenty lakhs of rupees and opened in 1925. The building covers an area of over 12,000

square yards and was designed to combine the leading features of both the New York and Liverpool Exchanges. It contains a spacious trading hall, 200 buyers and sellers rooms, offices and sampling rooms.

Bombay is one of the largest cotton markets in the world,—in a normal season upwards of three million bales are dealt with and in several years during the last decade the turnover has exceeded that of Liverpool. During the busy season,—November to June,—some 2½ to 3 million bales are railed in by the Port Trust Railway and unloaded at the Cotton Depot Station, the deliveries from which have at times reached 35,000 bales in a single day.

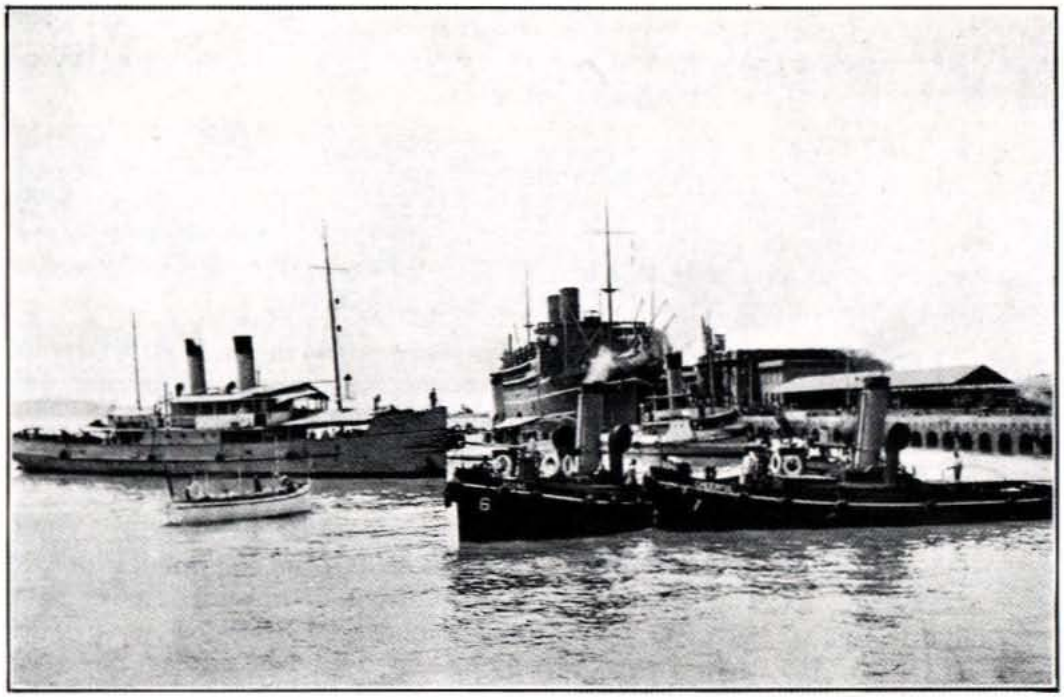
As regards passenger traffic the depot is served by the G. I. P. (Harbour Branch) Electric Railway and the electric tram and bus services. Provision has been made for future extension of the depot when necessary.

Grain Depot.

To the east of Cotton Depot, on the opposite side of the Port Trust Railway, lies the Grain Depot which,—as regards lay-out and communications,—is a model of its kind. Over 80 acres in extent, it provides more than one million square feet of covered accommodation arranged in parallel rows of sheds 500 and 1,000 feet long by 110 feet wide. Between each row of sheds are feeder lines off which run echelon sidings,—import on one side and export on the other,—one to each 250 feet bay of shedding, each siding accommodating ten wagons. This enables inward consignments from up-country or overseas to be unloaded into the sheds at the exact spot where they are required, while outward consignments for shipment or up-country distribution can simultaneously be despatched from the other side of the shed or plinth. In addition to these rail facilities the depot is equipped with excellent roads, conveniently arranged to serve the individual sheds, water supply, and electric lighting and power, and is within easy reach of the G. I. P. Electric Railway and the electric tram and bus services.

Originally designed and opened in 1914 for the reception, storage and shipment of grain and seeds,—one of the most important items in Bombay's export trade,—the depot has since been considerably extended to meet the increasing demands of other trades requiring extensive storage accommodation combined with rail and road facilities. An area of seven acres of covered and open accommodation has recently been leased to the General Motors, India, Limited for their Assembly Factory,—a new departure in the industrial life of Bombay. The factory, which is completely operated by electric power, employs 1,000 workmen and has a maximum output of 100 cars per day—both passenger and commercial vehicles,—assembled, tested and ready for the road. Magnificently equipped and ideally situated as regards docking and railroad facilities, the factory supplies the demand for the Company's products in all parts of India, Burmah, Ceylon and Mesopotamia.

Among other trades accommodated at the Depot are the great chemical and dye stuff Corporations, the Imperial Chemical Industries (India), Ltd., and the Havero Trading Company, who occupy extensive sheds for storage and



Types of Port Trust tugs and launches.

distribution of their products; bulk china clay is another commodity stored in large quantities at the depot and on the eastern side the Government Telegraph Department occupies over seven acres as a stores yard. The demand for storage accommodation is increasing to such an extent that an additional 250,000 square feet of shedding is in course of erection.

Other Storage and Industrial Depots.

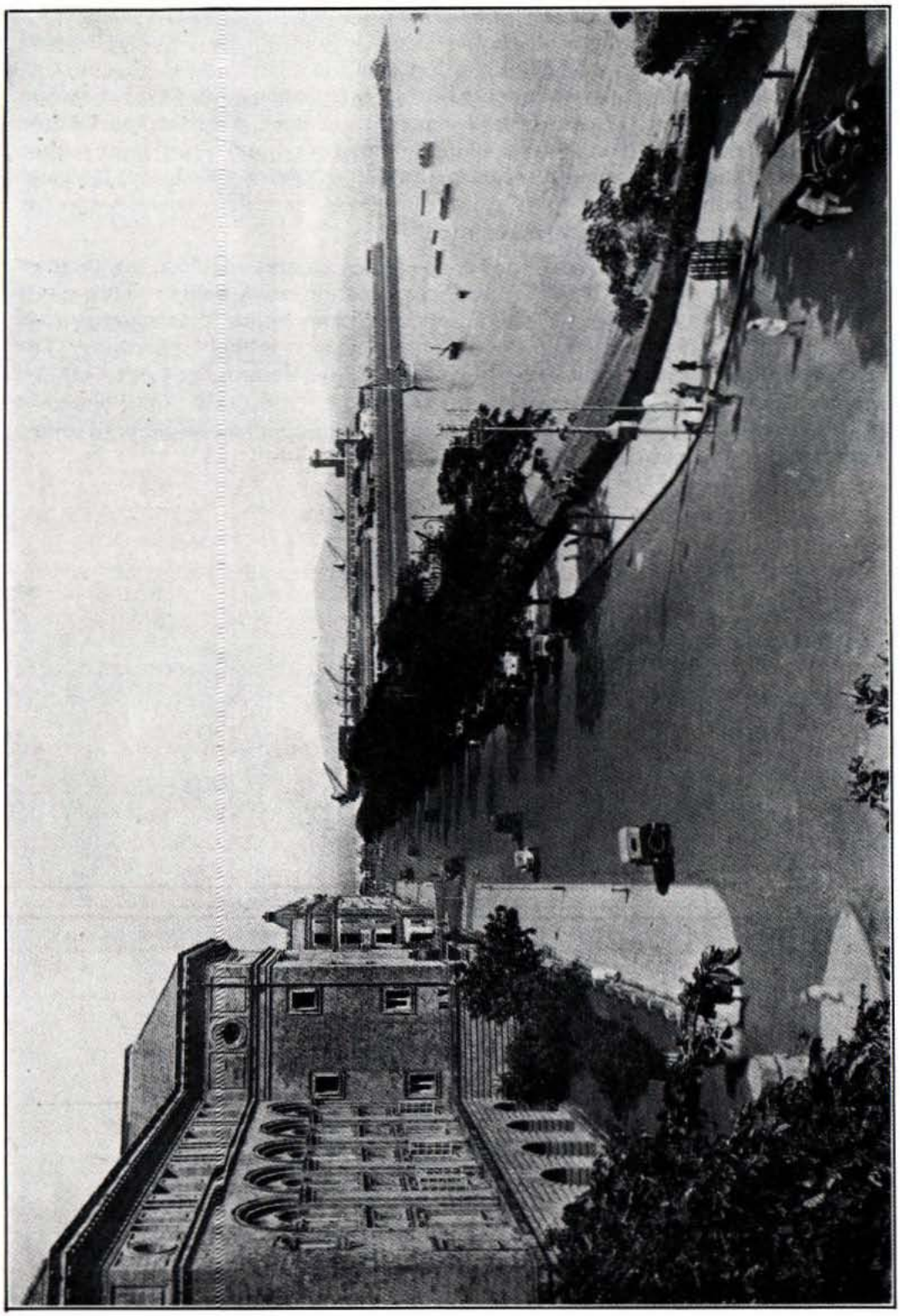
The *Manganese Ore* Depot covers an area of approximately 150,000 sq. yards east of the Grain Depot. It provides stacking accommodation for 300,000 tons of ore and is divided into 33 rail-served plots which are rented by the principal exporting Companies. The depot is equipped with electric flood lighting for night work and a weighbridge has been installed for weighment of wagon loads en route to the docks.

Sea-borne *coal* is accommodated at Mazagon, Frere and Haji Bunders, where storage plots aggregating 60,000 sq. yards are available, mostly for bunker coal. On the Mazagon-Sewri Reclamation, north of the Grain Depot, an additional rail-served storage area of 46,000 sq. yards is reserved for rail-borne coal intended for local consumption. A similar area on the Reclamation, plus 15,000 sq. yards on Tank Bunder, is reserved for *charcoal*, which is imported into Bombay in large quantities, both by sea and rail.

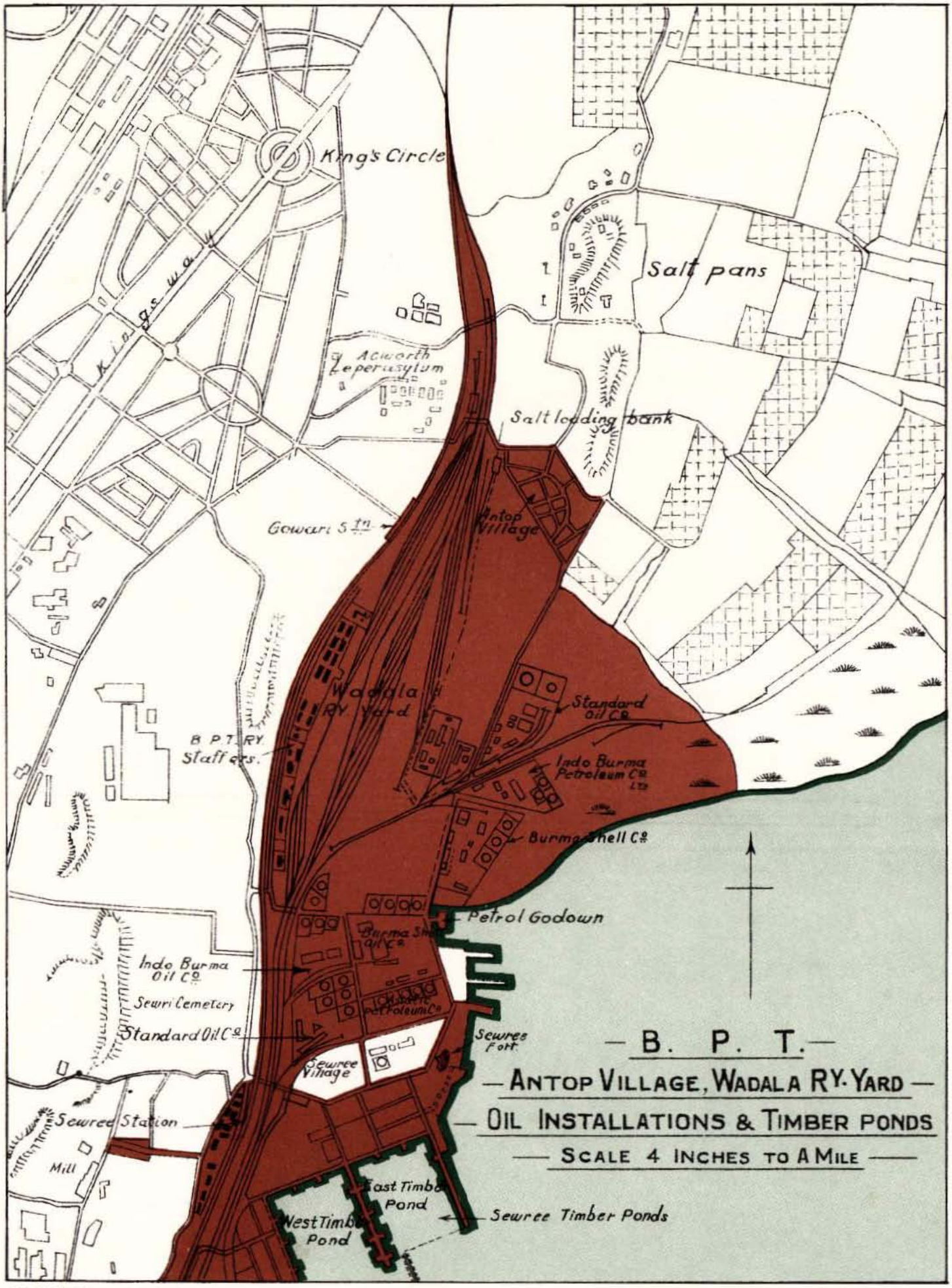
Other commodities for which ample storage areas are reserved on the Reclamation and the adjacent Bunders are *Bricks and Tiles*,—66,000 sq. yards

with 4,500 ft. of quayage, *Building Stone* (*Porbunder and Shahabad*),—18,000 sq. yards, with 500 ft. of quayage and *Hay and Straw*, 25,000 sq. yards in an isolated position on the south-east corner of the Reclamation, with 500 ft. of quayage. For all these commodities plots are rented to the merchants, either for the season or on monthly tenancy. *Iron* is stored generally on open plots in the vicinity of the docks, the main Iron Market being situated on Port Trust land on the Elphinstone Estate, conveniently near to the Goods Yards of the G. I. P. and B. B. & C. I. Railways. The plots are usually let on monthly tenancy and the occupants erect their own sheds as required.

As regards *Industrial Sites* for factories, etc., an area of close on 26 acres has been set aside on the Trust's newest reclamation at Wadala. This estate has been laid out in conveniently sized plots, admirably situated as regards road and rail facilities, and the demand for accommodation is rapidly increasing. The principal occupations up-to-date are Messrs. Mawson Vernon & Co.'s Asphalt Refinery Works, occupying an area of 15,000 sq. yards and the Standard Oil Company of New York, who have recently taken up an area here of some 10 acres for a bulk petrol installation.



Ballard Estate, showing the Custom House in the foreground.



THE TIMES OF INDIA PRESS, BOMBAY.

VII.

THE LAND ESTATES

Apart from the great storage and industrial depots described in the foregoing chapter the Port is fortunate in owning extensive estates on reclaimed land adjacent to the docks, the possession of which has enabled the Administration to provide warehousing and godown accommodation on an adequate scale and to set apart considerable areas for business and residential requirements.

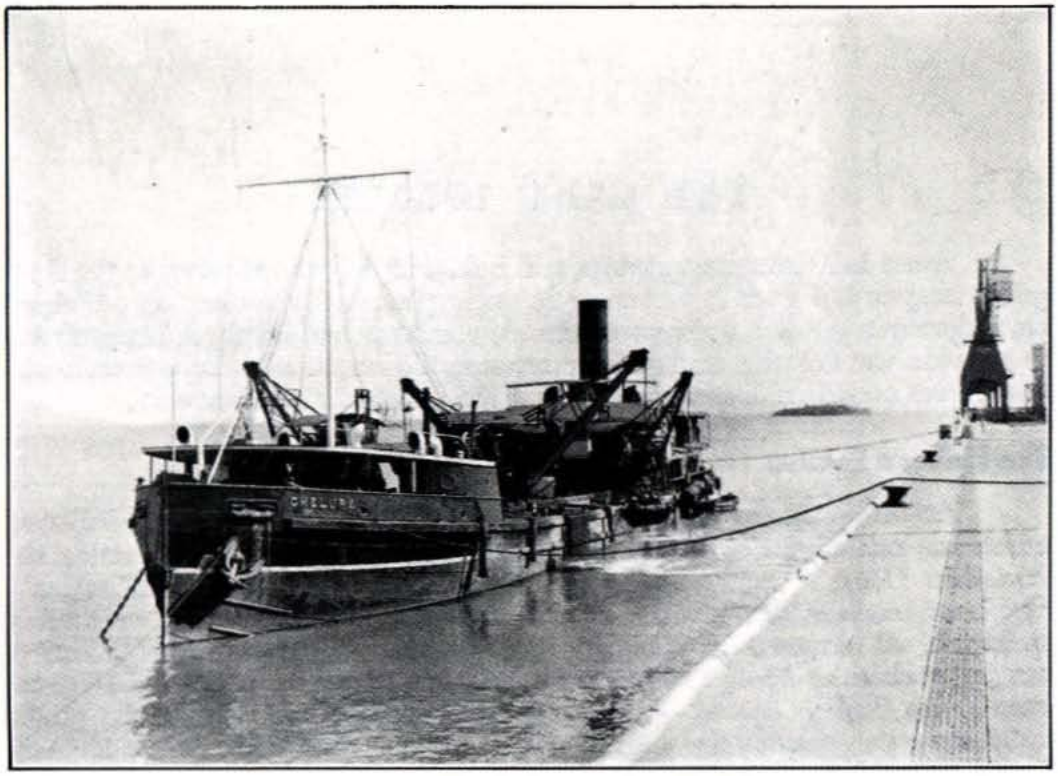
The Ballard Estate.

Adjoining the Alexandra Dock and the Mail Berth is the Ballard Estate, which was created out of the spoil excavated in the process of constructing the Alexandra Dock. Approximately 22 acres in extent, it has been laid out as a first class business centre and with its forty-three blocks of handsome office buildings, all designed in keeping, and broad, well-kept thoroughfares it can justly claim to be one of the finest business estates in the East. Here are located the Custom House,—one of the most striking of Bombay's public buildings,—the spacious new offices of Messrs. Mackinnon Mackenzie & Company, Agents of the P. & O. and British India Steam Navigation Companies, the Lloyd Triestino Company's offices, the Burmah-Shell Oil Storage and Distribution Company, and a number of important shipping, banking and insurance firms, as well as several of the foreign Consulate offices and that of His Majesty's Trade Commissioner. The Grand Hotel occupies a large corner site and next to the Custom House is the Port Trust War Memorial. The Port Trust Administrative Offices face the south-west corner of the estate and near by are the handsome premises belonging to the Royal Bombay Seamen's Society, with the church of St. Nicholas adjoining.

The Apollo Reclamation.

This estate includes the old Wellington Reclamation and the site of the former Cotton Green and comprises an area of 43½ acres, forming one of the principal residential districts of Bombay. Among other noteworthy buildings it contains the Gateway of India, the Royal Bombay Yacht Club with its residential chambers, and the Taj Mahal Hotel. The old Cotton Green site, commanding a magnificent view of the Harbour, has been laid out for the erection of blocks of modern flats and shops and in the centre an ornamental garden about an acre in extent has been provided as an amenity for the residents. The building sites which have lately been put on the market are rapidly being taken up on lease and several residential blocks are now in course of erection.

Further to the south is the *Sassoon Dock Estate* of 17½ acres which surrounds the oldest of Bombay's wet docks. The extensive range of godowns within the



The Port Trust 1,500-ton grab hopper dredger "Chelura".

dock area, formerly used for the storage of cotton, have now mostly been converted into motor and machine workshops. On the reclamation adjoining the old dock the Port Trustees have erected three large blocks of flats for the accommodation of their staff and a recreation ground has been provided for the use of the Royal Indian Marine ratings.

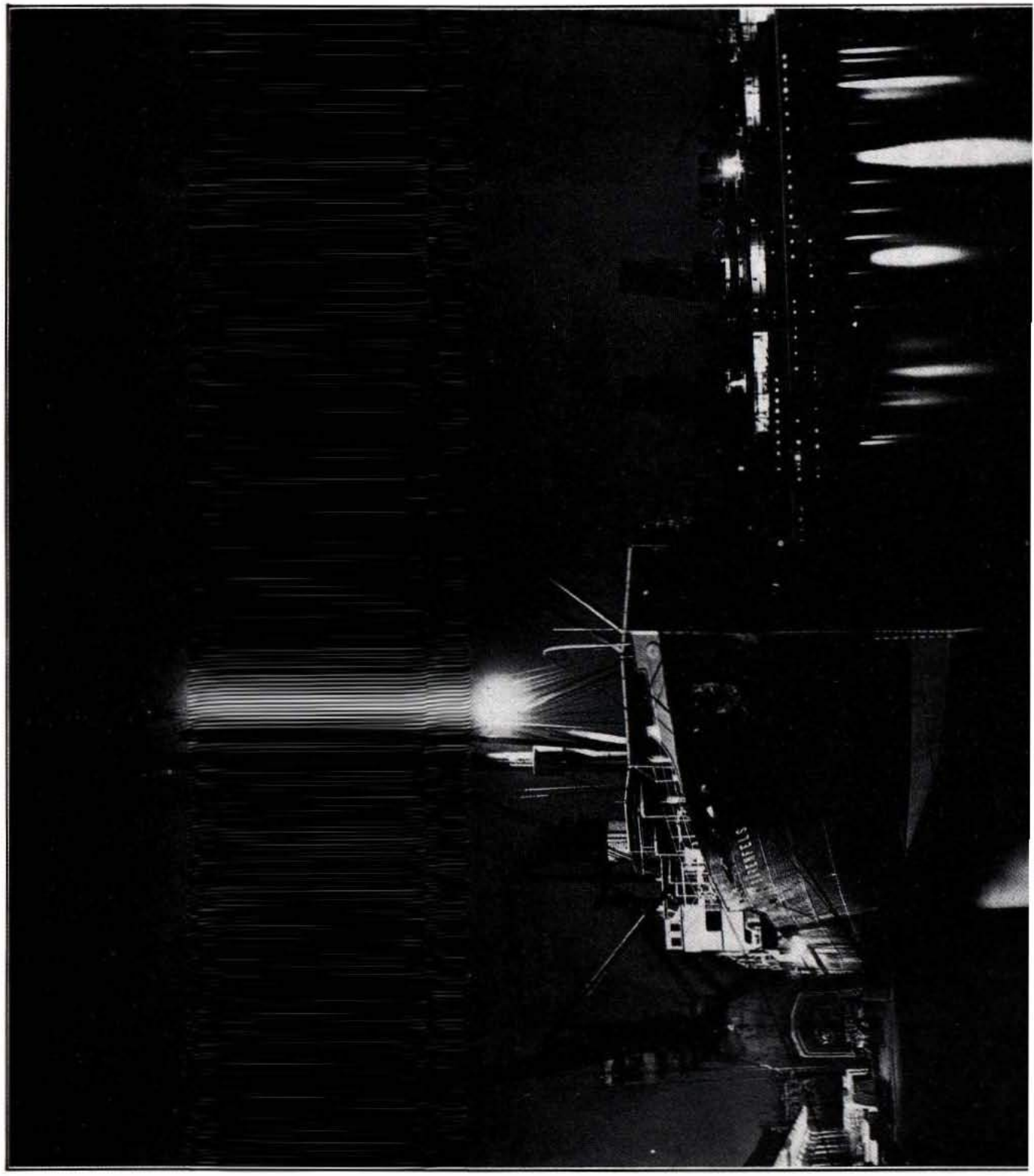
The Elphinstone and Mody Bay Estates.

These form the landward boundary of the Docks and comprise an area of 175¾ acres. Here are located the dock warehouses, the Grain and Rice Markets, the Iron Market and extensive ranges of storage godowns, shops and residences. A feature of the Elphinstone Estate is the Ryan Grain Market, a group of three large blocks of warehouses constructed by the Port Trust and covering an area of 267,000 sq. ft. Although the Grain Depot on the Mazagon-Sewri Reclamation is being increasingly occupied by the large exporting firms, the Ryan Market remains by virtue of its central position the hub of the local grain and seeds trade and for the greater part of the year its storage capacity of some 100,000 tons is full to overflowing with stacks of grain of various descriptions. On the northern portion of the estate are situated the liquid fuel installations and large areas reserved for storage of iron, building stone and other commodities.

The dock labourers' quarters, which house some 2,500 workers and their families, are situated just north of the G. I. P. Railway Goods Yard. An interesting feature of these quarters is the employees' welfare work to which the Port Trustees have given much consideration for some years past. Attached to the quarters is a vernacular school for children of the employees, together with a well equipped playground; another development highly appreciated by the employees is the Maternity Home and Infant Welfare Centre provided by the Port Trust and conducted under the supervision of the Bombay Presidency Infant Welfare Society, to whom the Trustees make an annual contribution towards the cost of maintenance and medical staff. The Docks Dispensary, also maintained by the Port Trust for the dock labourers and other employees, is situated near the main gate of the Prince's Dock and a large site in the vicinity has been reserved as a free gift for the erection of a Home for Indian Seamen, which the Government of Bombay propose to erect, with the aid of public contributions, as a memorial to the Indian lascars and firemen who gave their lives in the Great War.

Antop Village.

This is a model labour settlement on the northern portion of the Wadala Reclamation, marking the northern limit of the Port Trust properties. The village was built in 1920 and covers an area of some 13 acres; it comprises 508 single-storied cottages laid out in blocks of varying size and provides accommodation for about 1,800 residents consisting of Port Trust labourers and their families. The settlement is provided with shops, a dispensary, schools, gymnasium and playing grounds for adults and children. The supervision is under a qualified Indian doctor and the welfare work is in charge of a trained Y. M. C. A. worker. The scheme was in the nature of an experiment designed to prove the advantages, to employers and workers alike, of hygienic living conditions coupled with reasonable opportunities for education and healthy recreation. The experiment has proved in every way successful.



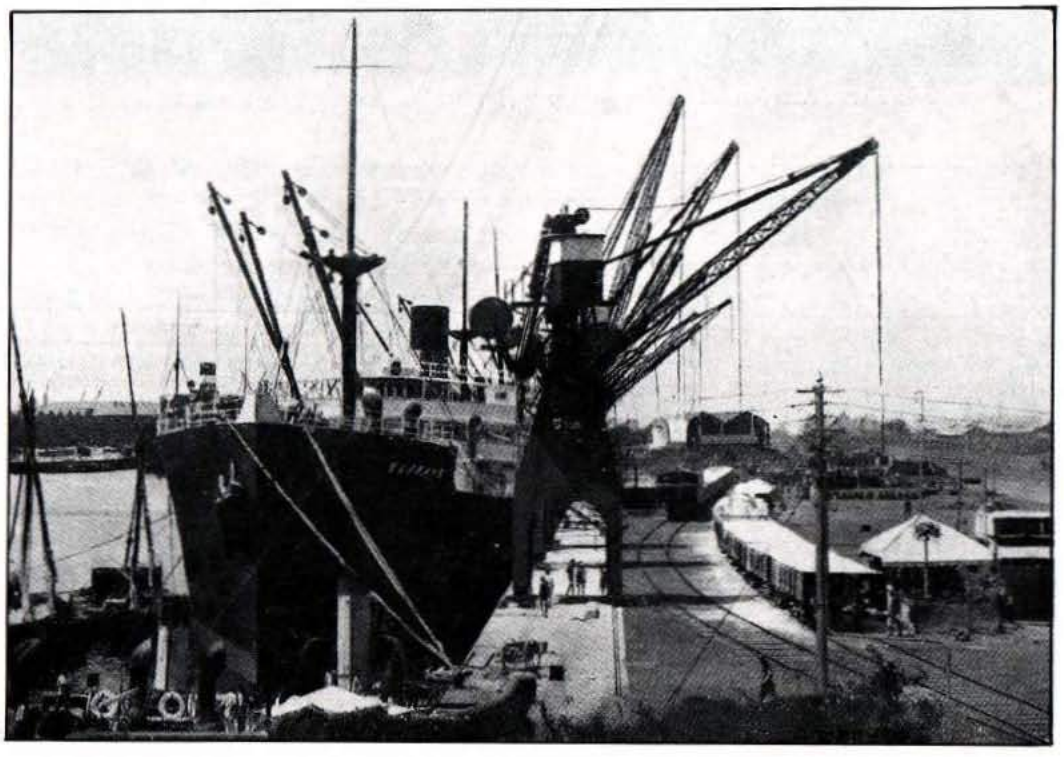
VIII.

THE TRADE OF THE PORT

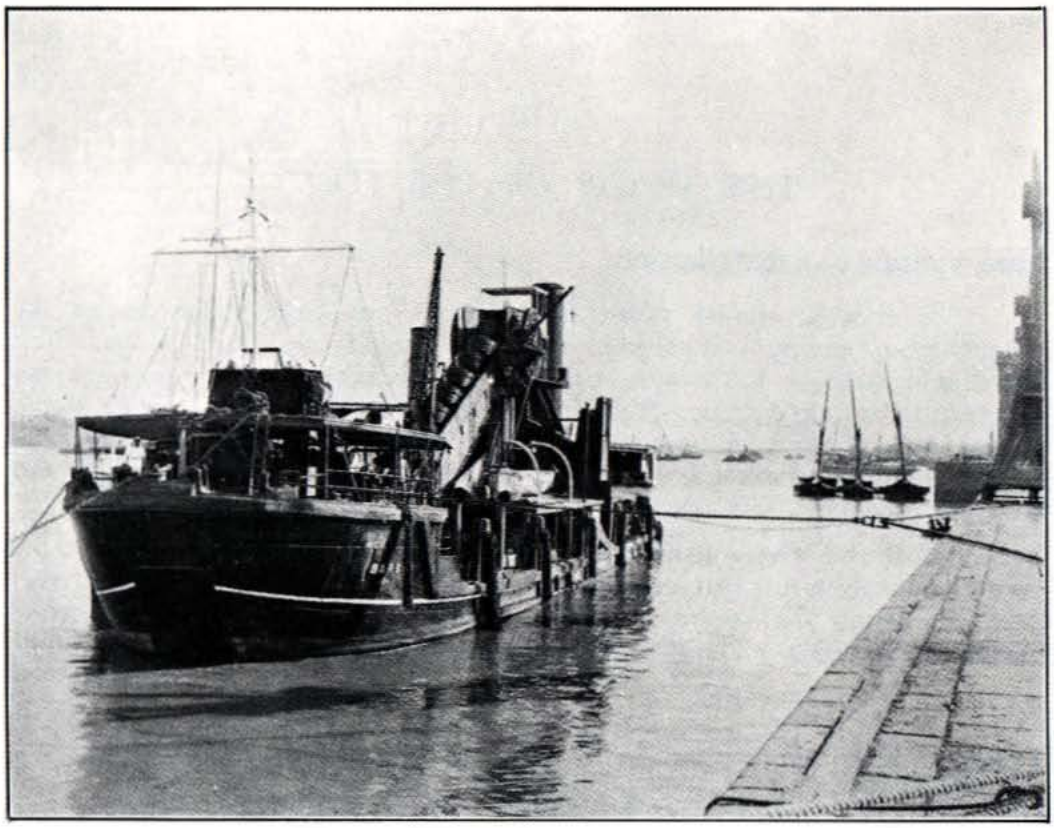
Value, volume and distribution.

The average annual value of Bombay's sea-borne trade during the quinquennium ending 31st March, 1929, was Rs. 2,83,15,00,000 or excluding bullion and treasure Rs. 2,33,00,00,000. Imports averaged Rs. 1,60,38,00,000 and exports Rs. 1,18,61,00,000 excluding Government transactions. The volume handled at the docks and bunders is between six and seven million tons, *vide* particulars in Appendix C. Details of tonnage of the principal imports and exports are given in Appendix D.

Before the War considerably more than half of Bombay's import trade was derived from Great Britain. The proportion has now dropped to a little over one-third, mainly owing to increasing competition from Japan, Continental Europe and America. The British Dominions provide about 10 per cent while



Unloading a bulk cargo of china clay into B. P. T. Railway Wagons, Alexandra Dock.



The Port Trust bucket ladder dredger "Barbus" at work off the Harbour Wall.

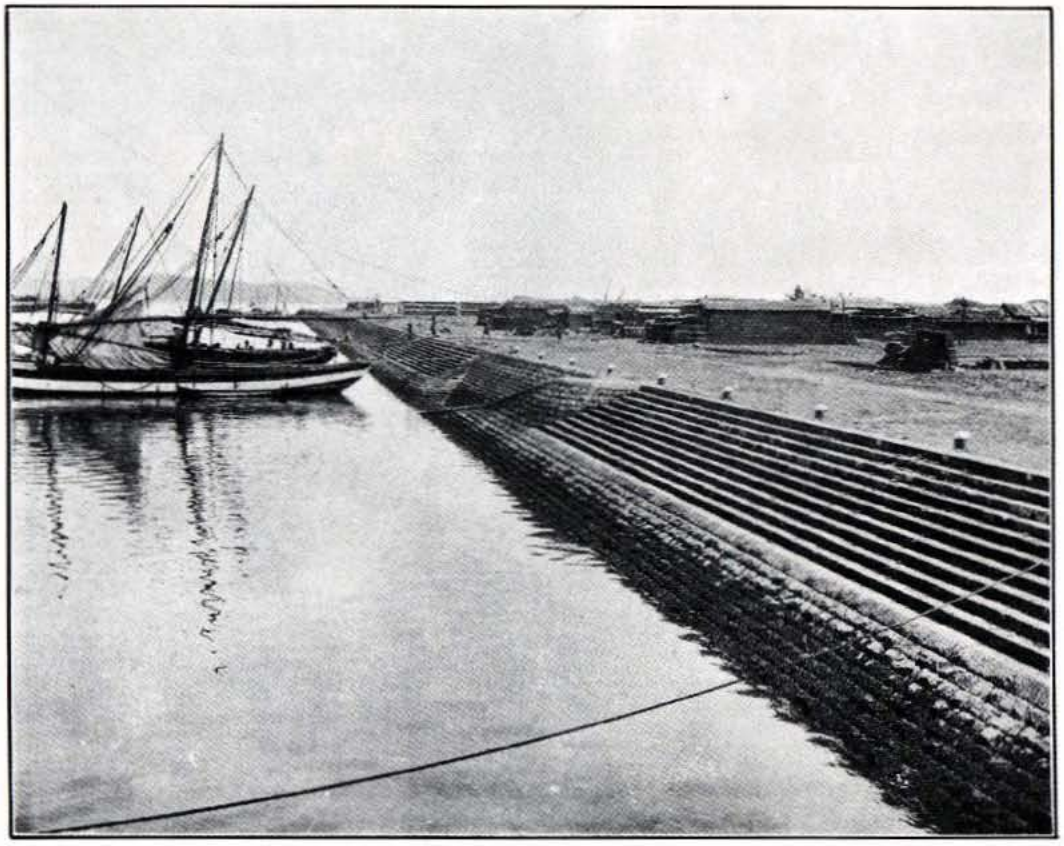
Continental Europe is responsible for approximately 25 per cent, the chief European contributor being Germany, whose proportion is climbing up to the pre-war level of nearly ten per cent. The largest individual increases among Continental countries of recent years have been registered by Belgium and Italy. Outside Great Britain the country which provides the largest share of Bombay's imports is Japan, whose claim is between 9 and 10 per cent as against 3¼ per cent pre-war. America contributes about 7 per cent, or more than three times the pre-war proportion.

As regards exports Japan is Bombay's best customer owing to her large consumption of Indian cotton; her share is about 30 per cent, or more than double that of Great Britain. The total share of Continental Europe is about equal to that of Japan, the principal consumers being Belgium, France, Germany and Italy. Details of the distribution of trade with foreign countries are given in Appendix E.

Local Market.

In addition to natural advantages unrivalled by any other port in India, Bombay possesses the three main factors essential to the prosperity of a world port,—ample accommodation for trade and shipping, a local market of great

Passenger traffic at the Ferry Steamer Wharf, Alexandra Dock.



Mazagon Tank Bunder, showing type of quay walls with landing steps and slopes alternating.

and growing importance and a vast trading hinterland equipped with excellent facilities for collection and distribution, both inland and coastwise. The resources comprised under the first category have been described in previous chapters; we will now briefly review the other two factors.

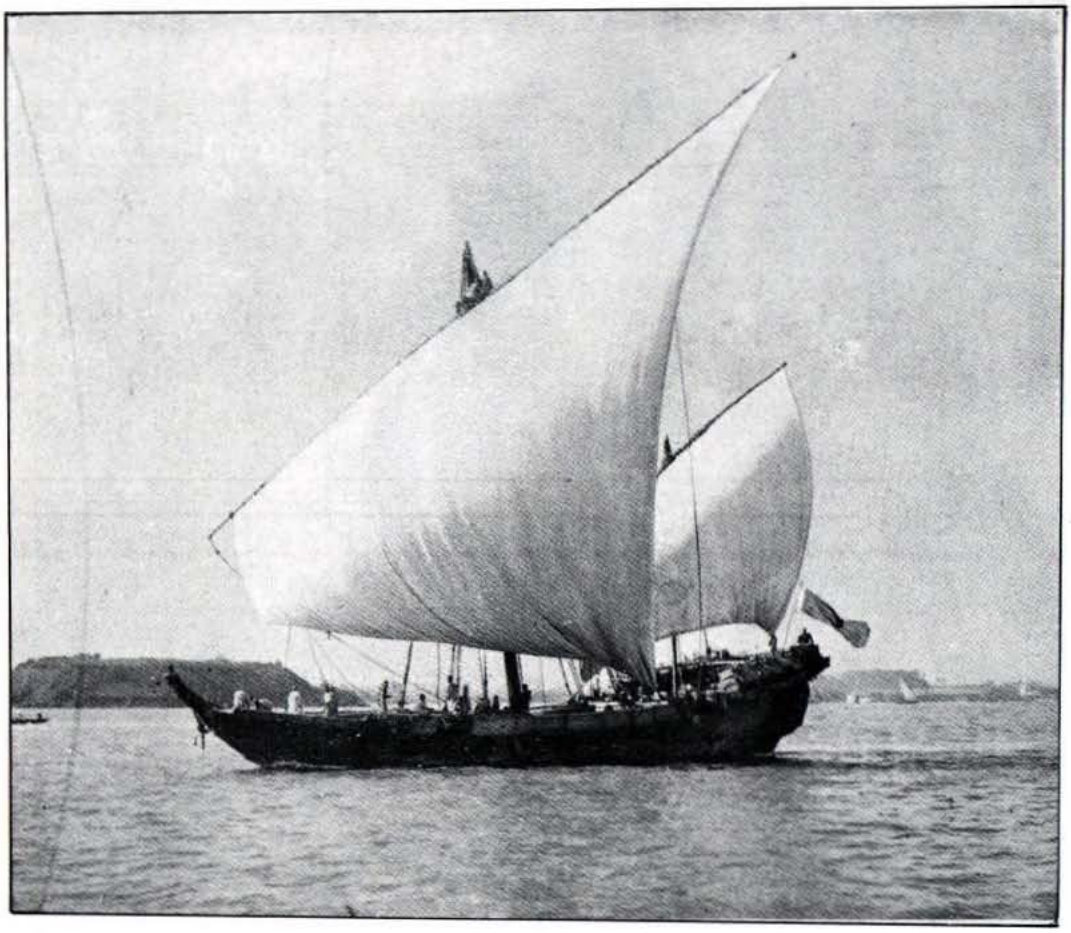
Within the short space of a hundred years the population of the City proper has increased from a quarter of a million to approximately a million and a quarter. The rapidity of this expansion and the great developments in road and rail communications have led to the opening up of large suburban residential areas which are steadily extending further afield. Bombay, as the home of the cotton trade and the centre of India's great textile industry, houses a large manufacturing population; her spinning and weaving mills,—over seventy in number,—produce nearly half the total output of cotton goods made in India and give employment to about 120,000 workers. Allied to the main cotton industry are the cotton ginning and pressing and the dyeing and bleaching factories and prominent among other local industries are the extensive group of engineering works and foundries, the big railway and tramway shops, the boat building and repair yards, flour mills, asphalt refineries, saw mills and motor assembly works. Bombay is also the headquarters for Western India of the seeds trade and the distributing headquarters of the great oil combines.

Some of the Port Trust bunders which accommodate the country boat traffic.

The provision of electric power, generated on a gigantic scale in the Western Ghats by the Tata Hydro-Electric and Andhra Valley Power Supply Companies, has given a great impetus to local industries and Bombay can claim the honour of being the first city in India to electrify her suburban railway services.

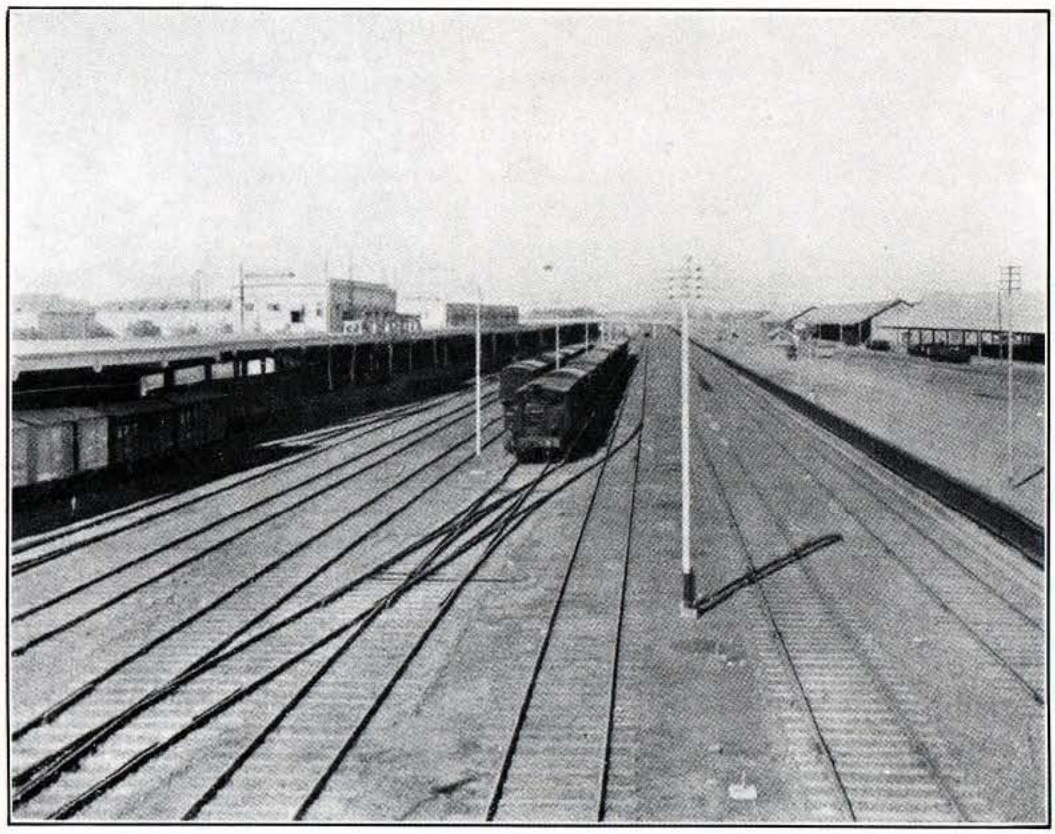
Distributing area and rail facilities.

Two main-line railways provide direct and economical access to practically all parts of the great sub-continent of India. In the centre, the Great Indian Peninsula Railway throws out a network of connections to the vast and productive tracts of Khandesh, the Berars, the Central Provinces and the Central India States, whence cotton, seeds, wheat, grain and manganese ore are transported to Bombay for export overseas. Further north the cotton, grain and seed-bearing plains of the United Provinces are similarly linked with Bombay while in the north-west the Punjab, despite its main connection with the sea at Karachi, receives from and despatches to Bombay a large volume of profitable trade.



A 200-ton "baghla" outward bound to Zanzibar.

Country boats discharging cargo at Malet Bunder.

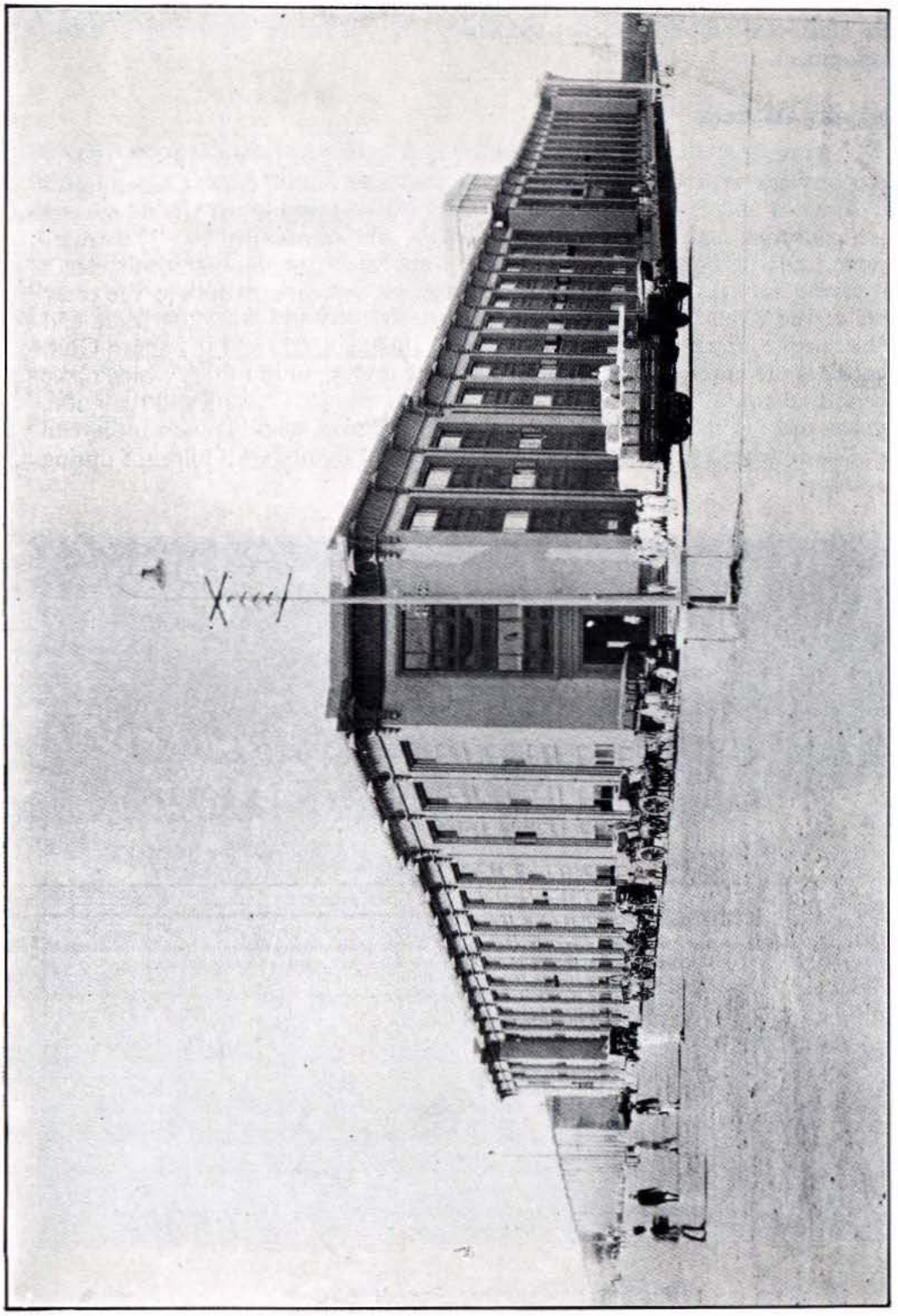


The Bombay Port Trust Railway Grain and Cotton Depots.

The most fertile districts of the Bombay Presidency,—Gujerat and Kathiawar,—and also the wealthy States of Rajputana, are fed by the Bombay, Baroda and Central India Railway and its subsidiary feeder lines while the southern districts of West and Central India, including the great principalities of Hyderabad and Mysore, rich in natural products, connect directly with Bombay by means of the south-east arm of the G. I. P. Railway and a network of metre-gauge lines.

The vast extent of the land area of which Bombay is the distributive base and clearing house for trade may be gauged by the fact that its two main-line railways own between them some 7,500 miles of track. The radius of Bombay's rail-borne trade extends even further afield and if we take the Customs statistics and Port returns as a guide we find that, excluding bullion, Bombay handles approximately one-third of the total import trade of India and Burma and about one-fourth of the exports. Two-thirds of the imports of specie and five-sixths of the exports also pass through Bombay. The general tonnage figures indicate a collecting and distributing area, within the confines of the Indian Empire, of some 500,000 square miles,—nearly six times the extent of Great Britain,—populated by not less than sixty million inhabitants.

These stupendous figures give some idea of the enormous scope of Bombay's activities as a port and the vast commercial possibilities of her future.

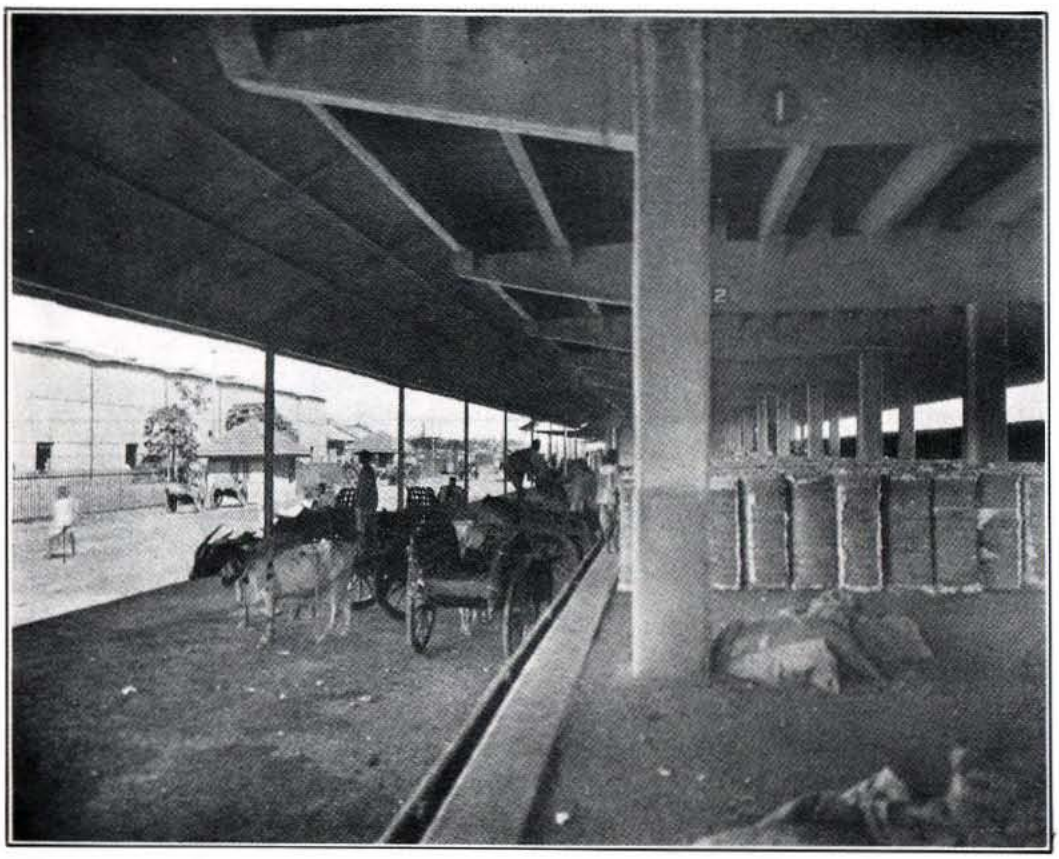


The Bombay Cotton Exchange.

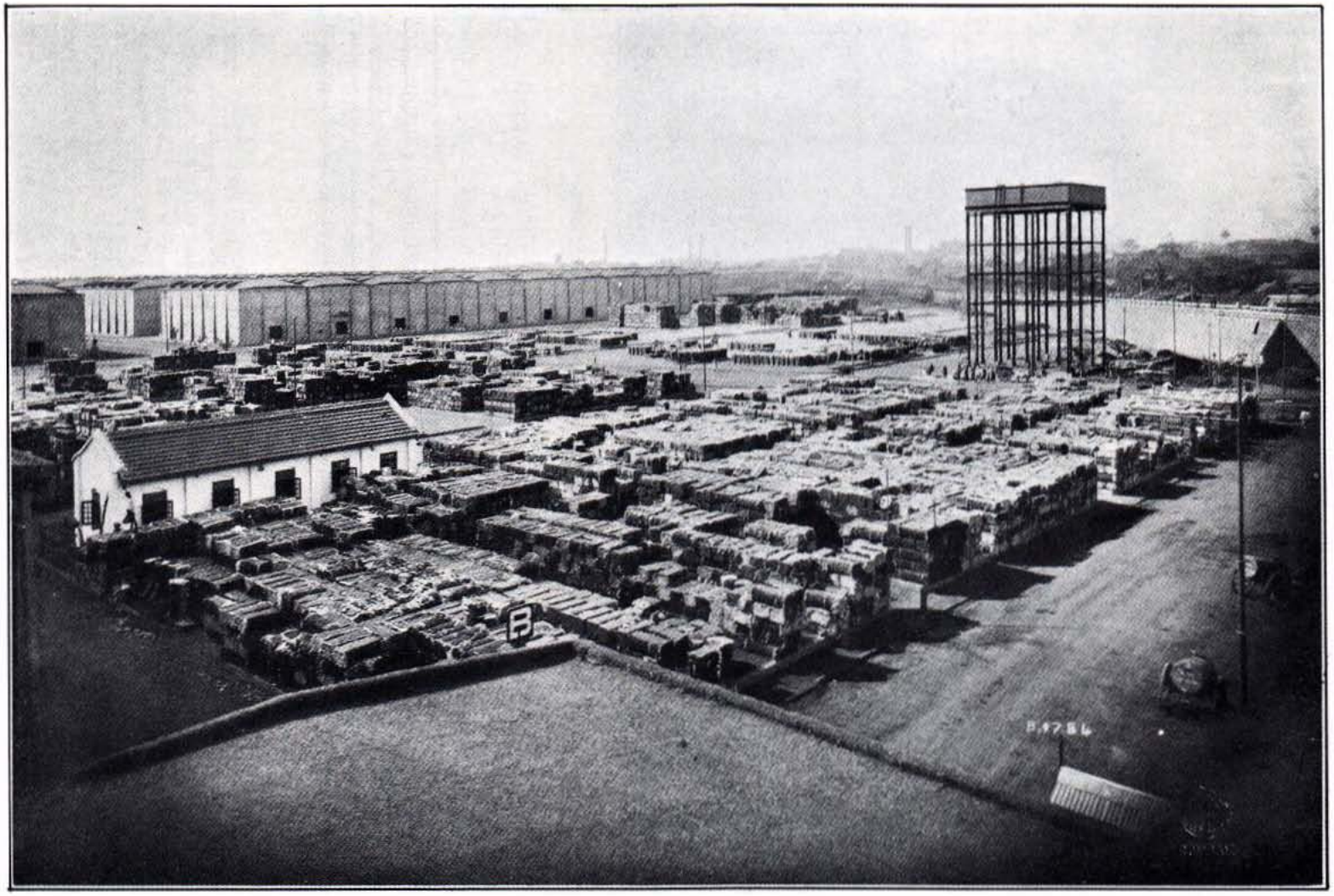
For the mineral and agricultural resources of India are not yet within sight of their maximum output and her industries are still in the early stages of their development.

Shipping services.

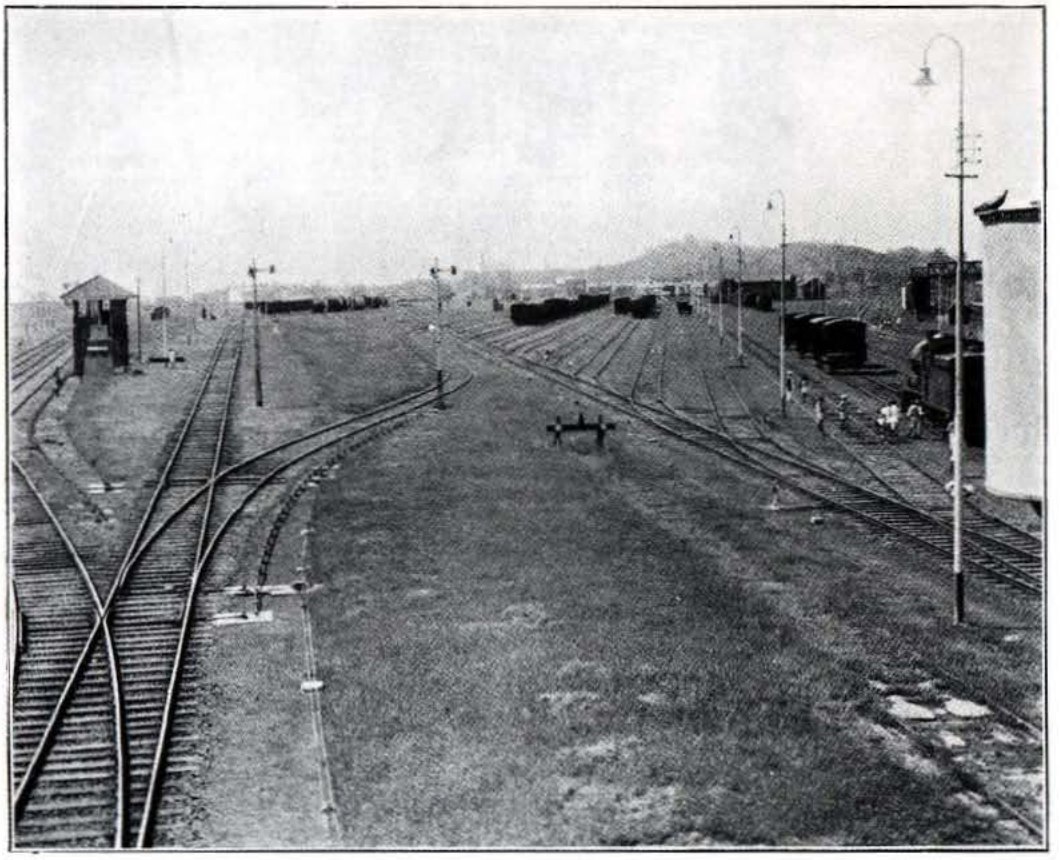
As regards overseas trade, Bombay is connected by regular passenger and cargo services with Europe, Australasia, East and South Africa, China, Japan and America and is also an important link in the transhipment trade between these countries and the seaports of Arabia and Mesopotamia. The trans-oceanic trade of Bombay has a valuable complement in the numerous steamer and sailing services plying along the Western Coast,—in the south to the coast ports of the Konkan, the Southern Mahratta country and Portuguese India and in the north to the ports of Kathiawar and Cutch, Karachi and the Persian Gulf. Bombay is the headquarters of these coasting services and of others which make a periodical round of the coastal ports between Bombay, Calcutta and Rangoon. Bombay also is the centre for the important pilgrim traffic between India and the Hedjaz; from 15 to 20 ships sail annually from Bombay with pilgrims during the season.



Unloading cotton at one of the Depot Stations.



A corner of the Cotton Depot, showing godowns and open iethas.



The Down Sorting Yard, Port Trust Railway, Wadala Junction.

No port enterprise can succeed without the continued support and good-will of the shipping services which utilise its facilities. The Port of Bombay is intimately connected with several of the world's greatest shipping interests, whose expansion has synchronised to a large extent with that of the Port. The story of these great undertakings makes absorbing reading and although space does not permit of a detailed review in all cases, a brief summary of the salient features in the history of the great passenger-cargo lines more closely associated with the past development of the Port will be of general interest.

THE PENINSULAR AND ORIENTAL STEAM NAVIGATION COMPANY.—This great organization, the pioneer of the mail service to and from the East, had its origin in the old Peninsular Service which in the thirties of the last century carried on a regular trade between London, Oporto, Lisbon and Gibraltar. In 1837 the undertaking, having been formed into the Peninsular Steam Navigation Company, secured from Government a contract for the conveyance of the mails between Falmouth and Gibraltar. Three years later it assumed the title by which it is known to-day, having in the interval extended its communications to Malta and Alexandria. In 1842, after much pressure had been brought to bear on the East India Company, the P. & O. embarked on its first mail contract service to India, the "Hindustan" of 1,800 tons being the first vessel to sail from Southampton for the Indian station. By

1844 the Company's mail services had been extended to Ceylon, Madras and Calcutta but it was not till 1854 that it secured the contract for the mails between Bombay and Suez. In 1857 the contract was further extended to connect with a fortnightly service between Marseilles and Malta. Steam communication with Australia, by means of a branch line from Singapore, had been inaugurated by the Company in 1852.

Until the opening of the Suez Canal in 1870 the Suez route to India was designated " The Overland Route " and the P. & O. had, by degrees, built up an elaborate and costly land transit organisation to deal with this vital overland link in its services. The opening of the Suez Canal rendered this organisation superfluous from a trade standpoint and at the same time the invention and general adoption of the compound engine as the motive power for trans-oceanic liners necessitated the practical replacement of the Company's entire fleet. Their position was made exceptionally difficult by the obstinate refusal of the British Port Office authorities to allow the mails to be transported through the canal and insisting on continuance of the costly system of land carriage between Alexandria and Suez. Not until 1888, when the Canal had been eighteen years in existence, was this objection overcome. Meanwhile, undaunted by difficulties, the Company had begun the transformation of their fleet by the construction of the " Jubilee " ships,—the " Arcadia ", " Britannia," " Oceania " and " Victoria " of about 6,500 tons each. The next half century registered continuous progress in design and dimensions of the mail steamers. The " Victoria " class was succeeded by the " Himalaya " class of 7,000 tons and these again by the five steamers of the " Persia " class of 8,000 tons. Then followed the first " M " class, ten vessels averaging 10,500 tons gross, the last of the pre-war fleet. The " Naldera " and " Narkunda " of 16,000 tons, projected in 1913 but not put into commission till 1920 owing to the intervention of the war, marked a big stride in design and dimensions. In 1923 the " Mongolia " and " Moldavia ", followed by the " Mooltan " and " Maloja," the two latter of 21,000 tons, were put on the Australian mail service. More recently four splendid vessels of the " Rajputana " class, 16,600 tons, have been commissioned for the Bombay mail service and three vessels of the " Cathay " class (15,100 tons) for the Australian service. The latest addition to the P. & O. fleet is the magnificent turbo-electric liner the " Viceroy of India " of 19,500 tons, placed on the London-Bombay run in 1929.

In 1914 the P. & O. and British India Steam Navigation Companies amalgamated and since that date a large number of other important shipping concerns have either been absorbed by or grouped in close association with these two parent Companies, among them the New Zealand Shipping Company, the Federal Steam Navigation Company, the Union Steamship Company of New Zealand, the Hain and Mercantile Steamship Companies, the Eastern and Australian Steam Navigation Co., the Khedival Mail Steamship and Graving Dock Company, James Nourse Ltd., and the General Steam Navigation Company. Out of these alliances a traffic system has been evolved which serves every important seaport of the British Empire and embraces India, China, Australia, New Zealand and America. The shipping owned by the P. & O. and British India Companies and their associated lines totals to-day two and a half million tons.

THE BRITISH INDIA STEAM NAVIGATION COMPANY originally started operating in 1856 under the title of the Calcutta and Burma Steam Navigation Company with two small steamers, having secured the contract for a fortnightly mail service between Calcutta, Akyab, Rangoon and Moulmein. In 1862 the operations of the Company were enlarged to inaugurate a general system of steamship communication serving the whole of the Indian littoral, with extensions to the Persian Gulf on the one hand and Malacca and Singapore on the other. The contract entered into with the Government of India provided, among other duties, for the carriage of troops and stores at a mileage rate, and for the maintenance, in addition to the fortnightly Calcutta-Burma mail service, of monthly services to Chittagong and Akyab; to Singapore; from Rangoon to the Andaman Islands; from Madras to Rangoon; a fortnightly service between Bombay and Karachi; and a service every six weeks to the Persian Gulf. At the end of 1863, when the Company's fleet comprised seventeen steamers in commission and four building, the widened sphere of operations led to the title of the undertaking being changed to the British India Steam Navigation Company. By 1864 the Persian Gulf service had become monthly and a fortnightly service was instituted between Bombay and Calcutta.

Shortly after the opening of the Suez Canal in 1869, at which juncture the Company possessed a fleet of twentyfive steamers, of which the largest was the "Dacca" of 1800 tons gross, a regular service was started between London, the Red Sea ports, and the Persian Gulf. The new line opened up trade centres on the Arabian and African coasts of the Red Sea previously almost unknown and placed these ports in direct communication with the Persian Gulf and East Africa.

In 1873, under a fresh ten-year contract with the Government of India, nearly all the sailings were doubled. The Red Sea-Persian Gulf line, above mentioned, was converted into the fortnightly through service between London, Bombay and Karachi which —saveforthe war interval—has been maintained to the present day. In 1876 an important trunk line, London to Calcutta, *via* Colombo and Madras, was inaugurated.

The Company's present list of services may be said to have been built up during the first thirty years of its existence, new ports having since been linked up and additional tonnage provided as occasion demanded. Thirty years ago the Company's fleet consisted of seventy-four steamers aggregating 141,457 tons gross register; to-day it owns 127 vessels of an aggregate gross tonnage of 756,654 tons including over sixty excellently equipped passenger ships. In 1914, after forty-five years of friendly co-operation, the fortunes of the B. I. and P. & O. became still more closely knit by the fusion of the two Companies under the chairmanship of Lord Inchcape.

THE ANCHOR LINE, which has been connected with Bombay for the last fifty years, owes its origin about the middle of the last century to the enterprise of four brothers of the name of Henderson, natives of a little village on the coast of Fifeshire, all of whom followed the sea and became masters of their own ships, after which they turned their practical experience to good account by establishing themselves in business in Glasgow as shipowners and marine engineers. About 1854 they placed two small sailing vessels on the Mediterranean trade route and shortly afterwards two steamers, each of 178 tons gross, were built for the same trade. Their house flag was a red anchor and hence the undertaking was designated the "Anchor Line." Their next enterprise was to purchase the auxiliary steamers "Tempest" of 855 tons and "John Bell" for service between Glasgow and Canada and in 1856 the present Glasgow-New York service was instituted, their steamer the "United Kingdom" of 1255 tons gross, built in 1857, being at the time one of the finest ships on the Atlantic run. In 1864 their Mediterranean service was extended to Alexandria and on the opening of the Suez Canal in 1869, the Anchor Line steamer "Dido" was the first British merchant vessel to enter the Canal. In 1875 a Bombay service from Glasgow and Liverpool was instituted and in 1881 a direct line of steamers was started to Calcutta. The present company, under the name of the "Anchor Line" (Henderson Brothers, Ltd.) was formed in 1899. In 1911 a fusion of interests was effected between the Anchor and Cunard Lines and the following year the Calcutta service was amalgamated with that of Messrs. T. & J. Brocklebank under the title of the Anchor-Brocklebank Line. In 1916 a service was formed between Glasgow and Quebec and Montreal under the name of the Anchor-Donaldson Line.

The Anchor Line own some of the finest passenger and cargo ships that visit Bombay, among them being the "California" and "Tuscania" of 17,000 tons and the "Britannia" and "Assyria" of over 8000 tons.

THE ELLERMAN LINES represent several important amalgamated interests of which those more closely connected with Bombay are the City Line, founded in Glasgow by Messrs. George Smith and Sons in the late thirties of the last century, and the Hall Line, founded in 1864, which inaugurated a regular service between Liverpool and Bombay in 1876, the "City of Baltimore" being the first ship put on this run. The Ellerman Lines, Ltd., was formed in 1901 and took over the City and Hall Lines of passenger and cargo steamers trading between the United Kingdom and the Far East; the Ellerman and Papayanni Lines trading between Liverpool and Mediterranean ports; the Westcott and Laurance Line running from London and Antwerp to Mediterranean ports and the Coverley and Westray Line to Portugal. Under the same owner-

ship is the Ellerman and Bucknall Steamship Company trading with South Africa and Australia and maintaining, in conjunction with the Strick Line, a joint service to the Persian Gulf. The old established Wilson Line, of Hull, is also allied to the Ellerman Lines.

The City and Hall Lines have a number of splendidly equipped passenger and cargo steamers ranging from 7,500 to 11,000 tons on the Liverpool-Bombay-Karachi service. The total tonnage controlled by the Ellerman Lines and their allied interests is 880,000 tons gross.

THE LLOYD TRIESTINO COMPANY. From the earliest days the Adriatic has been active in the trade between Europe and the Orient and in the middle ages Venice was pre-eminently the port whence the merchandise of the East flowed into Europe, passing over the land routes to the ports of the Levant and thence by sea to Venice. The Republic was then all powerful in the Adriatic, overshadowing the adjacent port of Trieste, but with the decline of the Venitian power, culminating in her overthrow by Napoleon and absorption in the territories of the Hapsburgs, Trieste rapidly acquired a large share of her commerce.

The early part of the nineteenth century saw the genesis of the Company which later became known as the Austrian Lloyd. Its activities were at first confined to marine insurance, after the manner of the celebrated London undertaking whose name it had adopted; then with the purchase and building of sailing vessels it embarked in trade, plying between Trieste and the Dalmatian ports, with an extension in a few years to the Levant and Alexandria. Later, with the opening of the Suez Canal, the Company sought a wider field in the Orient, and its vessels were seen in the port of Bombay. Cargo boats in time were supplemented by passenger steamers and with the establishment of a regular fast service between Bombay and Trieste the Line assumed an important position among the Companies engaged in the passenger traffic between Europe and India.

The war saw a cessation in the activities of the Austrian Lloyd Co., for Trieste with her Italian population and sympathies was an object of distrust to the Austrian Government as it was the goal of the Italians, with the result that the port was all but isolated, her shipping being sequestered along the deep indentured coast of Dalmatia. This was in the end fortunate for the city as on the cessation of hostilities and the acquisition of Trieste by Italy her shipping—and notably the fleet of the Austrian Lloyd Co.—was almost intact, so that Italian banking interests were able to acquire possession and with the addition of the vessels then on the stocks and approaching completion, the Lloyd Triestino Company was formed to trade on the same routes as its predecessor.

Since 1920 the vessels of the Lloyd Triestino Company have called regularly at Bombay, starting with a monthly passenger service which from time to time has been extended so that at the present time, in conjunction with the Company's sister concern, the Marittima Italiana Co. of Genoa, there are three passenger sailings each month between Bombay and Venice, Trieste, Genoa and Naples, as well as a regular cargo service. The vessels of the Company's Far East cargo service as well as the Marittima Italiana Company's Genoa-Java service also call at Bombay each month. The total tonnage of the Lloyd Triestino Company is 230,000 tons gross and that of the Marittima Italiana 40,000 tons gross.

A complete list of the shipping lines trading regularly to and from Bombay is given in Appendix 'B'.

Principal Exports.

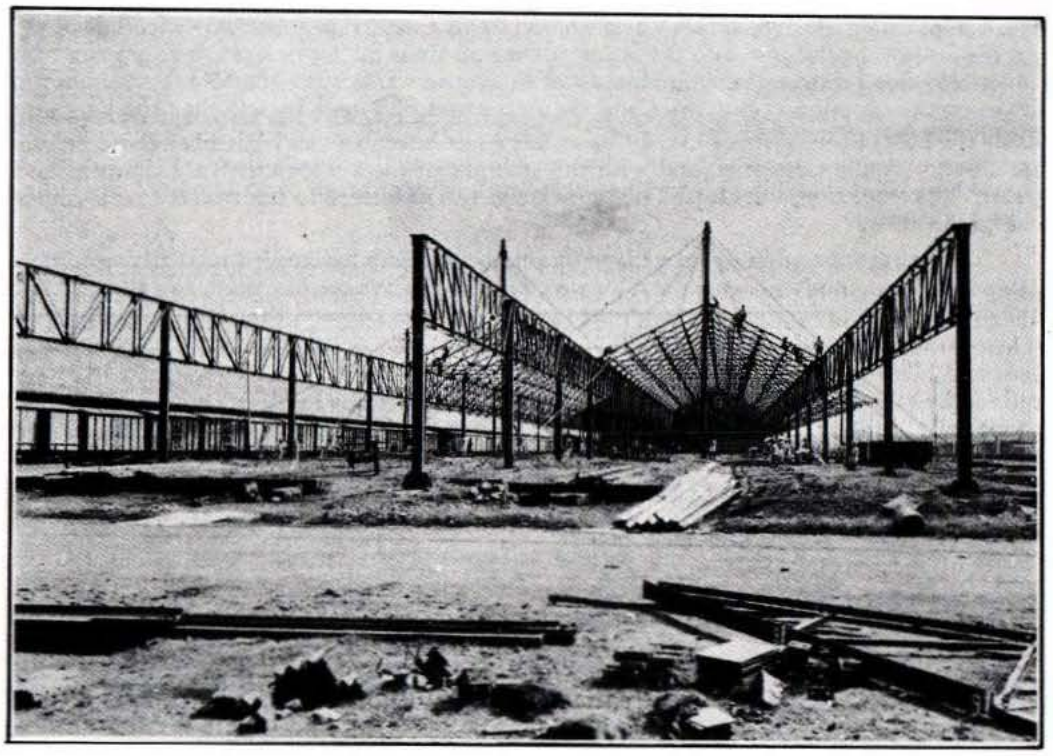
Although Indian manufactures are steadily growing in importance India is still pre-eminently an agricultural country,—approximately three-fourths of her population of three hundred and twenty millions are employed on the land,—and consequently her great export staples are mostly agricultural products, chief among them, as far as Bombay is concerned, being cotton and oil seeds.

Cotton is by far the most important item among India's exports of raw materials. India produces the second biggest cotton crop in the world, her average annual output now aggregating 5½ to 6 million bales of 400 lbs., of which the Indian cotton mills normally consume a little over two million. Nearly the whole of the crop is grown in the western half of the Indian continent, Bombay Presidency, the Central Provinces and Hyderabad being the chief producers. Bombay is in consequence the principal market and the main channel for overseas distribution, the average yearly value of her exports of raw cotton exceeding Rs. 55 crores.

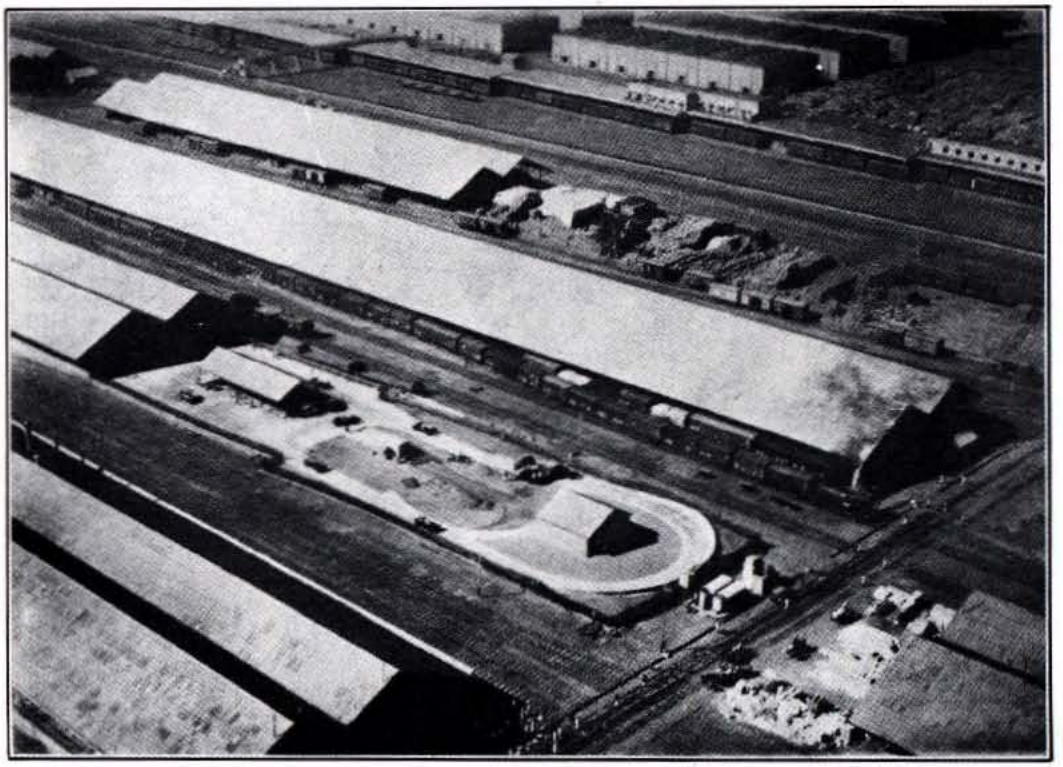
Japan is the largest buyer, her yearly purchases during the last quinquennium averaging over a million and a quarter bales. Purchases by Great Britain and Continental Europe averaged 70,000 and 624,000 bales respectively during the same period.

In all the Provinces and States in which cotton forms an important crop, the improvement of the staple is receiving constant attention from the Departments of Agriculture and the Indian Central Cotton Committee; the yearly statistics record a steady increase in the output of medium staple cotton and a marked improvement in quality and uniformity.

Bombay has a practical monopoly of the exports of twist and yarn and about two-thirds of the total export of cotton piece-goods.



New storage sheds under erection at Grain Depot.



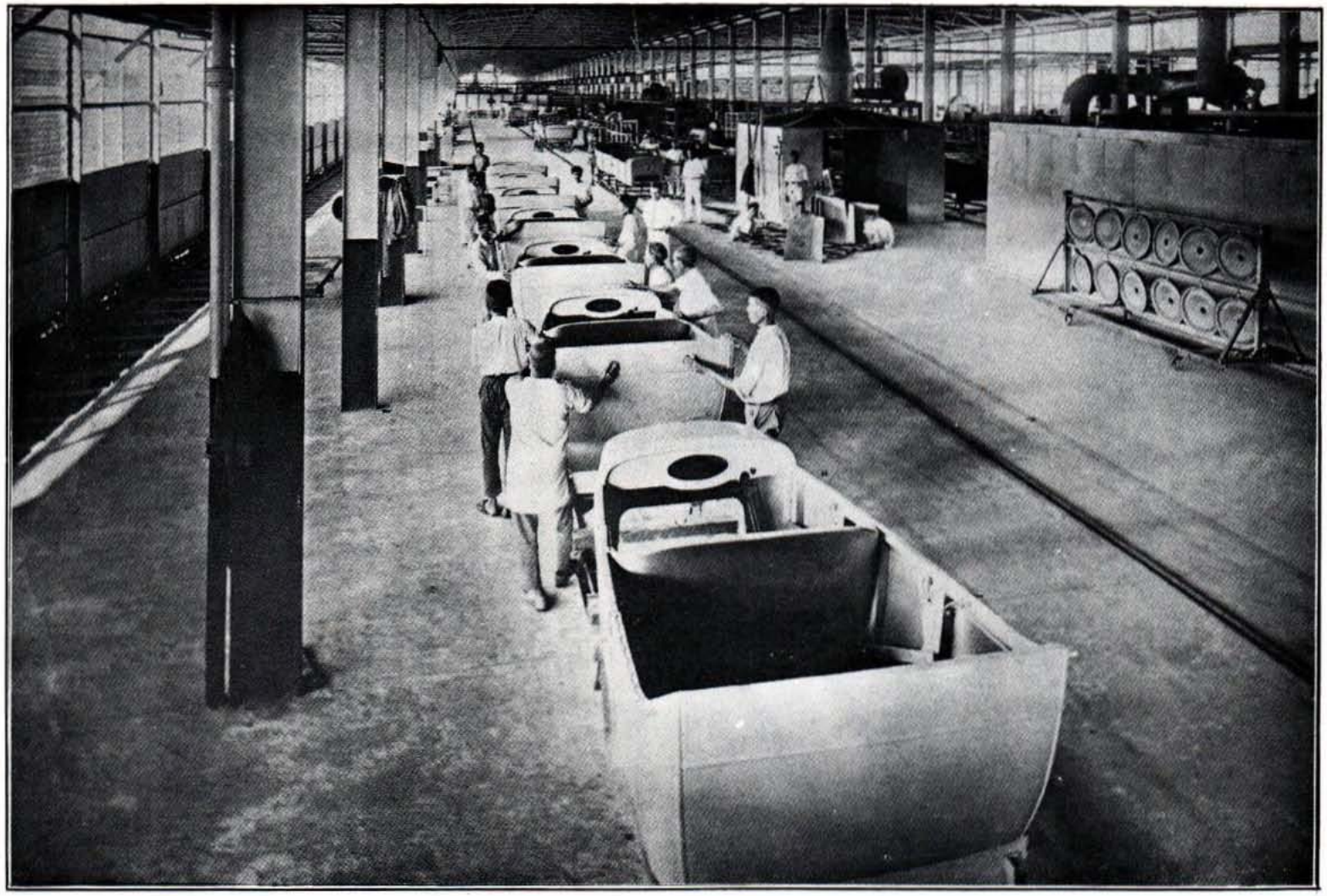
The Assembly Factory of General Motors (India), Ltd., at Grain Depot, showing test track in foreground.

[*By courtesy of General Motors (India), Ltd.*].

Oilseeds.—Second in importance in Bombay's export trade come oilseeds, which include groundnuts, linseed, castor, rape and cotton seed. Bombay exports on an average between 500,000 and 600,000 tons of these commodities, the principal consumers being the United Kingdom, Germany, France and Italy. A remarkable expansion has of recent years taken place in the export of groundnuts, a crop which does not require irrigation and is becoming more and more popular with the cultivators. Groundnuts are grown chiefly in the Madras and Bombay Presidencies and the Agricultural Department is making special efforts to ensure the cultivation of the purest varieties for export. The chief purchasers of Bombay's groundnut exports are Italy, Germany, the United Kingdom, France and the Netherlands. During the last quinquennium the annual exports of groundnuts from Bombay have expanded from 40,000 tons to over 200,000 tons, valued at more than 5 crores of rupees.

Oilcake is another export commodity which has shown a remarkable expansion of recent years, chiefly owing to increased demands from Germany, the Netherlands and Belgium for groundnut cake and linseed cake.

Under the heading of *Grain, Pulse and Flour*, Bombay exports annually over 200,000 tons of rice, wheat and various food grains, consigned mostly to East Africa, Aden and Arabia.



Interior of one of the Port Trust sheds at Grain Depot leased to General Motors (India), Ltd.

[*By courtesy of General Motors (India), Ltd.*]

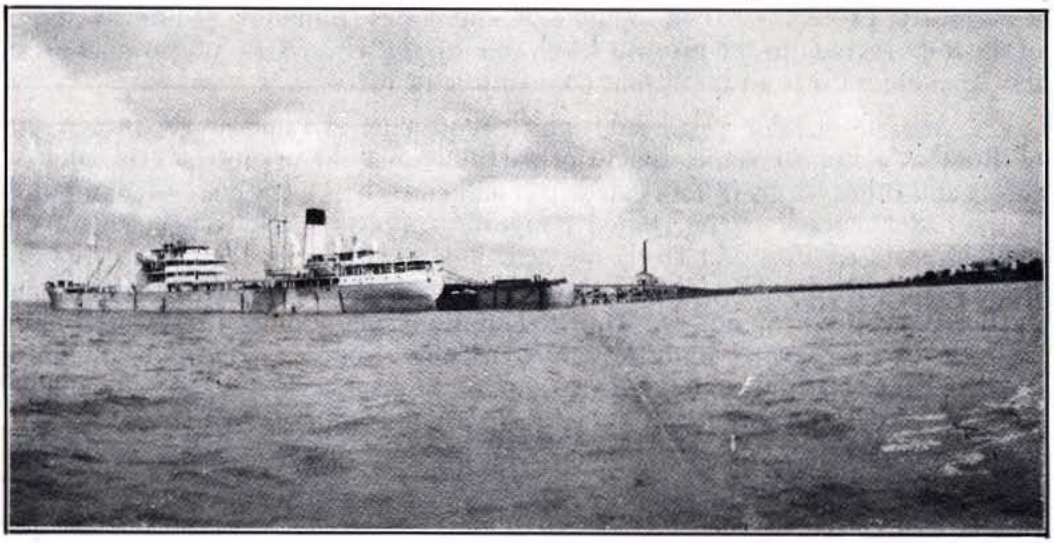
Metals and Ores.—The principal item under this head is *Manganese Ore* of which Bombay exports between 200,000 and 300,000 tons yearly, or about two-fifths of the total Indian export. The chief purchasers of this commodity are the United Kingdom, France, Belgium and the United States.

Among other leading exports and re-exports of Bombay are *Wool*, *Hides and Skins*, *Myrabolams*, *Sugar* and *Spices*.

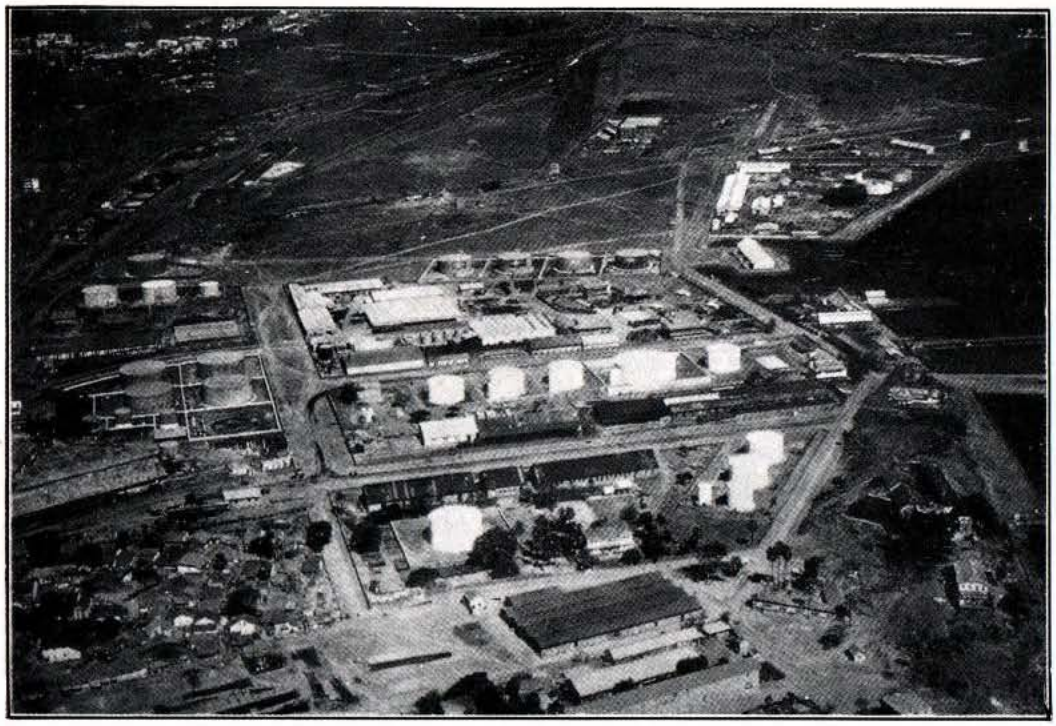
Principal Imports.

As remarked above, India's industries, although slowly expanding, are still relatively few in number and the bulk of Bombay's imports still come under the category of articles wholly or mainly manufactured. In value this class represents about 70 per cent. of the total, the principal individual items being finer quality cotton manufactures and other textiles, fabricated iron and steel, machinery and railway materials, motor cars and parts, chemicals and dye stuffs, hardware, provisions and miscellaneous stores. The chief commodities not included in the manufactured class are metals, sugar, bulk oils, coal, timber, food grains, and fruit and vegetables, the last four items figuring mostly in the coasting traffic of the port.

Cotton Manufactures.—This item represents in value roughly one-fifth of Bombay's import trade. The average annual import of cotton piece-goods during the quinquennium ending March 1929 amounted in value to about Rs. 15.40 crores. Prior to the war, Great Britain's share of this trade was about 90 per cent; of recent years, owing to the increased output of the Bombay cotton mills and the growing competition from Japan, Great Britain has dropped to about 65 per cent, Japan supplying about 21 per cent—chiefly in the grey and coloured varieties. Great Britain still holds her own as regards white piece-goods,



A tanker discharging bulk petrol at the bulk oil pier at Pir Pao.



The kerosene oil installations.

of which she supplies over 80 per cent of Bombay's imports. Although the volume of imported piecegoods has risen during the last few years it is still some 40 per cent below the pre-war figure. Indian mill production is now about double the pre-war volume and the natural inclination of India to support and, if necessary, protect her own indigenous industries militates against recovery of the import trade to the pre-war level, though the cheapness of production in the Japanese mills is an important competitive factor.

Metals.—Under this head, which represents in value nearly 10 per cent of Bombay's import trade, the principal individual items are galvanized iron sheets and other forms of fabricated iron and steel, brass, copper and aluminium in the order named. The United Kingdom supplies nearly 50 per cent of the total imports of iron and steel, the remainder coming chiefly from Belgium. Brass is supplied by the United Kingdom, France, Germany and Japan ; copper by Belgium, Germany and the United Kingdom ; aluminium by Great Britain, most of the Continental countries and the United States. The total volume of imported metals,—approximately 300,000 tons on an average,—is about equal to that of the last pre-war year, 1913-14; the value is roughly 50 per cent higher.

Next in importance in the list of imports comes *Machinery* (including *railway plant*) which represents in value about 6 per cent of the total. Great Britain's share, which prior to the war amounted to over 90 per cent, has now contracted to about 75 per cent owing to increasing competition from the United States and Germany. Of recent years imports of textile machinery, railway and

The Timber Ponds.

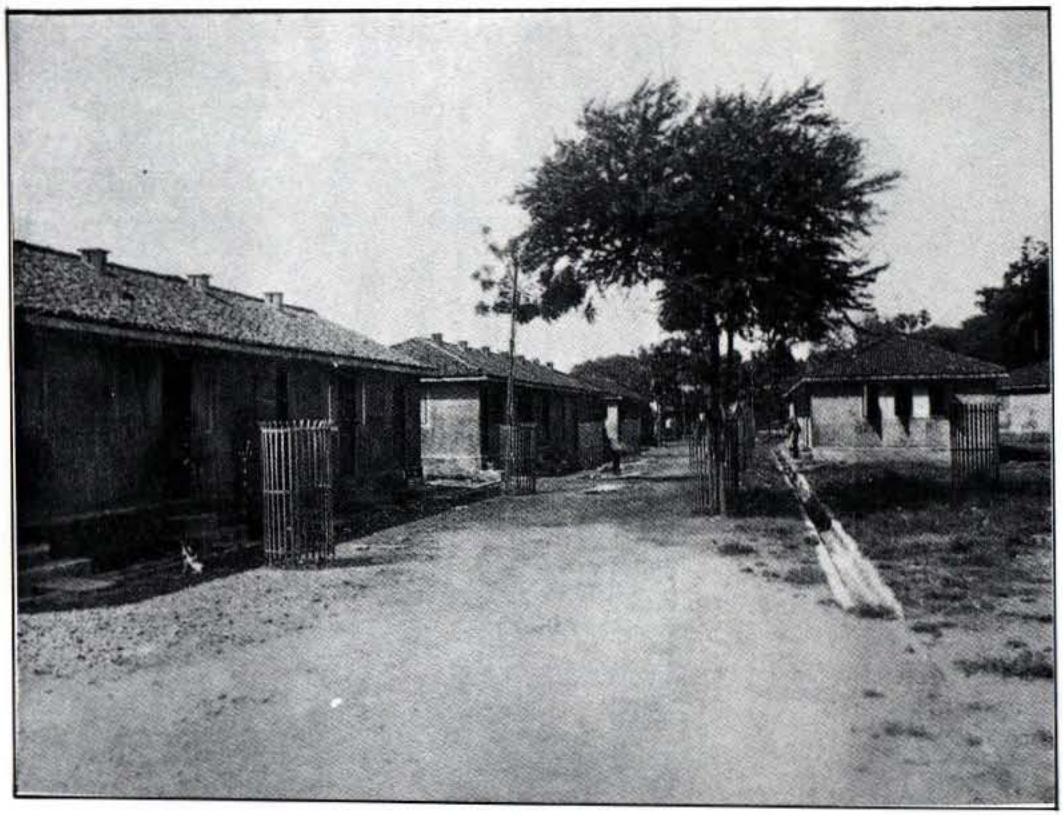
refrigerating plant and sewing machines have registered a considerable increase.

Sugar represents in value about 5 per cent of Bombay's total imports, the chief source of supply being Java. The average annual import is nearly 200,000 tons.

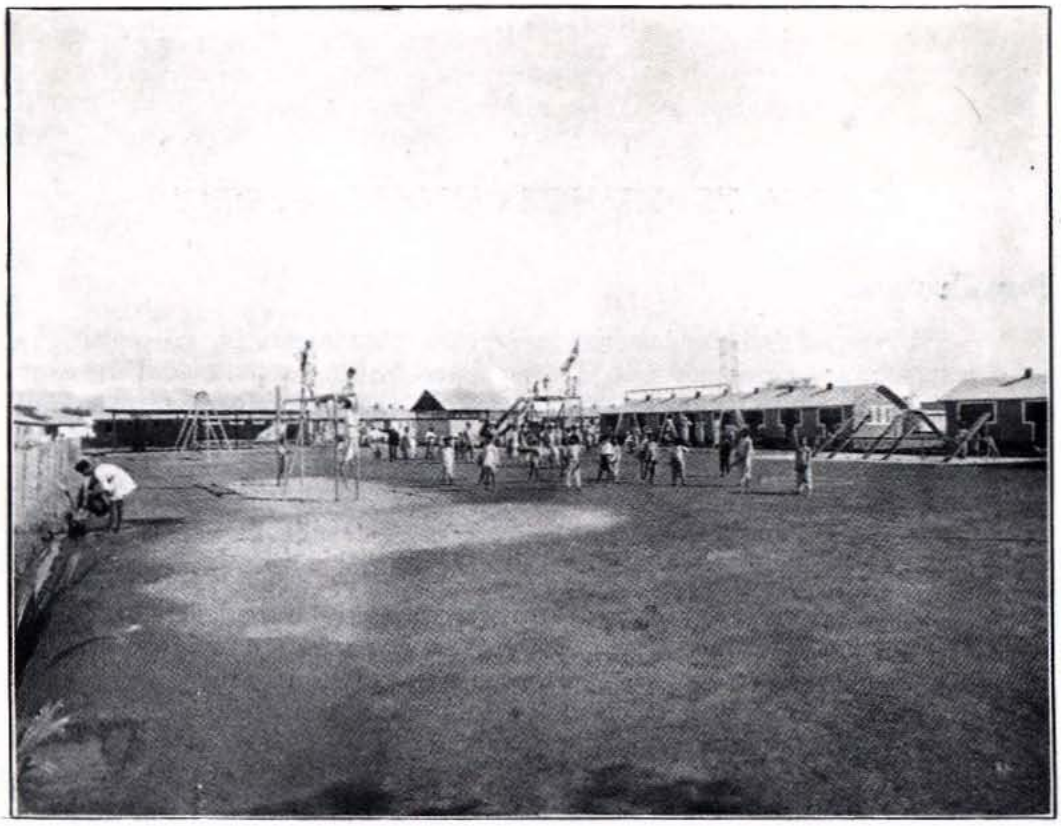
Silk, raw and manufactured (including the artificial varieties) is responsible for over 8 per cent of the total import value.

A remarkable increase has of recent years been registered in the importation of *mineral oils* in bulk, the total volume of which now amounts to about 120 million gallons per annum, the value being more than double the pre-war figure. The chief sources of supply are Persia, Burma, Georgia (Caucasus), Borneo and the Straits Settlements. Imports of petrol have increased from half a million gallons in 1921 to no less than 18 million gallons in 1929. Kerosene, the imports of which in 1900 totalled some 20 million gallons, has now advanced to about 45 million gallons. Liquid fuel imports have expanded from 2 million to about 60 million gallons in the last 15 years.

Another important commodity which has shown a remarkable expansion of recent years is *motor cars* (including motor cycles, spare parts and accessories), chiefly owing to the opening of a large scale assembly and distributing plant in



Port Trust labourers' quarters at Antop Village.



Social welfare in the Port Trust—the sports ground at Antop Village.

Bombay by the General Motors Corporation. The average annual value of imports under this head for the five years ending 1926-27 was Rs. 123 lakhs,—for 1927-28 it was Rs. 183 lakhs and in 1928-29 Rs. 263 lakhs.

Imports of *Dyeing and Tanning* materials represent about 2¼ per cent of the total imports and have doubled in value as compared with pre-war, Germany's share of this commodity being roughly 60 per cent.

Wool Manufactures, including yarns and knitting wool, also represent about 2¼ per cent of the total. The United Kingdom is still the chief supplier of woollen piece-goods, her share amounting to over 50 per cent.

Hardware, which comprises a large variety of manufactured articles such as agricultural implements, tools, ironware, lamps, stoves, etc., is responsible for nearly 2 per cent of the total imports. Great Britain's share, which before the war was about 55 per cent, is now in the neighbourhood of 30 per cent, Germany now being the largest supplier. The United States and Japan are also important contributors.

Detailed particulars of imports and exports are given in the Report on the sea-borne trade of the Bombay Presidency, published annually by the Customs Department.

IX.

THE PORT'S FINANCES AND ITS FUTURE.

Port Charges.

The Port of Bombay can justifiably claim that financially it stands in an extremely sound position and that, having regard to the capital cost of development and the extent of the facilities provided, its charges compare most favourably with those of any other port in India. During the post-war years of trade depression the administration has at times been criticised on the score of having developed the port on too lavish a scale but recent events have completely disarmed this criticism and, judging by the increasing demands for accommodation, the time is not far distant when further port extensions will have to be undertaken.

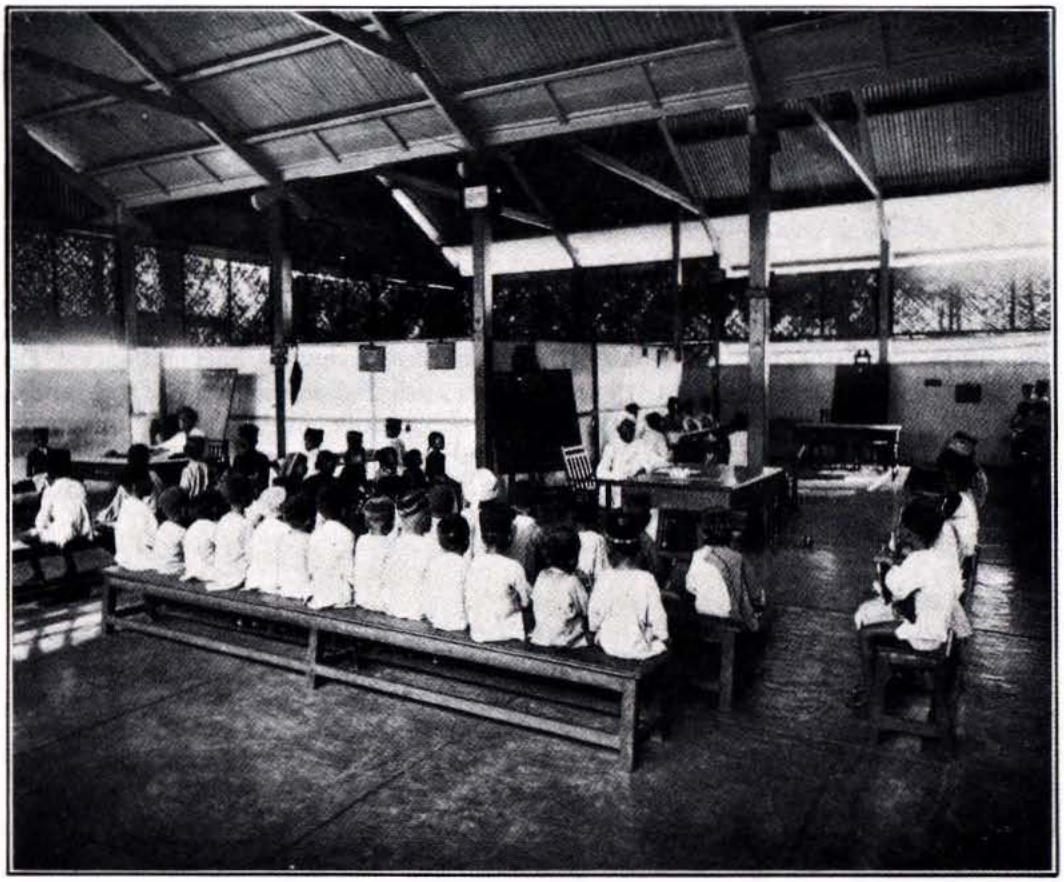
No modern port can afford to rest complacently on its laurels ; to retain its position it must not only keep pace with shipping and commercial developments but it must also possess a reserve capacity for some years of normal expansion. At the same time its administrators must be reasonably assured of a progressive return on new capital expenditure sufficient to obviate the undesirable expedient of increasing port charges to an extent liable to disturb trade. By 1914 the rapid growth of Bombay's trade had brought the then existing accommodation of the port very near to saturation point ; this was evinced by the frequent delays to vessels awaiting berths and the traffic congestion which had come to be almost a normal feature of the old docks. The great extension schemes brought to fruition in 1914, and augmented after the conclusion of peace in 1918, removed this disability for many years to come but, on the other hand, the catastrophic upheaval of economic conditions which the war left in its wake vitiated all pre-conceived trade and financial forecasts and necessitated the imposition in 1922 of a general surtax of 50 per cent on wharfage in order to counter-balance the falling off in revenue and the great increase in capital, maintenance and labour charges. In times of trade uncertainty a surtax is preferable to an outright revision of rates because it affects all interests in equal proportion and is easily adjustable in ratio to any general improvement in trade ; at the same time a surtax incurs more odium because it is perpetually in the public eye and comes in time to be regarded as a handicap from which ports which adopted the alternative of revising rates do not suffer. The Trustees, however, were optimistic enough to believe that a policy of drastic economy, coupled with a gradual return to more stable trade conditions, would enable them to reduce charges again before many years had passed. An intensive retrenchment campaign was undertaken, capital and maintenance works were cut down to a minimum and for a period of five years no fresh capital loans were raised. These measures, assisted by the gradual improvement in trade which became apparent in 1928, rendered it possible to reduce the surtax to $33\frac{1}{3}$ per cent with effect from 1st

April, 1929, a reduction which, added to those already effected in other rents and charges during the previous two years, afforded relief to the trade of Bombay to the extent of some Rs. 30,00,000 per annum.

It is the aim of the administration to effect further reductions,—given a normal improvement in trade,—until the surtax is completely abolished. The extension of the port and its facilities increased the capital debt from Rs. 12,97,00,000 in 1914 to Rs. 22,32,00,000 in 1929, which means that out of every rupee of revenue collected approximately seven annas, or nearly 44 per cent, is absorbed in payment of interest and sinking fund charges. It is satisfactory to note that in spite of this heavy liability the port charges are now lower on the whole than those of the other great ports of India, while the ratio of working expenditure to income is considerably lower.

Financial Progress.

Details of the financial progress of the port are given in Appendix F. Repayment of all capital loans at maturity is fully provided for by annual Sinking Fund instalments and, in addition to a substantial Revenue Reserve Fund, there



One of the Port Trust vernacular schools for Dock labourers' children.

Residents' garden—a feature of the Port Trust Estate, Apollo Reclamation.

are ample reserves for special purposes such as fire insurance, depreciation and emergency replacements. The docks, land estates and other capital assets of the Trust stand on the books at cost price, no credit having been taken for the very great appreciation in land values since the original acquisition of the landed properties. The port is, moreover, more favourably situated than others in that the extensions already provided are sufficient to cope with normal trade demands for several years to come without any heavy increase in capital expenditure and resulting enhancement of port charges.

Future of the Port.

Compared to the length of its coast line India possesses very few first class ports, in fact over 90 per cent of the foreign trade of the country passes through the five major ports of Calcutta, Bombay, Karachi, Madras and Rangoon, on which the main line railways converge. Bombay is particularly fortunate on account of its geographical and industrial situation and the fact that it possesses the only protected deep-water harbour on the West Coast of India, capable of accommodating at all seasons the deepest draft ships trading to the East. Its present dock and storage facilities are now being developed to their maximum capacity and will be ample to cope with progressive increases of trade for some

years to come; detailed schemes for future extensions have also been prepared for consideration as soon as the necessity for further expansion can be foreseen.

It is generally agreed that nothing approaching full use has yet been made of India's rich and varied resources. The economic development of the country is governed by factors too diverse and complicated to analyse in the space of a port handbook but it may safely be asserted that there are many hopeful signs of acceleration in the pace of India's advancement, both in agriculture and industry. The extension and improvement of road and rail transport, coupled with the provision of up-to-date port facilities, has been the chief factor in stimulating foreign trade and placing the producer in touch with foreign markets, with the result that there are now regular official quotations for most Indian products in general consumption. The comprehensive schemes actively promoted by the Central and Provincial Governments for the application of scientific and efficient methods and the extension of co-operative credit facilities in agriculture throughout the country are slowly but surely reaping their reward. The encouraging results already achieved, both as regards extension of the areas under cultivation and improvement in the standard of India's staple crops, afford some indication of the enormous benefits that will accrue to the mass of Indian cultivators when the advantages of modern scientific principles are generally realised and adopted. The extension of irrigation works in the agricultural districts is steadily converting vast tracts of barren land into fertile cotton and grain producing areas and has already done much to guard against the effects of any failure of the annual monsoon, on which in former years the well-being of India mainly depended.

In the industrial field a number of large scale industries have been successfully launched since the beginning of the century, notably iron and steel manufactories and coal and other mining projects. Great hydro-electric schemes of enormous benefit to the textile and other industries of the Bombay Presidency have come into being and similar schemes in the south and north-west of India are in the making. These projects, in addition to the great assistance they will render to local industries, will also materially benefit agriculture and irrigation. Electric power is now used by over fifty per cent of the textile and other large industrial concerns in Bombay City.

The Port of Bombay is fully equipped to play its part in the future economic development of India. The consistent policy of the administration is to encourage and foster trade by providing the best facilities at the lowest possible cost to the merchant and shipowner. So long as this remains the guiding motive of the port, Bombay may face the future confident in the hope that the progress of the past will be maintained and that its reputation among the great sea-ports of the world will advance in line with the industrial and commercial prosperity of the great Empire of India.

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