

# BOMBAY

# AND DREAMING

**Steps To Urban Areas**

Dr. Zakaria told the House that the recommendations made by the ministerial committee appointed by the Planning Commission were receiving the serious attention of both the Government and the Planning Commission.

**Reclamation of Land In City**

**PILOT PROJECT**

Dr. Zakaria said the Government would get an opportunity to discuss the current session Plan.



**Reclamation of Land In City**

Dr. Zakaria said the Government would get an opportunity to discuss the current session Plan.

**Engineering Underground Solving Traffic**

By A Staff Reporter

The Government of Maharashtra has the courage to face the future with resilient thinking and will set an example to the other States. Must we make the same mistakes as were perpetrated in Europe in spite of the warnings of Ruskin and Morris?

MULK RAJ ANAND  
Bombay, July 6.

**Civic Body Will Consider Development Plan Report**

**Rs. 700-CRORE SCHEME TO PROVIDE BETTER AMENITIES**

By A Staff Reporter

late had become very popular to have a bar Hill connecting the eastern and western parts of the city.

It is proposed to build a road on the western side of the city and four across the northern and southern parts.

The corporation had announced its intention to prepare the development plan and work for preparation in hand three years later.

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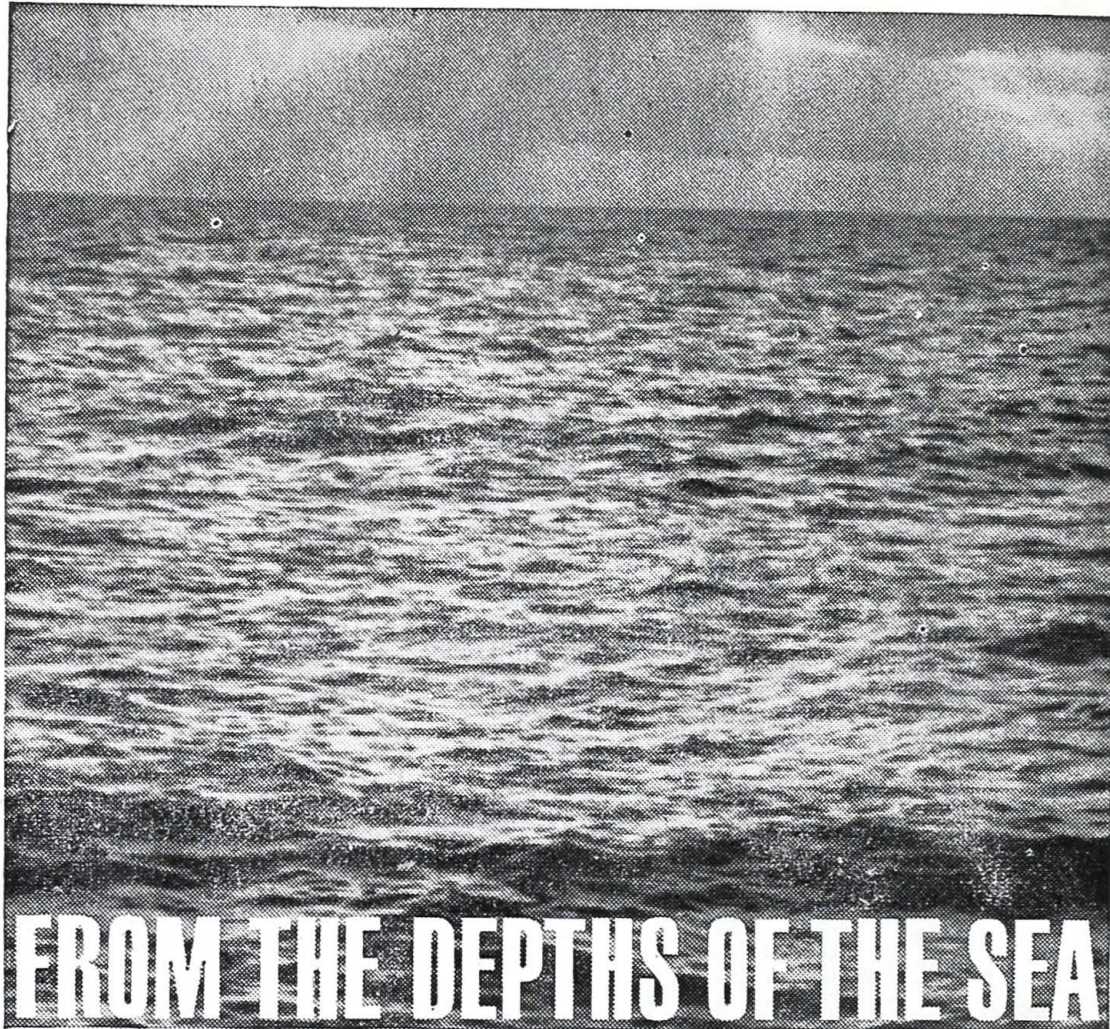
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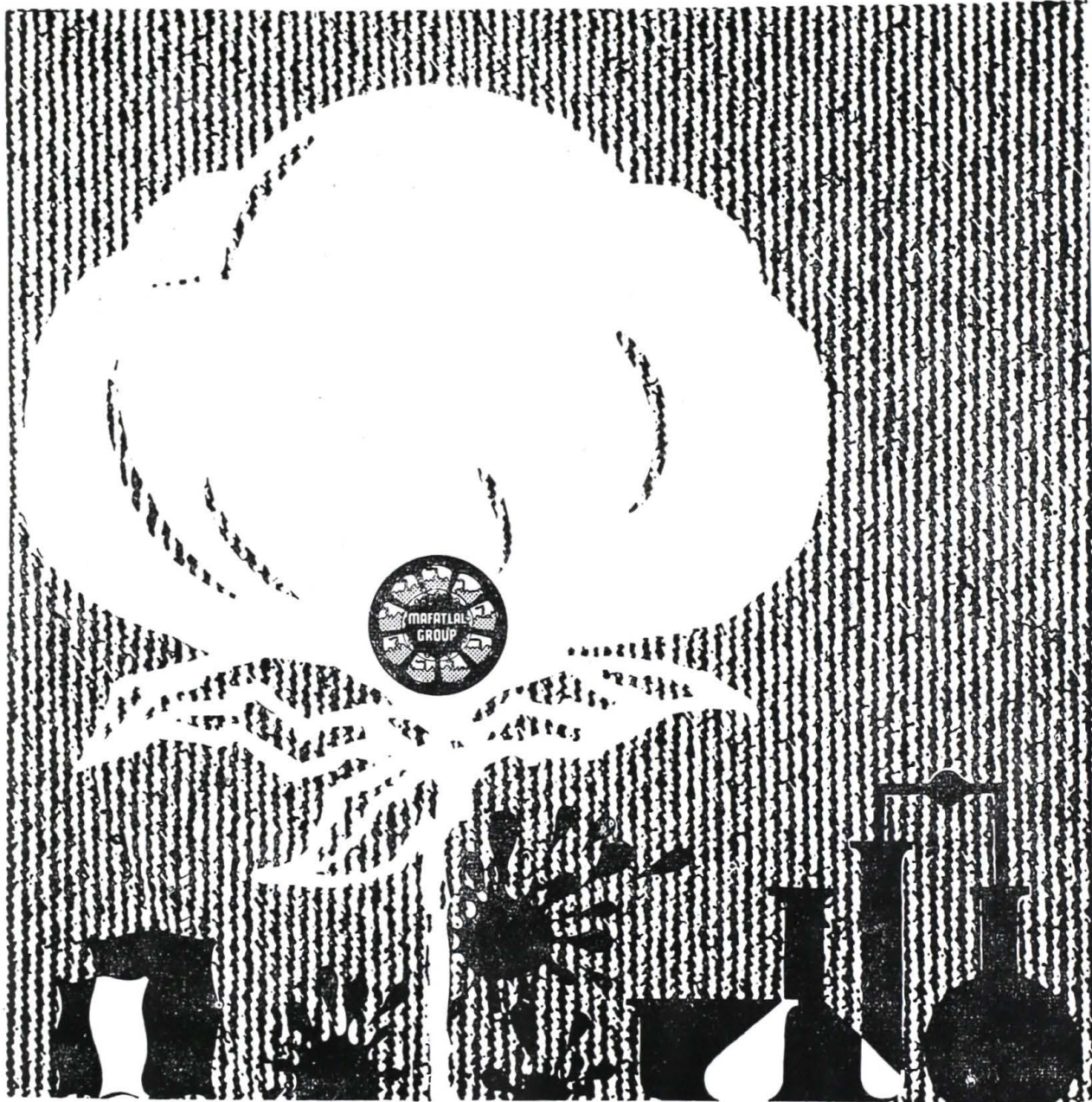
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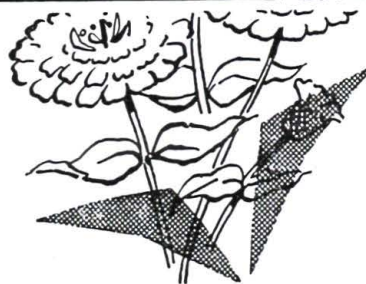
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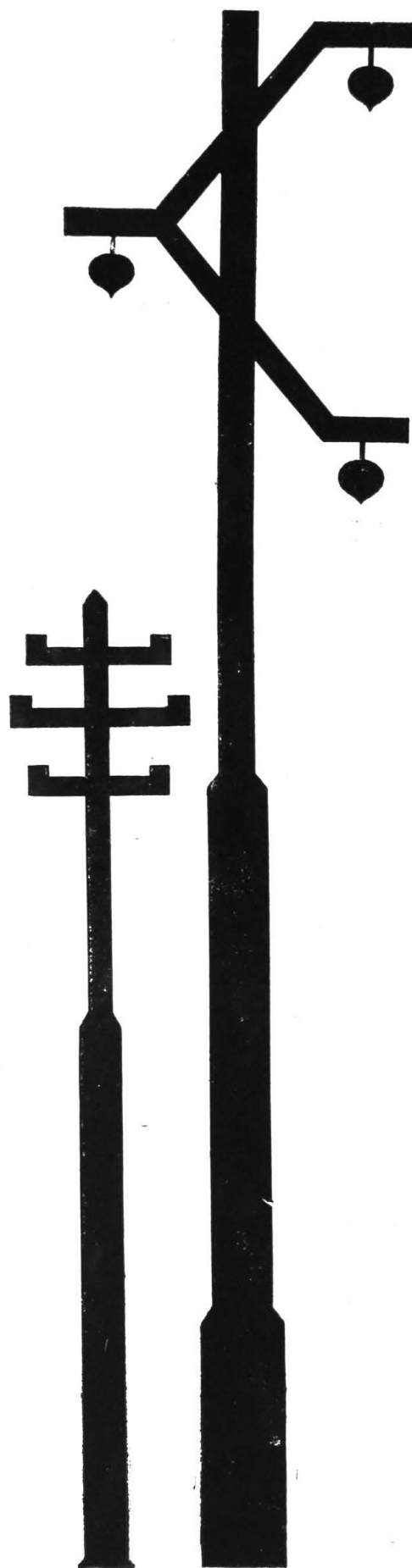
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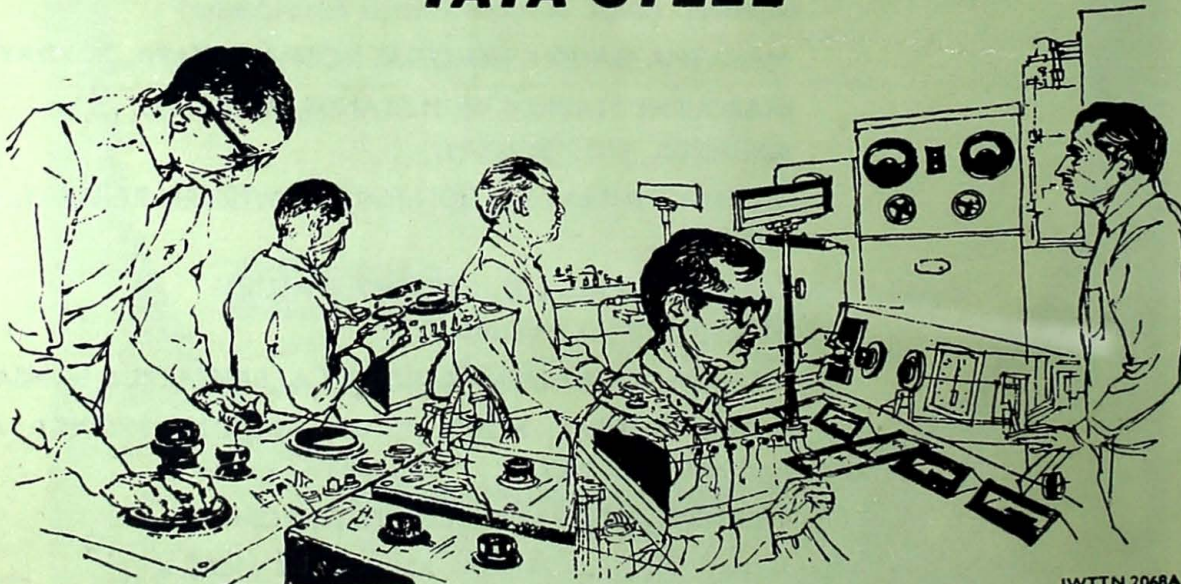
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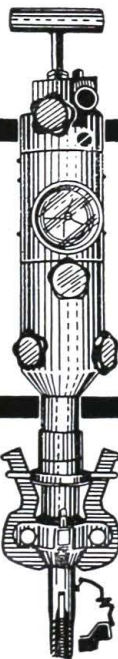


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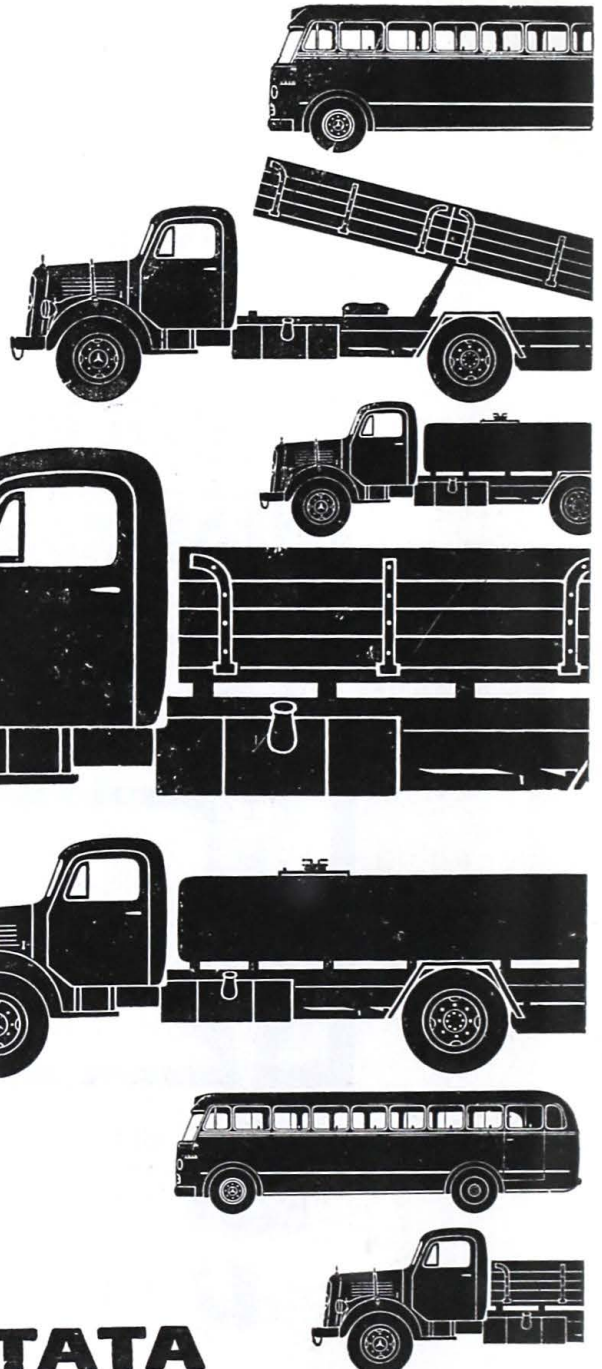
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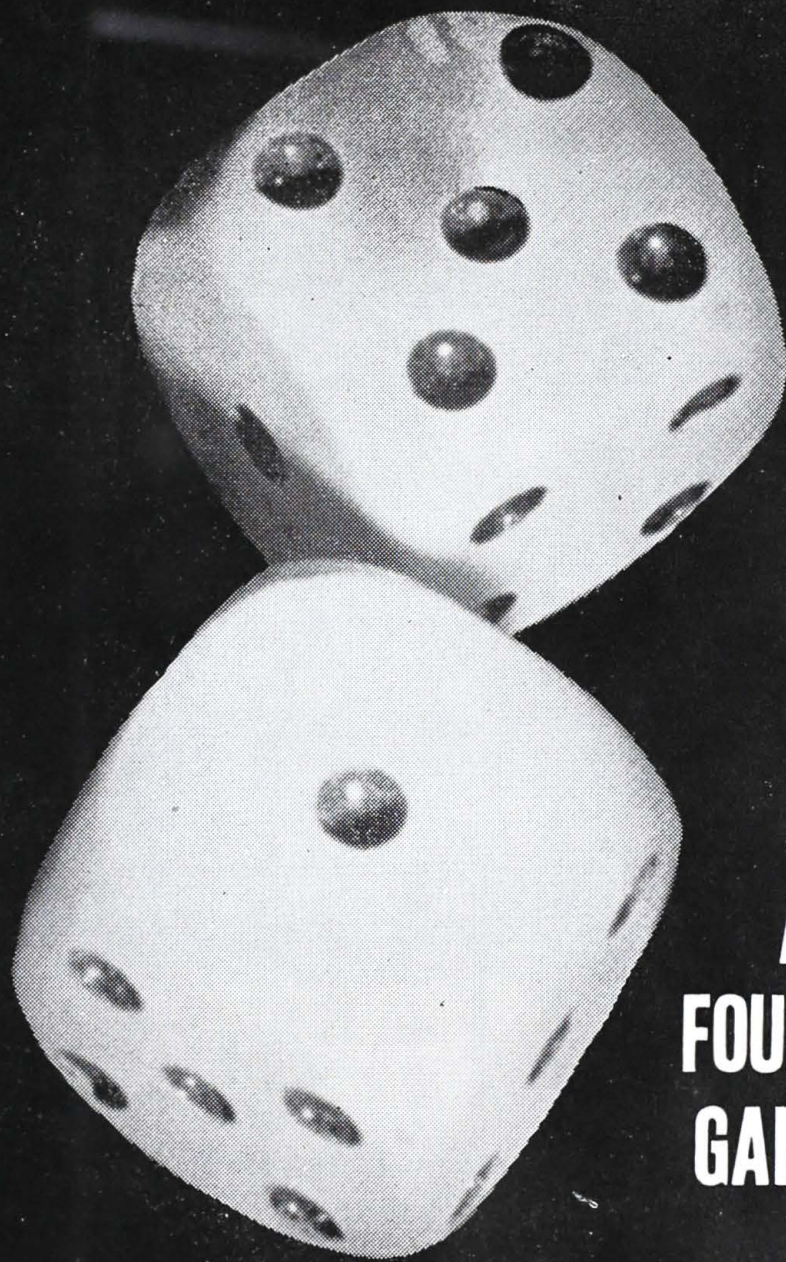
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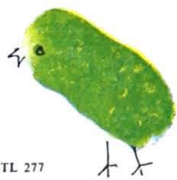
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VOLUME XVIII

JUNE 1965

NUMBER 3.

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d. BRIDGES

*The entire layout of this issue has been carried out by D. H. Sahiar.*

*MARG wishes to acknowledge the co-operation given by Charles M. Correa, Pravina Mehta and Shirish B. Patel in the preparation of this issue. The process was carried out through mutual discussion among architects, town-planners and public men. The comments of Shri V. N. Modak are reproduced by his kind courtesy, and of Dr. Jal F. Balsara by courtesy of the Bombay Civic Trust. The Summary of the Municipal Plan has been made by us through the courtesy of Bombay Municipal Corporation. Certain charts and statistical data are derived from the publications of the Census Board of India. Photographs and maps of Old Bombay are reproduced from An Historical and Descriptive Account of Bombay and its Environs, Published by Claridge. We also wish to thank the Government of India, the Bombay Municipality, Messrs. Wilbur Smith, Messrs. J. G. Bodhe and K. R. Irani, the Buchanan Committee, the B.E.S.T. and all others, for drawings, maps and photographs we have reproduced.*

*MARG offers this issue as a tentative effort towards the solution of a problem on which will depend, literally, the life and death of at least seven million people. The criticism, overt and implied, is offered in a spirit of constructive support for logical analysis and to correct vague thinking. Also, it is intended to create a broad consensus of agreement among the Government bodies, the Municipality, the Town Planners and Architects, Industrialists and the lay public.*

*We hope that a democratic discussion of the issue before us will help, in the next few years, to shape the destiny of a city which is bound to become one of the greatest centres of the Asian Continent, the meeting place of world trade and culture, a possible hub for human contact in a contracting Universe, where the jets will land one a minute from all parts of the globe.*

## Contributing Editors

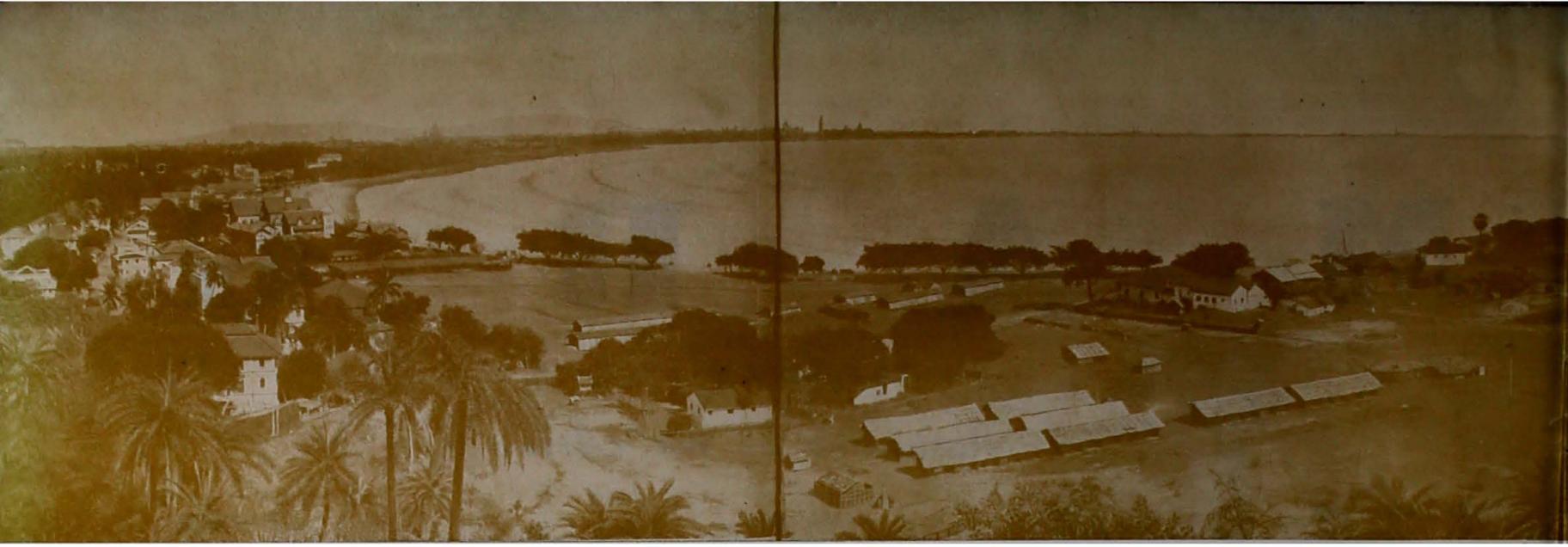
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M A R G P U B L I C A T I O N S , 3 4 - 3 8 , B A N K S T R E E T , B O M B A Y .

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# IN DREAMS BEGINS

In contemplating the development of man from comparative savagery and barbarism to all the civilisations that have been, and are, we are struck, inspite of failures, by the miraculous survival sense displayed by our species. Ofcourse, animals too have the instinct for survival. But much as we may denigrate ourselves, in view of our weaknesses, stupidities and suicidal impulses, we distinguish ourselves from the four-legged creatures by our capacity to say things from the compulsions of our passions, emotions and ideas. And, strangely enough, our slow evolution across time reveals certain fundamental traits, which may be biological, but certainly become the dialectic of the body-soul, cultivating itself almost on the parallel of the growth of the cellular organisations in nature.

The evolution of the city, to take only one instance of human endeavour, seems to have owed itself to an almost primordial urge for the building of civilisation.

Let us consider this and the other fundamental compulsions, which appear to lie at the root of all human civilisations, so that we can understand why there are cities, how they grow, and what they become, in relation to the other organic constructions of order in society.

Somehow, it seems to be the first uniform pattern of all human civilisations that men and women seek to produce food for sheer physical survival, eat it in forms that appeal to the taste of almost all the senses, and continually look for better and more efficient means of production.

The second aspect of human behaviour is that men and women seek shelter in a home—whether this be in the trees, cave dwellings, or later in brick structures and now in the more enduring materials like steel and concrete. This urge, inspired by the need for privacy, for the living of the intimate private life and for procreation, rest and renewal, leads to the building of neighbourhoods in which the various amenities can be secured with some degree of ease through communication systems. The village, the town, or the city is, ofcourse, subject to various other social needs, such as accessibility of water, nearness to the place of work and adequate defence against wild animals, dacoits and invaders. So that, in germ, urbanism springs from the need for total living.

The third factor, which seems to inspire human beings in the organisation of what is called civilisation, is the formation of a political state, like the panchayat, the commune, the municipal committee, or the legislature, in order to evolve certain byelaws, rules of behaviour and other ideal formulations covering the rites and responsibilities of individuals, in order to live, together and apart, in some state of balance. The struggle to create this minimum or maximum formal government for the making of laws creates inevitable tensions between the individual and the individual, the individual and the group, and between groups, castes, classes and hierarchies. And because man has seldom grown to the full heights of his individual capacities, all governments have hitherto remained bad governments, from the point of view of the perfection desired by the ideal of the freedom of the individual to govern himself. And yet governments are the inevitable answer to the demand of human beings for the regulation of people's conduct and their well-being.

The fourth expression of human endeavour in any civilised community, small or big, is the demand for evolving higher projects, whether these projects take the form of designing better tools, or of constructing of new townships, or even for getting rid of decadent political orders, the abolition of castes, classes and hierarchies, or the discovery of more refined means of communication. These works of men may be temporary or enduring, but they show his inveterate desire to make a thing well, when he makes it, with a certain perfectionism as the motive force of his endeavours.





# R E S P O N S I B I L I T Y

The fifth pattern which seems to have emerged in all human societies, almost as a by-product of all the other activities and specially of the energies which go into the making of higher projects, is the phenomenon of monumentality. This results in an uncanny synthesis of the various faculties of human genius. And by the intensive and extensive cultivation of all these energies man seems to evolve the need for perfection of his own nerves, muscles and tendons, the gods whom he worships when he exteriorises his energies and places them in gigantic temples, churches and shrines, surrounded by vast amalgams of earth, stone or wood, organised according to the impulses for bigness, majesty, glory, beauty and grace—all dedicated to the sense of immortality.

It is likely, that, in our present transition from the past historical periods to the new atomic and space age, the foregoing analysis of the various compulsions behind civilisation may be found to be a useful reminder to all those who are prone to accept things as they are, through various routine habits forced upon them, by lack of physical strength, will or enlightened understanding. Because, if we are going to even so much as survive on any acceptable human plane in the modern period, we will have to move out of the grooves of custom, stereotype ideas, insecurity, money lust, self-centredness, social snobbery and other causes of dead-soul-ness.

One of the problems that faces all civilisations today is the question of the growth of cities, which were useful for previous primitive, feudal or bourgeois historical periods, but which can no longer accommodate us now in view of the vastly improved and complicated means of communication, the growth of human needs and the availability of the good life for vaster number of peoples, in a world which must release more and more people into the ages of liberty, equality, social justice and potentials of human-ness.

The discussions which have been going on about the question of evolving a future Greater Bombay are, therefore, pertinent to the whole question: Wither Indian Civilisation?—back to the woods, stagnation in present chaos, or forward into the space age, with the private, intimate human needs and interests kept in full view?

The moot points of the Bombay Plan are presented in the following pages in the form of a tentative thesis by a group of public men, architects and town planners, for discussion—a blue print for an exhibition of images and ideas which may become the common pool of our efforts to develop a city for ourselves, our children, and children's children, in a whole region of outlying spaces, connected to the hills, valleys, and plains of India.

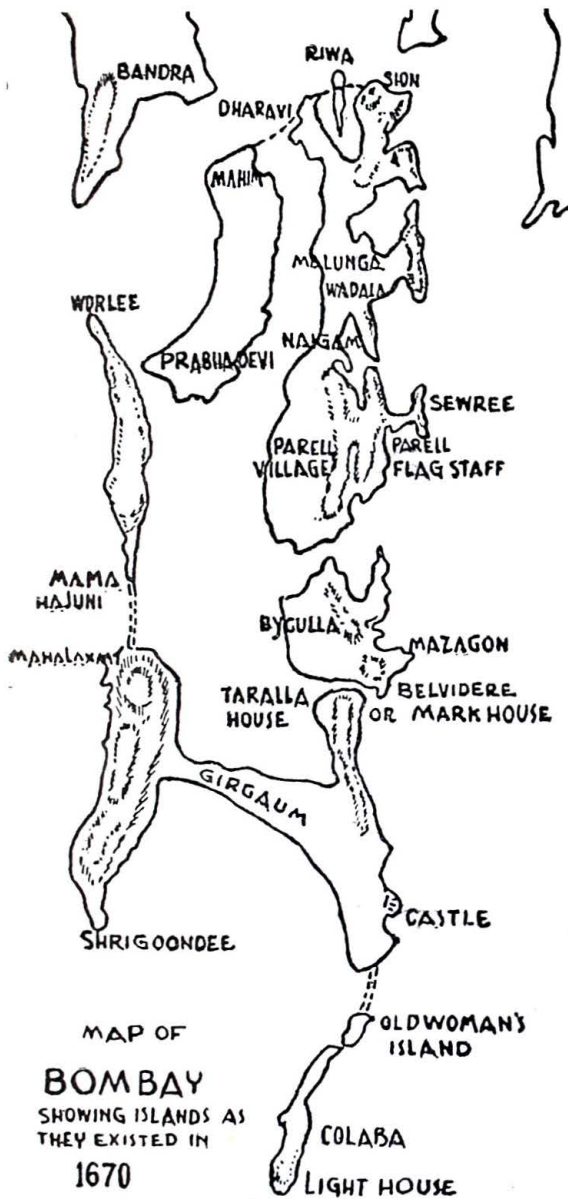
We emphasise the tentativeness of our efforts and offer this material for discussion in the hope that the present healthy controversy may lead to the acceptance of an adequate plan. We feel that we should say things freely and frankly now before all of us and our children are condemned to live in a veritable hell, merely because there was not enough discussion among the enlightened men and women, and the self-interest of a few unsocial elements or of ignoramuses is allowed to work havoc with the lives of whole peoples.

Nature has been bountiful to Bombay. Can it be said that, apart from a few men, many of us have done anything to embellish the beauty of this landscape? And will it be said that our generation, which fought for political freedom, answered the challenge of building a humane order?

The destiny of Bombay will be decided in our own time. Let us not build blind alleys. Let us open out to gardens, vistas, utilities, gathering places, schools, hospitals, on the hitherto neglected spaces, away from the congested 'Fort' of a bygone age, until many 'Xanadus' grow beyond the dream of Kubla Khan, nearer our own dreams for a city worthy of an emergent new world, beyond the concepts of London, Paris and New York, to our own inner aspirations towards the 'city beautiful'. Let us have the courage to dream:

For in dreams begins responsibility.

# SPLENDOURS AND MISERIES OF BOMBAY



If we look at the oldest extant map of the Western Coast of India, we will find that Bombay is the name of a number of unconnected, jungly islands, which have no resemblance whatever, except in their contours, to what Bombay became later, what is it today and what it might be tomorrow.

The logic of change, implicit in these contrasts, is presented here with a view to communicate an obvious hometruth: That if it was possible to build, re-build and renovate this city from time to time, by constructing new essential buildings, altering the facades, reclaiming land from the sea to gain more space, in fact to change the whole architecture from the fishermen's villages to the commercial needs of a harbour and the social needs of dwelling in homes and hovels, then the revolution, which is impending, beyond the village economy and the East India Company's trading empire, as well as the British Victorian, Edwardian and Georgian bureaucratic periods to the era of national freedom and a 'Socialist pattern of society,' it is possible to achieve more within the whole concept of living in the jet, the atomic and the space ages, that is to say, the age of world equality.

But we find that in each period, men had to invoke enough courage in them to secure themselves against the hostile elements, against their own feeble minds, hearts and will, and against the fear of the future.

For instance, the fishermen worshipped Mumbadevi after whom Bombay is named. Legend has it that the hut in which the Goddess lived by the tank could not be demolished and later architects had to skirt around it to make an unshapely structure for the pool in order to keep the shrine intact. Only lotuses grew there from the mud and the touch of them was supposed to cure all ills. The Victoria Terminus now stands on the site of the shrine of the Mother Goddess.

## II

The important places of worship from the ancient times in this area had been the Buddhist Kanehri Caves, and in the 6th century the Shiva temple at Gharapuri (Elephanta) built by Pulakesin II, commanding the Thana creek through which had plied the Egyptian, the Roman and Arab trade.

In the early mediaeval Hindu period, a temple seems to have been built at Walkeshwar, though the capital of the kingdoms was first at Chaul and then at Thana.

At one time, the Raja of Thana, called Bimba, transferred his capital to the island of Mahim, then almost entirely covered with cocoanut groves. Later, a palace, a court of justice, and a temple were raised in Mahakavati and thus the islands towards Colaba Bay began to be a little more important.

The island of Mahim was fought over between the Hindus and the Muslims and the aboriginals. A Mosque seems to have been erected here, after the temporary Muslim occupation.

In the later mediaeval period, the West Coast witnessed a good deal of micingenation, as Arab, Abyssinian, Persian, Israelite and Zoroastrian peoples wandered about the Gujarat Coast and patronised the fishermen. Perhaps, the dried 'Bombay Duck' formed part of the staple trade.



### III

After 1497 A.D. when Vasco da Gama skirted round the Cape of Good Hope and laid the basis for the Portuguese Empire on the Coromandel Coast, the Portuguese made forage raids to ward off the Arab junks. Under Don Francisco de Almeida, Viceroy of Goa, fifteen vessels sailed upto Dabhol, and captured a Gujarati vessel in a creek. As they did not find enough plunder, they landed at Mahim—this then being the first time the white folk set foot on the island. It was a kind of combined cattle raid and slave hunt, sufficiently rewarding to make the fleet loot the fishing village of Diu.

After this first taste of blood, the Portuguese wanted to have enough fortified posts on the coast, and approached the Sultan of Ahmedabad. This prince was willing to cede Mumbadevi, but the conquerors preferred Diu. In 1517, the Portuguese bombarded Mahim. Some years later they attacked the Mahim Fort and gave it to their ally, the ruler of Chaul. Still later, a naval battle took place between the Portuguese Captain Heitor de Silveira, and a Muhammadan admiral in Dharamtar Creek.

*Bombay, originally, was that finest of things: a city on the water.*

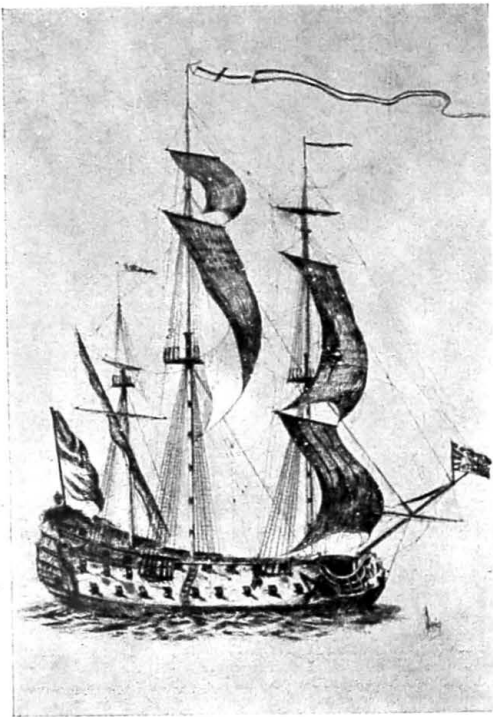


The local Raja of Mahim found the Portuguese incursions unbearable and became a willing vassal.

About this time, Capt. Nuno De Cuna held a naval review in the sea, which is now Bombay harbour. The four hundred ships, which constituted the Portuguese fleet, duly impressed the fisherfolk, as this was perhaps the first great demonstration of sea power on this coast, since the centuries before when the Shailendras had sailed in the Indian Ocean. Apart from the naval review, the Portuguese also held a grand parade on the land, which came to be known as Esplanade, in which five thousand white soldiers and sailors and eighteen thousand Indian troops presented arms. As somebody has said: 'The Sultan of Gujarat found himself between the devil and the deep sea'. He preferred the devil and made a treaty with the Portuguese, ceding Bassein Fort, with 'its territory, islands and the sea' of which Mumbadevi was a part.

Gorging on the plentiful food and wines in the fortified city of Bassein by the conquerors, led to its being called the 'Island of the good life'; and even St. Francis Xavier was shocked at the riotous living.

*Drawing of an old ship*



The Portuguese ruled the roost without opposition for a century. The Jesuit and Franciscan priests came to humanise them and built some churches. Our Lady of Hope was then erected on the Esplanade. And the conversion of the heathen began, an easy enough endeavour because of the available outcastes of the benighted Hindu system.

#### IV

The first Englishman who came to India was a Jesuit priest, named, Thomas Stephens, a linguist who learnt Marathi and wrote a religious epic. He wrote to his father, who was a merchant in London, about this wonderful rich country. This inspired the greedy hearts of the 'City,' under the shadow of St. Paul's Cathedral, to venture out on the East Indian trade.

The first two English expeditions miscarried.

After about twenty years of dreaming, Hawkins sailed up to Surat and reconnoitred the area, tentatively. The British were still frightened of the might of Spain and Portugal.

After the defeat of the Armada in western Europe, the Surat Factory came to be built.

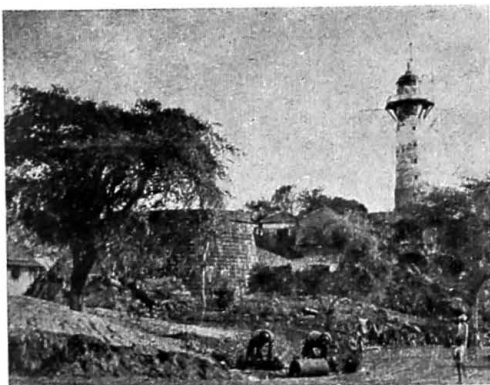
The Governors, or Factors, of Surat soon saw the advantages of the harbour near Mumbadevi, and set up the castle, with ramparts and a look-out tower, enclosing a spacious garden, with shady walks and garden bowers, and a platform on which a couple of guns were placed as the chief fortifications.

The islands from Mahim to Mumbadevi and below were still unconnected. About ten thousand people were scattered and the orchards of cocoonut, jack fruit, tarcolla, tamarind and the gulmohar spread around. In the inlets and the creeks, the wild seas rushed in with the tides. The waters washed Kamatipura, Byculla and Dadar, leaving puddles and stagnant pools and noise-some smelly, mudflats.

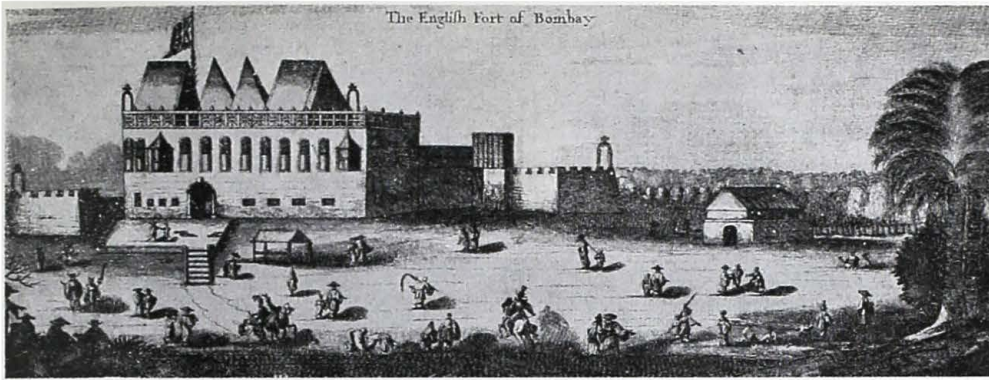
As the island of Bombay was given in the dowry to the English monarch, but the word, 'island' was not defined, Humphary Cooke claimed all the islands. The only difficulty was to expel the priestly landlords. The Portuguese Governor got no support from home against Cooke's acquisitiveness and Cooke made a fortune by raising illicit revenues and putting them into his own bulging pockets.

Sir Gervase Lucas was sent to arrest him, but was foiled and had to be content with Depoiling the Jesuit College at Bandra. After the personal rule of Cooke and Judge Gary, the Dower Royle was handed to the East India Company. Thus Gary gave up charge to Sir George Oxendon, the Surat 'President', from which fact came the name, 'Presidency of Bombay'.

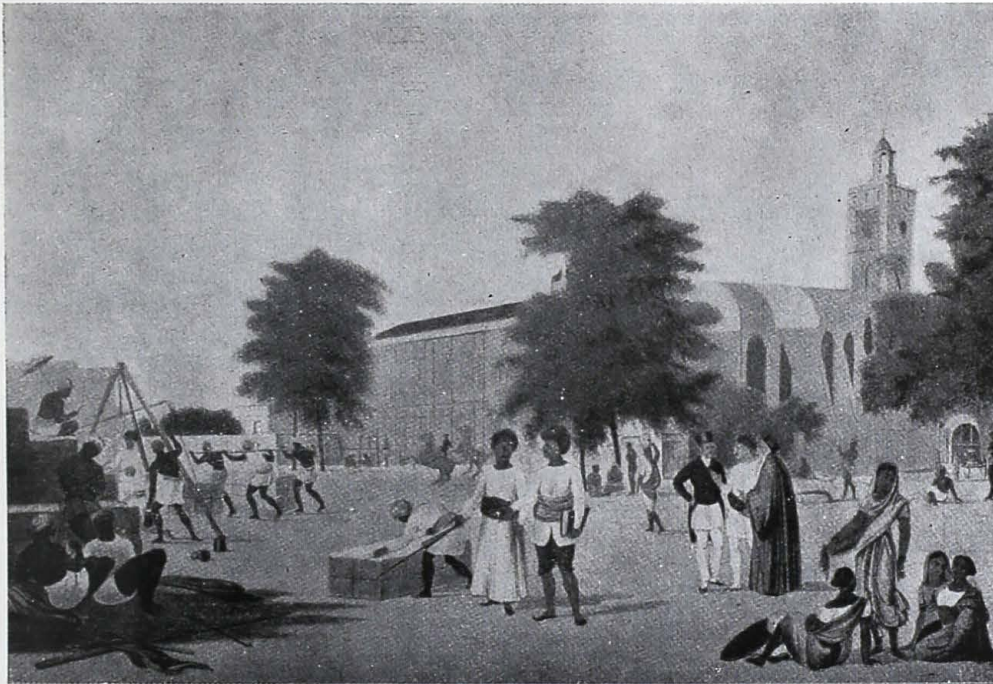
The minor forts were now supplied with guns, the garrison was increased. A Custom House and Quay were constructed near the Bombay Castle, the pleasure gardens of 'Our lady of the manor' were wiped out and a castle-like enclosure was put up, over which was hoisted the British flag.



*The Old Light House, Colaba*



Bombay Fort in 1670, from "Baldeus Voyage"



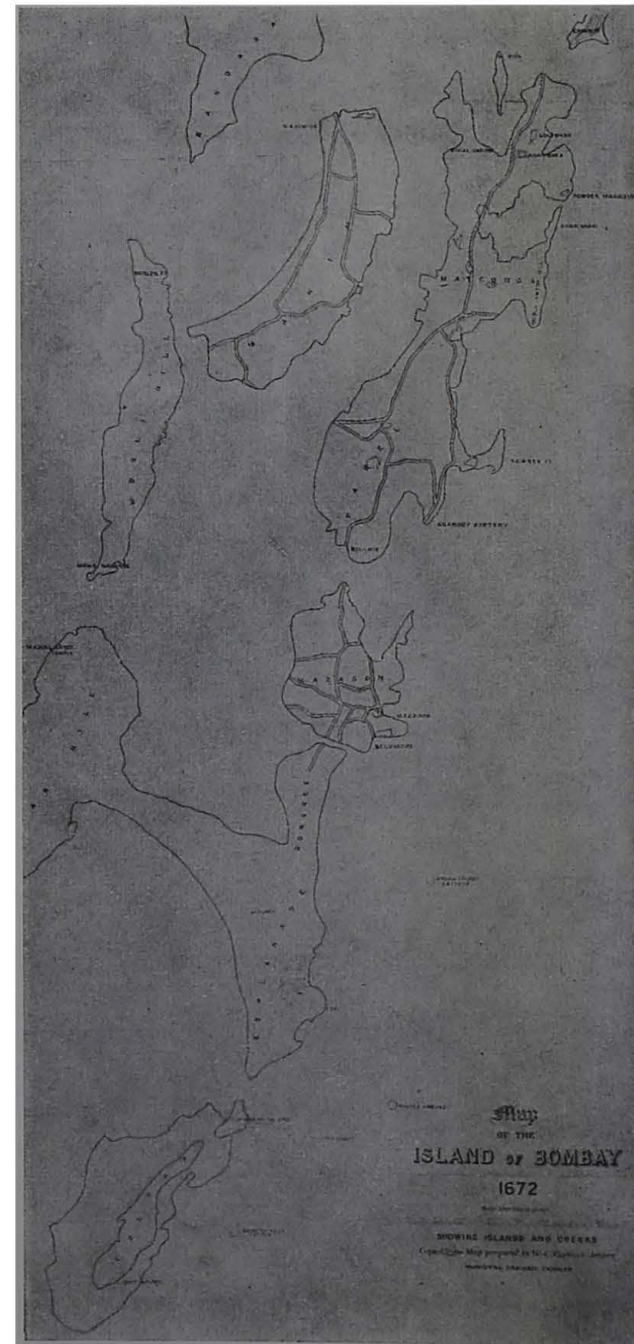
Bombay Green and St. Thomas' Church a hundred years ago

V

On 14th July, 1669, Gerlad Aungier, appointee of the East India Company, arrived in Surat. He has been called a man of "dreams... impossible dreams, the heart made possible."

Early in his career in India, he thought of transferring the Company's headquarters from Surat to Bombay, still holding the license from the Mughal Governor of Surat, while Shivaji was galvanising the Maratha peoples and the Dutch were attacking the British establishment. Aungier faced a difficult task. He uttered inspired words in order to help men to realise his dream of Bombay city:

'No City by a Sardanapalus made  
 For regal pleasure in a single day  
 Is this—no sudden bloom for swift decay  
 But raised with patient toil by men of trade  
 Opposing kings and armies unafraid,  
 And who, though marred by many a human trait,  
 For God's great help were not ashamed to pray  
 Their work is here enshrined: where they arrayed  
 Against all hostile hordes a rampired front,  
 Thrust back encroaching seas with labour stark,  
 Expressed in brick and stone, each passion's need—  
 Truth, justice, mercy, every struggle's brunt  
 Was borne by heroes, Aungier to Clarke  
 They call who follow excel each deed.'



And, forthwith he ordered the building of a Quay to berth twenty ships. He projected a fortified wall around the whole city, which was not carried out for another forty years. He improved the government house inside the castle. He established a mint, had a hospital erected and conceived the church. All this encouraged adventurous merchants and even women, from England to come and settle in Bombay. The English soldiers who seemed to like what they called 'black velvet' (the skin of the Indian women) were often murdered by the Indians for taking liberties with their women. So a law was passed to enable the Europeans to marry native women, if they so chose, provided the women kept to Indian dress, the privilege of wearing European dress being left to those who could pay special fees. During this period, the English respected Indian customs, drank arek, smoked the hookah and many of them lived Indian style.

The mixed population grew to sixty thousand, including the assortment of most of the neighbouring countrysides, plus fugitives and vagabonds.

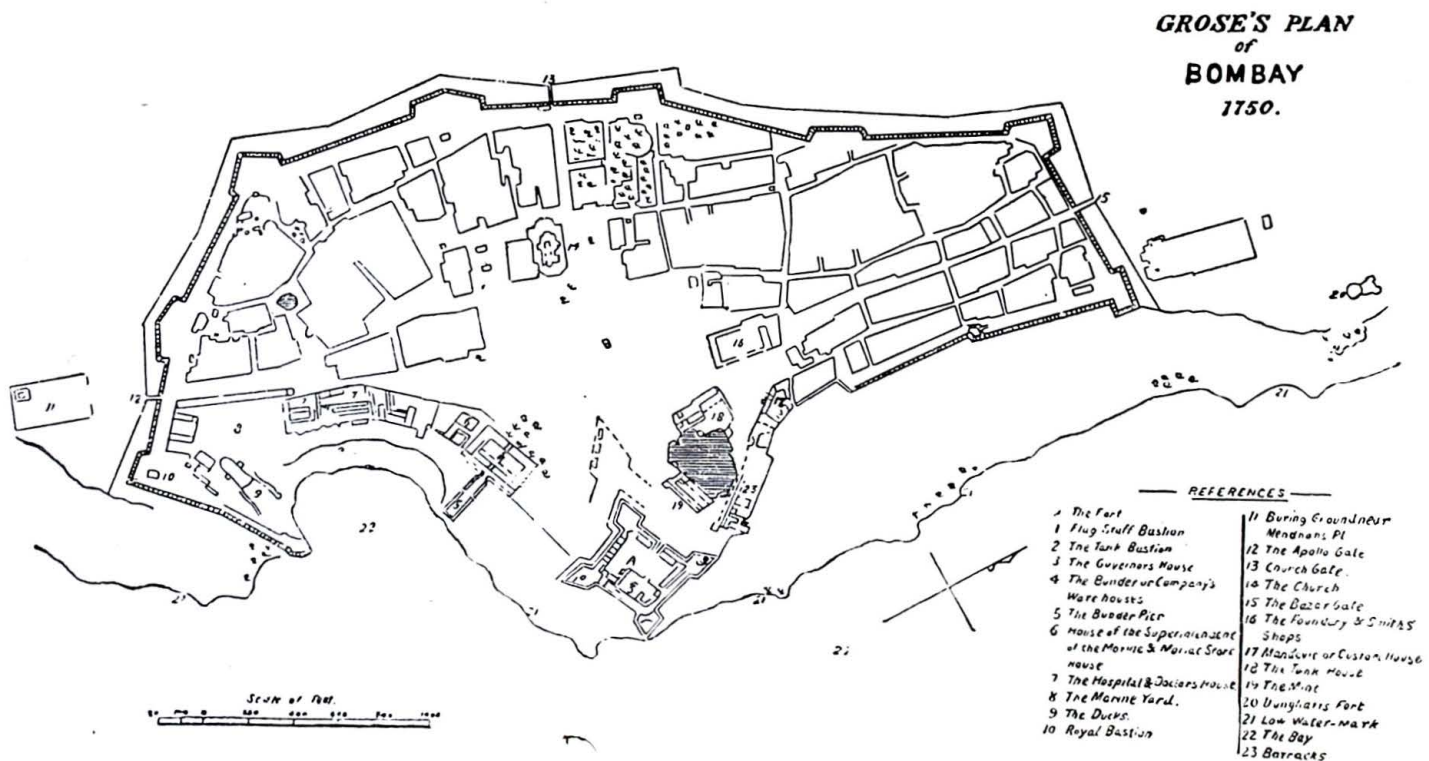
The growth of the population led to serious consequences. There was no drainage. Conservancy of water was unknown. There were only a few wells. The creeks were silting up, leaving marshes and swamps. The manuring of fields with fish and toddy palms made a continuous stink. Padri Ovington wrote that Bombay was "nought but a charnel house in which two monsoons were the age of a man". All kinds of diseases were rampant. By 1691 there were only eightysix Englishmen left on the island. Plague killed everyone of these except twenty-seven. In 1706, Sir Nicholas Waite, the Governor, called Bombay "this unveryhealthyful Island".

John Company was stingy and did not pay its officers, who naturally became corrupt.

The Sidi Nawabs of Janjira began to dominate Bombay, sold slaves in Mazgaon market, and decorated the foreshores with Maratha heads on poles. The scattered English were helpless against the Marathas. The Mughal Emperor did not answer their pleas. The Sidi Yakut burnt down Mazagaon Fort before he left. And a plague followed.

## VI

The next era saw a free for all between the pirates. For instance, Avery came in the ship "Charles II" in 1694 and levied toll on the Red Sea trade. Then he seized a Mughal ship outside Surat and set off with the booty for America. Captain Kidd was sent from home to suppress the pirates but became a pirate himself and looted the Company's ships and native boats alike. Chased by a combined Dutch and English fleet, he went towards Janjira, looted an English ship and sailed away with a quarter million sterling



worth of plunder stowed away in his boat. Of course, he paid for his crimes at home by being executed in Tyburn. More daring than Avery and Kidd was Angrea who collected all the pirates under his leadership and became uncrowned emperor of the West Coast. John Company sent a squadron under Commander Mathews to arrest him, but he evaded the fleet.

A new governor, who came in 1716, named Charles Boone, began to build the fort wall designed by Aungier. During Boone's regime, Rev. Cobbe built an English Church, according to the design left by Sir George Oxenden.

At this time, Bombay began to look somewhat like what it appears in Grindlay's paintings. In spite of the fact that piratical raids did not cease, the sun was rising on the British empire. Colonel Robert Clive arrived in Bombay in 1755 and seems to have left his mark by his campaign against the pirate Angrea. The colonel marched his fifteen hundred troops by road, while Admiral Watson brought up twelve ships and numerous mosquito crafts towards the nearly impregnable fortress of Viziadrug. Angrea fled. Clive sailed away to Madras 'to give England India'.



*St. Thomas' Church  
from an old print*

*St. Andrew's Church,  
after an old photograph*



*Church Gate with the  
walls in course of demolition  
1862*

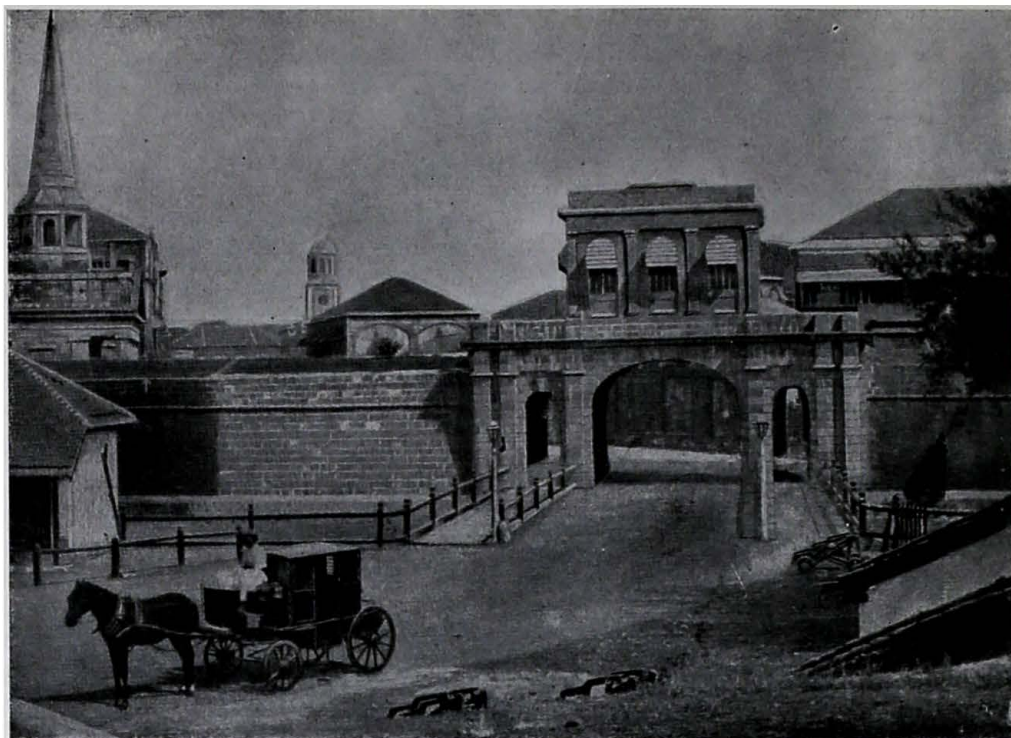
VII

The English and the Portuguese on the West Coast had to contend with the Marathas. The Portuguese, who had been besieged in the fort of Bassein in 1738, had escaped and retired to Goa. The English began to build new bastions. All the trees around the fort for hundred and twenty yards were cut down and a moat was dug. The dockyard was extended. The first great Parsi ship builder, Lowji Nusserwanji Wadia, began to build ships of war in Bombay harbour.

The Maratha diplomacy conceded to the British, the offer of asylum in Thana Fort, should the French attack. There was a minor sea battle between the British and French off Breach Candy in 1747.

But a period of peace followed during which a new lighthouse was erected on Old Woman's Island in Colaba, in order to help ships to avoid the reefs on the coasts. There was a rough landing stage among the clustering shoots, where there is now Apollo Bunder. There was a graveyard where there is now the sailor's home. This was shifted to Sonepur. Soon Bombay was growing and had one lakh inhabitants in the third quarter of 18th century. The European and Indian houses were being built, the English bungalows being spacious, with large verandahs, without any thought of architecture. The Governor still lived in the castle from which place to St. Thomas' Church was a big green with tamarind trees. This was the main business area

*The Apollo Gate*



by day and for entertainment by night. The city is said to have grown healthier through the presence of the 'Honourable, the Town Scavenger' on the council. Some of the swamps were reclaimed and this improved the atmosphere, though standards of public health were, in those days, low. The difficulties of the future were piling up through the crowding of the north part of the fort with slums and the clusters of huts near Dongri.

The flagstaff bastion, which overlooks the island in the harbour, was then erected above a mile long wall. The Apollo, Church and Bazar gates were the only outlets on the land. On the west of the fort was the spacious green of the Esplanade, where the Ayahs amused the white children, while the sahibs and memsahibs sauntered down for the evening walk.

The palm groves spread along the shores of the Bay. Some houses were coming up on Malabar Hill as the Koli fishermen were giving up dacoity and taking to their own trade.

*Memorial to Parsi Sāybuilder*



### VIII

The defeat of the Marathas at Panipat removed the only possible hindrance to British power on Western Coast. The recruitment of the marine battalion in 1770 kept the Portuguese at bay. The cotton trade with China began to be the main source of the city's fortunes.

The Governor of Bombay from 1771 to 1784, William Hornby, gave much attention to the consolidation of all the northern islands of the group, into one compact land system. This great public work, which was undertaken without the orders of the Directors of Company, came to be known as the Hornby Vellard. The memory of this man was also kept alive by Hornby Road and Hornby House, built for Governor Hornby, away from the castle, came to be known later as Admiralty House. It was occupied in 1798 by the Recorder's court, being later extended to house the High Court, giving place, ultimately to the Great Western Hotel.

The Peshwas still held the field in Poona. So the first few attempts to occupy the land upto Panvel and Khandala were badly foiled. Ultimately, however, the English were to break through to Poona.

### IX

The 19th century saw a tremendous amount of building activity.

The Marathas took the "fatal aid of the English troops". During the rivalries of the Peshwas, Holkar and Sindhia, the Surat factory was abandoned. The Company's centre of



jurisdiction was transferred to Bombay. The taking of Perim stronghold gave John Company's ships more or less complete control of the Arabian sea. The pirates were hunted and hung. The rule of law was established. The Wadia family made Bombay dockyard the most important naval centre in the East by building the strongest warships.

The Duke of Wellington, who was to clear the interior, occupied a bungalow on a bluff of Malabar Hill. Sir James Makintosh, the Recorder, who came in 1804, made Government House, Parel, the centre of the city.

The population now numbered one lakh eighty thousand. The four or five-storied houses of the "black inhabitants" congested the fort area. But the fire of 1803 proved to be a great boon and swept off four hundred and seventeen houses and other buildings from the north section, as also some barracks near the Castle.

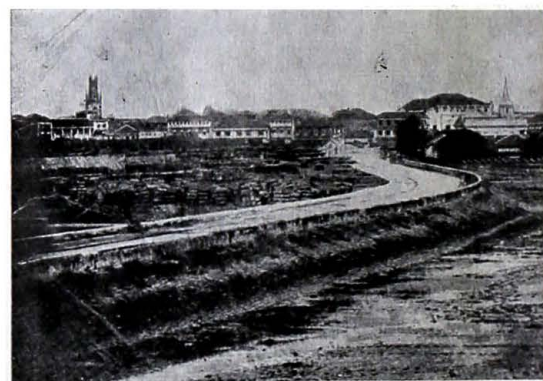
This led to a certain amount of planning. The Indian part of the township was transferred further away from the Fort. Communications were improved by the building of Sion Causeway. And Bombay became a more or less continuous stretch from Old Woman's Island in Colaba to Thana.

The bad monsoon of 1802 and 1803 brought a famine in the Konkan and the Deccan. The refugees were employed on Public Works and settled down as a permanent labouring population under the role of John Company. The English traders were thus forced to become a government, as well as a commercial monopoly. The abrogation of the Company's monopoly in 1813, however, led to the increase of private enterprise. The



*Mahim Creek and the old Portuguese Church*

*The Colaba Causeway about 1840*



last battle against the Marathas was joined by a sudden dash of 1800 'Bombay Fencibles', who quick-marched to Poona and attacked the Peshwa's force of 18000 horse and 8000 foot, disintegrated the defenders and made them flee to the jungles. The English became masters of the Deccan. John Company pensioned off the Peshwa, paying him eighty thousand pounds a year in his exile on the Ganges.

## X

In 1819, Mountstuart Elphinstone was appointed Governor. He raised taxes, stabilised the territory and gave much thought to education in Bombay.

The spread of cholera epidemic in 1820, mainly due to the polluted water, forced the government to sink some new wells on the Esplanade. The whites, however, were in the habit of taking boatloads of bottles to fill from the natural spring in the cave, and stored them for drinking purposes.

The gap between the lazy, rich in their remote English residences and the Indian population was increasing and the oppression began to create rumours of revolt.

The authorities put the excess labour on repairing the Duke of Wellington's road upto the ghats.

We get a glimpse of what Bombay looked like at this time from the verses of Bishop Heber who toured India and walked up from Khapoli to Khandala, picnicked at Salsette, camped besides Vihar and Tusli Lakes and took the air everywhere from Bandra to Mahim.

That course, nor Delhi's kingly gates  
 Nor wild Malwa detain,  
 For sweet the bliss that both awaits  
 By yonder western main.  
 Thy towers, Bombay, gleam bright, they say  
 Across the dark blue sea,  
 But never were hearts so light and gay  
 As then shall meet in thee.

XI

Already in the 1820's, John Company's rule was being criticised and the crown in England was being asked to take over. Two years before the accession of Queen Victoria, the Town Hall of Bombay was built at the cost of rupees five lakhs.

In 1837, Queen Victoria was proclaimed, 'Supreme Lady of the Castle, town and island of Bombay and its dependencies'.

Bombay assumed a new Victorian look: The image of trade was dominant, as piles of cotton and half pressed cargoes of fibre lay on the dusty land beyond the Town Hall, with the noise of the cotton screw disturbing everybody's sleep. As Colaba was still cut off at high tide, the long discussed causeway was erected, to connect the old burial ground of Mendham's point with the tip of the land in the Arabian Sea. The mercantile centre spread to the Esplanade, later occupied by Elphinstone College and the old Secretariat, and beyond the Causeway, so that the land values in Colaba went up five-fold.

The emphasis on commerce, on bare Victorian living, building for glory of Empire, led to the emergence of sharp contrasts. On the one hand was the stench of rubbish, coconut shells and of the beef factory, where meat was recasked to be sent to naval and military establishments. On the other hand grandiose buildings were coming up, combining Mughal Palace motifs with Victorian, Gothic and Doric architecture. The pigs roamed in the swamps of Mazgaon and tigers and cobras haunted the fort, while Sir Robert Grant led the singing of the hymn to worship the king. Life was wonderful for the few who lived in Grant Road, or in tents and bamboo houses on the Esplanade. The new Governor's house was built at Malabar point, for week ends, though the Parel house continued to be the official residence of the Governor, till it later became the Haffkine Institute.

XII

The growth of Capital, in British and Indian hands, led to a spate of building under Lord Elphinstone, who became Governor on Christmas Day 1853.

In 1845 the Jamshedji Jeejibhai Hospital was built.

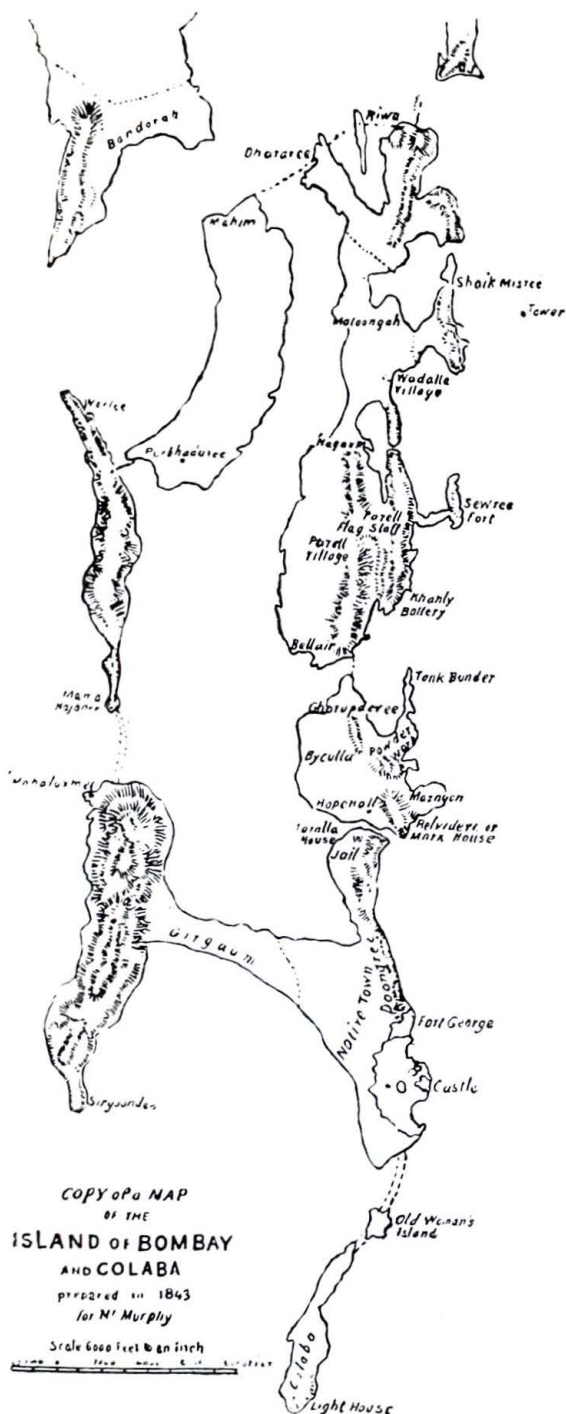
In 1853, the Great Indian Peninsular Railway started off, twelve years later to go up the ghats and open the way to the Deccan and to south India, via the West Coast. The west was connected with India by the contract for a fortnightly mail service with the P & O Company in 1855.

The British Parliament ban on the import of calicoes and muslins from India, led to the opening of Textile industry in Bombay, so that the traders could be nearer the source of raw materials, nearer the cheap labour, and the ultimate market for finished goods.

This process of exploitation demanded clerks for subordinate jobs. So the Bombay University was created in 1858.

The plans for the building activities were extended and reclamation schemes projected. The slogan was: 'every man who reclaims a foot of land or gives a new foot of pier room in Bombay deserves to be looked upon as a public benefactor'.

The clouds of the Indian War of Independence of 1857 passed by without causing much trouble in Western India, because of the severe measures taken in Bombay. The



suspects were tied to the mouths of guns and blown to pieces. The Indian forces were disarmed. And the seditious meetings act was enforced by Commissioner Forgett with characteristic ruthlessness.

### XIII

The period of the shake up in the north has been called the era of the 'Great Boom'. The new Governor, Sir Bartle Frere, who came in 1862, was a man of dominating personality, dedication to work and enlightened self-interest.

Under his benign rule, the G. I. P. Railway spread its connection to Central India, Baroda and Gujarat.

The Vihar Lake was completed by 1865, and brought the life-giving waters of the mountains to Bombay, through tremendous engineering feats.

The threat of war between England and America made the Home Government demand better fortifications for Bombay. Instead, Sir Bartle Frere made the military committee agree to the demolition of all the old fortifications. The network of embattled walls, sally-pots and moats, which strangled the traffic between Apollo Gate and Churchgate, were demolished like the walls of Jericho. The ditch was filled with rubble.

The roads, which had been so far "being macadamised with offal and dead dogs" were mended. The Kitson lamps were installed on the waysides, because British common sense thought that each of these lights, was worth the price of ten constables, against the thieves who plied their trade between Esplanade and Cruickshank roads.

The Elphinstone Circle was made the busiest centre of banking and commerce.

The River Steam and Navigation Company, later Shepherds, and still later the Bombay Steam Navigation Company, opened up the whole coast, from Colaba to Konkan, to trade and traffic. The telegraph communications with England via the Persian Gulf, first established in 1866, made Bombay the connecting link between Whitehall and the British Capital at Calcutta.

The sudden demand for cotton in Lancashire, which arose through the blockade in the War between north and south America, led to a financial boom in Bombay, when fortunes were made by almost everybody, leading to the building of many banks and financial associations.

One of the greatest financial speculations of the time was the Backbay Reclamation Company, which aimed to reclaim fifteen hundred acres for building purposes. Shares worth two thousand rupees were sold for fifteen thousand each. Some reputations crashed and bankruptcies were frequent. But the bulls and bears within the Stock Exchange could be heard screaming all day. The most sought after man was a sharebroker, named Premchand Roychand. Sir Bartle Frere had to pass an order forbidding government officials to indulge in speculation.

In April 1865, there was a sudden crash, when peace was declared between north and south America. All the banks became bankrupt because of the fear that cotton would be now available from the new world. The Backbay Reclamation Company, inspite of the most vigilant direction, lost a crore of rupees when the Asiatic Bank, where it had a fixed deposit of ninety one lakhs, closed its doors. Some sobriety dawned upon businessmen, so that, inspite of their panic, good work was done on Reclamation. But the speculators never learnt the lessons, and Bombay remained a principle centre for *satta*.

The net gain of the 'Great Boom' were the Premchand Roychand University Hall and the Rajabhai Clock Tower, the town planning of Elphinstone Circle, the creation of the Elphinstone College and High School, the Sailor's Home, the Victoria Museum and Sir J. J. School of Art. Light Houses were projected at Kanehri and Prong. The cantonment was improved. The harbour was fortified to make Bombay safe from attack from the seaside. The group of fishing villages, which had once been in Bombay, had now come to be called the 'Queen of Western India'. The title was not deserved except for the fine houses of the rich. The greater part of the landscape remained unhealthy and

pestilences broke out every year. The labour force of 816,562 was crowded into Japda hutments, with piles of filth all round, without drainage and sufficient water. There were no bylaws against mushroom growth of buildings. Many of the roads resembled sewage canals during the monsoon, and dung heaps during the dry weather. The villagers brought their cattle and there were very few sweepers to clear the rubbish. In 1865, Sir Bartle Frere created the Bombay Municipality and gave unlimited powers to the Executive Officer, Arthur Crawford.

This act of belated imaginative fervour brought some order. Arthur Crawford closed the many graveyards and had a new cemetery built at Sewri. He had the roads widened. He introduced drainage. He expelled the fat boiling, tanning and Bombay duck factories, with their stinks, out of the fort area. He had a special market place constructed which is still named after him. Apart from Vihar Lake, the new Tansa Lake was projected, though government shied away from the scheme and later paid heavy prices for executing this idea. The bureaucracy sacked him for borrowing money for his official activities. And, of course, this stupid act left Bombay derelict again.

#### XIV

The new phase of construction owes its vitality to a number of pioneers among whom Sir Phirozshah Mehta stands out. The Municipality, under this great man's stewardship, employed M. C. Marzban as an executive engineer. With its sixty-four members, representing the people by a special act of 1872, it took charge of construction. The growth of the township at the end of the 19th century and the early 20th owes a good deal to the first Local Self Government Act of Bombay.

The textile mills multiplied, from eight, of the period of 'Share Mania', to over 80, while other industries multiplied to 163.

The Prince of Wales, later King Edward VII, visited India in 1875 and laid the foundation stone of Princess Dock which improved facilities for ships. Later, the Alexandra Dock was built on forty-nine and a half acres of land with Hughes Dry Dock for an extra 1000 ft. The Bombay Port Trust with its Chairman, Sir Walter Hughes, supplemented the work of the Municipality on the wharfside.

The Portside Trust evolved the Tramway system. Also it gave power and light. The old buggy gave place to the respectable victoria. The Tansa waterworks, sixty miles from Bombay, constructed at the cost of one hundred and fifty lakhs of rupees, supplied more water. Some attention was given to parks and palaces.

All the same, Bombay remained the "Island of good life" here, a charnel house there and almost everywhere else. Epidemics of cholera, phthisis and smallpox continued to appear. A plague broke out in Mandvi in 1896, and played havoc. Dr. Haffkine's institute stemmed the tide somewhat, but the growth of the small business houses, with the emphasis on quick money returns, left the city as an "ever pestiferous hole of dust, mosquitoes, pariah dogs and pigs".

In 1898, Lord Sandhurst, the Governor, brought about the Improvement Trust, which began to think of housing. Unfortunately, however, the law of supply and demand governed the situation more than the Governor. And, all through the Georgian era, the colonial Government found itself short of funds to rebuild Bombay, because of the large exodus of exploitation money towards 'Home'.

#### XV

The contribution to the making of the great Hydro-Electric schemes made by the late Jamshedji N. Tata was a turning point in the growth of Industry. The concept of six-foot pipes coming down from the edge of the high plateau of Khandala, to bring the water of the lakes 1800 ft. down to the generating station at Campoli (now Khapoli) was a miracle of engineering, which had been thought out by David Gostling, but put into operation by the pioneering Industrialist, Tata. The overhead cable, which brought the power from the hydro-electric to drive the cotton mills, transformed the industrial economy. The sleepy little village of Campoli was to become the farthest point of the future Bombay 75 miles away.

Unfortunately, however, apart from a very few Indians, who were engaged in the Municipality work, the devoted politicians and statesmen of the Indian National Movement had no time during their struggle on behalf of India, to think of the problems of future Bombay.

At any rate, during the years of the second world war and after, while the population grew to nearly four millions, the facilities in the way of housing, water and power, roads etc. remained the same as they were before the second World war.

After the transfer of power from British to Indian hands in 1947, there was a spurt of Industrial activity which meant the extension of Greater Bombay upto Thana on the one hand and Ghodbunder on the other. The multiplication of private enterprise, under the Five Year Plan economy, still further increased the demand for land and other services until the State Government of Maharashtra was compelled to extend the limits of Greater Bombay to Panvel.

These solutions have been welcome signs of the awareness by the Government of the inevitable coming to be of a new 'Greater Bombay.' The Municipality has also prepared a Master Plan, which has obviously entailed detailed work in regard to the study of the various problems incidental to reconstruction of the city. Of course, this plan has been criticised by various authorities and the Government of Maharashtra has now set up an advisory Committee to help in the framing of the Plan.

The Modern Architect's Research Group wishes to amplify these efforts by bringing to bear expert technical evidence, with a view to an acceptable solution of the vast intricate and continuous problem, which is going to face the authorities, not only in the next decade but during the next fifty years.

A possible plan which seeks to solve the problem is presented in the following pages by the MARG group and its associates.

We wish this tentative blueprint to be discussed at the same time as the Municipality Master Plan is being examined, so that through public interest in this matter, the democratic will can be ascertained.

Meanwhile, let us sum up here a few of the problems which loom large on the horizon and which have to be answered before a final Master Plan is evolved from the citizen's point of view.

The first premise in any reasoning about the Master Plan is that, like London, New York, Paris, Calcutta and other big cities of the world, Bombay is likely to expand, if there is no third World war, to atleast seventy-five miles towards the ghats. It is likely that as the industries have already spread to Panvel, and Khapoli, the Greater Bombay area may soon have to be extended to the foothills of the ghats at Khandala (even beyond to Poona) on the one side and to Kasara ghat (and even beyond to Nasik) on the other side. Also, Greater Bombay is bound to annex the area of the various islands at the mouth of the harbour, including Elephanta and upto Alibag, as well as to Pen and beyond towards Ratnagiri. This kind of thing has happened elsewhere—(London is nearly 50 miles long and 40 miles broad). And there is no reason to doubt that this will happen to Bombay.

The problem which arose in the great cities of the West in regard to communications, water supply, power, rails, roads and airways are likely to face Bombay in an ever heightened form, because while the advanced cities of Europe and America began to solve some of these problems, we have only recently begun to ask how to solve them. For instance, if we get even fifty thousand more cars and other vehicles into operation, the present city of Bombay cannot absorb them, as London, Paris or New York cannot absorb any more vehicular traffic, and the planners are forced to think in terms of escalators for passenger transport.

In the case of Bombay, therefore, the concept of a concentrated fort area will become an abject surrender to immediacy, unless the imagination is released to comprehend a much bigger Greater Bombay, with an adequate communication system to allow the incoming and outgoing of the working population to nearby areas, at present cut off by the sea. Our communication system has not even envisaged the use of the sea

for ferry services from the congested areas to the suburbs, from which people come to work and go back at the day. And the orchards of azure sea water around the island, are neglected except on the harbour, a waste which the love of pleasure of the new young cannot afford to allow to go unquestioned.

It is likely, again, that if the increase in population is maintained at the present rate of growth, then the population of Bombay will be seven to ten millions by 1970. As the present excess population of four millions has not been housed properly, the nightmare of basties, Japda hutments and pavement dwellers will make Bombay into Dante's *Inferno*, unless the whole situation is realistically considered now. The scarcity of water throughout the year has already made itself felt, and sanitation can only be seen at its worst through foreign accounts like those by Arthur Koestler's in the *Lotus and the Robot* and V. S. Naipaul's *Area of Darkness*. The power from the present hydro works will be found inadequate during the next ten years. And fresh water sources will have to be found.

A new factor in the situation is likely to come into view with the rapid increase in world communications, through the extension of airways. Already, London has three aerodromes; Moscow has four, and Paris owns two vast complexes. Greater Bombay, inevitably, will have to have five aerodromes, of which at least one will have to be specially fitted to receive the new aircraft which may come from West and East—in half an hour from New York to Bombay or Tokyo to Bombay, while the others will receive jets one in every two minutes.

The utopian dream, of a large city, with various well defined complexes, separating industrial areas from residential accommodation, by not too large a distance but by integrated open spaces, gardens, parks and community and shopping centres, could possibly be envisaged now, when it would be too late to do so even in five years' time, since real estate and vested interests in land may make the situation impossible.

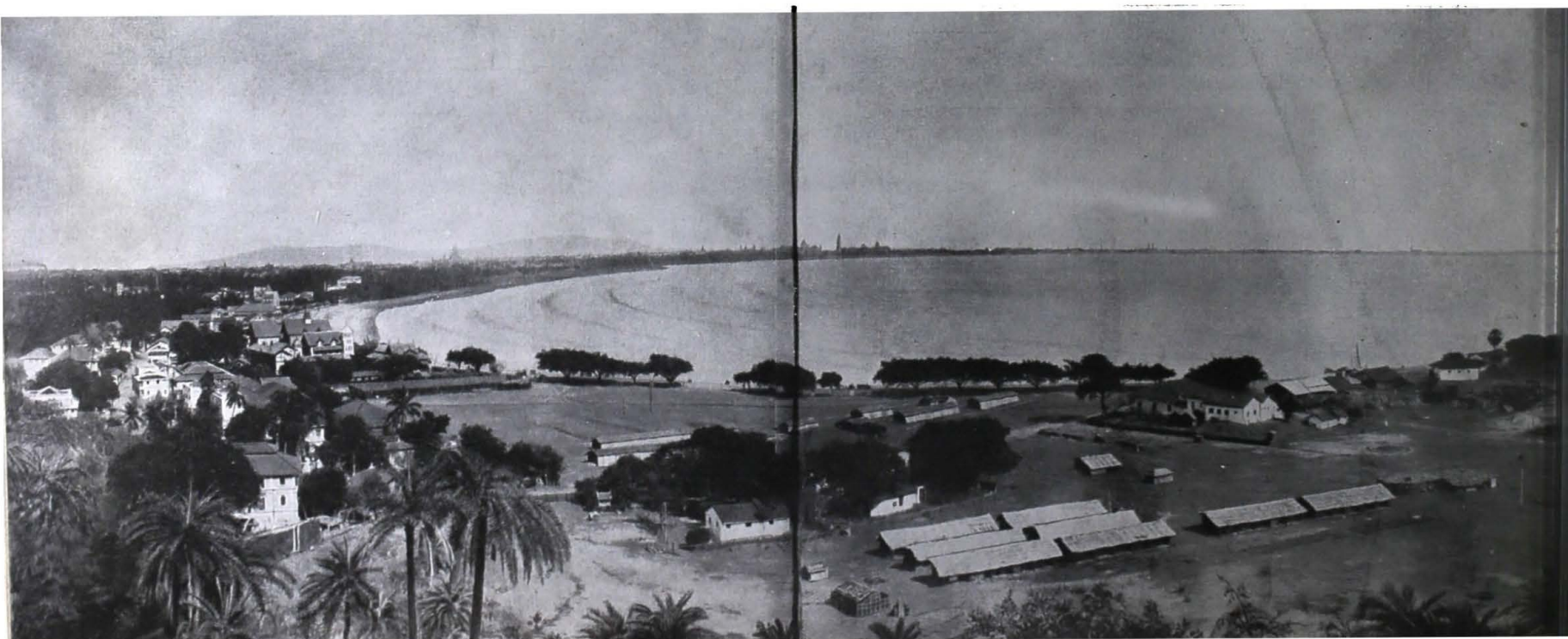
It is conceivable that the enlightened self-interest of the Government of Maharashtra, the Industrialists of Bombay, the publicmen and working peoples, may lead to the pooling of human needs and interests, in order to bring about a comprehensive Master Plan, which may be flexible enough to accommodate the revolutionary changes expected to take place in India in the shortening world, in our own lifetime.

I believe the new generations of the young will never agree to live with the miseries, paucities, and the privations of the last hundred years, but will demand the good life of a society which enjoys basic plenty in regard to food, shelter, clothing and recreation.

Rooted as are the old in the debris of the feudal, colonialist and narrow commerce of small business, with their fortified walls against all comers, they cannot imagine that the world of the year 2000 may demand open cities, built through a collective world organisation, utilising the monies that may become available from 5% disarmament.

I know it is easy to dismiss such talk as the vague talk of idealists, dreamers and poets, but the present day Bombay, inspite of all its inadequacies, only became possible from such talk on the part of a few who were men of poetry and courage.

*View of the Bay from an old painting about 1870.*





The rest of the population has always been compelled to take short measures, like widening roads here, building bridges there, and improvising everywhere, for lack of understanding of their own social needs. And, often, interim solutions have become possible, because it became impossible to survive without 'doing something'.

*View of today's Bay  
(photo by K. P. S. Kurup)*

What MARG is asking for is a breakthrough from the obfuscated minds of our intelligentsia to a vision of Bombay as one of the major cities of India in the 'One world' of the future.

I realise that this breakthrough may not be possible, because the intelligentsia handicapped as it is by many insecurities, lives in a democracy, where the vote has been given to illiterate peoples, who have so far been deprived of the knowledge of their own self interest.

I still feel that it is the duty of those who have considered the whole problem humbly, sincerely, and with serious intent, to offer the hope that if discussion is opened up on this subject, a tolerably adequate solution, agreeable to the vast majority, may be found during the next five years.

Only, it must be remembered that dreaming precedes planning, and planning is the fulfilment of self conscious, well thought-out, organic, overall concepts in which very little has been left to chance, except the inspiration of architecture, the poetry of building of houses, public works and cities.

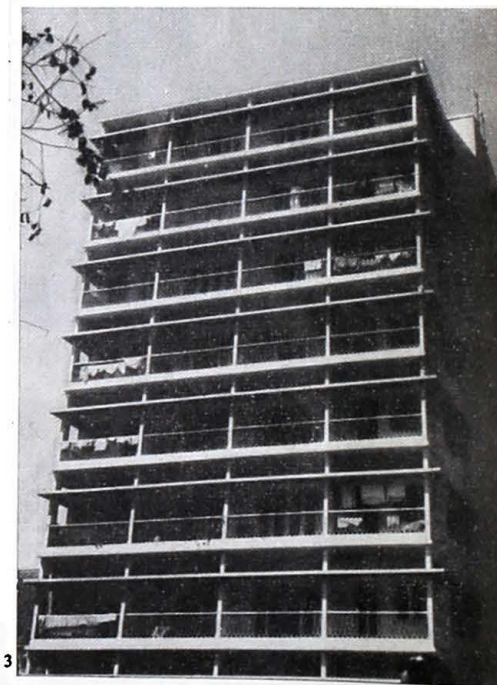
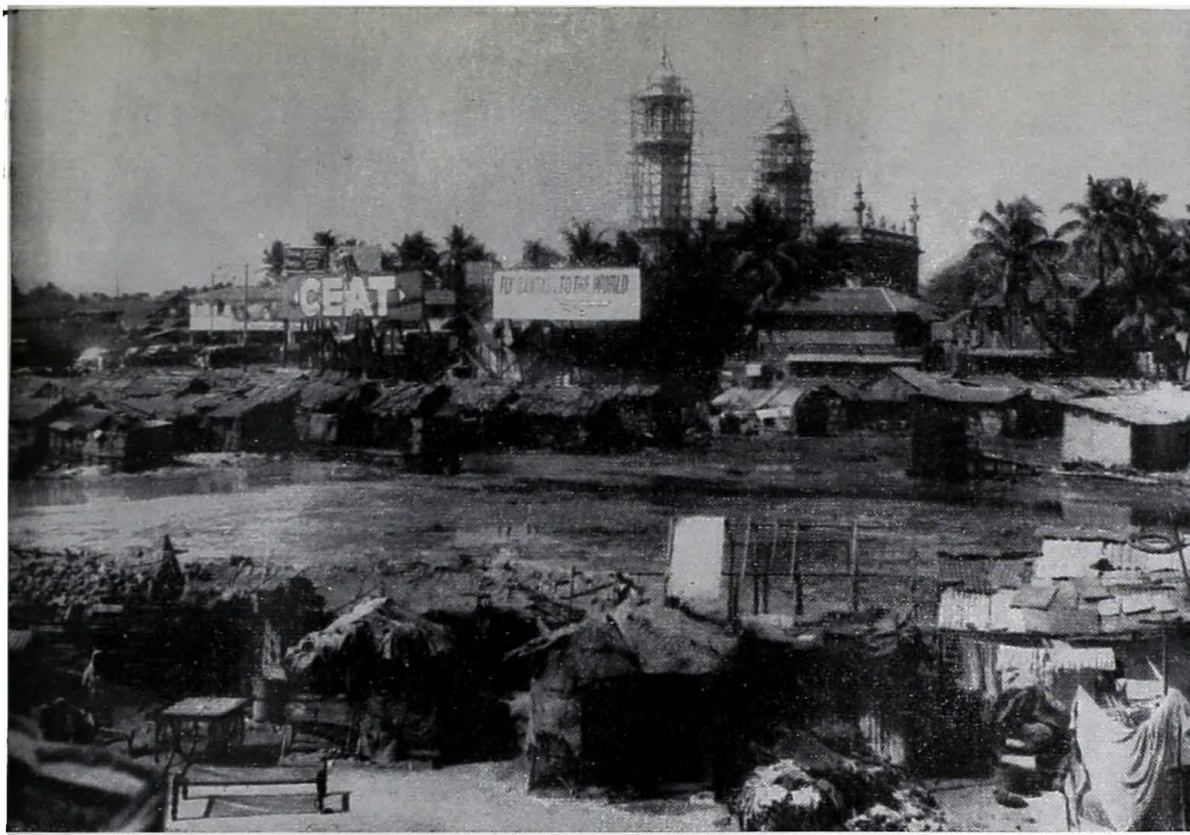


## AGONY, AGONY DREAM AND FERMENT

*(Photos by Indrajit N. Nalawalla)*





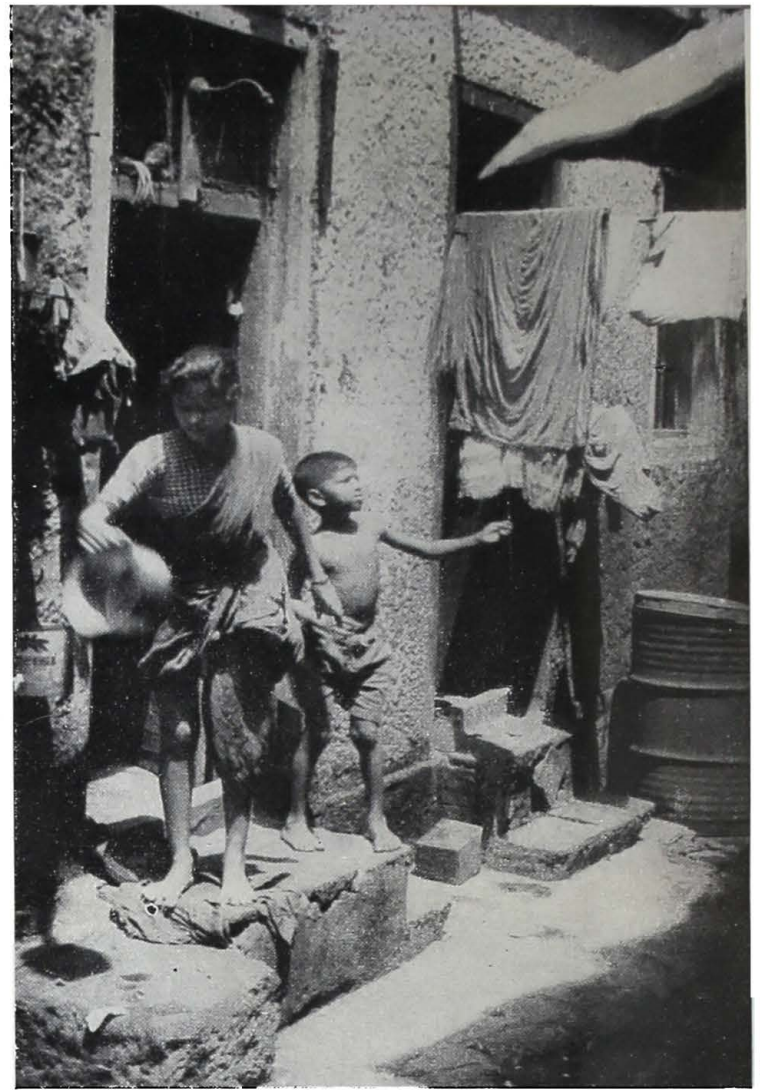


1, 2, 3 *Two views of hell in the sunshine made by men, to make others suffer. The hutments above border the Western Express Highway and house those who build new houses for contractors! Around them are the foetid waters of a marsh, while to the north is a sacred shrine which might have demanded some cleanliness if only because of the ancient precept—cleanliness is godliness. Below, the imitation of the European style flats has been carried out without any commonsense arrangement for the laundry, so that each layer of the habitation looks like a construction for “washing dirty linen in public”. All our architects fail to remember that the Indian must wash four times a day and put on new clothes every morning. The western contemporaries design each block of flats with a machine laundry in basement or on top terrace. Our own colleagues have seldom thought of importing this idea when they imitate other forms.*

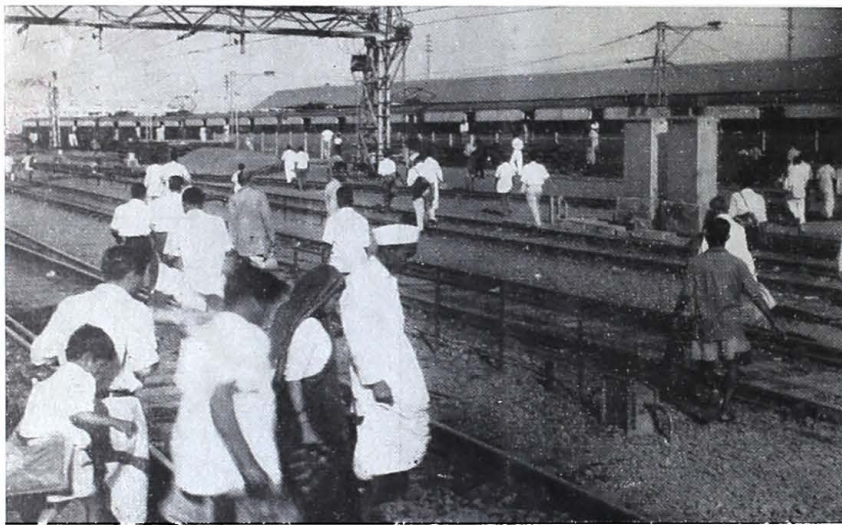
(Photos by Dr. F. C. R. Avari)



4



6



5

4. 5 *Life is not safe on the public highway because of the narrow roads. On the railway yards there is a continual invitation to suicide, but the citizens have no choice except to cross the lines and catch the trains from the other side, because there are not enough bogeys being built to carry all the millions of new passengers.*
6. *If there was no 'black hole' of Calcutta, then certainly here is the entrance to one in Bombay.*
7. *On the stone pavement of the new jungle of so called civilization, two and a half million live on the pavements like these mortals.*

*(Photos : 4, by Dr. F. C. R. Avari, and 5, 6, 7 by K. P. S. Kurup)*



7

# SYMPOSIUM

## OBSERVATIONS ON THE DEVELOPMENT PLAN FOR GREATER BOMBAY

Planning must proceed from the whole to the part, i.e. Nation, Region, City, Sector, Neighbourhood and House. It cannot be prepared in a piece-meal fashion. Its execution may be done in parts; but it must, in the initial stages, be a comprehensive Plan for fulfilling the aspirations of the people for whom it is intended, for a fuller, happier and richer life.

- (1) The Development Plan of the Municipal Corporation is nothing but a land-use map. It has no regional bias and the recommendations made therein appear to have been made without making detailed studies and layouts. The targets for population aimed at in the Plan are 32.5 lakhs in the City (island) and 42.5 lakhs in the suburbs. These targets demand abnormally high densities and are bound to curtail standards of amenities drastically in respect of open spaces in residential areas, educational institutions, public buildings, etc. Instead of concentrating such a huge population within a comparatively small area of 169 sq. miles, it would have been much better if the strategy of dispersal of population and industry was followed in the preparation of the Plan. Apart from the decentralization of employment, such a policy requires to be adopted from the strategic point of view also.
- (2) The minimum gross densities for residential areas adopted in the Plan, viz. 290 in the City and 220 in the suburbs are very high. According to the actual layouts prepared, the workable and reasonable densities should be of the order of 170 for the City (island) and 90 for the suburbs. Even these gross densities are high according to foreign standards. For example, the gross densities in the county of London Plan vary from 100 at the Centre to 60 persons per acre at the outskirts. The net residential densities adopted in the Plan vary from 360 to 480 persons per acre for the suburbs and City (island) respectively, while the town density with 75 lakhs of people works out to 67 persons per acre, against 20 per acre in London and 31 in New York. The net residential density in the Dadar-Matunga estate is 290 persons per acre against 480 persons per acre recommended in the Plan for the northern part of Bombay.
- (3) With the revised densities suggested herein the City (island) can comfortably accommodate only 20 lakhs of people, 8 lakhs less than the existing population and the suburbs, only 32 lakhs, including the existing population of 13 lakhs at a gross density of 90 persons per acre.

- (4) Room must be found for the spillover population from the City (island) and that for the population in excess of 32 lakhs from the suburbs to provide for the estimated increase in population of 75 lakhs by 1981.
- (5) The spillover of 12.5 lakhs of people from City (island) which includes the future population of 4.5 lakhs and 10.5 lakhs from the suburbs making a total of 23 lakhs should be accommodated outside the present Bombay limits by extending the scope of the Plan. (6 lakhs between Dahisar and the Bassein Creek and 17 lakhs in New Townships on the mainland—east of Thana Creek.)
- (6) The most suitable sites for accommodating this spillover population are (i) land lying between Dahisar and Bassein Creek, admeasuring 28 sq. miles out of which 10,000 acres are fit for being developed for residential use and (ii) area admeasuring 120 sq. miles or more to the east of the Thana Creek on the mainland in the form of 12 to 15 industrial townships in an area of 50 sq. miles leaving the balance of 70 sq. miles to act as inviolable green belts round the new towns, so as not to affect the agricultural economy of the region.
- (7) With the utilization of the two areas referred to in (6) above, the distribution of the population will be as under :
- |  |          |
|--|----------|
| (i) City (island)  | 20 lakhs |
| (ii) Suburbs included in Greater Bombay                                  | 32 lakhs |
| (iii) Land between Dahisar and the Bassein Creek                         | 6 lakhs  |
| (iv) New industrial towns on the mainland to the east of the Thana Creek | 17 lakhs |
| Total :  | 75 lakhs |
- (8) The area within the present Municipal limits can accommodate comfortably only 52 lakhs of population—20 lakhs in the City and 32 lakhs in the suburbs. Even from the point of view of utility services, a population of 75 lakhs cannot be adequately served in this area.
- (9) Adequate provision for secondary schools and higher educational institutions has not been made presumably on the ground that it is not the responsibility of the Bombay Municipal Corporation. This ground is untenable and suitable sites must be provided for them to meet future educational needs of the citizens. In the absence of such facilities, it is likely that Bombay students may migrate to other centres for secondary and higher education.
- (10) The actual layouts of Neighbourhoods and Sectors have revealed that 1.25 to 1.50 acres of land are required to meet the needs of neighbourhood park, playground, children's park, tot lots, etc. Only 0.51 acre for this purpose has been provided in the Plan.
- (11) The size of the plots reserved for school buildings is on the basis of  $4\frac{1}{2}$  sq. yds. per pupil in the City (island) and 6 sq. yds. per pupil in the suburbs. These standards are inadequate, and at least in the case of suburban schools, the standard should be raised to 20-25 sq. yds. per pupil.
- (12) The Plan makes no reservation for cinemas, theatres, art galleries, museums and other buildings to meet the cultural needs of the citizens. These are necessary for general enlightenment and pursuit of leisure as more leisure will be at the disposal of the citizens due to granting of paid holidays and shortening of the hours of work in the future.
- (13) The Plan contemplates building 9 lakhs of dwelling units in the next 17 years at the rate of about 50,000 units per year. Land earmarked for residences in the Plan will be able to accommodate only 1,61,000 dwelling units of the minimum area of about 240 sq. ft. at the high densities suggested in the Plan. It is not clear from the Plan how the deficiency of the land is to be met.

The difficulty of securing materials for the construction of new dwellings in the public sector does not appear to have been considered. Unless the building industry is better organised, it will be very difficult to get the scarcity materials in time to enable the target of 50,000 units per year being achieved.

Suggestions for reducing the housing costs have not been made. Prefabricated components may be helpful in speeding up the programme and in reducing the cost.

- (14) Proper relationship between home and work is not established in the Plan. In the absence of such relationship, the workers will still continue to travel by rail and bus to reach the place of work, adding to traffic congestion which has already assumed alarming proportions.
- (15) No sites for taxi stands, public conveniences, public dustbins and bus stops have been indicated on the Plan.
- (16) No sites for off-street parking, underground and multi-storeyed garages and community garages in residential areas have been reserved in the Plan. The planners believe that there is no serious parking problem for the present though a large number of vehicles are parked on streets day and night obstructing the traffic and resulting in accidents.
- (17) The proposal for the underground railway made in the Master Plan of 1948 requires to be reviewed in order to meet the present needs of the passenger traffic and to reduce congregations of pedestrians on roads, walking on the carriageways owing to inadequate widths of footpaths. The carriageway in most parts of the City and suburbs is inadequate to meet the growing demand of the vehicular traffic due to the mounting increase in the number of motor vehicles plying on roads.
- (18) The central park provided at Bellasis Road covers an area of 14 acres only. The hope is expressed that this area will be increased in the subsequent reviews of the Plan. The hope is not likely to be fulfilled in later years due to vested interests. There is an urgent need for a central park of 200 acres in the centre of the City (island).
- (19) The large parks in the suburbs are sited on swampy and hilly areas, situated far away from residential developments. The citizens will not be able to make full use of these parks due to their being far away from their homes.
- (20) There are no proposals for redevelopment of the central congested areas and for urban renewal.
- (21) The Plan envisages an expenditure of Rs. 700 crores. It is likely that the total expenditure will be much in excess of this amount owing to the rising trend in the prices of labour, materials and land. It will be more advantageous to spend a part of this amount on the creation of a new Industrial Township rather than to spend it on development in Greater Bombay, because, if the Plan is sanctioned as it is, even by spending Rs. 700 crores, the living conditions of the citizens will not improve, but on the contrary will worsen.
- (22) It would be worthwhile to consider the question of shifting the **capital of Maharashtra from Bombay** to the central township to the east of the Thana Creek, leaving Bombay a purely commercial, industrial and trading city. This will cost less and relieve the housing shortage and increase the efficiency of the administrative staff of the State and Central Governments as they will be living close to their place of work and in ideal environment.
- (23) A Committee of Experts having grasp, vision and experience of the problem confronting Metropolitan cities should be appointed for the scrutiny of the Plan. Such a Committee will be in a better position to advise Government on right lines.
- (24) It is necessary that a Development Board or Authority should be established by legislation to prepare a Master Plan and to implement it. It should have the assistance of an Advisory Council.

In the absence of such Development Board or Authority and the Advisory Council, the preparation and implementation of the Plan will be considerably hampered.

About 95% of the work on the Plan still remains to be done. For this purpose, the services of competent and experienced town planners, architects and engineers should be secured. At present, there is great difficulty in securing such persons. The implementation of the Plan will depend on the work to be done by this staff and if the staff is not appointed soon, the implementation of the Plan will be considerably delayed.

### **Prevailing Diseases in the City (Island)**

Special emphasis must be laid on the present state of affairs in respect of public health in the City. Diseases like influenza, measles, mumps, smallpox, typhoid, polio, hepatitis, etc., which are highly contagious, are spreading widely. If one member of a family falls ill, not only his family, but a large number of families residing in the neighbourhood are affected, because of the overcrowding and congested environment. Except for polio and typhoid, no preventive measures for other diseases can be taken. According to the Municipal Administration report, one adult in three suffers from pulmonary tuberculosis, which is the result of overcrowding, unhealthy environment, and inadequacy of open spaces. The number of beds for tubercular patients is inadequate even for the present population of the City, with the result, that an affected person staying in his home is a carrier of the disease among his neighbours. These facts should serve as a pointer to those who are advocating an increase in the population of the City from 28 lakhs to 32.5 lakhs. Actually, it should be the other way round, in the interest of public health.

Overcrowding is making the citizens pay indirectly not only for medicines and doctor's bills, but it is also responsible for increase in the cost of fire services, reformatory schools, detection of crime and maintenance of law and order and the like.

It is suggested that the views of the Indian Medical Council and various social service institutions be obtained in the matter of standards of density, etc. required for the maintenance of perfect environmental health.

### **General**

The comments offered are with the sole object of focussing attention of the State Government on the fundamental concept of the Plan and its shortcomings.

There is no intention whatsoever to find fault with the Municipal Officials who have prepared the Plan. It is hoped that the comments would help in improving the unbearably miserable conditions in which a large majority of the citizens of Greater Bombay are living. The Plan prepared by the Corporation is not likely to achieve this end. On the contrary, it will worsen living conditions of the masses.

Bombay has glorious traditions. It has been the home of leaders of all-India fame in different walks of life. If old traditions are to be preserved and the life of the citizens, present as well as future, is to be made fuller, happier and richer, opportunities must be afforded to them to live in environments which make for a comfortable and pleasant life rather than for mere existence. Such environments can only be created by providing decent housing, adequate recreational, cultural, educational and other amenities and utilities capable of being expanded from time to time to cope with the demands of the people as their standard of living goes on rising. The objective of the Plan should be to achieve all this. If, however, defective planning is now acquiesced in, the present ills will be perpetuated and the well-being of Bombay's citizens will be very adversely and permanently affected.

(Extracts from Shri Modak's comments, reproduced by courtesy of V. N. Modak)

# THE FUTURE OF OUR CITY

Dr. Jal F. Balsara

## If allowed to drift as now, the City will be beyond redemption in the next ten years

I am not an astrologer by profession and I cannot therefore prophecy what the shape of Bombay will be like twenty years hence. But it needs no prophet to predict that if allowed to drift as has happened till now, the City will degenerate almost beyond redemption within the next ten years. Let us admit that mercifully Bombay has still a few beauty spots left, such as the Marine Drive, Government House, Apollo Bunder, Pheroze Shah Mehta Gardens, Kamala Nehru Park, Hornby Vellard, Juhu and some others. There were a few quiet, pleasant, shady avenues like the Mahatma Gandhi Road, Gibbs Road, Clarke Road, Cadell and Shivaji Park Roads, which are fast disappearing together with the beautiful flowering trees of the City.

Twenty years ago, Bombay had the lowest ratio of open spaces amongst the cities of the world, viz., .33 acre per 1,000 population. By a deliberate policy of connivance, in 1964 it has been further reduced to .29 acre per 1,000 persons. There are nearly 500 Municipal Primary Schools in the City in rented buildings with nearly 500,000 young children of 6 to 14 attending in two shifts. Like all children in the world, they love to play and exercise in the open. But, strange to say, there are no playgrounds attached to them, except for about 25 schools. In a large number of these rented buildings, there are less than 5 latrines for 200 to 500 children.

## Bombay's record population density

2. The island part of the City admeasures a little over 26 sq. miles or 17,388 (17,400) acres. The suburban part of Greater Bombay comprises an area of 143 sq. miles or 91,397 (91,400) acres. Few of you may be aware that our city holds the world's record of population density. India's average density is 373 persons per sq. mile. Kerala, the most densely populated State of our country has 1,127 persons to a square mile. Vertical New York boasts of 26,000 persons to a square mile. Our otherwise beautiful island city has the record density of 115,000 persons to a square mile. Our planners, however, think this is not good enough for their imagination. They would like to add 2½ lakhs. more to the island population of 30 lakhs, so that the record density can be rounded up to 125,000 persons per sq. mile. They would like the suburban area to absorb more population, so that the present 15 lakhs may reach the figure of 47½ lakhs, i.e., more than 300 per cent in 20 years. They are not happy with a metropolis of 45 lakhs. They are planning to build a megalopolis of 80 lakhs, so that Bombay could compete with London, Tokyo and New York — at least in size of population, if not in affluence, amenities, or good life.

## Steady progress from Homes to Ant-hills

3. Fifteen years ago, we had some spacious houses and some beautiful bungalows on a few residential streets. Slowly they have been replaced first by 'Rabbit Warrens,' then by 'Pigeonholes', and now, with India's technological advancement by 'Beehives'. It will not be a matter of surprise if very soon the ingenuity of our Real Estate Developers will carry us to a further perfection of the miserable living of Ant-hills.

## Noise and nerves

4. I mentioned a while ago that because of ancestral foresight we had luckily a few residential localities in our city, where the fortunate dwellers could enjoy some silence during the day, but especially at night. Most of these are being turned into traffic lanes, with noisy buses plying from 5 o'clock in the morning to 12 at midnight, affecting the nerves and temper of citizens with the continuous din of traffic.

## Rare privacy of the lavatory

5. The city boasts of other records besides density. Only 4.8 per cent of its residents live in their own houses; 95.2 per cent live in rented premises. 77.6 (78)

per cent of the City's population never know what it is to have the rare luxury of privacy. They live in one-room tenements, and 4.8 persons to a room on an average. The only time they may be having some privacy would be when they are in the lavatory.

### **Common latrines and common water taps for 80 per cent of the population**

6. But only 12.7 (13) per cent of the City's 4.5 million residents have an independent latrine of their own; 79.3 (79) per cent have to resort to common latrines, not infrequently sharing one latrine between 50 to 100 persons. 8 per cent have no latrines whatever. They squat in the open or use public sanitary conveniences on payment, or resort to those of their neighbours or work places. The women use umbrellas to hide their faces when compelled to squat in the open, with people passing by in cars or coaches. Only 28 per cent of the households have an independent water tap. 67.4 (68) per cent of the population use common taps, again 50 to 100 persons resorting to one in hutment areas. Water is regularly purchased at a price per bucket, varying according to locality. The third floor tenants of buildings on the fashionable Queen's Road have also to fetch and buy water from the ground floors. When there is a fire, more damage is caused because of the low pressure which takes considerable time to boost up. Only 28.6 (29) per cent of the families possess a separate kitchen; 71 per cent either cook in their single-room home or in the corridor, verandah or passage. 70 per cent of the families are without a separate bath-room — a blessing in a tropical city.

### **This 'Urbs Prima in Indis' is proposed to be enlarged to 80 lakhs in the next two decades**

7. Such is our *Urbs Prima in Indis* (the first city of India) of 45 lakhs, which the Councillors and the Commissioner have proposed in their Development Plan to enlarge into a bigger and better city of 80 lakhs in the next 20 years. Let us examine the considered proposals of development, which it took the planners and administrators six years to evolve, having begun in 1958.

(a) The first is that they will give us 40 gallons of water per day, augmenting the water supply sources of Vaitarna, Bhatsai and Dahisar at a cost of Rs. 138 crores. This supply is meagre if not miserly, when we recall that an average of 75 to 80 gallons per day is considered an optimum in cities, and especially where the weather is sultry or tropical as in Bombay.

(b) We are promised in the island part of the City open spaces aggregating to 1 acre per 1,000 population as against the accepted minimum of  $2\frac{1}{2}$  acres per 1,000 people in built-up cities, and 5 to 6 acres in newly planned towns. These open spaces are to be acquired by purchase under the Land Acquisition Act at a colossal cost of Rs. 118 crores for 3,584 acres, i.e., at a cost of Rs. 3,33,000 per acre.

(c) Our surcharged sewers would be improved and extended by spending an additional sum of Rs. 58 crores.

(d) The cost of other amenities, in which some housing for offices and for the low-income and essential Municipal staff has been included costing about Rs. 229.54 (23) crores, communications costing about Rs. 50.32 (50) crores, primary education and recreational programmes costing Rs. 70 crores, and miscellaneous services costing Rs. 36 crores, would cumulatively amount to Rs. 386 crores, bringing the total expenditure for the Municipal Corporation to about Rs. 700 crores on the proposed Development Plan.

### **The objective aimed at**

8. Let us for a moment forget this imposing figure of Rs. 700 crores to be spent on a few amenities and some absolute basic necessities. Let us ask the fundamental question as to what is proposed to be achieved by this so-called Development Plan of Greater Bombay. For, all sensible people make plans and spend money, energy, time, skill and imagination on them in order to improve conditions of living and to elevate standards, if not to attain a millennium.

(a) It would be pertinent to ask, 'Does the Development Plan increase the income of the existing 45 lakhs citizens, and promise better living to the 35 lakhs more, who will mostly come from villages and small towns? Does the Plan contemplate a higher income for the workers? This question becomes more pertinent, when we recall



the figures given by the Socio-economic survey of Greater Bombay of the earnings of the million families in the City. The survey finds that a per capita income of Rs. 35 per month were considered necessary for minimum subsistence, and this is not a magnificent amount for a manual worker in an expensive metropolis. 36 per cent of the families are living *below the poverty line*. 20 per cent of the families were found to earn less than Rs. 25 per month per person, i.e. they are actually living *below the destitution line*.

(b) Will the Plan proposals improve the *housing conditions* of the 75 per cent of the city dwellers or augment their *capacity to pay higher rent*? For, today 43.5 per cent of the households pay a monthly rent of Rs. 10 or less (30 per cent 5-10 per month; Rs. 13.5 per cent Rs. 10 per month); another 30.6 per cent pay Rs. 11 to 20 per month; 16.4 per cent pay a monthly rent of Rs. 21 to 40, and only 9.5 per cent are in a position to pay more than Rs. 40 per month as rent. With the current cost and condition of housing in the city, we can imagine what standard of housing 80 per cent of the people have. Even when better housing is being provided, it is difficult to persuade the people to pay higher rents, which are subsidised and therefore are lower than economic rents, because their rent-paying capacity is exceedingly low. This would become obvious from the average monthly income of an average household of 4.8 persons of Rs. 269 in Bombay. Only 30 per cent of the families in the city had a monthly income of Rs. 250 or more and 50 per cent families had an income-range of Rs. 100-249 per month. 20 per cent families earned less than Rs. 100 per month.

(c) Let us not ask more such questions, for, the Planners are aware of them as could be seen from the factual data they have given in their excellent report. One question, however, you would like to ask if you move about parts of Bombay—the Beautiful—with open eyes—such parts especially as Reay Road, Kamathipura, Tulsi Pipe Road, Annie Besant Road, Worli, Tardeo, Zopadpatty, Parel and of course all along the two sides of the Express Highway, coming to the Business Centre of Bombay from our international airport — which our irrepressible wit, Rtn. Bobby Kooka, has done so much to popularise among American men and women. That question would be what is proposed to be done by the Plan with our more than half a million working people of the 150 non-stop slums of the city? Are they to be removed outside our ken with high screens like the sky-scrapers which seem to have caught the fancy of our progressive Municipality and Government of Maharashtra? Or, are they to be provided with better housing, which culminates in the imagination of our Housing Board at a uniform one-room and kitchen tenement of 180 sq. ft. area at an uneconomic cost of Rs. 7,000 to 9,000 per tenement? If these half a million people are to be given better accommodation than we give to our buffaloes in the Aarey Milk Colony, we will need at least 1,00,000 such tenements at 5 persons to a room, costing no less than Rs. 70 crores, exclusive of the cost of land which may be another Rs. 16 crores.

### Development Plan viewed critically

9. Awaiting answers to these legitimate questions, which are fundamental to any planning undertaken with deliberation and counting all the costs and consequences to us and to posterity, let us analyse some of the planned development, and its proposed expenditure thereon at the cost of the tax payer, i.e., you and I, and the rest of the honest citizens, who do not knowingly evade payment of taxes.

### Astronomical costs of redevelopment of built cities

10. (a) We are told that an expenditure of Rs. 138 crores would place the contemplated 80 lakhs of citizens in no better position than today as regards the quantity, quality, frequency and duration of water-supply. At most we will have to rest content with the 40 gallons per day or with a per capita supply lesser than today. Our meagre .29 acre of open space is promised to be raised to 1 acre per 1,000 persons at a colossal cost of Rs. 118 crores, i.e., purchasing recreation land at Rs. 3,33,000 per acre.

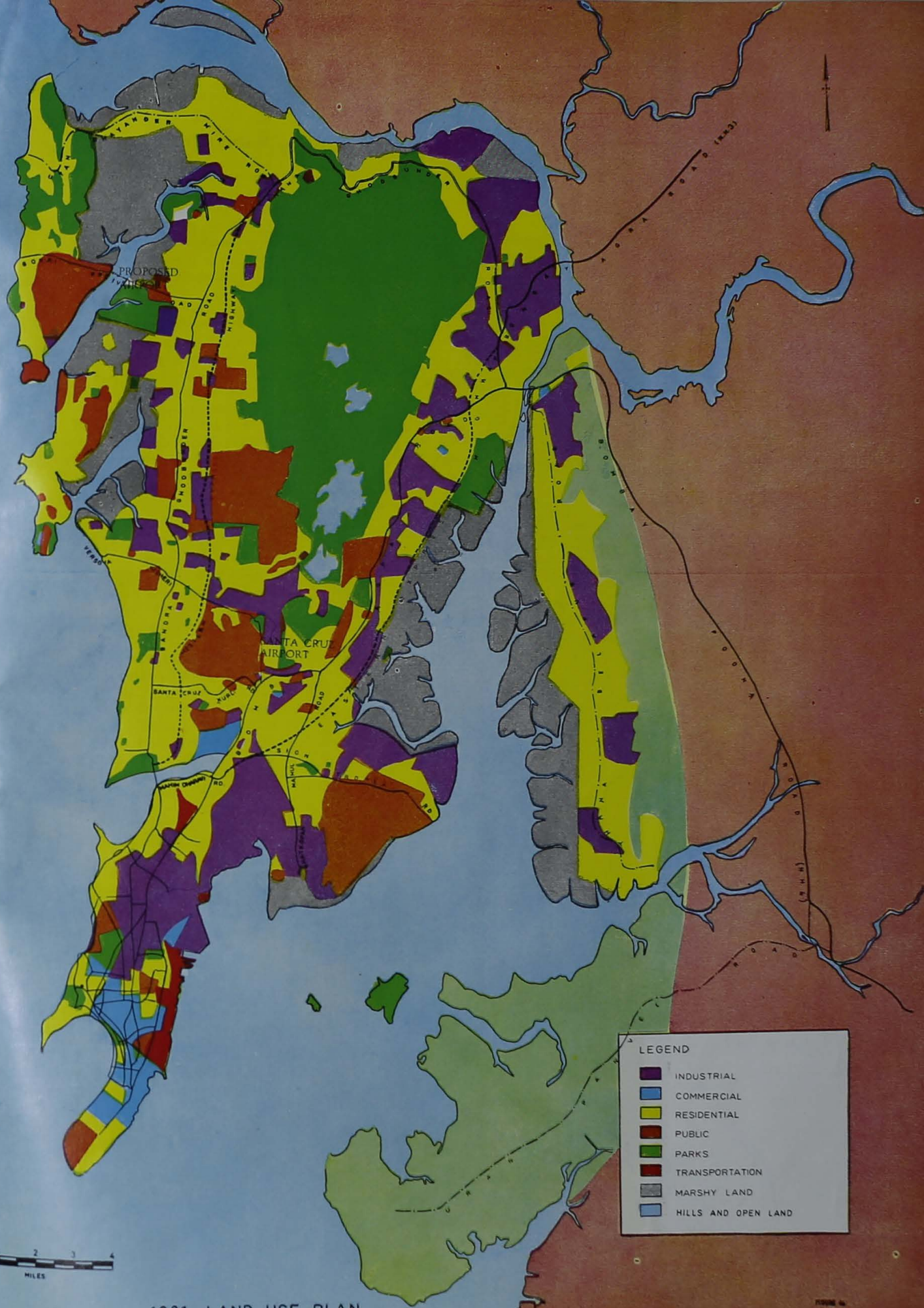
(b) Let us pause a little to consider the devastating economics of urban development when planners become enthusiastic about big cities, large population and sky-scrapers, without adequate thought being given to human psychology, children's needs, and the contents of civilised living. Instead of acquiring 3,250 acres for open spaces and 334 acres for public buildings at a cost of Rs. 118 crores at the artificially fancy price of Rs. 3.33 lakhs per acre in a heavily congested city, if the same amount were spent in acquiring unbuilt land in a potentially urban region, Rs. 118 crores will buy 2,36,000 acres of land at Rs. 5,000 per acre, which is good price for agricultural land. This area is more than double the total area of our island city and the suburban land put together,

### **Dispersal—the true remedy**

14. The true remedy is to disgorge at least 12 lakhs of people from the island part of the City; and by giving proper facilities and inducements to willing as well as objectionable and unwanted industries and concerns, to attract the occupants to the more spacious Salsette island, and to fix its development at a maximum of 30 lakhs, and that too not in 20 years but in 30 or 50 years.

15. The loose talk of not being able to direct the flow or movement of people in a democratic country of free citizens is tantamount to handing over governing responsibility to drift or chaotic sprawl, and legitimate directive capacity to paralysis of action. Of course you can limit the per acre density of congestion by strict rules and stop the influx of people by legitimate restrictions on building construction. In fact limitation is essential to preserve the health of all the free citizens when they begin living in large agglomerations in what cannot but be limited space by the very nature of urban living. They would not claim freedom to live like rats and die like flies. If shown the way, they would welcome all sensible arrangements for attaining the maximum of good life, if good life is within the reach of all and is not proposed to be confined to a privileged few.

*(Reproduced by Courtesy of Bombay Civic Trust)*



1981 LAND USE PLAN

BOMBAY STUDY AREA

◀ **Bombay Landscape 1981**  
 (Reproduction of 1981 Land Use Plan, Bombay Study area, from *Bombay Traffic and Transportation Study, Volume I*, Wilbur Smith and Associates).

# MUNICIPAL PLAN

## SOME IMPORTANT POINTS FROM THE DEVELOPMENT PLAN FOR GREATER BOMBAY

The total estimated outlay of the development plan during the next 20 years will be of the order of Rs. 700 crores. The capital outlay of some of the major schemes is indicated below:—

	Rs. (In crores)
Water supply .. .. .	1,67.06
Sewerage .. .. .	58.07
Communications .. .. .	50.22
Markets .. .. .	13.11
Primary Education .. .. .	34.69
Medical Facilities .. .. .	18.75
Housing .. .. .	2,29.54
Recreational Facilities .. .. .	35.95
Industrial Estates .. .. .	1,07.38

It would be necessary to finance some of the schemes by raising long term loans and hence the need to approach an International Agency for financing the scheme.

The loan assistance will also help us to tide over the acute scarcity of foreign exchange required for executing some of our major projects.

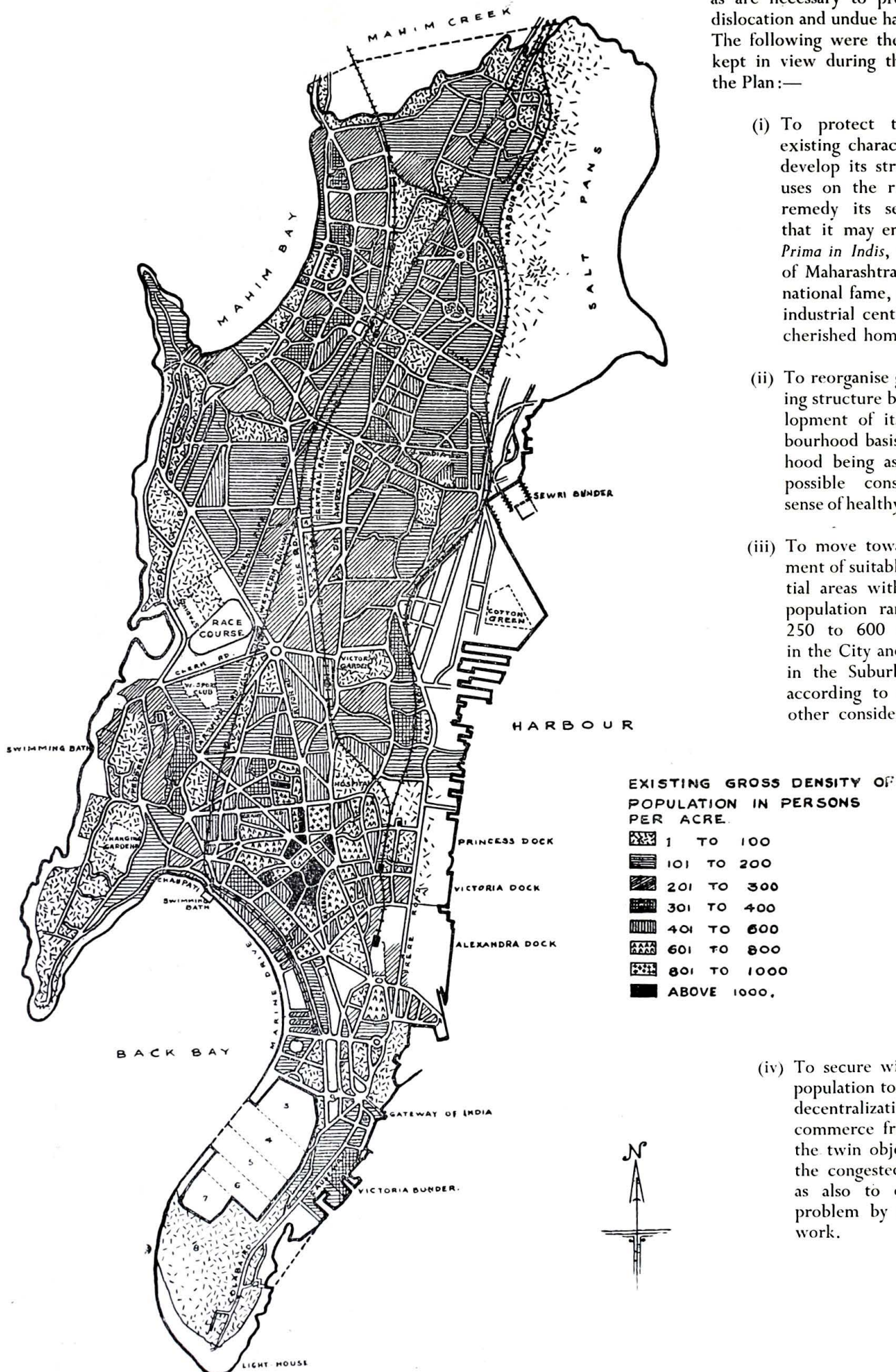
Bombay,  
December 1964.

*Municipal Commissioner  
for Greater Bombay.*

## MAIN OBJECTIVES

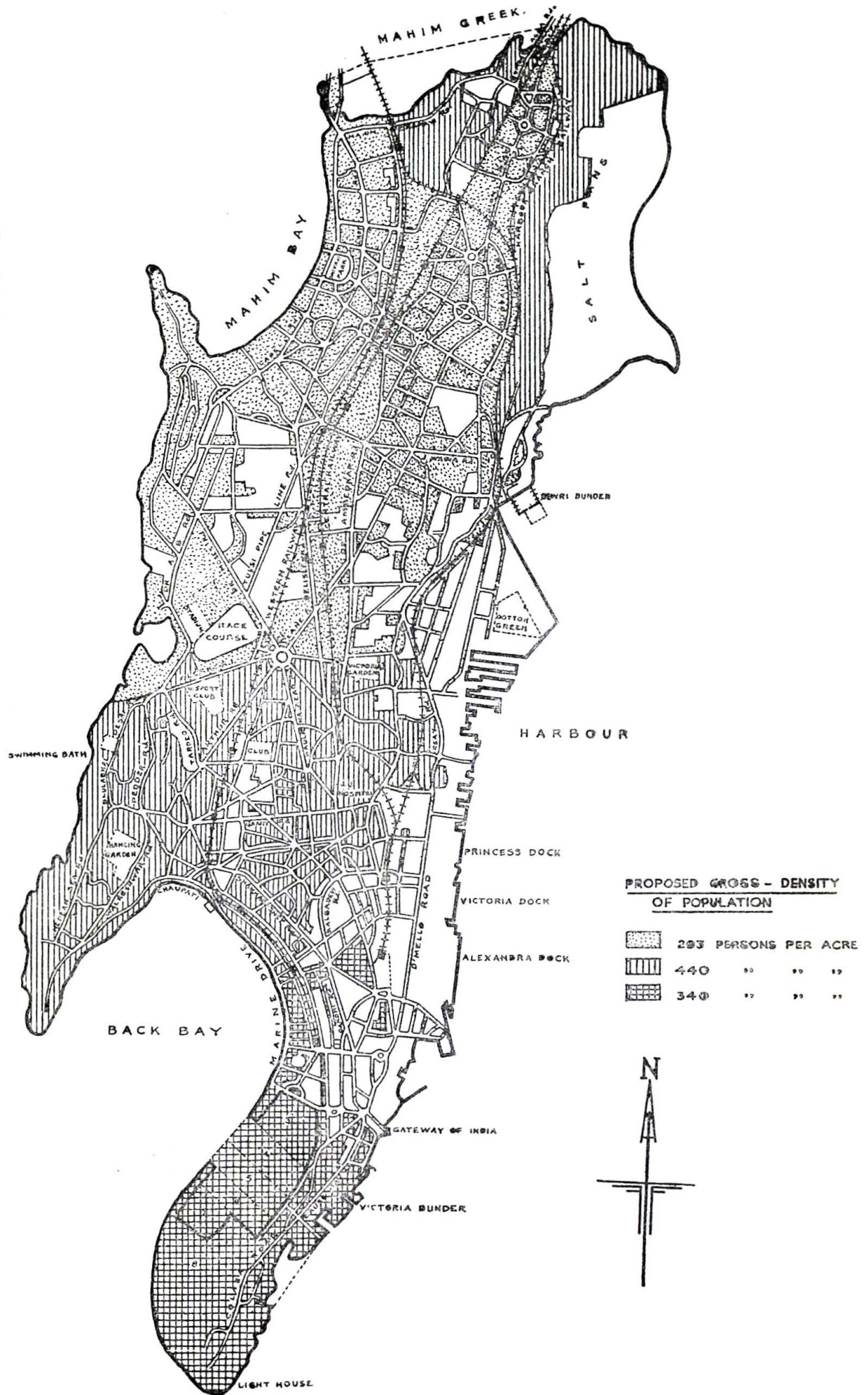
The Plan has been prepared in accordance with the general planning ideals and principles with such modifications as are necessary to prevent large scale dislocation and undue hardship to people. The following were the main objectives kept in view during the preparation of the Plan:—

- (i) To protect the best of the existing character of Bombay; to develop its structure and major uses on the right lines and to remedy its several defects so that it may emerge as the *Urs Prima in Indis*, a worthy Capital of Maharashtra, a port of international fame, a commercial and industrial centre and above all a cherished home for its millions.
- (ii) To reorganise gradually its existing structure by promoting development of its areas on neighbourhood basis, each neighbourhood being as self-contained as possible consistent with the sense of healthy interdependence.
- (iii) To move towards the establishment of suitable zones in residential areas with gross density of population ranging from about 250 to 600 persons per acre in the City and from 150 to 250 in the Suburbs with variations according to topographical and other considerations.



- (iv) To secure with the dispersal of population to the Suburban areas, decentralization of industry and commerce from the City, with the twin object of redeveloping the congested areas in the City as also to ease the transport problem by reducing travel to work.

- (v) To ensure that those in urgent need of housing receive an adequate share of housing accommodation either within or outside Greater Bombay and to lay down a comprehensive programme of slum clearance.
- (vi) To provide sites required for the schools badly situated and also for the new schools required and to provide adequate playgrounds near to them and also to provide sites for other public facilities such as hospitals, markets etc. and for operational requirements of statutory undertakings.
- (vii) To construct new roads in the Suburbs and to improve the existing road system in the City and Suburbs on a comprehensive and co-ordinated basis.
- (viii) To acquire and reserve additional land in those areas in the City where the provision of recreational spaces falls short of 1 acre per 1,000 persons of population and to make up for the low standard in the City by improving the foreshore for recreational use and adopting a higher standard in the Suburbs, the overall deficiency being made up outside Greater Bombay.
- (ix) To lay down a phased programme of reclaiming the 27 sq. miles of low lying areas with a view to making them available for development
- (x) To ensure through development control and in cooperation with and between the developers that all new development in Greater Bombay conforms to the general principles set above with the ultimate view of improving Greater Bombay in accordance with the approved planning standards of density, floor space index, adequate lighting and ventilation etc.



## POPULATION

The table below shows for each decade from 1901 the population of Greater Bombay, which is 169 sq. miles area:

Year	Population
1901	.. 9,27,994
1911	... 11,48,757
1921	.. 13,80,448
1931	... 13,97,812
1941	.. 18,01,356
1951	.. 29,94,444
1961	.. 41,52,056

The growth rates in the earlier decades were slow; in recent years the growth rates have become quite large.

Table below gives the Birth rates for the period 1951-63:

Year	Birth rate
1951-52	27.98
1952-53	28.11
1953-54	26.44
1954-55	25.95
1955-56	26.78
1956-57	26.08
1957-58	25.36
1958-59	25.62
1959-60	27.95
1960-61	26.43
1961-62	27.81
1962-63	28.20
1963-64	29.81

Taking into consideration the extent of births escaping from the registration, an omission of 15-20 per cent of births in the registration is reasonable to anticipate. As regards the future prospects of fertility in Greater Bombay two kinds of factors may be anticipated to alter it. The first one is the age of marriage and the proportion married at the different ages. The second is the impact of social and economic factors as manifested by family planning programmes.

The table below gives the Death rates for Greater Bombay for the period 1951-63:

Year	Death rate
1951-52	13.64
1952-53	13.65
1953-54	13.26
1954-55	12.13
1955-56	10.50
1956-57	10.62
1957-58	11.62
1958-59	10.47
1959-60	9.38
1960-61	9.96
1961-62	10.31
1962-63	9.19
1963-64	9.19

For projecting mortality level in the future it is assumed that by 1981 the expectation of life at birth in Greater Bombay will be about 60 years.

During 1941-51 about a million persons were added to the population by migration. During 1951-61 about 0.6 million persons were added. It seems that the tempo of migration to Greater Bombay has slowed down and this may be expected to continue in the future also. The drastic reduction in migration during last 10 years seems more due to the abnormal migration during 1941-51. It is anticipated that even though there will be a reduction in the number of net migrants in the future, it cannot be as drastic as in the past. A fifteen per cent reduction in the first ten years and a 20 per cent reduction in the next decade appears reasonable.

The table below gives the projected population for the years 1966-81 for Greater Bombay:

Year	Population
1966	49,51,970
1971	57,06,419
1976	63,84,132
1981	70,62,073

## WATER SUPPLY:

The existing sources of supply are capable of giving an assured supply of 233 m.g.d. as under:—

(1) Vaitarna	:	108 m.g.d.
(2) Tansa	:	92 m.g.d.
(3) Vihar	:	20 m.g.d.
(4) Tulsi	:	3 m.g.d.
Total:		223 m.g.d.

Against this, a supply that can be brought to Bombay today is only 210 m.g.d. due to the condition of the old masonry duct conveying a supply of 20 to 22 m.g.d. from Tansa to the City and of the 72" 57" steel mains which were laid about 30 years back.

The supply brought to the City is at present distributed partly through the Service Reservoirs and partly by direct tapplings on the trunk mains. There are three Service Reservoirs located at Malbar Hill, Bhandarwada Hill and Worli Hill all in the City proper, there being no reservoirs in the Suburbs. The first two have been in existence for a long time, the last being constructed only recently as a part of the Master Plan for distribution of water supply, which is currently under implementation. About 1/3rd supply is being given through these Service Reservoirs and the rest is drawn by direct tapplings on the trunk mains. This arrangement which leads to uneven distribution of supply is proposed to be corrected by constructing 10 more Service Reservoirs so as to do away with the direct supply from the trunk mains. The work on most of these reservoirs is already in hand and it is expected that by June 1965 all of them with their inlet and outlet mains would be ready for being commissioned.

Further, great difficulty is experienced at present in conveying water at adequate pressures to the Western Suburbs, particularly the Northern townships of Malad, Kandivli, Borivli, Dahisar, etc. This happens because a range of high hills intervene between these Suburban towns and the existing trunk mains system, necessitating the supply being taken round the hills, resulting in considerable drop of pressures due to their long lengths. To correct this situation, the work of driving a tunnel between this range of hills has already been taken in hand the size of the tunnel being so designed as to convey additional quantities of water when they would be available as a result of the future augmentation schemes, such as Upper Vaitarna, Bhatsai, Kalu, etc. The work is expected to be completed by October 1965.

The average per capita consumption for domestic needs in Bombay today is only about 29 gallons. The actual consumption, however, varies considerably from this average, the richer population of Malbar Hill, Marine Drive and such other areas drawing at a rate between 100 to 120 gallons per capita while the poorer sections of the population, particularly in the Suburbs, drawing as low as 10 to 12 gallons per capita. Metering of supply has already been resorted to with a view to: (i) put a check on the excessive use of water by richer community and (ii) to avoid wanton wastage of this scarce commodity. The areas, where the use of water per capita was excessive, were metered first, but experience has shown that the consumption of water has not reduced by this expedient.

An allowance of 50 to 60 gallons per capita for domestic consumption for a City like Bombay would be appropriate, considering that it is situated in the tropics. It is, however, not possible to adopt this standard as, with the phenomenal growth which is taking place in and around Bombay, the water supply requirements would be of a huge order and it will not be possible for this corporation to find sufficient resources both in men and money to implement simultaneously all the schemes that would be necessary. An allowance of 40 gallons per capita is therefore adopted in working out the requirements. This figure is considered a bare minimum in case of Bombay which has a fully water-borne sewerage system.

The same allowance per capita has been assumed both for the City and the Suburbs though it is not so at present. This has been done as sewerage system is being provided in the Suburbs and it is expected that in the next 5 to 10 years, all the developed parts of the Suburbs would have already been sewered.

The requirements of water supply based on per capita consumption of 40 gallons for domestic use and anticipated requirements in regard to other uses such as industries, public utilities, supply given en-route, etc. have been estimated as follows:—

Year	Anticipated population	Requirements of water supply.
1966	51,00,000	349 m.g.d.
1971	59,00,000	418 m.g.d.
1976	67,00,000	487 m.g.d.
1981	75,00,000	560 m.g.d.

If the per capita consumption is taken as 50 gallons, which would be required in time to come, the requirements for the same population as in 1981 would be of the order of 635 m.g.d.

It is proposed to tap the following sources of supply, in order of priorities indicated below and at the estimated costs shown against each, for meeting the ultimate requirements.

Source	Supply Available	Cost Rs.	Period of Construction.
(1) Dahisar River Scheme	.. 6 m.g.d.	3.5 crores	1965-1969
(2) Upper Vaitarna Scheme	.. 120 ,,	37.36 "	1964-1970
(3) Bhatsai River Scheme	.. 250 ,,	66.20 "	1966-1974
(4) Upper Kalu Scheme	.. 200 ,,	60.00 "	1974-1981
		576 m.g.d. 167.06 crores	



With the implementation of Dahisar, Upper Vaitarna and Bhatsai Schemes, the supply brought into Greater Bombay will be stepped up to about 600 m.g.d. which will be adequate for the estimated population of 1981. With the implementation of Upper Kalu Scheme, thereafter, it should be possible to meet all the water supply requirements of the City till the turn of the Century.

It will be seen from the above, that an amount of about Rs. 167 crores will have to be spent for meeting the ultimate requirements of water supply to this City. Of this, a sum of Rs. 60 crores is proposed to be spent in the Fourth Five-Year Plan.

The Corporation has decided to go ahead with the Dahisar and Upper Vaitarna Schemes with their own finances, but in regard to Bhatsai Scheme, loan assistance will be necessary particularly from an International Lending Agency like the I. D. A.

The progress of the various schemes mentioned above depends on the availability of essential materials such as steel plates, cement, specialised plant and machinery etc. which are at present in short supply in the country. The Corporation naturally expects co-operation and assistance from the State and the Union Governments in this respect. As most of these essential materials are in short supply in the country major portion thereof will have to be imported. A sum of about Rs. 25 to 30 crores will be required in foreign exchange for this purpose.

Water supply schemes are remunerative. An overall picture for the next twenty years however discloses a deficit of about Rs. 30 crores on the basis of an average water rate of Re. 1 per 1,000 gallons. There is however scope for upgrading this rate to reduce the deficit appreciably.

#### SEWERAGE:

The sewerage system covers the entire city except the undeveloped areas of Raoli, Antop Hill and Dharavi. The inadequacy of the sewerage system was apparent with the rapid growth of population in the year 1945 with the surcharge of sewers and consequent silting. With the completion of Vaitarna Water Supply Scheme the situation had worsened. The Corporation therefore proposed some relief sewerage scheme in the year 1948. This scheme was designed for a population of 15 lakhs for the City with the sewers running full. It was based on a total water supply of 150 gallons per day.

A water supply of 231 m.g.p.d. would be needed for the City by 1981. The sewerage system would therefore need a carrying capacity to meet 90 per cent of the water consumption and a peak discharge of  $2\frac{1}{2}$  times the average.

The total estimated cost of the sewerage schemes for Greater Bombay is about Rs. 58 crores including the cost of land. The schemes consist of provision of new sewers, augmentation and improvement of old sewers, construction of new pumping stations and augmentation of old ones and construction of new and augmentation of existing treatment plants in the city and the suburbs. The details of amounts to be spent on these items are as follows:—

Item	City	Suburbs
	(Amounts in lakhs of Rs.)	
New Sewers	480.28	2,034.00
Improvement and augmentation of old sewers	68.01	263.50
New Pumping Stations	46.50	94.50
Improvement of old pumping stations	62.24	115.40
New Treatment Plants	210.00	300.00
Augmentation of old treatment Plants	1,165.00	785.00
Land Acquisition	282.50	199.40
	Rs. 2,314.53	Rs. 3,492.40
	Total Rs. 5,806.93 lakhs.	

The schemes have been taken in hand. It will be necessary to spend about Rs. 17 crores in each of the next three Five Year Plans for the completion of the programme, so that by 1981 when all water supply schemes have been carried out for supplying adequate quantity of water to the increased population, arrangements have been made for the safe and efficient disposal of the spent water.

Sewerage schemes do not result in the yield of appreciable direct income. The Corporation levies halalkhore tax at a certain percentage (at present  $3\frac{1}{2}$  per cent) on the rateable value of buildings. It is not possible to estimate the number of new buildings that will be built, their rateable value and the amount of halalkhore tax realized.

Foreign exchange requirements for sewerage works will be about Rs. 1 crore as follows:—

4 Nos. 50 M.G.D. pumps	Rs. 9 lakhs
2 Nos. 60 M.G.D. pumps	Rs. 5 lakhs
4 Nos. 100 M.G.D. pumps	Rs. 20 lakhs
Equipment for treatment plants	Rs. 66 lakhs
	Rs. 100 lakhs

#### TOWN GAS:

Out of the 5.4 million cubic feet per day gas supplied in the City, 4.7 million cubic feet per day is distributed to over 18,000 consumers as gaseous fuel. The remaining 0.7 is utilized for lighting about 8,100 street lamps comprising of about 20,000 mantles. Because of the requirement of higher illumination for roads the gas street lamps are being gradually replaced by electric lights.

The present fuel needs of Greater Bombay based on the daily consumption of various fuels in terms of town gas of 500 B.Th.U./cft. calorific value is of the order of  $48.58 \times 10^6$  cft./day. Assuming that town gas is to be supplied to all persons, requirement of town gas of above value will rise from  $104.6 \times 10^6$  to  $211.8 \times 10^6$  cft. with the increase of population from 41.52 lakhs in 1961 to 70.6 in 1981.

As an immediate step, the Government of Maharashtra had made a provision in the Third Five Year Plan to make available to Bombay  $20 \times 10^6$  cft. per day of town gas utilizing 94,000 tons of petroleum naphtha per day by M/s. Fertilizer Corporation of India Ltd., a Government of India Undertaking. The distribution of gas will be done by the Bombay Municipal Corporation through network of mains designed to handle ultimate load of  $60 \times 10^6$  cft./day of town gas.

Contract for the preparation of a project report and consulting services for the implementation of the project has already been awarded to M/s. Sofregaz, a French firm involving an expenditure of Rs. 10 lakhs. The total cost of the project is estimated at Rs. 9 crores.

#### REFUSE DISPOSAL:

In Bombay the roads, footpaths and house gullies are swept twice daily. These are also brushed, scraped and periodically washed to remove dirt, mud and dung from the surface; so also the house gullies are periodically flushed. The refuse thus collected is either carried to the nearest Scammel trailers in baskets and handcarts or removed in travelling motor vehicles, to the place of disposal. Refuse from domestic establishments is collected in two ways. In the first method dust bins and trailers are placed at suitable places in congested and sine-congested areas and in the other method, house to house collection of refuse is made. The collection and removal of trade refuse is done by respective owners. The Corporation also provides transport arrangements for removal of trade refuse on scheduled charges. The refuse thus collected is removed to Mahalaxmi siding near Mahalaxmi Station.

The work of attending to basket type of privies, cess-pools and septic tanks in the unsewered areas is done by the halalkhore staff of the Corporation. The night soil and cesspool contents are removed to the nearby night soil depot which is connected to the sewer.

The quantity of refuse collected from different regions of Greater Bombay per day is about 2,200 tons as follows:—

Bombay City	..	2,000 tons
Suburbs	..	168 tons
Extended Suburbs	..	52 tons
		2,220 tons

The refuse of 220 tons/day collected from Suburban areas is disposed of either by burning or by filling low lying areas close to each district.

#### COMMUNICATIONS:

##### Roads: •

The transportation problem of Bombay which is a result of the cumulative effects of several factors would be greatly compounded with the passage of time, if no remedial measures are adopted. With the growth in population, a phenomenal growth in car ownership is anticipated with car population ratio being reduced from 104 persons per car to 54 persons per car.

Government and the Municipal Corporation had engaged the services of the Traffic Experts, M/s. Wilbur Smith & Associates in association with M/s. Freeman Fox and Partners to study the traffic and transportation problem of Greater Bombay and its nearabout area and to suggest solutions to the same. The Development Plan proposals were fully taken into account by the team, but since the Plan was finalised prior to the Publication of their report, their additional recommendations have not been shown on the Plan, but these could be put into effect under the ordinary law. The report also does not deal with access roads, the absence of which has retarded development in the Suburbs.

The estimated expenditure on road network shown in the Development Plan is Rs. 50.32 crores, Rs. 20.14 crores for acquisition of land and Rs. 30.08 crores for construction. The traffic experts' report has estimated the cost of development at Rs. 96 crores, phased in four stages.

The works shown in the Development Plan but not covered by the Report is estimated at Rs. 20 crores taking the total liability of the Corporation towards road construction to Rs. 116 crores. Since there has been some delay in the implementation of the recommendations of the traffic experts' report it is proposed to combine the first two stages and the total liability of the Corporation can be divided into four Five Year Plans as (i) Rs. 59.0 crores, (ii) Rs. 29.8 crores, (iii) Rs. 22.2 crores and (iv) Rs. 5.0 crores.

In view of the enormous growth of pedestrians as well as vehicular traffic, congestion on the present road system in the city is tremendous. With a view to giving relief to this situation, grade separation between vehicular and pedestrian traffic at major crossings is indicated. In the beginning, foot-bridge at a few important locations have already been undertaken and a continuous grade separator "Sky Walk" across and along at one of the City's major traffic generators has been planned. Similarly separation of vehicular conflicts at important intersections such as Kemps Corner and Princess Street have also been undertaken.

##### Truck Terminii:

Bombay has no specially designed truck terminii. Trucks are parked along the kerb line in certain areas in the vicinity of the port and other ware-housing and wholesale market activities. For freeing the roadway of parked trucks the need for provision of truck terminii all over Greater Bombay emerges. Under the Development Plan three sites in the vicinity of the dock area and seven sites in the suburbs are proposed.

##### Bus Transportation:

Another problem which requires consideration is of transportation. The present bus system is only effective transport system in the city coupled with the Suburban Railway services which bring bulk of traffic from north to south and *vice-versa*, during the peak periods; but the present system is far below the requirements. Putting additional bus services to augment the present system is not possible as the present road system is not capable of taking any additional bus traffic.

Buses provide excellent coverage of the entire Greater Bombay. Coverage in the suburbs is however limited to developed areas. It covers about 659 miles and maintains a fleet of about 1,230 buses. The carrying capacity of these buses is 71,849 seating and 12,206 standing.

To meet the requirements of 1981, the Undertaking proposes to increase its strength to 2,000 buses.

### Underground Railway:

Surface public transportation has its limitations. The surface trains of the Central & Western Railways can no doubt carry 40,000 passengers per hour. However, both are beyond the scope of expansion. During the whole day, the buses are at present handling the traffic of about 2 million passengers. Any further addition of buses without addition of roads will only add to the existing chaotic conditions prevailing on roads. No traffic flow improvement schemes will be a success unless it includes definite proposals and measures for grade separation of mass transportation system by having a well planned underground railway network.

The only answer therefore is either a tube railway or a monorail connecting the surface railway at various points. The economics of both these systems is being worked out for adoption of the cheaper one and more suitable one.

Underground railway for Bombay has been recommended by the Japan Consulting Institute in 1957. The underground railway is suggested in five stages. The details regarding length and cost in 1957 are shown below:—

Stage	Route	Length in Km.	App. cost in million Rs.
I	Victoria Terminus to V.T. (loop) (via Sachivalaya)	4.75	95.00
II	Victoria terminus to Byculla Bridge	3.90	78.00
III	V.T. to Byculla via Bombay Central	5.85	117.00
IV	Byculla Bridge to Sion	9.00	180.00
V	Byculla Bridge to Mahim	8.41	168.00
		31.91	638.00

Detailed calculations have revealed that the underground railway starts earning profits immediately after it is put into commission and therefore, the project can be financially self-supporting.

### HOUSING:

A number of tenements are required to remove overcrowding in the existing tenements and to rehouse the number of families residing in temporary hutments, unauthorised sheds and the requirement in this respect is figured at about 1,30,652 tenements. The liability in respect of the obligation under the Slum Clearance Schemes and house collapses would be about 1,50,000 tenements. Rehabilitation for the implementation of proposals under Development Plan would impose a liability of 28,182 tenements by 1981. Enforcement of Zoning Regulations and Development Control Rules and Acquisition of set-backs for road widening would impose a further burden of 20,000 tenements by 1981.

The tenements required to house the natural increase by 1981 would be 5,82,200. Thus the total requirement of tenements by 1981 comes to 9,11,034.

Housing accommodation is being put up in the public and private sectors by the following agencies in Greater Bombay:

- (1) Maharashtra Housing Board
- (2) Employers for their employees
- (3) Municipal Corporation
- (4) Cooperative Housing Societies
- (5) Private Sector

The limited resources of the Corporation precludes it from having an ambitious programme, though its requirements are quite large. However, in a single year it has achieved a target of 4,000 tenements and its aim is to construct 6,000 tenements in a year. To supplement this, an additional programme is contemplated by developing sites for Janata Colonies, providing an accommodation for 2,000 families a year. It has been estimated that with determined efforts on all sides, the total new housing that can come each year would be about 30,000 tenements. As against this, the annual requirements would be 50,000 tenements and 40,000 tenements during the current and next decades respectively.

In the Development Plan, about 490 acres of land in the City and 3,000 acres in the Suburbs are reserved for public housing. Reservations in the City would accommodate about 45,000 tenements and those in the Suburbs about 1,43,700 tenements. The total cost of acquisition of land for housing is estimated at Rs. 32.75 crores and the cost of construction of tenements at 196.79 crores, i.e. a total outlay of Rs. 229.54 crores. This could be split up into four Five Year Plans as (i) Rs. 65.6 crores (ii) Rs. 65.6 crores (iii) Rs. 49.3 crores and (iv) Rs. 49.2 crores. It is expected that the capital expenditure on housing can bring to the Municipal Corporation a net return of about 5 per cent.

### INDUSTRY:

Greater Bombay has an area of 0.1% of the total area of the Maharashtra State and possessed about 1/3rd of the total number of factories in the whole State. More than 75% of the factories in Greater Bombay are located on the island of Bombay and C, E, D, Wards alone have about 42% of the factories in Greater Bombay. Southern part of F and G Wards account for 15% and thus about 57% factories are located in more or less a continuous belt ranging from Dadar on the North upto Carnac Road in the South.

In the Development Plan for Greater Bombay, 22.66% of the City area is earmarked for industrial purposes and 16.93% of the Suburban area. A number of industrial estates have been proposed in the Development Plan for the reallocation of non-conforming industries and hazardous storages located in residential areas. For developing all the Industrial Estates, the Corporation will have to spend Rs. 12.34 crores on acquisition of land and Rs. 95.04 crores on development, i.e. a total outlay of Rs. 107.38 crores. This total outlay of Rs. 107.38 crores would be distributed over 4 Five Year Plans as (i) Rs. 29.93 crores (ii) Rs. 29.93 crores (iii) Rs. 23.76 crores and (iv) Rs. 23.76 crores. The Industrial Estates are expected to give a return of 6 to 8% on capital expenditure.

## EDUCATION :

Reckoning congestion of population and high land values in the City, adoption of a high physical standard has not been possible in the City.

(1) Land for the construction of schools at 2 sq. yds. per pupil in the City and 3 sq. yds. per pupil in the Suburbs. This would ensure a minimum floor space of 10 sq. ft. per pupil.

(2) Playground facilities at  $2\frac{1}{2}$  sq. yds. per pupil in the City and 3 sq. yds. in the Suburban area.

(3) Limiting the size of the school building to 1,200 students in City and 900 students in the Suburbs.

(4) The limitation of student-teacher ratio to one teacher for 45 students.

Surveys carried out under the Development Plan of all existing Municipal Schools reveal that primary education is imparted in the City and Suburbs to 4,54,089 pupils in the year 1961 in (1) 696 Municipal Primary Schools, (2) 343 Private Primary Schools (Aided) and (3) 107 Private Primary Schools (un-aided but recognized) imparting education to 3,33,066, 1,00,402 and 20,621 pupils respectively.

Many of the existing Municipal school buildings, though sound structurally do not come up to modern standards of planning so far as adequate facilities regarding light, ventilation and sanitary arrangements are concerned. Many of the school buildings lack playground facilities.

Private buildings wherein the Municipal Schools are accommodated were originally designed for residential purposes and lack the necessary amenities.

Regular school buildings on modern lines as per prescribed standards to house the number of primary-going children in 1981 are most essential.

A sample survey conducted by the Education Department of the Corporation has revealed that the number of children of the primary school-going age group is about 10% of the population. However, from the 1961 Census it is safer to assume 11% of the population as school-going children between the ages of 6 and 11.

Future requirement is based on the assumption that number of children attending private primary schools will remain constant.

For the City, 5,12,366 sq. yds. of land have been provided in the Development Plan in addition to existing 1,04,961 sq. yds. making a total of 6,17,327 sq. yds. for the year 1981. Municipal Student Population of 2,94,903 resulting in 2—1 ratio of area of land to 1981 population.

For the Suburbs 11,73,194 sq. yds. of land have been provided in the Plan in addition to the existing area of 1,16,236 sq. yds. making a total of 12,89,470 sq. yds. to cater to 1981 Municipal Student Population of 3,85,444 resulting in 3.34 ratio of area of land to 1981 population.

## MEDICAL RELIEF:

Inadequacy of the existing medical facilities become apparent when viewed against prevailing standard of

7.14 beds to 10.48 beds in London and U.S.A. respectively as compared to the prevalent 0.24 bed per 1,000 population in India. The Health Survey and Development Committee have concluded looking to the country's need and financial status, a standard of 5.6 beds per 1,000 population.

However, under the Development Plan of Greater Bombay, hospital requirements are estimated on the basis of 4 beds per 1,000 population with land requirement on the basis of 50 sq. yds. per bed for City and 100 sq. yds. per bed for the Suburbs and the Extended Suburbs. For a maternity home, requirements are based on 60 confinements per bed whereas for dispensaries, one dispensary for 60,000 population is proposed. 60% of the hospital staff is required to be housed on the hospital premises.

Total number of existing beds excluding maternity beds in the City hospitals comprising of Government Hospitals, Teaching Hospitals, Hospital for Special Diseases and Hospital exclusively for children is 8,557 beds as against the 1981 requirement of 12,600 beds causing a deficit of 4,083 beds.

In the Suburbs and the Extended Suburbs 7 hospitals have 1,547 beds including maternity beds as against 1981 requirement of 15,600 beds, thus leaving a large deficit of 14,053 beds for the ultimate population of 39 lakhs.

Total financial outlay for medical facilities is Rs. 18.75 crores, out of which Rs. 5.64 crores will go towards cost of acquisition of lands and Rs. 13.11 crores towards cost of works. The outlay can be spread over four 5-Year Plans as (i) Rs. 6.10 crores; (ii) Rs. 6.10 crores; (iii) Rs. 3.28 crores and (iv) Rs. 3.28 crores. This would need foreign exchange to the tune of about Rs. 1.5 crores.

## OPEN SPACES:

Considering a total acreage of the City viz., 17,388.83 acres and ultimate population of 32.5 lakhs obviously adoption of a suggested standard of 4 acres/1,000 population would absorb 73% of the Island which is an impossible proposition and hence in the Development Plan a modest standard of  $\frac{1}{2}$  acre/1,000 population is feasible within the City limits and which in the subsequent increases can be stepped upto 1 acre/1,000 population and the deficiency can be supplemented by development of sea-beaches.

The Suburbs which provide a wide scope for a more ambitious standard can afford a standard of 4 acres/1,000 population, 1 acre on neighbourhood basis in the form of playgrounds and gardens and the remaining to be provided in the form of large parks.

Surveys of existing amenities reveal that the City of Bombay has developed with scant attention to provision of open spaces. It has roughly  $\frac{1}{4}$  acre/1,000 population of open space as against 7 acres to 10 acres/1,000 population standard in Britain and U.S.A. respectively.

At present for a population of 27,71,933 in the City, there are 363.138 acres of recreation grounds with full access to general public, 355.759 acres with limited access and 74.79 acres of private spaces without access to general public, totalling 793.687 acres giving 0.29 acre/1,000 population.

Whereas in the Suburbs, for a population of 13,80,112 persons 5,734.68 acres with full access to general public exist. 137.82 acres have no access to general public. Thus the total acreage of 5,872.57 gives a ratio of 4.25 acres per 1,000 population.

Thus for the future population of 31.60 lakhs in the City in 1981, at the standard of 1/2 acre/1,000 population 1,560 acres are required to be provided resulting in 568.97 acres of deficit, but only 1,011.03 acres are provided.

In the Suburbs at a standard of one acre per 1,000 population on neighbourhood basis, for 1981 population of 39 lakhs, 3,699.427 acres are required to be provided, whereas for larger parks the deficiency is only 1,907 acres, as against these deficiencies in the Development Plan 200.573 acres and 5,717.20 acres respectively are provided.

Due to congested nature of the City and very high rates of land value, the programme of providing open spaces is proposed to be phased over a period of 20 years. These reservations pose a serious problem of rehabilitation.

Under the development plan open spaces of 1,011.03 acres existing in the City will be augmented by 609.56 acres giving a ratio of 0.51 acre/1,000 population in 1981.

#### Stadia:

Plan proposals provide for one additional stadium at Wadala in the north of the City, three stadia—2 in western suburbs at Bandra and Kandivli (East) and 1 in the eastern suburbs at Vikhroli are provided. More of these can be provided in recreation ground reservations.

#### Swimming Pools:

Mahatma Gandhi Swimming Pool is the only Municipal Swimming Pool. At Worli and Sewri, sites for the purpose are provided. In the Suburbs, sites at Bandra, Bhandup, Chembur, Muland, Kandivli, etc. have been provided but this amenity can also be provided in recreation ground reservations if required.

Total cost of the development plan proposals for these amenities is Rs. 35.95 crores—Rs. 30.58 crores for land acquisition and Rs. 5.37 crores for the development of sites. This outlay can be spread over four Five Year Plans as (i) Rs. 16.63 crores, (ii) Rs. 16.63 crores, (iii) Rs. 1.34 crores and (iv) Rs. 1.34 crores.

### ACCOUNTING AND FINANCE:

#### Accounting:

The accounts will be maintained as usual on a full-fledged double entry book-keeping system. There is strict pre-audit control on financial transactions apart from independent statutory audit as provided under Sections 78A and 78B of the Bombay Municipal Corporation Act. The sinking fund provisions are also examined and certified annually by the Accountant-General, Maharashtra State.

Weekly abstracts of income and expenditure are published in the official gazette and an administration report on the accounts and finances of the Corporation is printed and placed before the Standing Committee of the Corporation soon after the close of the financial year ending 31st March.

#### Finance:

The total plan outlay is of the order of Rs. 730 crores spread over a period of 20 years. The plan aims at an integrated system securing for the first time a comprehensive approach to the different problems confronting the city administration. Apparently the plan looks ambitious. In the context, however, of the civic functions, which are growing both in magnitude and complexity, the attempt cannot be said to be utopian. The city population is expected to rise from the present figure of 41 lakhs to 71 lakhs by 1981, and the plan will have to be vigorously implemented if the citizen is to be guaranteed a standard of amenities obtaining in progressive cities of comparable size.

Having accepted the need to expand the services, the next problem will be to find the necessary resources. Here again, we must have a dynamic approach so as to keep pace with the march of events. With this end in view we shall have to tap to the maximum extent the existing sources of income as well as explore further avenues of augmenting the resources. We have accordingly taken steps to upgrade the town-duty schedule which may bring in an additional income of Rs. 1 crore per annum if the maximum rates are finally accepted. The Profession Tax is yet another source expected to yield Rs. 1 crore per annum. Apart from these items, we have represented to Government for sources of income including inter-alia a larger share from State and Central Government taxes, viz., duty and sales tax on petrol, betting tax, entertainment tax, duty on electricity, motor vehicles tax and duty on transfer of immovable property. Levy of terminal tax and assessment of State and Central Government properties including Railways and Port Trust at the same rate as that for private owners are other items which will add substantially to the Municipal revenues. The aggregate potential of these sources can be placed at a conservative estimate of Rs. 6 crores per annum when fully exploited. This together with the normal increase of Rs. 2½ crores per annum on the minimum basis at 10 per cent increase per annum would give a margin of 12 crores (including the present margin of Rs. 4 crores as indicated in the Annexure).

It will be seen from the above that the position of the Municipal finances is quite sound with regard to the capacity to borrow funds. The present difficulties are the result of the money market conditions which do not permit long term borrowings. In fact loans have to be floated at present with a currency of 10 to 12 years as against the limit of 60 years permitted under Section 109(e) of the Bombay Municipal Corporation Act. The incidence of debt charges is proportionately much greater with short term borrowings, which is a positive handicap in carrying out large scale capital works programme as contemplated in the Development Plan. Foreign assistance in the form of credit on easy terms will go a long way in solving our present difficulties in finding capital resources apart from helping us to tide over the problem of securing foreign exchange required for executing some of the major projects.

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*The above Summary of the Bombay Municipal Corporation Plan has been reproduced by Courtesy of the Municipality. We have left out some minor items like Milch Cattle, Markets and Slaughter houses, Libraries and Development Control, but the fundamental features are given in entirety.*

# PLANNING FOR BOMBAY

1. PATTERNS OF GROWTH
2. THE TWIN CITY
3. CURRENT PROPOSALS

*CHARLES M. CORREA  
PRAVINA MEHTA  
SHIRISH B. PATEL*

Bombay, originally was that finest of things : a city on the water. From this grew its character. Yet, inexplicably through the years the city has been allowed to grow away from the waterfront. Apart from the old city in and around the Fort area, there are hardly any localities which relate to the surrounding water. Result : Most of the city's inhabitants sleep, work and live in an asphalt jungle. Additionally, Bombay faces two critical functional problems : Firstly it has a population growth which is quite phenomenal, and secondly it is handicapped by a traffic pattern which runs longitudinally north-south, crippling any chance for normal healthy expansion. Any rational plan for Bombay must find solutions to these two problems. But more than that, Bombay can only be the splendid city it once was, if it regains its character as a city on the sea.

# 1. PATTERNS OF GROWTH

Bombay has been changing rapidly and, so it seems to many, changing for the worse. Citizens notice many examples of deterioration as for instance: the monstrous blocks of apartments springing up all over the city, from Malabar Hill to Sion; the maidan areas which are diminishing through a process of gradual encroachment; the overcrowding of the suburban trains; the congestion of motor traffic; and many others. Suggestions pour forth in response to these problems: control building heights; prohibit tenants from drying washing in their front balconies; plant more trees; and so forth.

Now all these problems are real and many of these suggestions are useful, but in order to make any progress in dealing with this subject, it is essential that we distinguish between the various types of problems we face; in other words there are major problems endangering the orderly growth of Bombay (such as the colossal increase of population expected in the next 15 years) and there are other minor and relatively local dilemmas (such as the ugly buildings on Peddar Road). Our tragedy is that much of our energy goes fighting the little problems, while very few people indeed are willing to discern the larger and really critical ones.

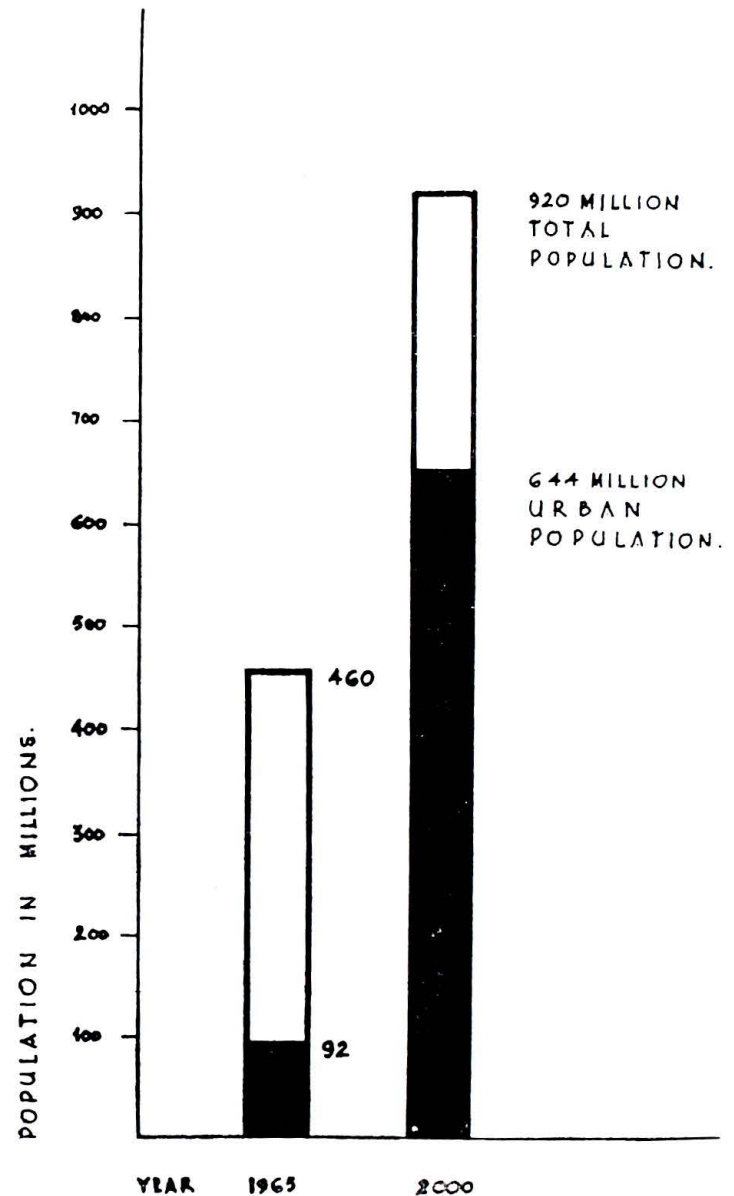
Of all the problems we face, the most crucial concerns population. Let us look at the total picture of the country. India, today, is a nation of 460 million people; approximately one-fifth of this population (i.e. 90 million) lives in urban centres, the rest is scattered in over half-a-million villages.

The next thirty-five years will see a considerable change in this picture. At the turn of the century, the population is expected to double itself, and if planned industrialisation should fully materialise, approximately 70% of this population (i.e. 630 million) may seek to live in urban communities. This constitutes an increase of 700%.

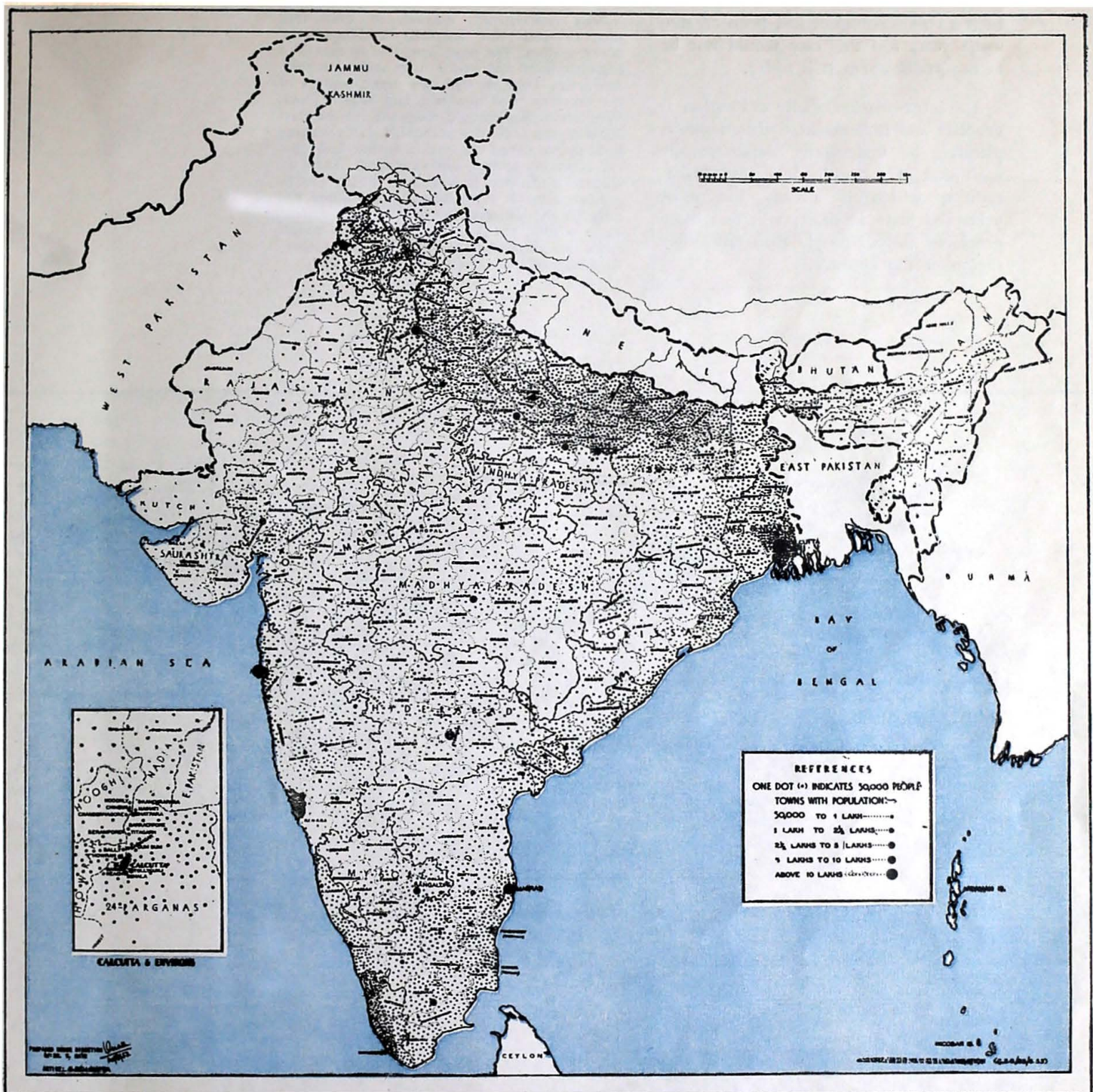
From this we can conclude :

1. The task of creating this urban environment is enormous and of unprecedented dimensions.

2. It may necessitate the creation of an entirely new structural pattern, a pattern in which the existing environment and culture will form only a remnant of the past, being less than one-seventh of the overall urban scene.



1. All India Population Growth, 1965—2000



**2. INDIA—Distribution of Population by Districts—1951 Census.**

(At any given moment the density pattern across the country represents a dynamic structure, each unit of which serves to balance the whole).

What pattern will this vast urbanization of the country assume?

Existing towns and industries, and the nuclei of new towns and industries will act as magnets to attract the population.

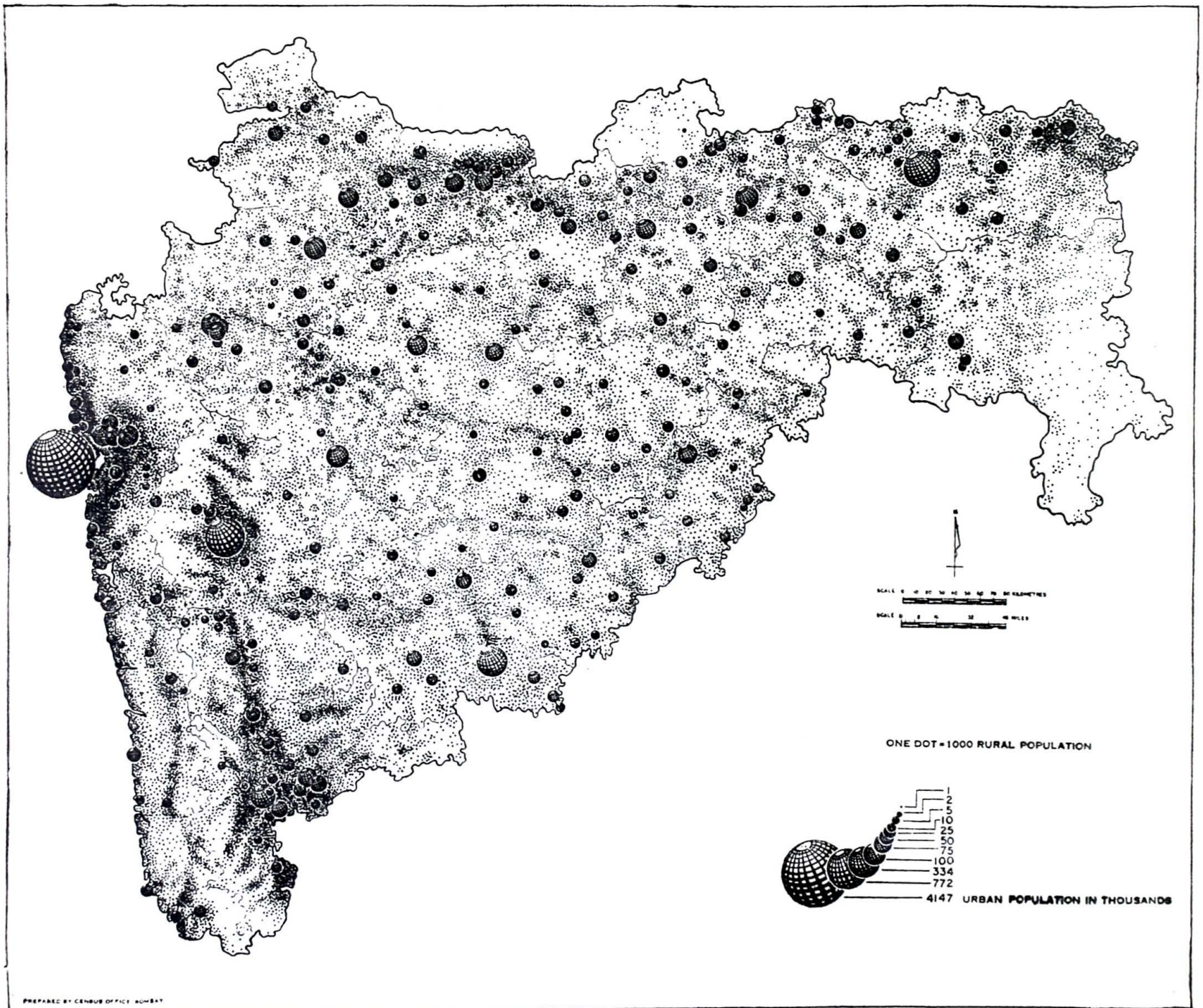
On looking at the overall region of Maharashtra (Fig. 3) we can immediately perceive that strong counter-magnets are needed if we are to draw away a sizable percentage of the hordes of immigrants who will otherwise descend upon the existing cities in the next 35 years. For instance, in Bombay, if



such a counter-magnet had been created some years ago this city would not be in the predicament it is today.

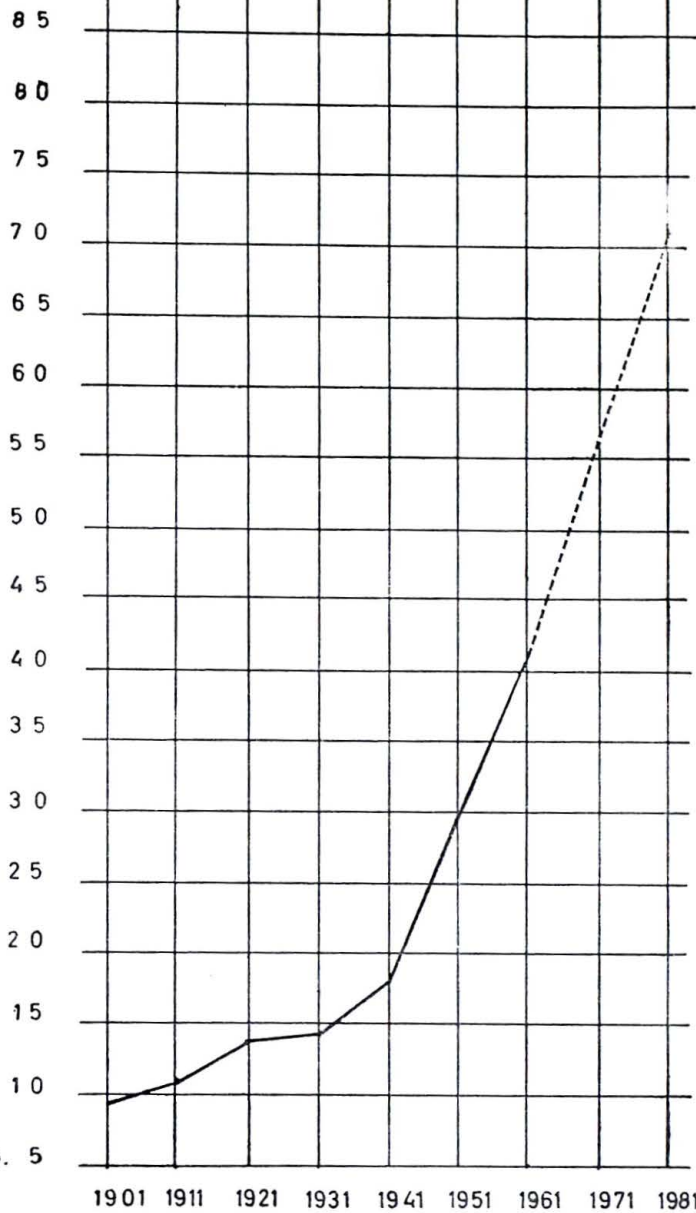
The inter-relation of city and region is crucial\* and it is essential that regional planning be undertaken simultaneously with that of the individual city. Maharashtra, which is already the most urbanised State in India, will feel these pressures more strongly than any other region of the country.

\*An unresolved tension in one area distorts—and can mortally endanger—the entire system. The most sensitive elements of the system are the major cities and metropolitan areas. They are truly the nerve centres of the country. For instance, last year a Dock Workers' strike brought shipping on the east coast of the U.S. to a standstill. The resulting hold-up paralysed the entire nation and cost the economy several billion dollars. Thus we see that a proper functioning of the metropolitan areas is a matter of importance not only to the citizens thereof but the nation as a whole. If Bombay and other major cities are allowed to disintegrate, then surely the future of India itself will be in jeopardy.



3. MAHARASHTRA STATE—Distribution of Population, 1961—One dot=1000 rural population.

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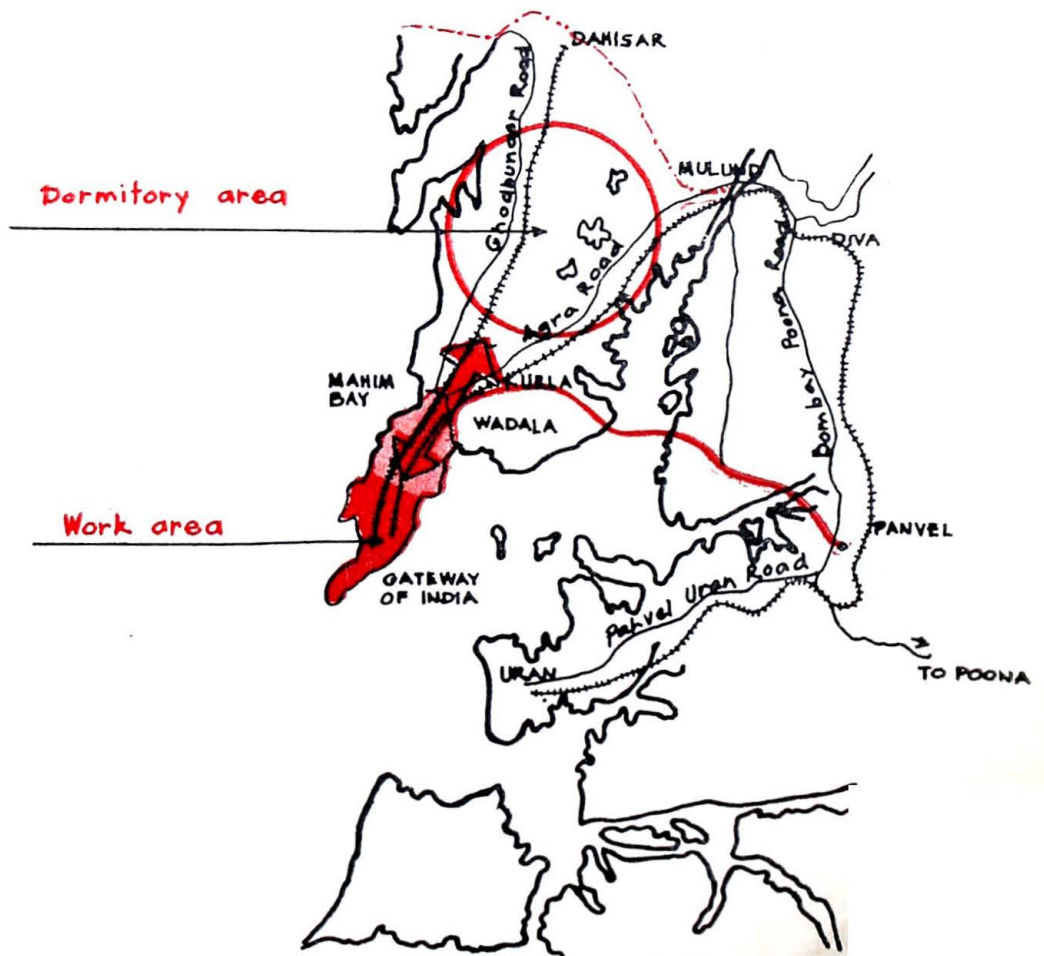
The accompanying chart (Fig. 4) shows the population growth of Bombay from 1901 to the present day, with population projections up to 1981. As recently as 1941 the population of Bombay was 16 lacs; in 1951, 30 lacs; today it is 46 lacs. By 1981 it is expected to reach 70 lacs. This is, indeed, a phenomenal rate of growth, one which doubles itself every 20 years.

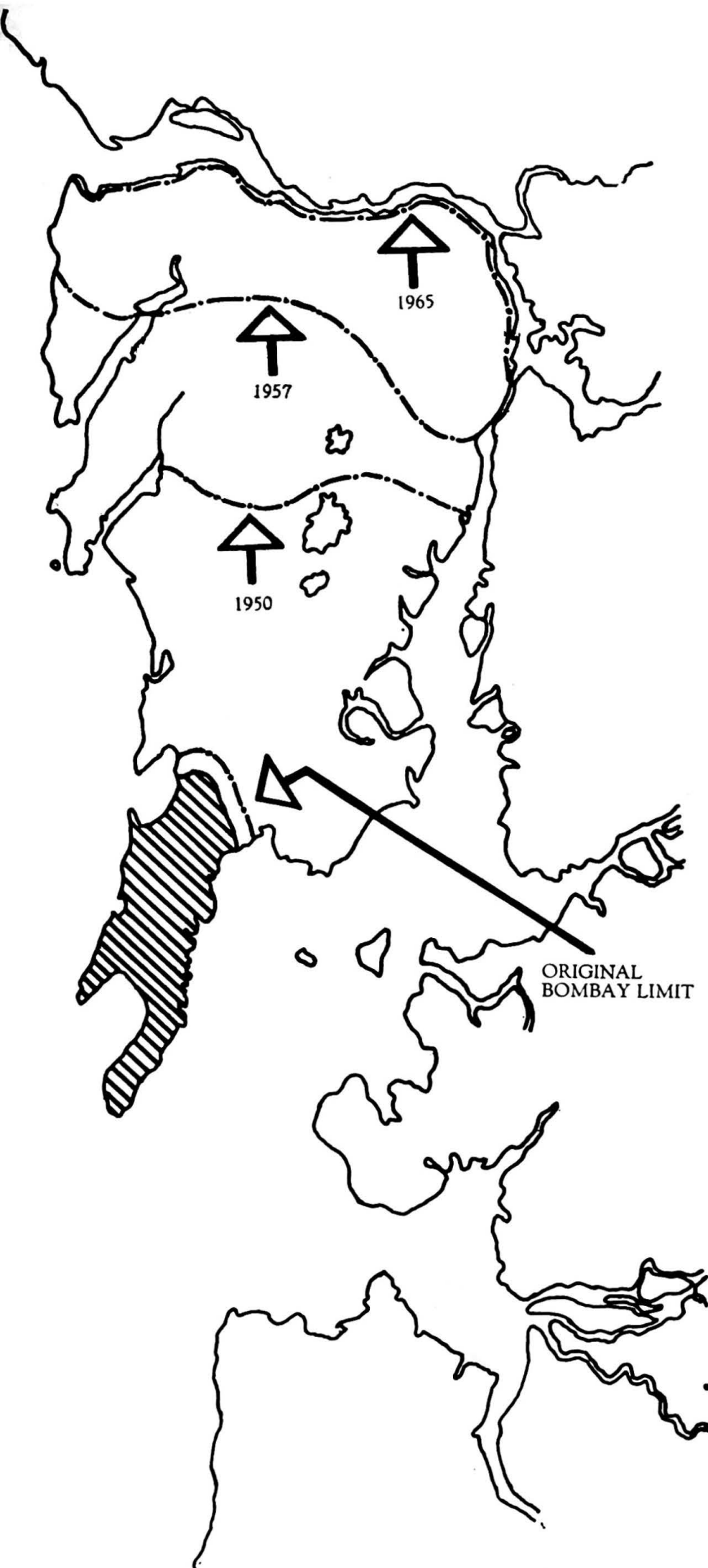
Many of the cities of India are expanding at this rate; the special dilemma of Bombay is its structural pattern. Being an island connected to the mainland only at the northern tip, Bombay has developed on a longitudinal axis, with an enormous quantity of traffic generated along the north-south arteries. Most of the problems of Bombay arise from this longitudinal development.\*

There is a heavy concentration in the south of the island: of Government offices; of most commercial and business houses; of the docks; of much of the industry; of many of the cinema houses; and of sports stadia and exhibitions whenever these are held. The suburbs have developed principally as "Dormitory" areas. This has resulted in over-congestion of the existing road and rail systems, for there is a massive flow of traffic during the peak hours from north to south in the mornings and south to north in the evenings (Fig. 5). The difficulty of traffic movement in turn has created an intense demand for housing in the already congested southern tip, and many families are content to live in overcrowded slums in the centre of Bombay rather than face that daily time consuming, inconvenient and costly travel entailed in commuting to more open areas further north.

\*A city grows around its centre. Normally the growth is concentric in all directions around this focus. In Bombay, because of the location of the centre at the southern tip, growth has had to be in a narrow 30° wedge, northwards. The repeated extension of Municipal City limits illustrates this pattern of growth.

- 4. Greater Bombay Population
- 5. Bombay and surrounding region





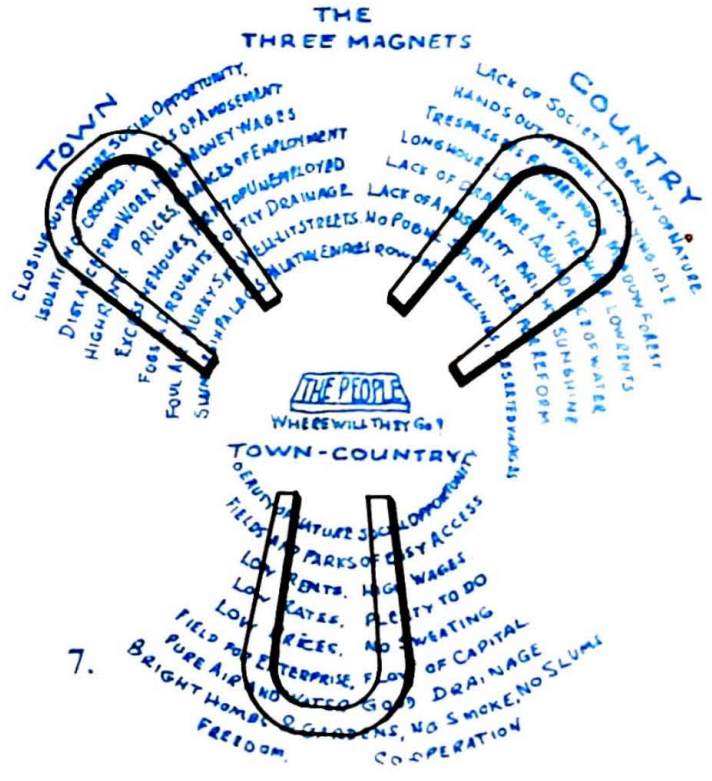
6. Bombay Municipal Limits

How did this pattern come about? If we look at the early plans of Bombay we find that this longitudinal development with a focus at the southern terminus was natural and adequate for the original city. It probably sufficed—in a manner—for the first extension as well. Subsequent extensions have stretched this North-South pattern further and further until now, like a rubber band, it is ready to snap.

What alternatives do we have? We can either accept the existing centre of activity as the continuing focus for future development and attempt to deal with the mounting pressures of density and traffic as they develop; or we can create alternative centres of activity to serve as counter-magnets to draw the pressures away.

The island of Bombay, already near saturation point, cannot possibly absorb the increase of traffic and population expected in the next 15 years.

This being so can we create counter-magnets to alleviate the pressures on Bombay?



One of the techniques sometimes suggested by city planners is the creation of satellite towns.

Will satellite towns around Bombay succeed in relieving pressures on the existing city? To answer this let us first examine the concept of satellite towns.

The working of satellite towns—as their name suggests—is based on an analogy with planetary systems. The behaviour of planetary systems is governed by laws of mass and gravitational pull. The pull between two bodies is proportionate to their mass and diminishes as the square of the distance between them. The planetary system of satellites around a sun achieves a balance when the masses are correctly disposed in relation to each other. (Figs. 8, 9).

That certain parallel laws govern the movement of people has been observed by planners\*.

Where a great metropolitan centre exists—as in Bombay—small satellite towns located haphazardly at a considerable

distance away from the mainland (Fig. 10) cannot possibly fill the role for which they are designed. At that distance no small townships will succeed in attracting residents away from Bombay.

\*With certain satellite towns planners have observed a movement of people back to the congested central part of the city:—

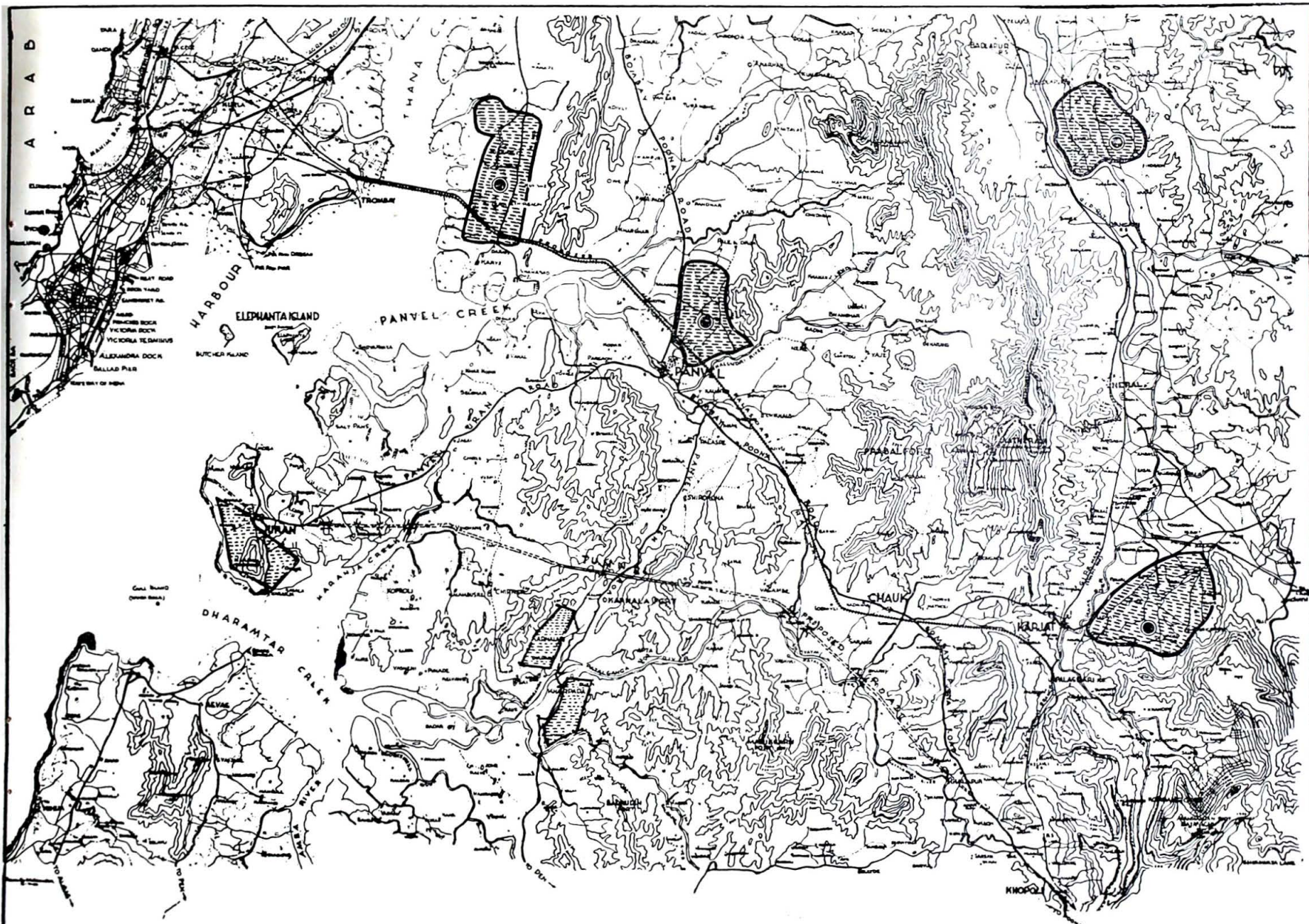
“At the present time in Britain there is a disconcerting drift of population into London. This is not a drift of population from areas of meagre employment to full employment; it is to some measure the attraction of the Metropolis drawing younger-age groups from the drabber urban/industrial areas and their even drabber centreless dormitory estates, to metropolitan vitality and variety.” (Taken from Hansmartin Bruckmann & David L. Lewis, *New Housing in Great Britain*, Alec Tiranti Ltd. London, 1960. Page No. 18).



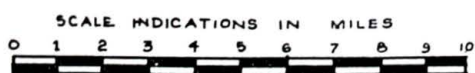
8. A pair of interacting galaxies



9. Triple galaxy



10. Proposed Satellite Towns



- INDEX
- POSSIBLE SITES FOR SATELLITE TOWNS.
  - EXISTING ROADS.
  - PROPOSED ROADS.
  - TUNNELS.
  - CULVERTS.

To serve their purpose, the townships must be large—accommodating up to 10 lacs people each—and they must be located much more in the form of a half-ring around Bombay. In London because of its geographical location, it has been possible to completely encircle the city with satellite areas (Fig. 11).

In the case of Bombay, the size of the satellite towns, accommodating up to 10 lacs people each, would be imposed not only by the need to create a balance against the tremendous pull of Bombay but would be dictated also by the fact that the population in the region of Bombay is expected to grow from 45 lacs today to about 90 lacs in the near future, and the satellite towns will have to absorb the largest part of this increase.

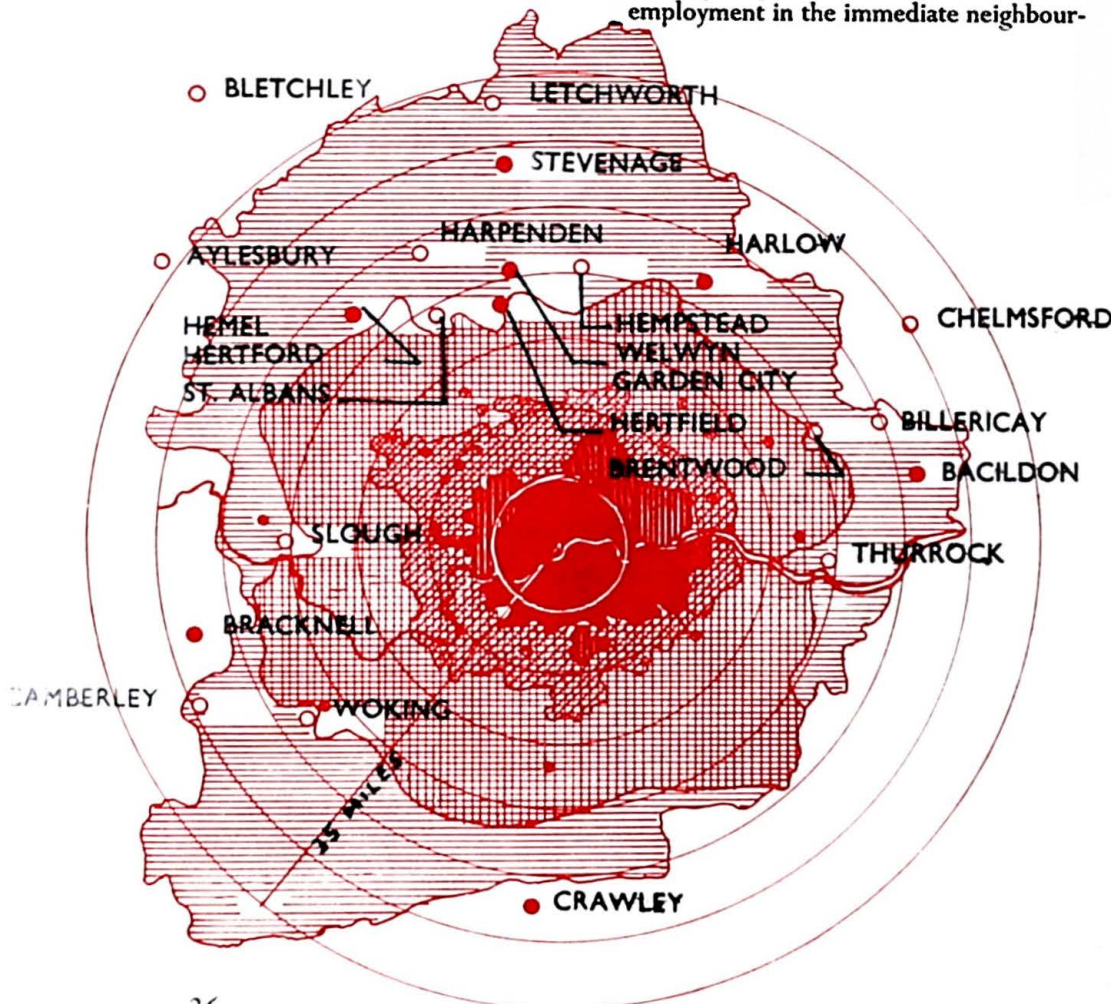
To have several satellite towns around Bombay, each one with a population of 10 lacs (that is, about the size of Poona) means that each town will have to be equipped with all the secondary services of a metropolitan area. The duplication of facilities involved in establishing several satellite towns would be exorbitant and highly improbable in the conditions of the Indian economy today\*, and it is most likely that only marginal services will be provided. If this happens the satellite towns will inevitably grow as shanty towns and near-slum areas, housing only those who have industrial employment in the immediate neighbour-

hood (e.g. Ulhasnagar and Panvel today). The pressures on Bombay will not be relieved.

If however a single major urban centre is created on the mainland directly opposite Bombay, of equal prestige and importance, it could develop into an area as large as the older city. (Fig. 12). Its very size would provide the equilibrium necessary between the old and new developments. If growth continues even further the new city could be ringed later by satellite towns around it (Fig. 12), located close enough to the major centre so that its presence stimulates their growth. This new centre would open up the region all the way to Poona (Fig. 13).

\*“Very considerable sums have been spent on these project townships which are generally nearly planned in neighbourhood units and with standards of accommodation and civic amenities in terms of schools, hospitals, water and electricity supplies, roads, markets, recreation centres and parks that would be the envy of most cities. The Indian Drugs and Pharmaceuticals Ltd., for example, is spending Rs. 40 crores on its three plants at Rishikesh, Hyderabad and Madras. The townships will cost Rs. 8 crores. The Neyveli township has cost Rs. 14 crores (for 6,500 houses); the three new steel townships (9,000 to 11,000 houses each) around Rs. 50 crores. The cost of these townships and their maintenance is a direct charge on the projects concerned. This casts on them a heavy burden which is not made any lighter by the provision of subsidised services. The steel plants for instance incur an annual expense of Rs. 60-70 lakhs each on township subsidies, and these subsidies are going to be permanently reflected in higher steel, fertiliser and drug prices.”

B. G. VERGHESE  
Design for Tomorrow  
The Times of India Press-1965  
Page No. 220.

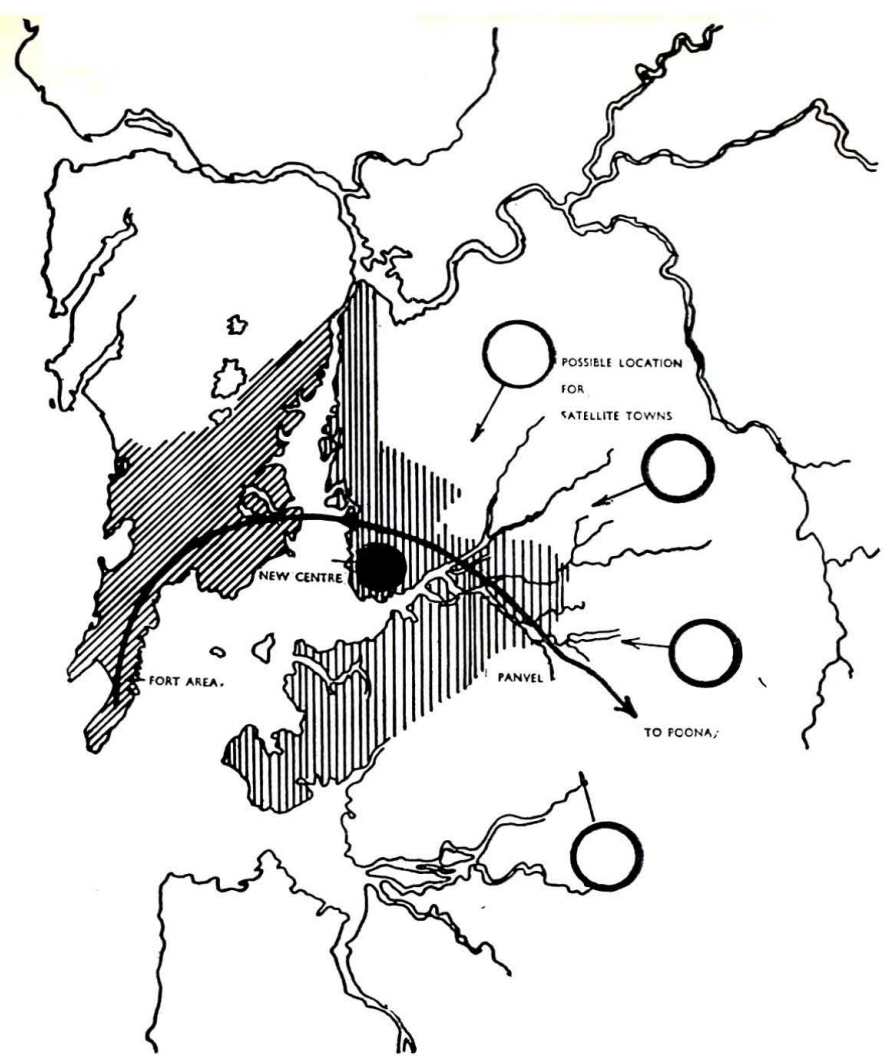


11.  
THE GREATER LONDON PLAN OF 1944 BY PROFESSOR ABERCROMBIE

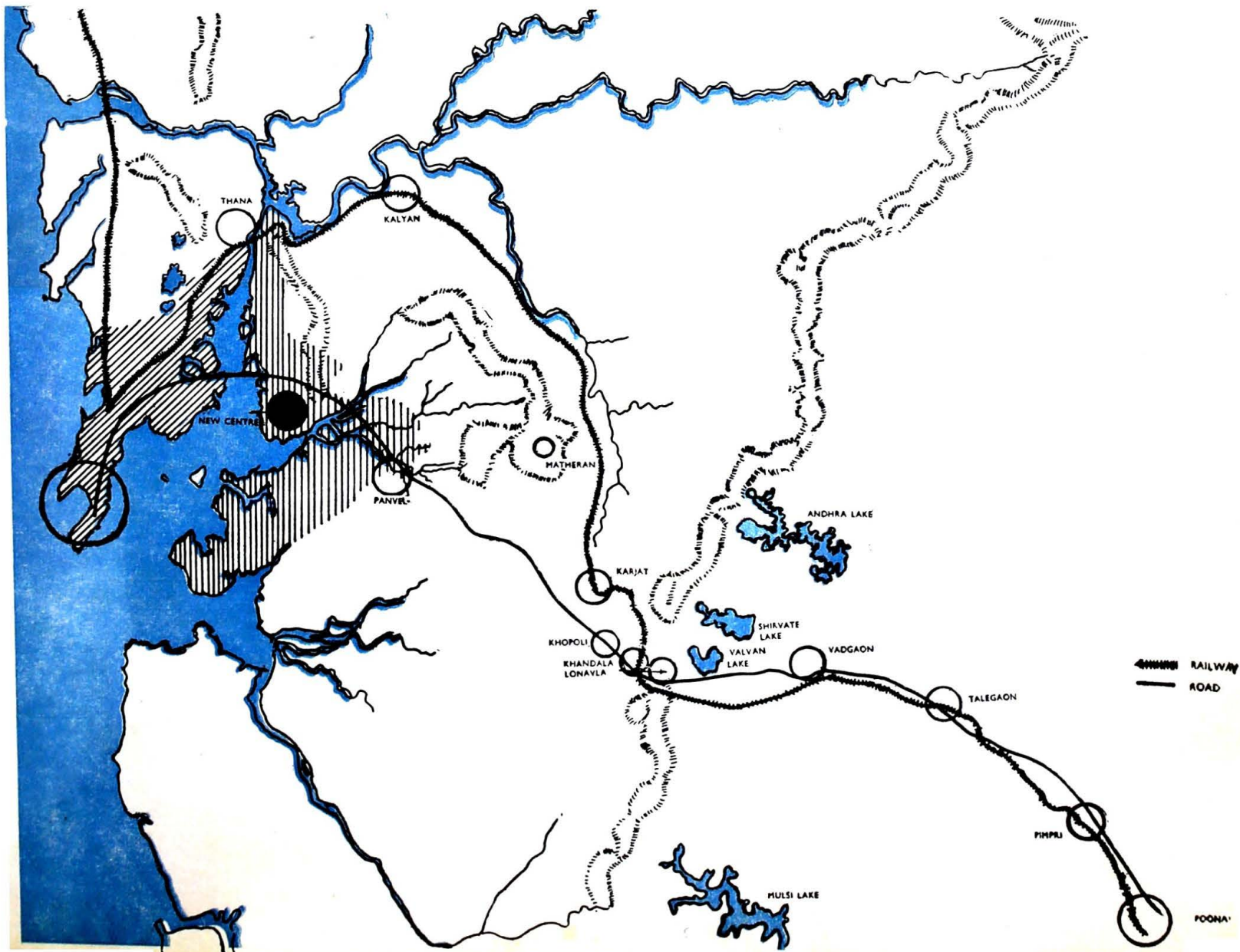
- ADMINISTRATIVE COUNTY OF LONDON
- INNER URBAN RING
- SUBURBAN RING
- GREEN BELT RING
- OUTER COUNTRY RING
- NEW TOWNS
- EXPANDED TOWNS
- ⊙ L.C.C. OUT-COUNTY HOUSING ESTATES

Located thus on the mainland, a new urban centre would not suffer—but on the contrary benefit—from the magnetic pull of Bombay. It has the following advantages :

1. It would relieve the pressure on Bombay.
2. It would re-orient the North-South growth of Bombay to an East-West axis.
3. The proposed new docks and industrial development envisaged on the Thana Creek and at Panvel will generate a great deal of activity on the mainland for which the new centre would form a focal point.
4. The existence of such a metropolitan area on the mainland at such a key location in the industrial belt would stimulate growth in the entire region.
5. It would act as a focal point for the development of satellite towns.
6. This new development is visually connected with Bombay and thus will exploit the magnetic pull of the existing city.



12. *New Urban Centre on the Mainland.*  
 13. *The Bombay-Poona belt.*



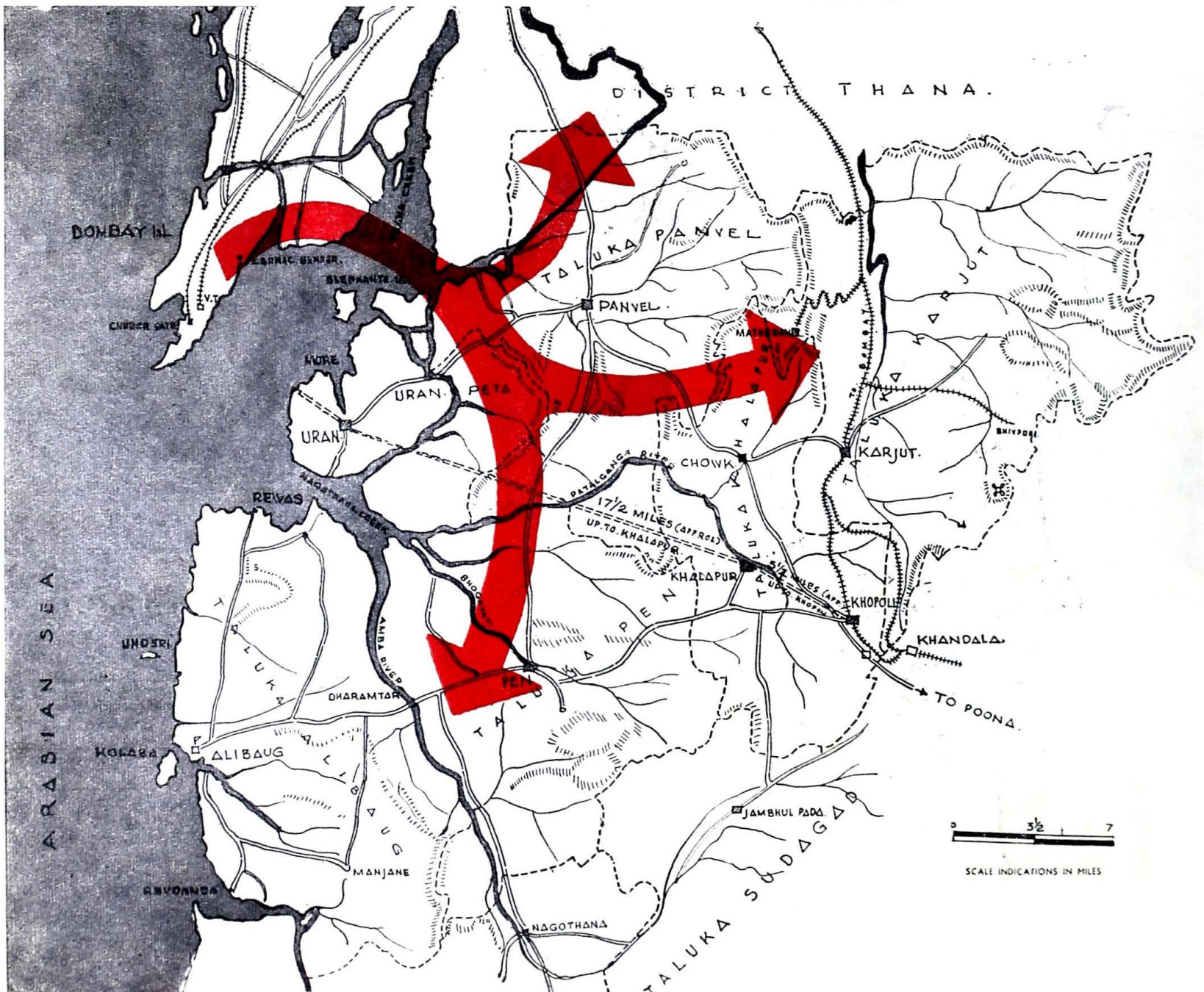
Such a proposal was originally made by the Barve Report of 1956, which recommended a direct connection between Bombay and the mainland across the Thana creek. The precise words of the Report bear quotation:

“The Communications and Traffic Panel have therefore viewed the problem from the wider angle, and it is on this account that its first and main recommendation is to the effect that the error of history must be corrected and the handicap of geography must be overcome by developing a city on the mainland-side of the Bay. Such a development would have multiple effects. Firstly it would relieve the pressure on the railways and the roadways that now have to move a considerable amount of traffic between the North and the South; secondly, it would provide room for the development of a Port on the other side of the Bay, thereby again reducing the demand for transport in the City of Bombay; and thirdly, it would open up the possibility of the development of a new township, which would in time not only draw away from the island of Bombay

the over-flow of the industrial units and residential colonies, but also enable the City to develop in an orderly manner.

“There is little doubt that the development of the mainland opposite the Island of Bombay would really be a master-stroke; the progress of the country would seem to demand the siting of a new township on the mainland of the God-given harbour of Bombay. For it would permit the building of a series of docks, which would serve as termini of the vast hinter land of Maharashtra and Andhra, eliminating Bombay’s precarious dependence on the bridges which link the island to the mainland. From the angle of security, a port on the Eastern side of the Bay would be ideal. In any case, the Defence Services would most certainly welcome such a development; immediately even without a railway connection, access to the Bombay-Poona route is easy. It is understood that consideration has already been given to the building of a Naval Harbour in that area; and if such a lead is followed, the growth of a satellite town would be a matter of course.”

14. Opening up the mainland opposite Bombay.



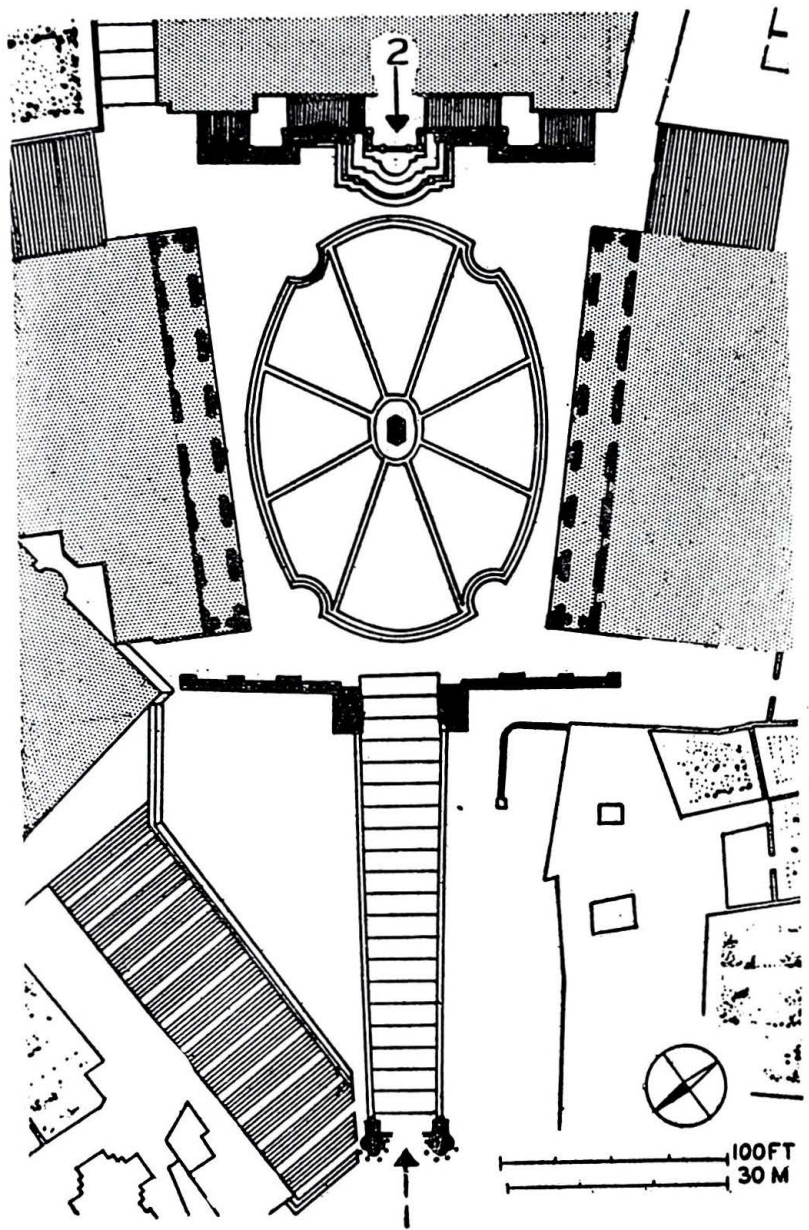


15. *New Centre will act as a catalyst in the development of the mainland.*

Can such a centre be created?

There have been several examples through history of significant cities created around governmental centres. These examples range all the way from Washington D.C. to Chandigarh and Brazilia in recent times. Perhaps the closest parallel to Bombay would be the creation of New Delhi 50 years ago, a



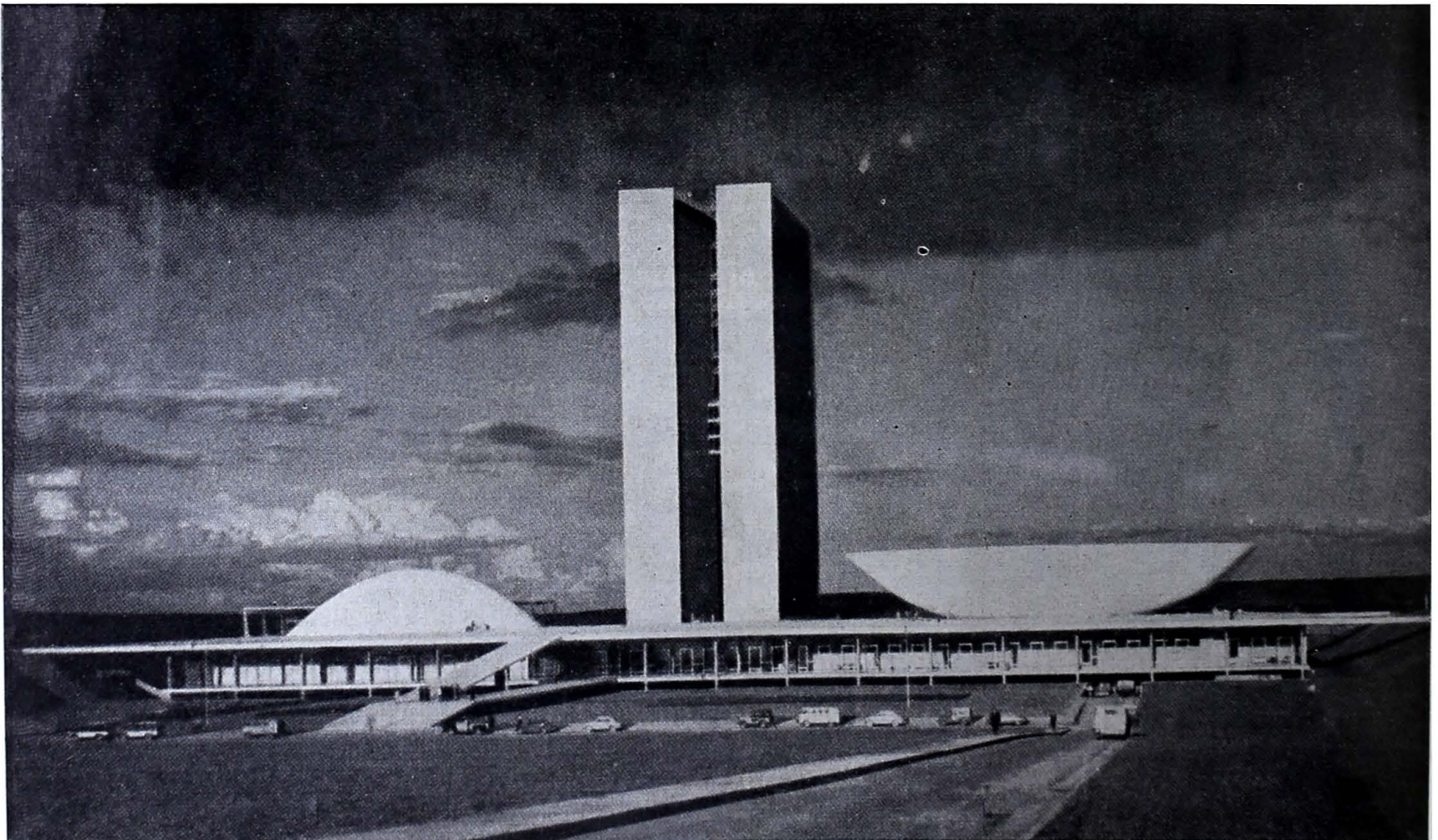


creation which involved the construction of a new centre 15 miles away from the old city. It was a manoeuvre boldly conceived and executed and today the benefits of this decision are unquestioned.

It is obvious that in Bombay the importance of the second centre can be assured if Government undertakes to participate actively by moving its offices there and creating a new capital for the State. Where new capitals have been created it has been found that they not only fulfil the functional requirement of creating efficient administrative centres but they also become a source of pride for their citizens.

16. *The Capitol : Rome*  
by Michaelangelo. A. D. 1540-1644

17. *Capitol Complex : Brasilia*  
by Oscar Niemeyer. (1960)



**TO SUM UP:** The development across the water is essential to the orderly growth of Bombay; at the same time it also presents a unique opportunity to establish a new capital for the State of Maharashtra. This could be done without incurring any of the costs usually associated with creating a new capital city in undeveloped area; its creation would give a new image and new vitality to the citizens of the city and the State.

In the following pages are included further details of the city just outlined. This city is not an extravagant proposal, i.e. something divorced from reality. In fact most of the decisions have already been taken by forces operating on this city. This scheme attempts to make a *meaningful* pattern out of the haphazard occurrences which are taking place. At the present moment there are several different bodies—as for instance, the State Government, the Municipal Corporation, the P.W.D., the Railways, the Port Trust, the B.E.S.T., the Defence Services, etc., all with interests in this area and all working in a largely unrelated manner (for instance, Municipal sources state that the reason why they have developed their Plan in a northerly direction is that they have no jurisdiction over the Panvel area). It is essential, therefore, that a single co-ordinating authority be created so that an overall pattern of growth can be developed.

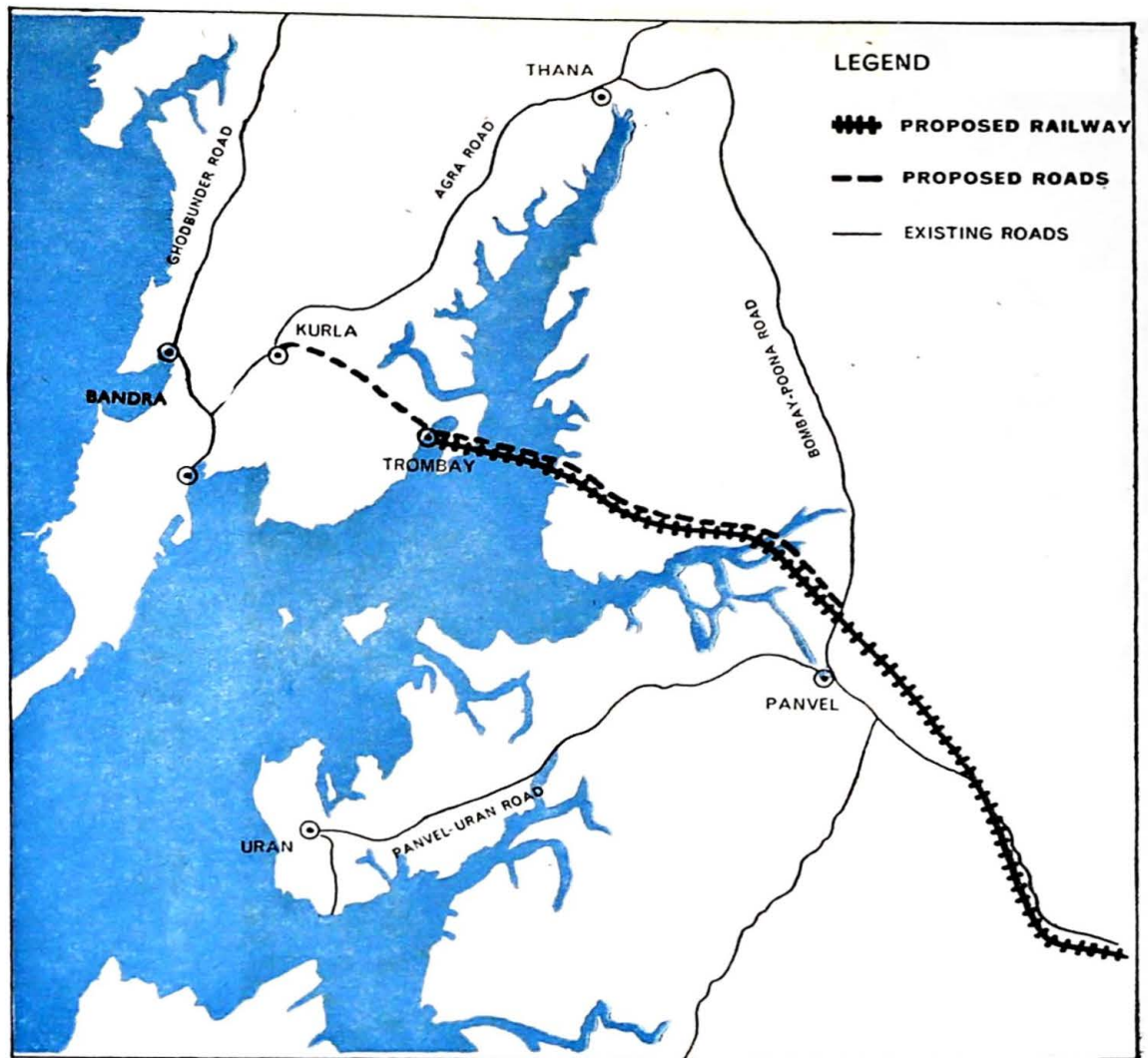
In other words, the Government should establish at the earliest possible date a Chief Co-ordinating Authority on the highest level whose directive would have to be followed by all organisations working in this area. Such a body would have the power to *commission* a proper master plan and, furthermore, to *implement* it.

The creation of this Authority is the single, most crucial problem we face.

## **2. THE TWIN CITY**

## STAGE 1

Traffic is probably the most critical problem in the plan of any city. Until now the main traffic arteries in Bombay have been positioned North-South with the consequence that the development of the city has taken place longitudinally in a North-South direction. It is evident that traffic should be reoriented to the maximum extent possible on an East-West axis. One of the panel reports of 1959 (known as the Barve Report) had suggested a Kurla-Karjat Highway with a bridge across Thana creek. A project for constructing this bridge across the creek is already under way. However, a serious start is to be made in diverting traffic from the North-South to an East-West direction. It is imperative that the highway bridge across the creek be designed as a major artery with the clear objective of opening up the mainland on the East of the creek for early development. This is taken as the starting point of this alternative plan because at once a new pattern emerges in the expansion of Bombay.

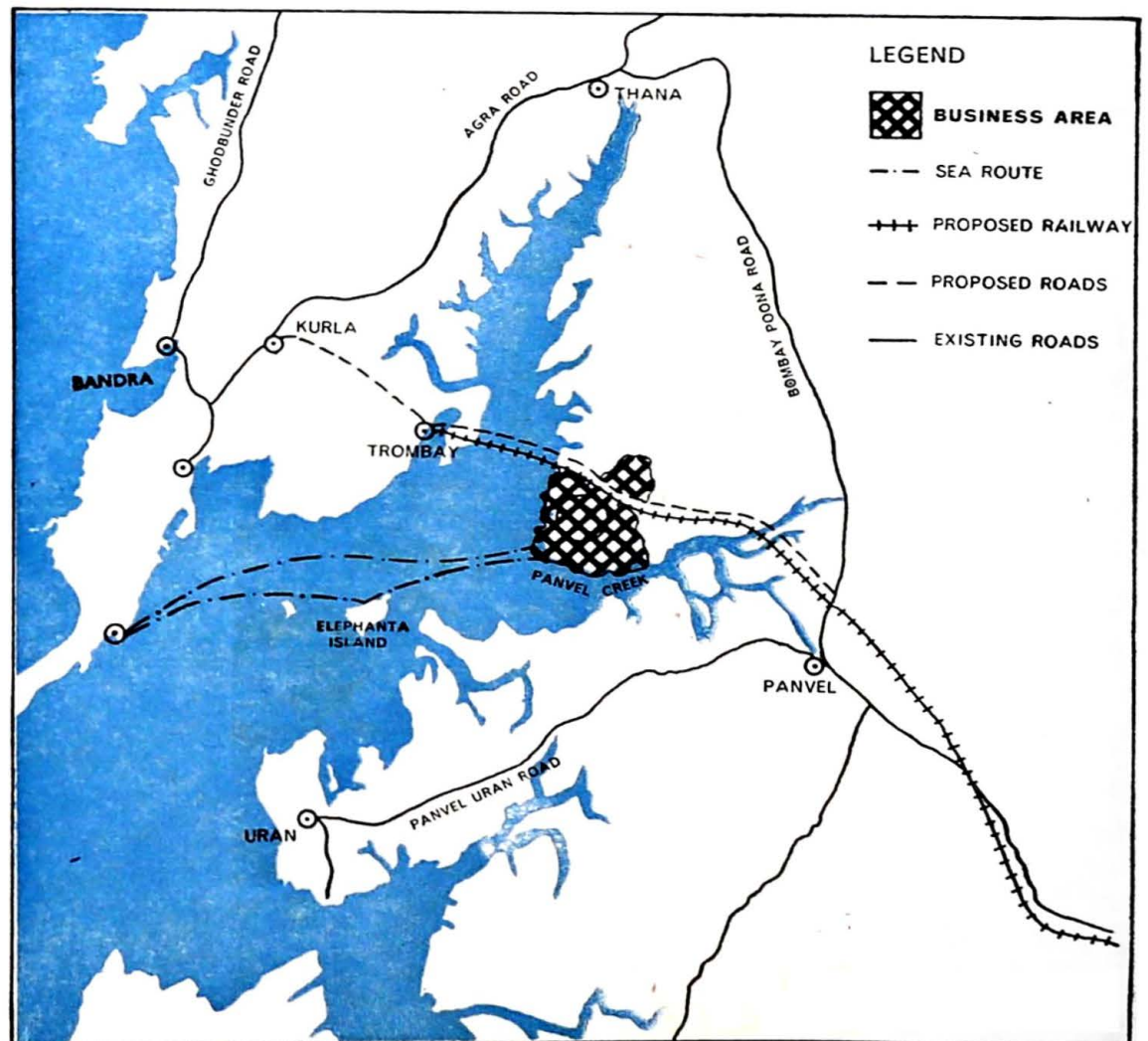


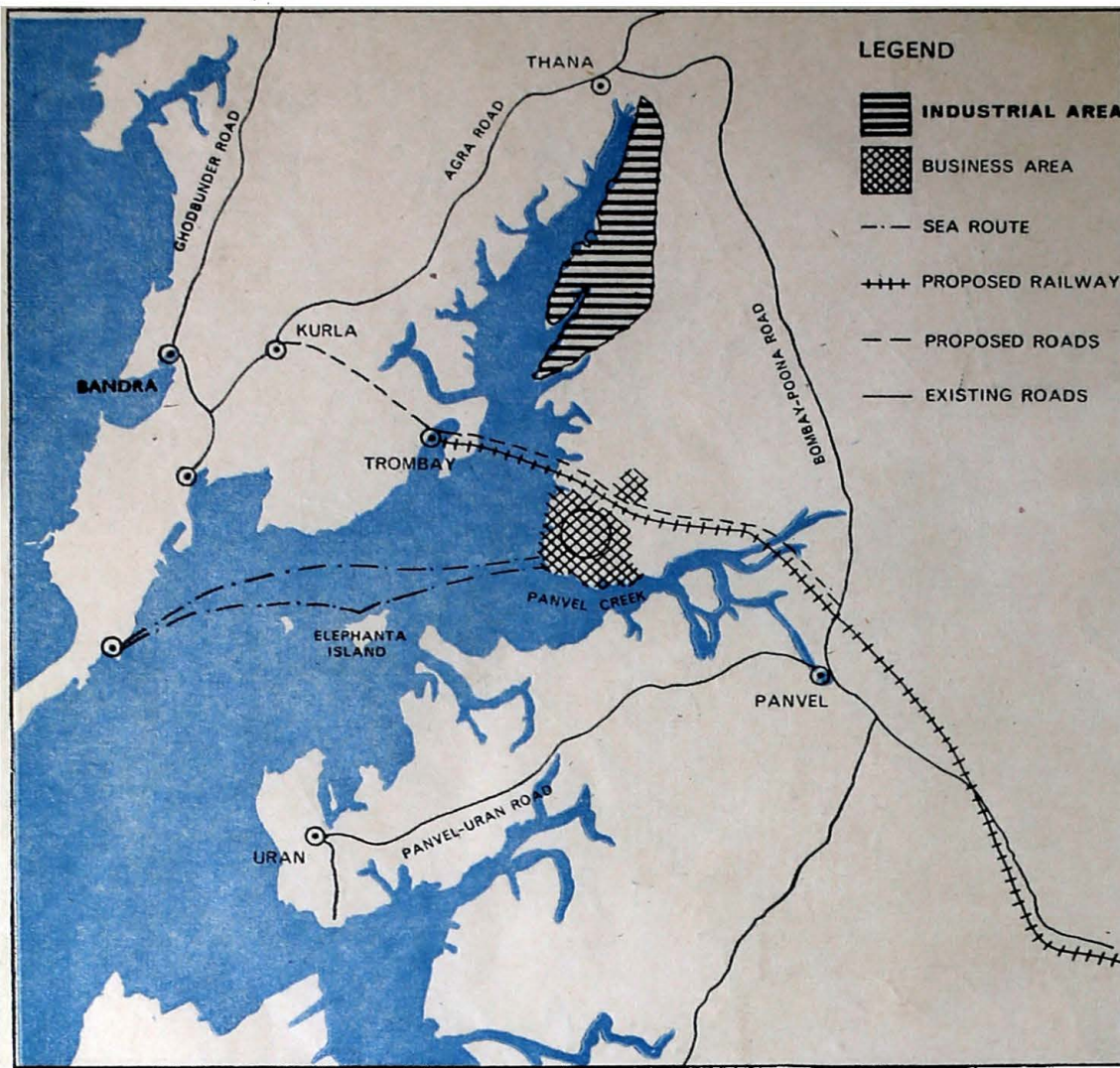
18. *Kurla-Karjat link.*

19. *Key area created on mainland.*

## STAGE 2

With the Kurla-Karjat link becoming the major highway into Bombay the areas on the mainland next to the artery become key areas in the new development. It is suggested that these key areas should become a new business and administrative centre opposite the peninsula. The beginning of this development should be such that it would act as a catalyst for further development of the mainland.





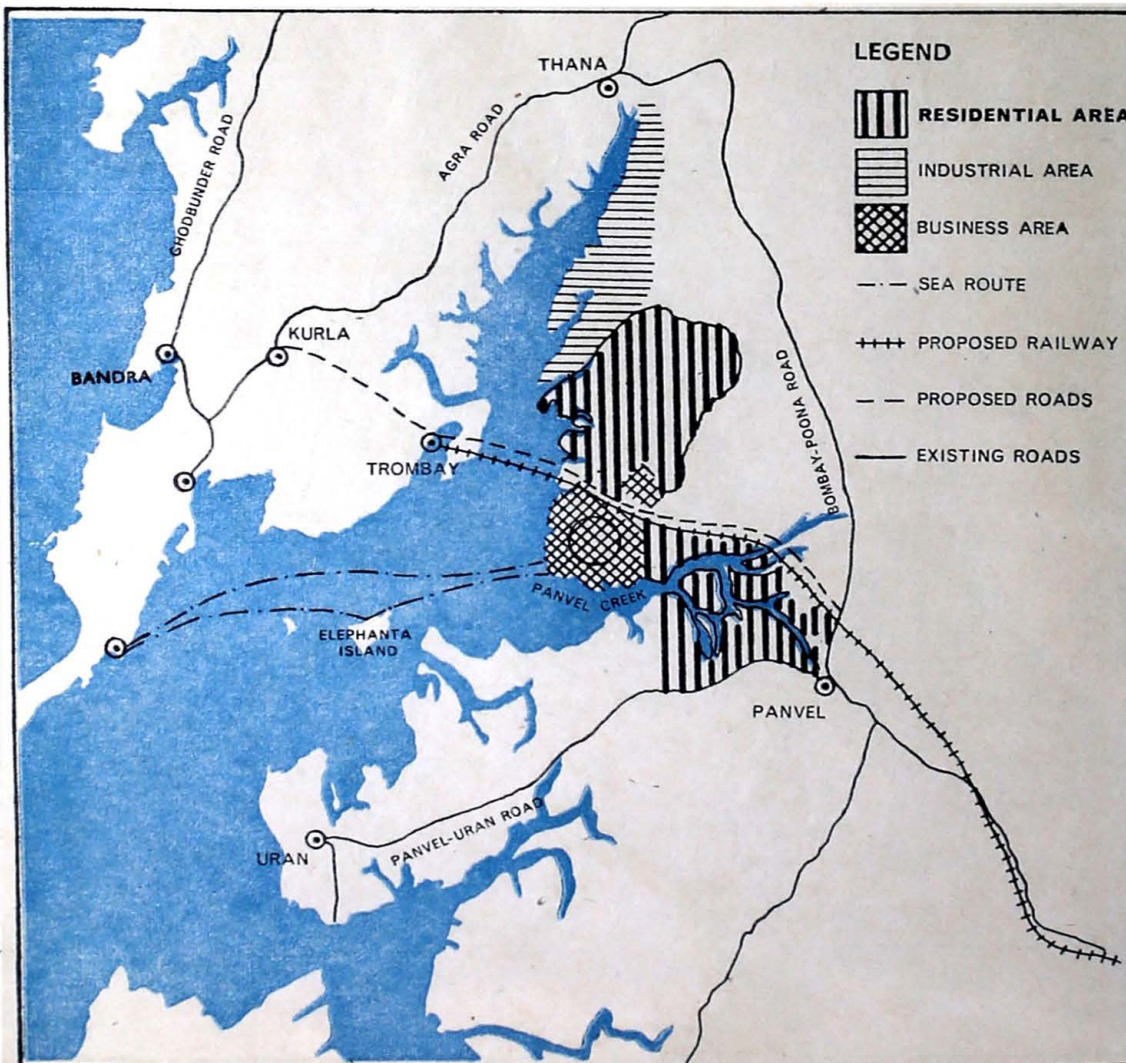
## STAGE 3

The presence of the new centre would encourage industrial development along the road connecting it to Thana. This new industrial development would be a continuation of the industrial belt which already exists across the creek.

Thana creek thus becomes an Industrial waterway; and can be used by barges which can pass beneath the Thana creek bridge and which will carry material and finished goods directly from the industries to the city of Bombay, and to the docks, etc.

20. Industrial Development along Thana creek.

21. Housing.



## STAGE 4

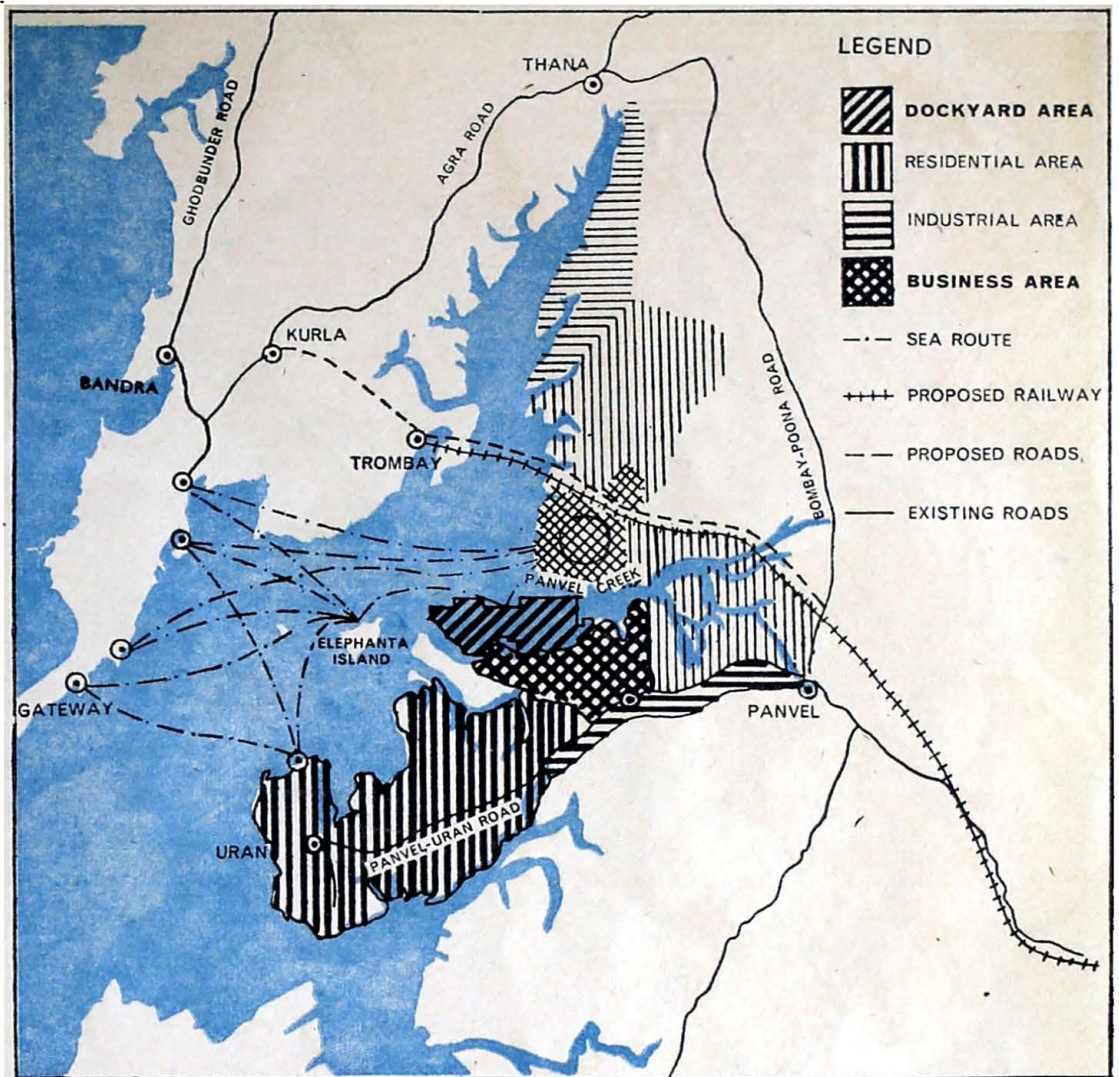
As industry and the commercial centre develop, a demand for housing for all income groups will be created.\* This housing can be located near the business centre on the waterfront and also on the hills beyond.

A small dam can be built on Panvel creek just east of the centre. This dam will carry the highway which connects Thana to Uran; it will also control the water levels of the rivers in the interior, which would greatly enhance the development of residential areas on the islands and river fronts.

\*Even slum clearance—so difficult to enforce today would be greatly facilitated by a new city. The presence of employment areas across the harbour with their ancillary residential facilities would itself induce a movement of people out of the old slums into the new areas. The slum areas vacated could then be redeveloped with the legal and political difficulties vastly diminished.

## STAGE 5

The Bombay Port Trust finds that the present docks in the island cannot be extended sufficiently for want of space. Fresh docking facilities will have to be located across the creek on the mainland and the areas most likely to be selected are adjacent to the site proposed for the new business centre. The location of the docks here would further stimulate development.



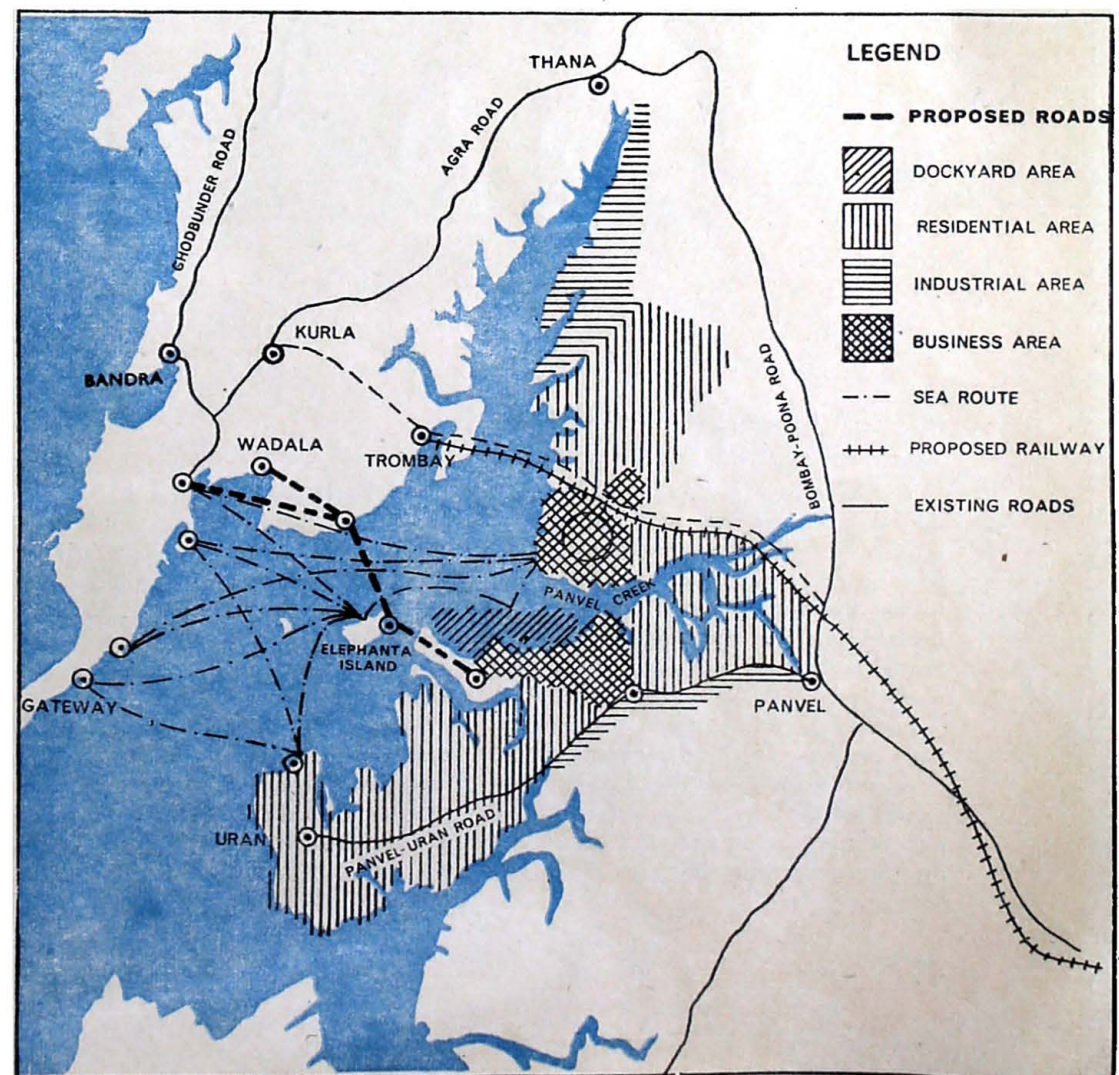
22. *New Docking facilities.*

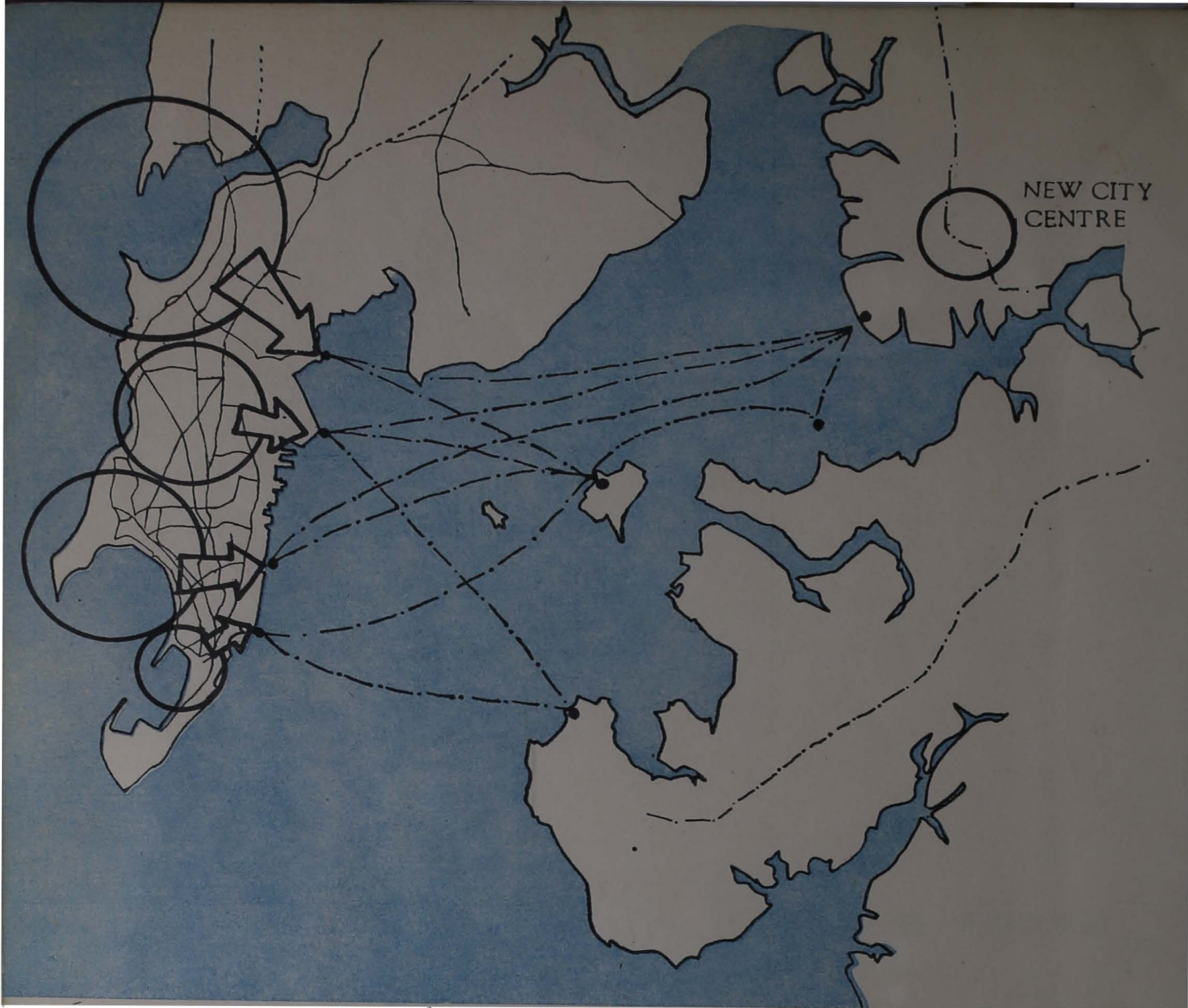
23. *Additional Road—Rail links to Bombay Docks.*

## STAGE 6

As development proceeds, the need will eventually be felt for more than one link between the mainland and the peninsula. The feasibility of a second bridge across the harbour exists from Trombay to Elephanta island and the mainland near the new dock area. Traffic coming over such a bridge into Trombay would have the choice of turning Northwards towards the new industrial areas and the suburbs or of skirting an area of 2,700 acres to be reclaimed between Wadala and Trombay (a proposal recommended by the study group on Greater Bombay) and moving directly into Frere Road and the Southern tip of the island. The large volume of traffic flowing over the bridge could thus be dispersed and the open areas available at Trombay would permit a spacious layout of fly-overs and intersections.

This area would then develop into a new self-sufficient city whose continual contact and exchange with the older city would be primarily for social, cultural and commercial reasons and not as a 'dormitory' area feeding the already overcrowded island.





**24.** *Effect of the New City on the Old.*

The new twin city of Bombay would be a city on the sea, with much of its traffic moving across the harbour. Citizens who formerly spent much of their time in the interior of the island and away from its shores would begin to experience the harbour and the sea as part of their everyday lives.

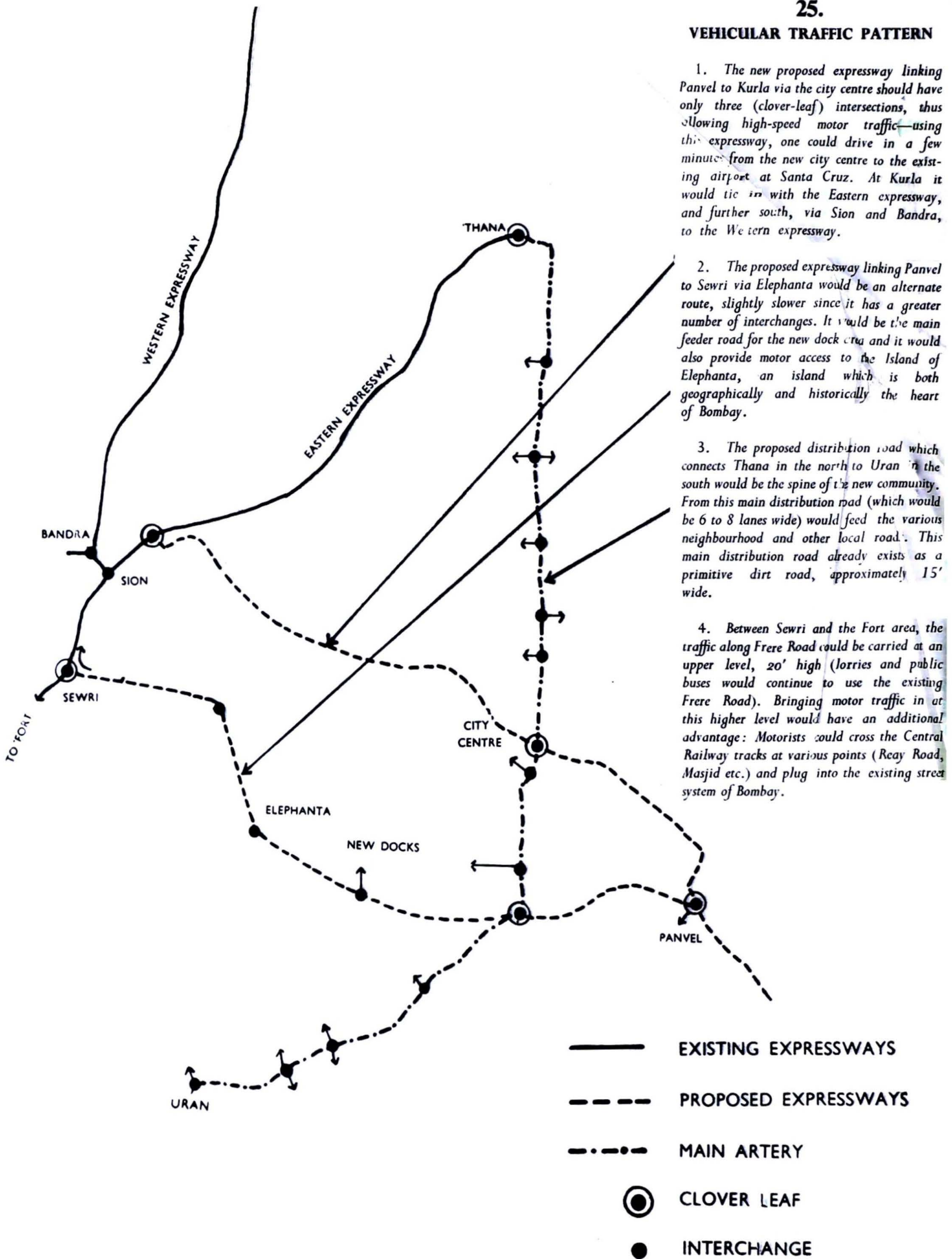
Elephanta, and with it a sense of the past, would stand in the centre of the twin city. Entering the harbour one would see the city on both sides on the one side extending over the island, and on the other rising above its shores into

the hills beyond. In the harbour and across the bridges one would see a constant and busy movement. Arriving from the mainland one would descend the hills into the new city, part of the capital of Maharashtra and beyond over a bridge and the harbour into the older city.

Within the older city, the East-West road would grow considerably in importance as they would become major arteries connecting the Western areas of the island with the waterfront along the harbour. Since these East-West roads

are less than one-tenth as long as the North-South arteries, the cost of widening them would be considerably less. Citizens from all over the island would use these East-West arteries to cross to the Eastern waterfront where would be located large, magnificent plazas which would act as focal points for the island. From these plazas one would board boats and motor launches to cross the harbour. One of them—Apollo Bunder—already exists; the other two—Wadala and Sewri—would be treated in a like manner.

**VEHICULAR TRAFFIC PATTERN**



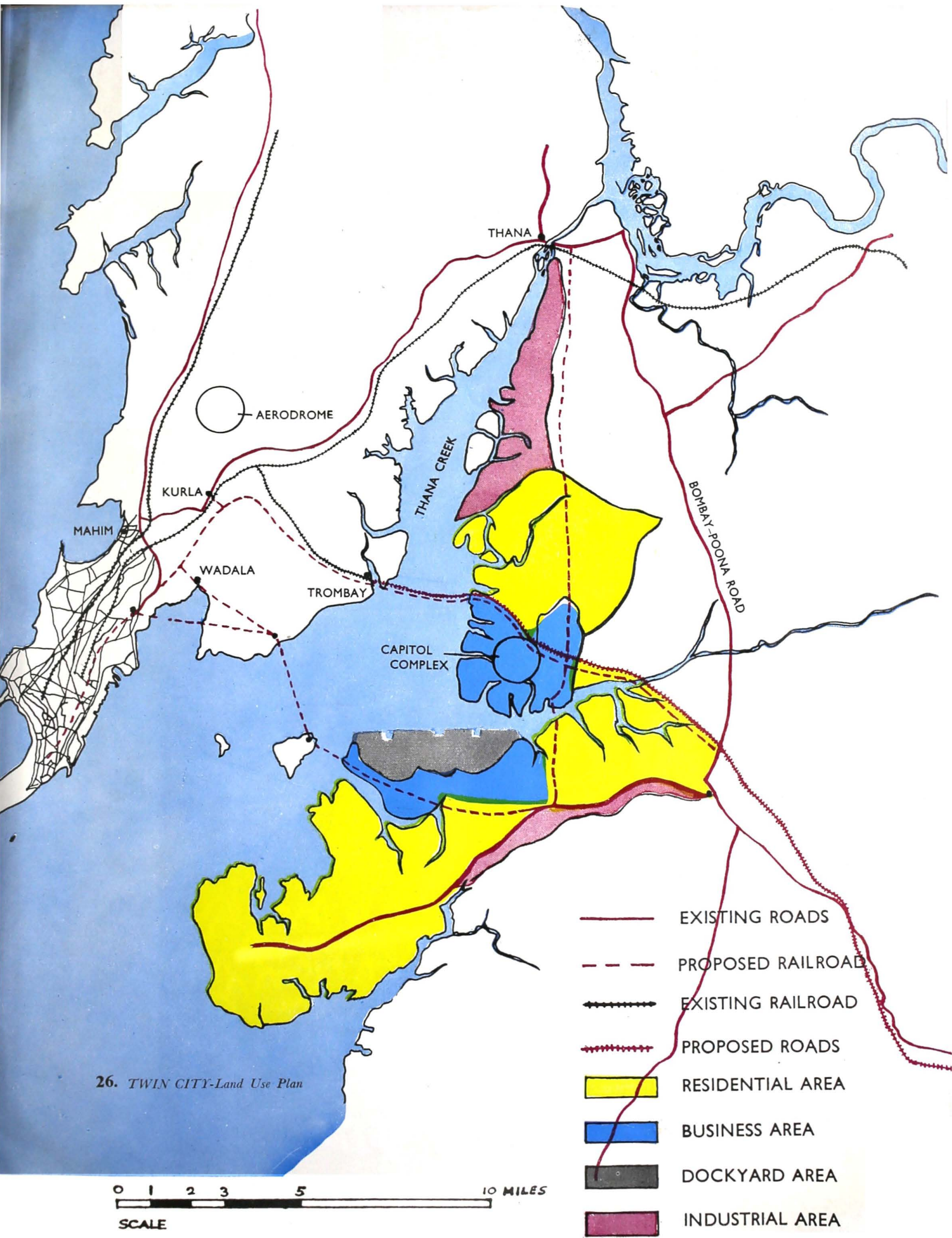
1. The new proposed expressway linking Panvel to Kurla via the city centre should have only three (clover-leaf) intersections, thus allowing high-speed motor traffic—using this expressway, one could drive in a few minutes from the new city centre to the existing airport at Santa Cruz. At Kurla it would tie in with the Eastern expressway, and further south, via Sion and Bandra, to the Western expressway.

2. The proposed expressway linking Panvel to Sewri via Elephanta would be an alternate route, slightly slower since it has a greater number of interchanges. It would be the main feeder road for the new dock area and it would also provide motor access to the Island of Elephanta, an island which is both geographically and historically the heart of Bombay.

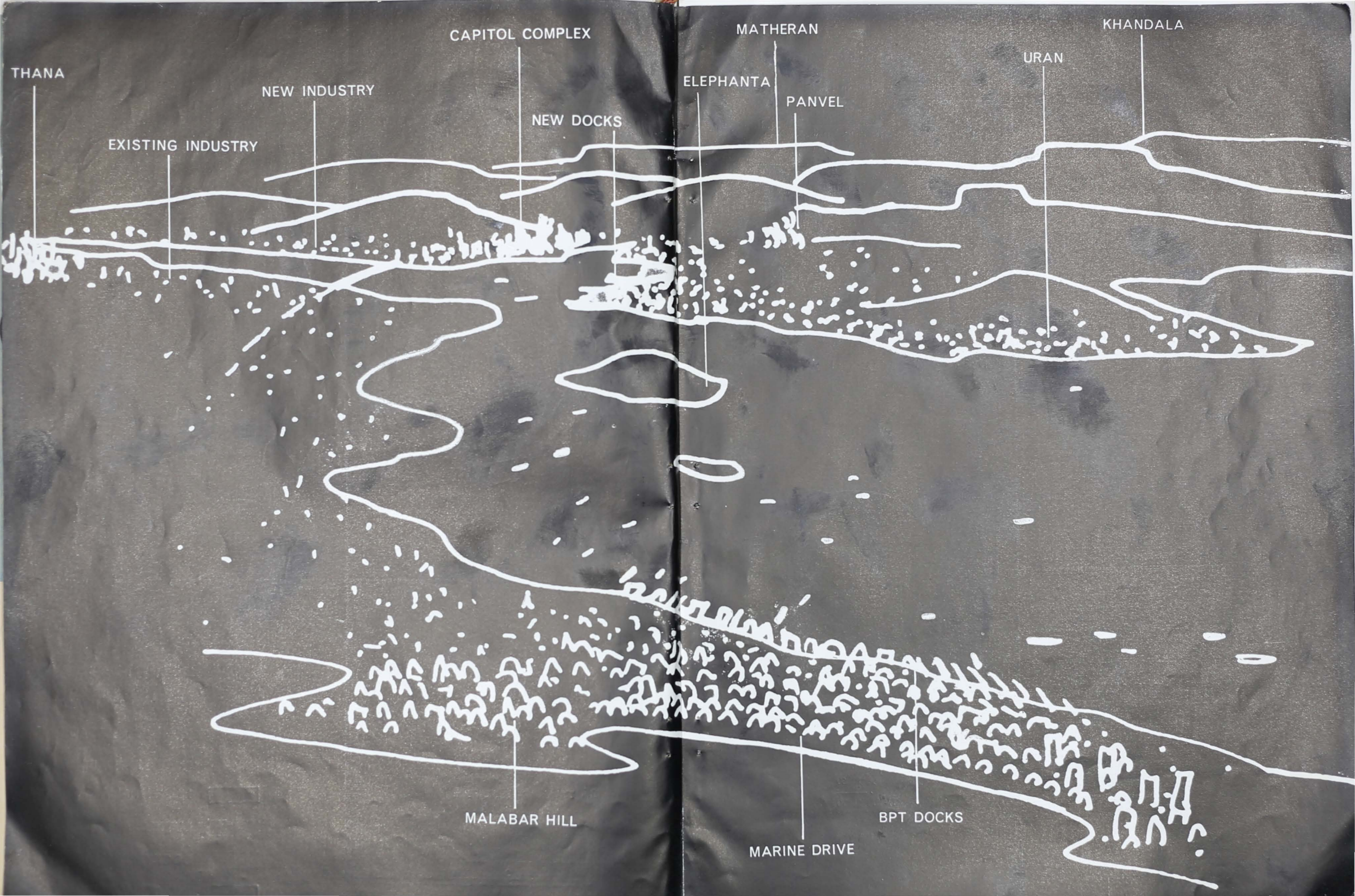
3. The proposed distribution road which connects Thana in the north to Uran in the south would be the spine of the new community. From this main distribution road (which would be 6 to 8 lanes wide) would feed the various neighbourhood and other local roads. This main distribution road already exists as a primitive dirt road, approximately 15' wide.

4. Between Sewri and the Fort area, the traffic along Frere Road could be carried at an upper level, 20' high (lorries and public buses would continue to use the existing Frere Road). Bringing motor traffic in at this higher level would have an additional advantage: Motorists could cross the Central Railway tracks at various points (Reay Road, Masjid etc.) and plug into the existing street system of Bombay.





26. TWIN CITY-Land Use Plan



◀ 27. The old city and the new

## Financial Outlay

### Planning and Policy

Planning and policy-making run a parallel course. Policy decisions on certain specific issues are pre-requisites for any development planning. Timid land policy, as displayed by our State and Central Governments, has jeopardised the effectiveness of many development plans. For example, although the present Bombay Municipal Master Plan recommended the freezing of prices at 1958 levels, they remain unfrozen. (This despite the notification of intent to prepare a master plan under the terms of the State's Town Planning Act.) One has only to look at the financial outlay of the plan to see the result: An enormous cost of acquisition of land for development ... 20% of the total development cost.

An official project report on the metropolitan development of regions around Bombay, prepared in 1962 by Mr. J. D. Daroga, Municipal Councillor, says in part:

"From our experience we know that after the merger of suburbs with Bombay in the year 1950 the land values in the suburbs have risen from Rs. 2,000/- per acre to Rs. 50,000/- per acre and this greatly hampered planned development in the Bombay area. It is, therefore, safe to assume that the price of land in this area (near Panvel) will also rise from the present price of less than Rs. 500/- per acre to at least Rs. 25,000/- per acre with a period of 10 years from the date of implementation of the scheme."

This lack of timely policy has led to the present urban chaos we see around us. The promised land of the five year plans threatens to disintegrate into vast slums; in the words of Lewis Mumford "as the pace of urbanisation increased the circle of devastation widened".

Serial No.	Amenity	Cost of		Total cost
		Acquisition	Development	
(Rs. in crores)				
1.	Primary Education	7.10	27.59	34.69
2.	Medical	5.64	13.11	18.75
3.	Public Health	0.99	0.33	1.32
4.	Housing	32.75	196.79	229.54
5.	Recreational	30.58	5.37	35.95
6.	Markets	3.88	9.23	13.11
7.	Industrial	12.34	95.04	107.38
8.	Water Supply	5.00	132.58	137.58
9.	Sewerage	3.07	55.00	58.07
10.	Communications	20.14	30.08	50.32
11.	Miscellaneous	4.88	7.03	11.91
Total		126.37	572.15	699.52

It is remarkable that in the Municipal Master Plan nearly a quarter of the total development cost is for land acquisition. Obviously this acquisition cost will be very much less for development across the creek. As regards the other costs for development in the city and suburbs, these are a function of the square mile areas to be developed and the number of additional people to be accommodated. We can assume that the influx of people into the city over the next 20 years will be the same regardless of whether they are accommodated on the peninsula or across the creek.

Consequently, the development costs will be practically identical for either location, and the only additional costs for the alternative plan would be for land reclamation and for the major bridges and highways. These costs would be approximately as follows:

	Rs. in crores
Kurla-Karjat Road Bridge (cost being incurred anyway) . . .	2.50
Kurla-Karjat Rail Link . . .	10.00
Elephanta Bridge including approaches . . .	28.00
Reclamation of land:	
1. Creek area—Wadala and Chembur . . .	5.70
2. 10 sq. miles low-lying land . . .	12.50
Total . . .	<u>58.70</u>

## To sum up:

- It is most important that any development plan should look beyond its immediate period to the patterns it will establish for future growth. The north-south choking of traffic needs to be relieved by east-west arteries. And if one considers the broad aspects of the development of the State, a city across the creek would obviously stimulate much better growth into the hinterland than development on the relatively isolated peninsula.
- Obviously, cost would be approximately the same for development across the creek as on the mainland. Consequently the idea of development across the creek cannot be lightly dismissed as "too costly" unless a fair and detailed comparison is first made; nor is it valid to plead that the municipal limits do not extend beyond the creek, since the municipality has over the years successfully extended its limits northwards and there is no reason why they cannot go eastwards.
- The development of a new capital across the water will entail the shifting of several government and business offices which are at present housed in the Fort area. This exodus will release large areas of office space, housing, etc. in the Fort area which can be used for relieving congestion and thus greatly reduce the pressures on the island.
- We cannot postpone this decision of whether or not there should be a major urban development on the mainland. At the present moment the land is untouched and the prices are low; if we wait until the satellite towns are formed, then the land prices will rise and a disorderly conglomeration of factories and houses will cover the area, thus rendering any future coherent development prohibitively expensive, and thus improbable.

### **3. CURRENT PROPOSALS**

## a—Municipal Plan

### 1. Objectives :

Considering that the future of a great metropolis is involved, the Municipal Master Plan is surprisingly myopic in its objectives. Now, any Master Plan has both short-term and long-term objectives. The most important among long-term objectives is to give the city a structural pattern which will endure beyond the immediate Plan and will serve as a basis for the future plans which must follow. At the end of 20 years the city's population will be double its present figure. That the Municipal Master Plan may fail is probable; that it will have done nothing towards future growth is certain.

Instead of boldly altering the North-South pattern of Bombay, the Municipal planners have in fact outlined a series of proposals which will merely stretch the existing pattern even further. As could have been expected, the new Plan has been greeted with an even higher rise in land-values in the Southern part of the city.

### 2. Population Growth :

It should be emphasised that although the Bombay Municipality is responsible for the Development Plan they have prepared, they are not responsible for the growth of population. It seems that a grave misconception of this fact exists. The argument is as follows: "Bombay is a city of 4½ million people and we are crowded. Now the Municipality proposes to increase it to 8 or 9 million". In fact the Municipality is *not* responsible for the population increase, for the city is going to grow to 9 million regardless of whether or not the Municipality prepares a Plan.

### 3. Density Control :

The system of floor space indices to control building heights on a given plot and the encouragement of high rise development to allow more open spaces, are means of controlling built-up areas; but these will not control the number of apartments in a building or how small they might be, nor will they prevent two or more families from sharing a single tenement. As long as the South remains the most important area, people will prefer to live there even in overcrowded conditions. The experience of other cities has shown that the objective of controlling density is difficult to achieve unless the inducement for development away from the centre is formulated in realistic terms.

### 4. Mahim Centre :

With regard to establishing a second business centre at Mahim the main disadvantages are :

## 28. PROPOSED MAHIM BUSINESS CENTRE

THE MUNICIPAL CORPORATION 'DEVELOPMENT' PLAN - 1964



For instance in 1941 the population of Bombay island (the area south of Mahim-Sion) was 15 lacs and that of the suburbs was 2 lacs. One of the objectives of the 1948 Modak-Mayer Municipal Plan was to permanently limit the population of the island to 20 lacs, and to accommodate all further increase in the suburbs. In 1961, thirteen years later, the population of the island was 28 lacs, that of the suburbs 14 lacs. The Planners' objectives in wanting to limit the population on the island were perfectly laudable. Their failure was in not recognising how much the Fort is the focus of all activities in Bombay and how strongly a centre attracts people.

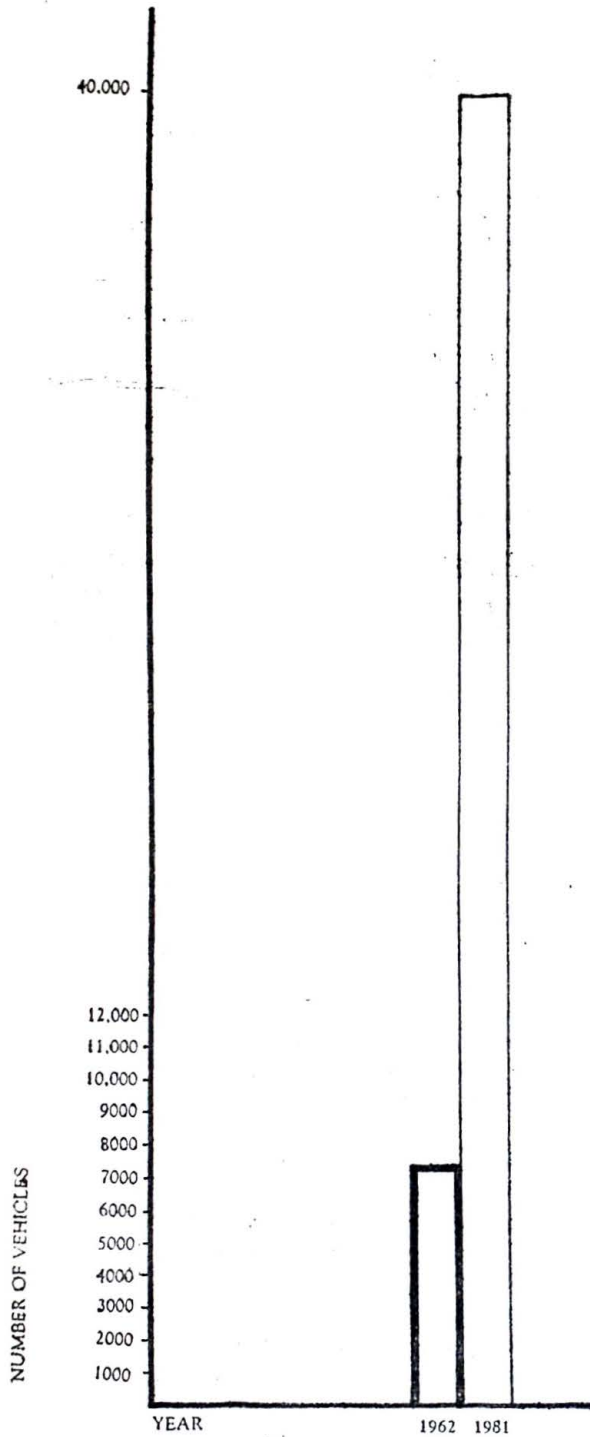
- (a) The area on which it is to be located is wedged between two existing built-up areas and consequently expansion to meet the needs of a growing city would be impossible. (Maximum area available is 0.7 sq. miles only).
- (b) Clearly the Mahim Centre can only be developed as a centre of secondary importance subsidiary to the main centre in the South. Congestion in the Southern part of the island would continue to increase.
- (c) There would necessarily be a heavy exchange of traffic between this Centre and the Fort area and because the new Centre lies on the North-South axis of the island this would only add to and aggravate the difficulty of existing North-South traffic.

## b—Wilbur Smith Report

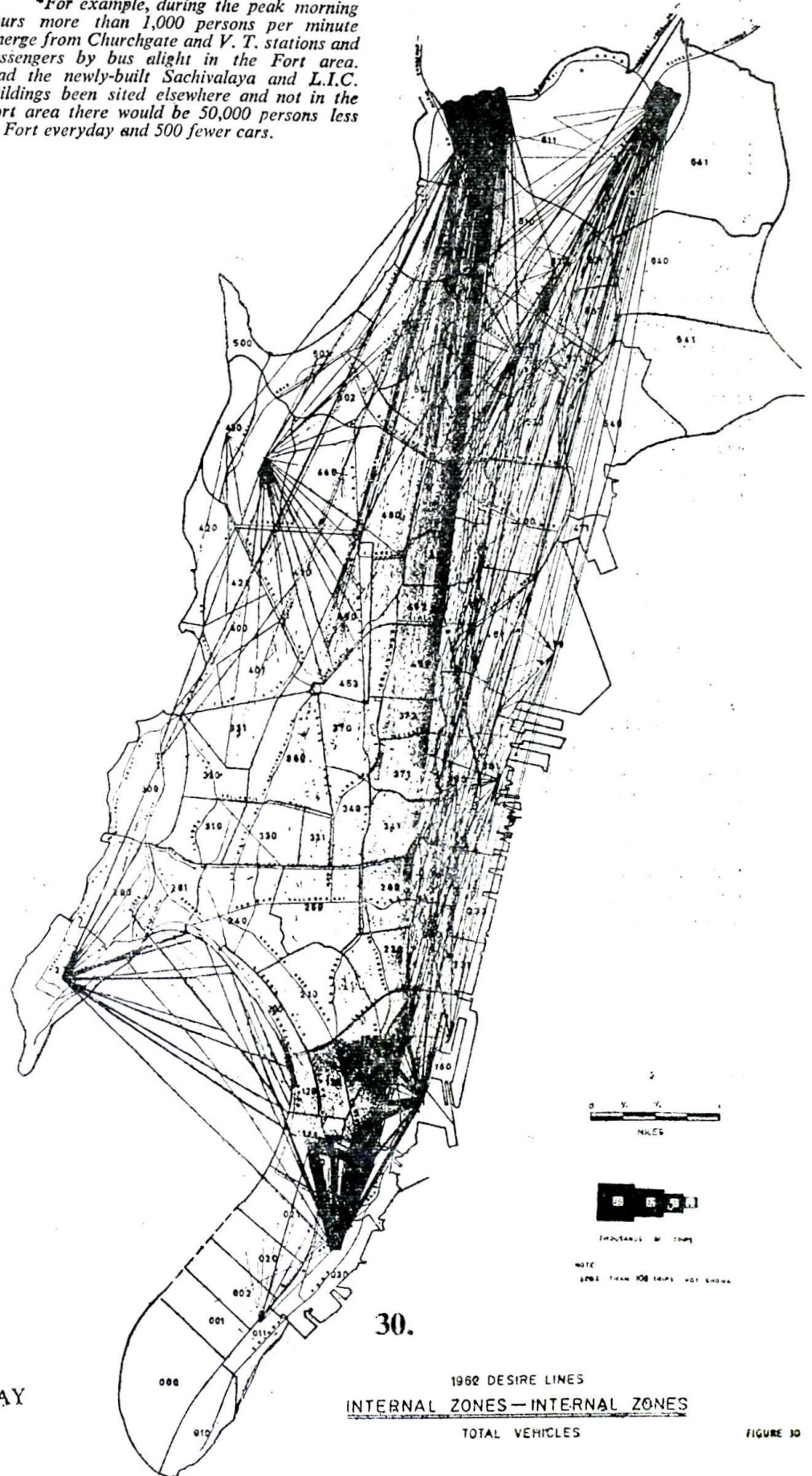
Land-use is the most powerful tool in the planner's hands for controlling traffic. By prescribing land-use, the planner determines which areas shall be for business and which for industry and which for avenues and which for parks, and thereby determines the patterns of movement in the city.\* Thus the plan for traffic cannot be divorced from the overall plan of land-use and densities. Indeed, because of this complex inter-relation they are usually studied

simultaneously. A traffic study brings to light much information concerning desire lines and traffic patterns. This information is then used by the planner to modify the land-use pattern he is

*\*For example, during the peak morning hours more than 1,000 persons per minute emerge from Churchgate and V. T. stations and passengers by bus alight in the Fort area. Had the newly-built Sachivalaya and L.I.C. buildings been sited elsewhere and not in the Fort area there would be 50,000 persons less in Fort everyday and 500 fewer cars.*

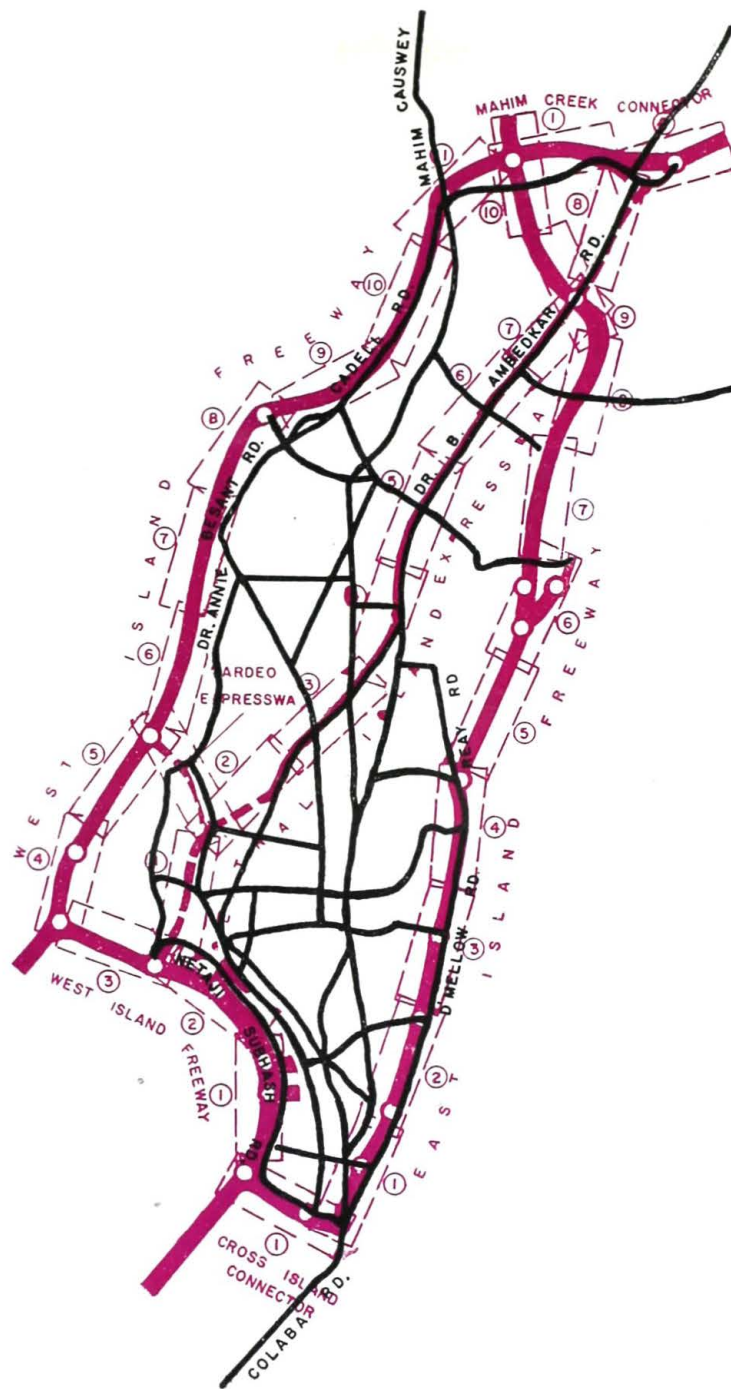


29. TRAFFIC FROM OUTSIDE BOMBAY (FAST VEHICLES) 1962 AND 1981



30. 1962 DESIRE LINES INTERNAL ZONES—INTERNAL ZONES TOTAL VEHICLES

FIGURE 30



31. Functional Plan—Bombay Island

creating. The new modified patterns are then fed back to the traffic consultant for further studies, and so forth. Unfortunately, Wilbur Smith & Associates, a firm of American Consultants, was allowed to play no such role in the Master Plan prepared by the Municipality. For in the case of Bombay, the land-use was pre-determined and the function of the Wilbur Smith study was reduced to that of merely relieving traffic pains.

Within this limited frame of reference the Traffic Consultants have made the following proposals:

1. Freeways along the East and West sides of the island which carry fast motor traffic between the suburbs and the Fort area.

2. A cross island freeway connecting the Eastern and Western sides of the island.

3. Several gradient intersections, e.g. tunnels at Kemp's Corner and Princess Street, a tunnel under Malabar Hill, etc.

4. Automatic traffic control lights at important city intersections (e.g. Flora Fountain, Dhobi Talao etc.).

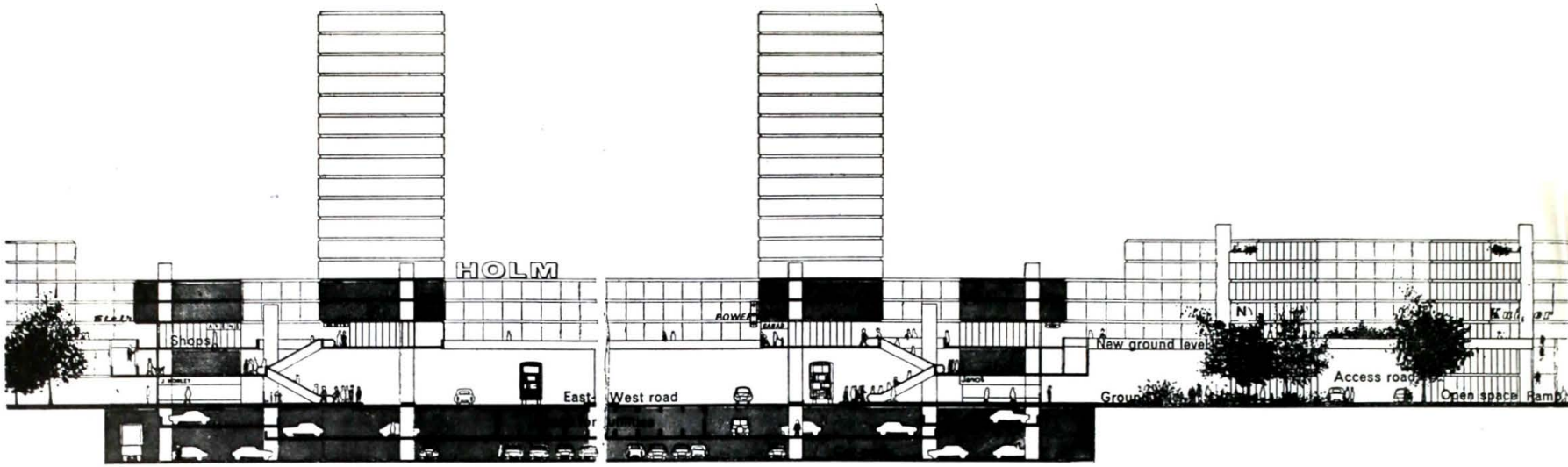
The total cost of these proposals is Rs. 95.92 crores. The accompanying table shows a detailed break-down of these costs; it would seem that the possibility of constructing some of the freeways (e.g. the West island freeway) can be met either by the State Government or by a system of tolls.

But apart from the proposals of the Wilbur Smith Report for easing vehicular traffic flow it must also be recognised that there is a problem of handling pedestrian traffic as well. Development according to the Municipal Plan will result in not only more cars in the Fort area but also more pedestrians.

**Costs of Wilbur Smith Proposals**

	Rs. in crores
1. East Island Freeway (8.9 miles) .. ..	32.88
2. Cross Island Connectors (2.8 miles) .. ..	6.54
3. West Island Freeway (10.3 miles) including Malabar Hill Tunnel ..	24.12
4. Western Expressway widening and grade-separated interchanges (4 miles) .. ..	1.35
5. Eastern Expressway widening and grade-separated interchanges (2.5 miles) .. ..	1.02
6. Tardeo Expressway (0.7 mile) .. ..	1.97
7. Central Island Expressway (7.7 miles) .. ..	5.74
8. Sewri Expressway (4.9 miles) .. ..	4.16
9. Major Street Improvements .. ..	18.14
Total	<u>95.92</u>



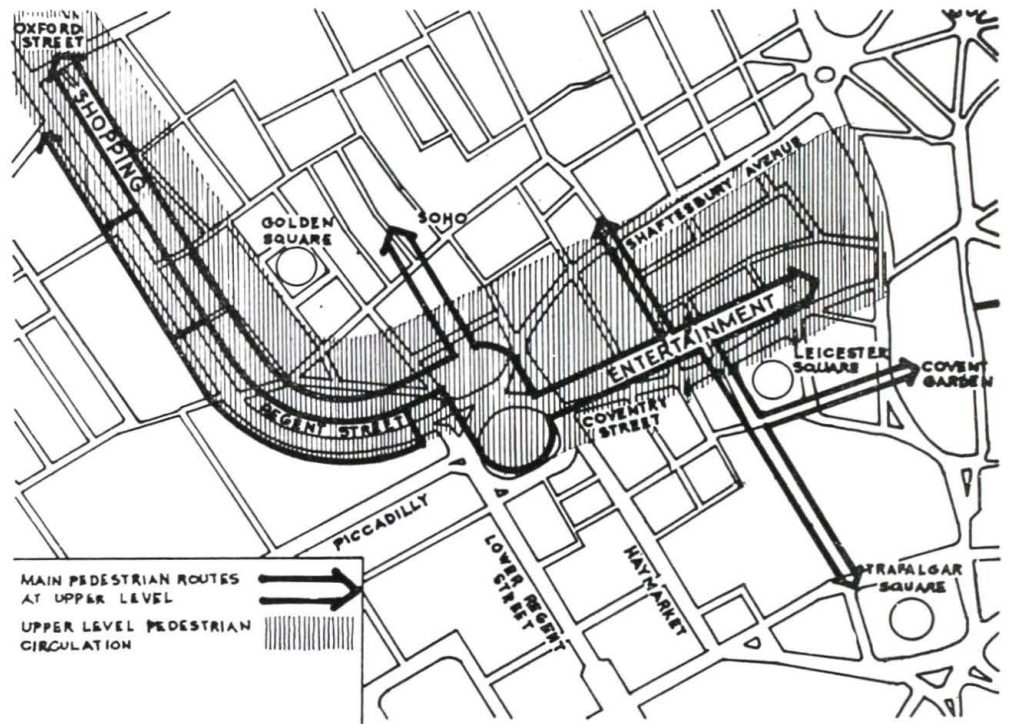


The need to separate motor traffic from pedestrian areas is now generally accepted; so also is the need, in crowded areas, to think of buildings and traffic together and not as separate entities. The Buchanan Report, recently published in Britain, put forward several suggestions concerning this (Fig. 32). In dealing with problems at this smaller scale, the feed-back between planner and traffic consultant is as vital as it is in the overall picture.

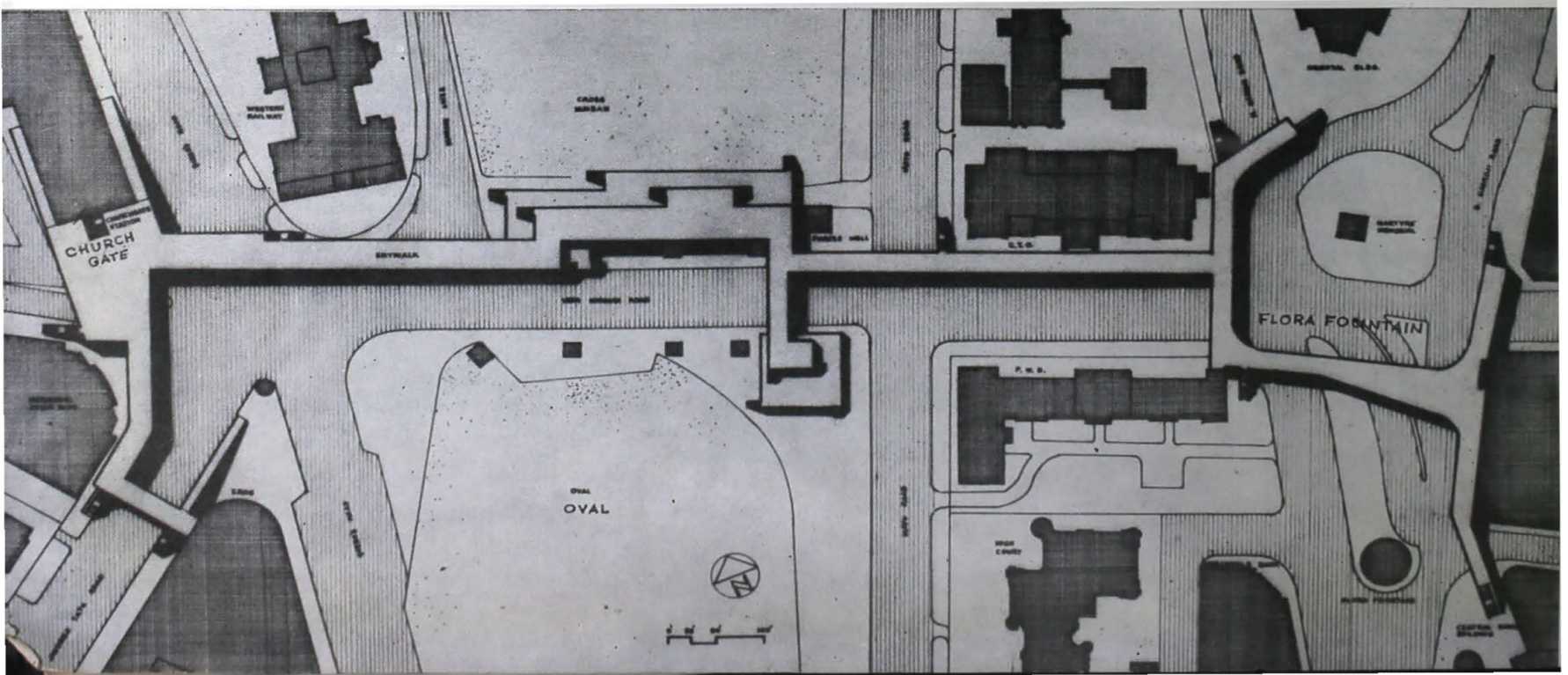
Figure 34 shows an elevated pedestrian way (called a "skywalk") which was proposed about a year ago for the Fort area in Bombay, linking Churchgate to Flora Fountain. As we go to press, it is announced in the *London Times* May 1, 1965 that the British Government has decided to construct a similar scheme at Picadilly Circus (Fig. 33). Like the Bombay skywalk, the London scheme proposes shopping facilities at a height of 10', surmounted by a pedestrian walk at a height of 20'; the ground floor level will be devoted to the rapidly increasing traffic. Escalators will be used to carry people to the upper levels.

32. *Traffic Separation by use of Levels*

33. *Proposed Elevated Pedestrian Walk at Picadilly Circus, London*



34. *Proposed Elevated Pedestrian Walk from Churchgate to Flora Fountain, Bombay*



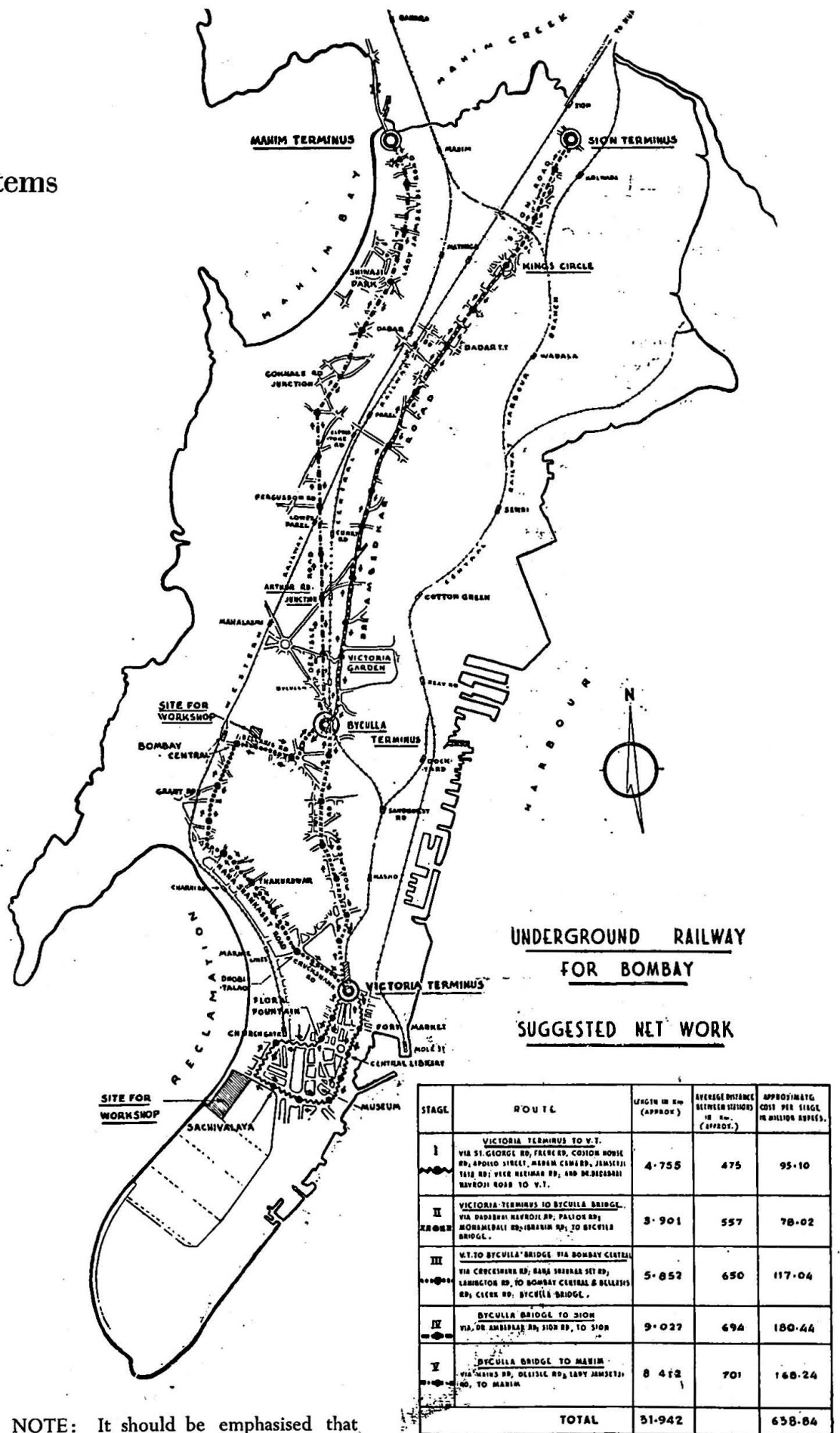
## c—Other Transport Systems

The accompanying drawing outlines a proposal for an underground railway for the Island of Bombay. This particular proposal (Fig. 35) which was prepared by Mr. P. G. Patankar of the B.E.S.T. estimates the costs of the underground railway at Rs. 2 crores per mile. There has been some controversy over this figure and many engineers feel the cost will not be less than Rs. 4 crores per mile.

Besides the underground railway there are several other systems of mass transportation, other than buses and suburban railways, which merit investigation; for instance the monorail which is increasingly being used abroad at costs competitive with and often cheaper than the underground railway. In Bombay it would also be possible to use fast ferry boat services using perhaps hydro foils or hovercraft along the eastern and western sides of the Island and across the harbour. It is important that all these systems be investigated in terms of costs and also in terms of their sociological consequences. (For instance, with the pavement dweller problem that we have in Bombay the problem of policing an underground railway would be considerable.)

With regard to cost, it is not only the initial investment that must be considered but also all direct and indirect operating costs. A realistic estimate of the running cost per passenger mile for an underground railway should be compared with the equivalent figures for mass surface transport by bus and for mass surface transport by suburban railway. It is essential that such a comparative study be made though it is not intended to suggest that the underground railway proposal should be ruled out because operating it may be costlier than operating buses or suburban trains. When the capacities of these older systems are exhausted there is no option but to adopt more expensive systems to handle additional traffic.

If an underground railway is constructed in Bombay it would be possible to connect it under the harbour to the mainland to a new city centre on the mainland. The distance between Fort and the new centre on the mainland would be approximately 11 miles and the time required to traverse this distance would be approximately 15 to 20 minutes.



NOTE: It should be emphasised that the construction of additional transport facilities would not affect the land-use pattern determined by the Planners for the city. These new facilities would consequently serve merely to ease existing traffic tensions and the new tensions created by the land-use pattern. If land-use patterns could be more thoughtfully established many traffic problems might be prevented from arising at all. The need for new and expensive transport facilities could thus be minimised.

35. Proposed Underground Railway

## d—Bridges

### A. Thana Creek Bridge:

In order to provide a direct connection between Bombay and the mainland (and incidentally reduce the road and rail distance from Bombay to Poona) the Barve Report of 1956 recommended the construction of a new bridge linking Chembur to Panvel, across the Thana Creek.

As mentioned earlier the Barve Report of 1956 recommended the construction of this bridge with the objective of opening up the mainland.

In order to fulfil this function, it is imperative that such a bridge carries not less than 6 lanes of motor traffic, with separate lanes for bullock carts and pedestrians. Only then will the bold objective of opening up the mainland be realised. Unfortunately, the bridge which the P.W.D. is now constructing falls far short of this requirement. The overall width is 44 ft., without any additional provision for foot-paths. Quite obviously there will be a heavy traffic of pedestrians over the bridge as well as bullock-carts, trucks and fast motor vehicles. The conditions of mixed traffic which cause severe slow-downs in traffic flow will exist, and the capacity of the

bridge will consequently be much less than its width of 44 ft. would suggest.

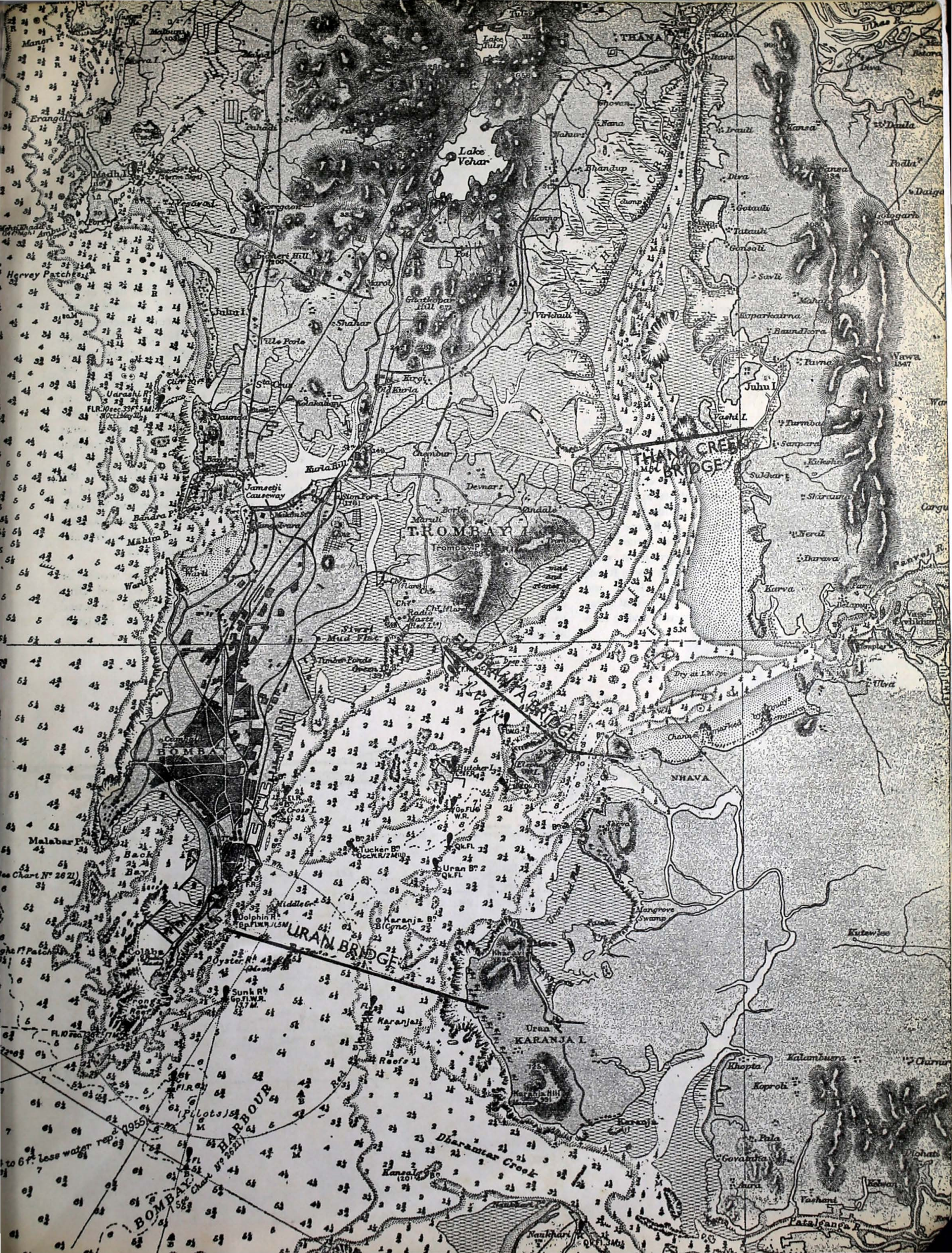
Further, the new bridge is being built with a clearance of only 30 ft. above sea level. This means that even the smaller country craft, of which there is a steady traffic on the creek at present, will have to lower their sails to get through. Larger country craft will have to lower not only their sails but their masts as well. If the craft are unfortunate enough to be caught on the wrong tide or with unfavourable winds, they may have to wait up to six hours before crossing under the bridge. Taking through taller craft such as medium-sized ferry boats or coastal steamers will of course be out of the question.

Whatever plans are evolved for the development of Bombay and the mainland, it is fairly obvious that the nine-mile stretch of coast on both sides of the creek between Thana and the new bridge will undergo extensive industrial development. The new bridge with its 30 ft. clearance will permanently deny these industries the facility of direct loading on country craft or coastal steamers or coastal tankers for receipt or shipment of goods. It will also not be possible to move people in and out of this area on ferries.

### 37. *Location of Proposed Bridges in Bombay Harbour (water depths marked in fathoms)*



36. *Approaches to the Verrazano-Narrows Bridge, New York*



**B. The Uran Bridge:**

A bridge has been proposed which would connect the mainland at Uran with the Fort area, a distance of 6 miles. The proposal ( Fig. 38 ) is that the bridge has a series of clear spans each of one mile. This would constitute the longest spans of any suspension bridge anywhere in the world, and there is no doubt that the bridge would be an expensive one. Furthermore, the Wilbur-Smith Report has established that a bridge at this point would fail to generate a volume of traffic between Fort and Uran sufficient to justify its construction.

In making a decision on the Uran Bridge, other factors will also need to be considered:

1. The capacity of a bridge is dictated not so much by the number of lanes it carries as by the capacity and efficiency of its approaches. The Howrah Bridge in Calcutta suffers considerably from the inadequacy of its approaches. Similarly, it must be realised that the traffic coming in over an 8-lane Uran Bridge would have to be forced into one of the four Northward main exits from the Fort area, which are Frere Road, Mohamedali Road, Queen's Road and Marine Drive. It is unthinkable that these streets can carry much more traffic than they do already.

2. In order to clear shipping the Uran Bridge would need a clearance above sea level of 165 ft. This would bring traffic in somewhere near Apollo Bunder at the height of a 15-storey building. Thereafter the bridge would need to have access ramps and spirals to descend to the lower levels. According to current planning standards these access ramps would occupy an area of 40 acres. At the prevailing land price of Rs. 5,000/- per sq.yd. in the Fort area, this would mean a cost of Rs. 100 crores for land acquisition alone. Also since the Fort area is at present almost completely built up, these bridge approaches would require the existing construction to be entirely devastated. An example of the extensive nature of bridge ramps can be seen from the accompanying photograph of the bridge recently completed at Verrazano-Narrows, New York. (Fig. 36)

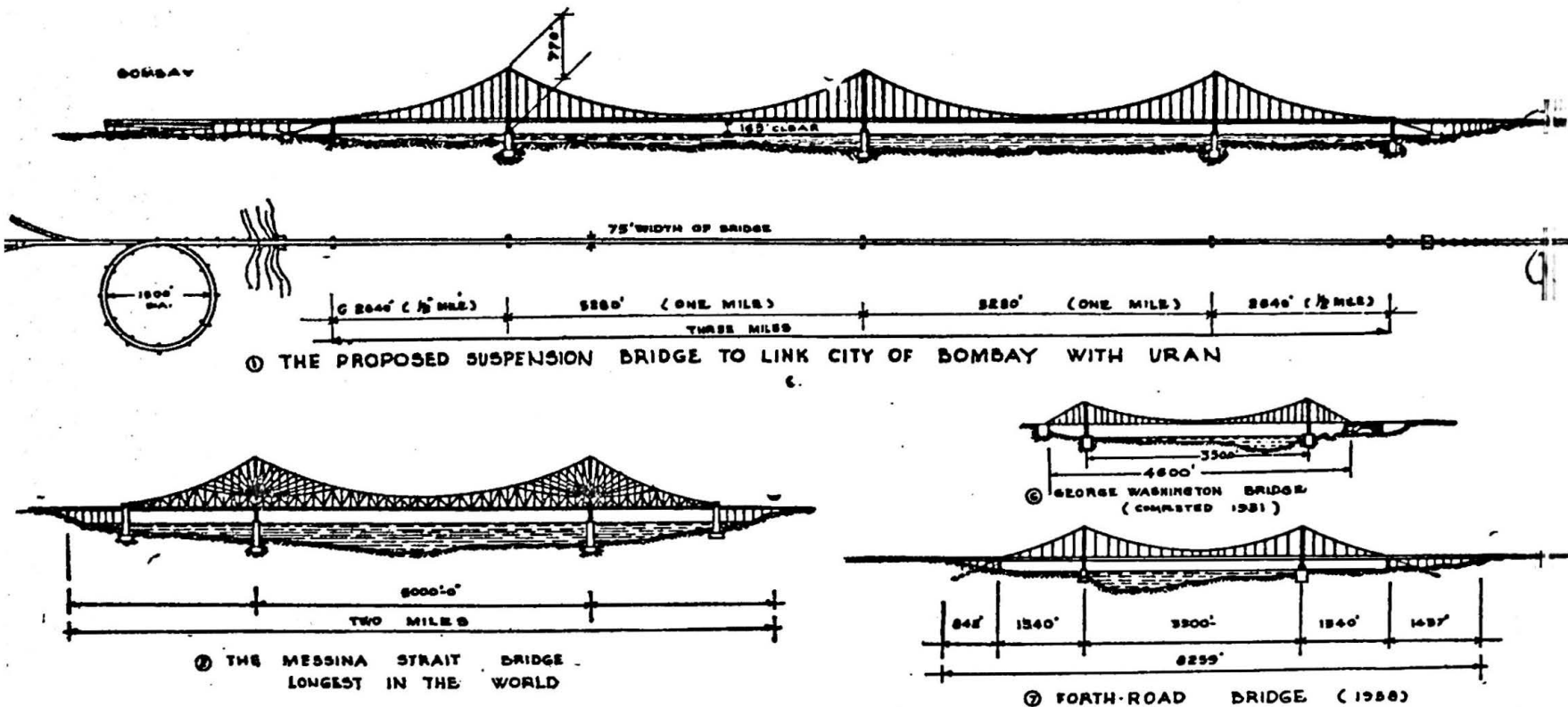
3. It is misleading to suggest that the Uran Bridge would divert traffic East-West from the North-South pattern of traffic flow in the island. In fact the bridge would extend the North-South flow by continuing it longitudinally past the Fort area. Not only would the new bridge bring more traffic into the already congested Fort area but it would mean that traffic from Uran, desiring to go to the North of Bombay, would necessarily have to traverse the Fort.

In conclusion, it is evident that the proposed Uran Bridge would be an irrational step to take at this moment. Its construction can only be justified at a later stage in the development of the region, i.e., when the mainland is developed sufficiently to generate the quantity of traffic which makes such a line of communication imperative.

**C. Elephanta Bridge:**

As the traffic between the new centre and the existing city of Bombay grows in volume, it will become necessary to construct a new bridge. The most suitable location for this bridge would be from Pir Pau Pier at Trombay to the mainland opposite, via Elephanta Island. There would be little difficulty in constructing the approaches to this bridge since at Trombay large areas comparatively free of any construction are available. Traffic here could be readily dispersed. It would have the choice of turning directly northward to the suburbs via the Eastern and Western Expressways or of taking a road skirting the Sewri mud flat directly to Wadala, Frere Road and the Fort area.

The length of the bridge would be roughly 2/3 that of the proposed Uran Bridge and foundations would be found at a shallower depth below sea-level. (Fig. 37)



38. Comparative Magnitude of Suspension Bridges  
(all drawn to identical scale.)

“Cities are a product of time .

They are molds in which men’s lifetimes have cooled and congealed,  
giving lasting shape,

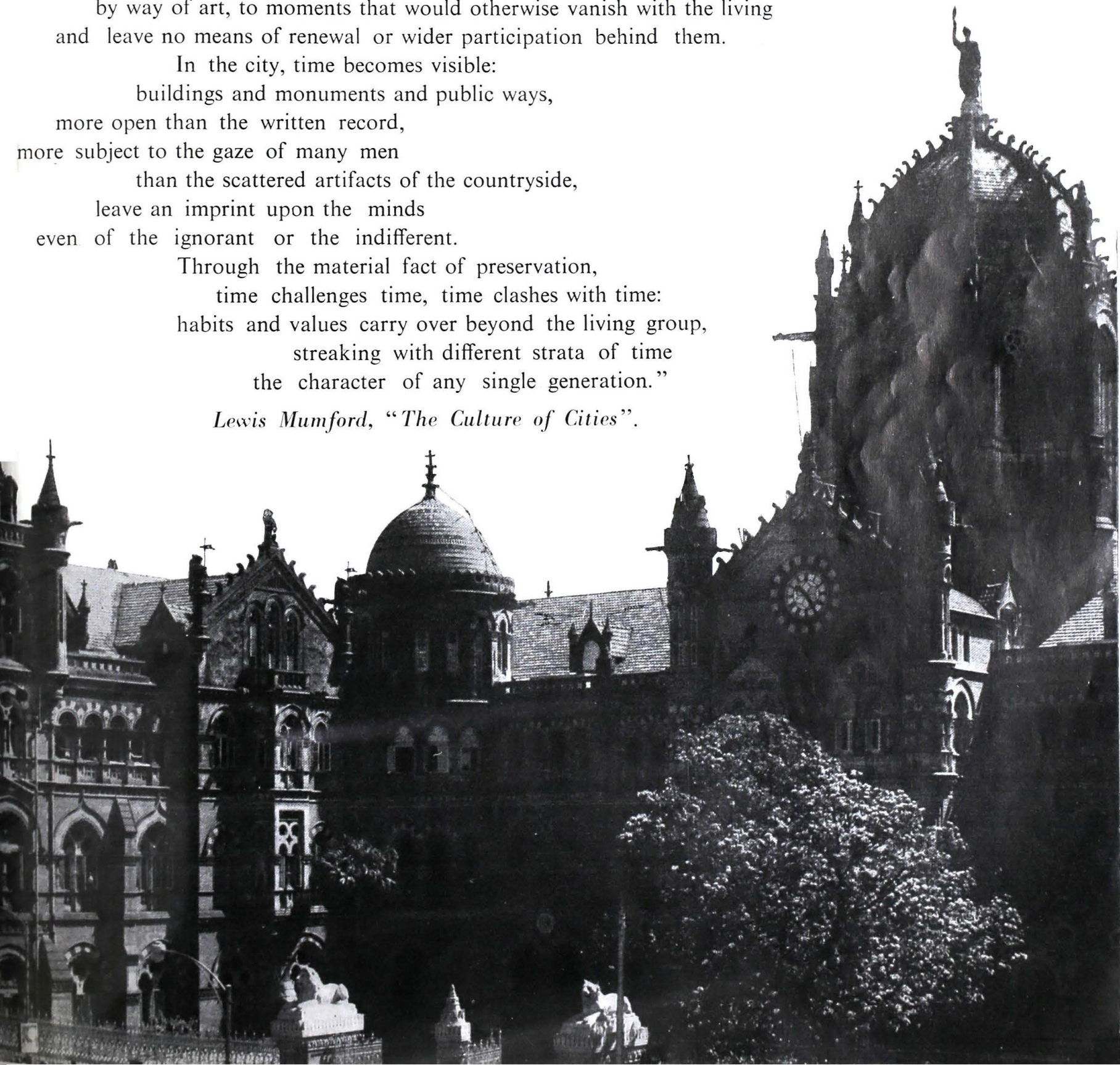
by way of art, to moments that would otherwise vanish with the living  
and leave no means of renewal or wider participation behind them.

In the city, time becomes visible:

buildings and monuments and public ways,  
more open than the written record,  
more subject to the gaze of many men  
than the scattered artifacts of the countryside,  
leave an imprint upon the minds  
even of the ignorant or the indifferent.

Through the material fact of preservation,  
time challenges time, time clashes with time:  
habits and values carry over beyond the living group,  
streaking with different strata of time  
the character of any single generation.”

*Lewis Mumford, “The Culture of Cities”.*



“Cities are a product of the earth.  
They reflect the peasant’s cunning in dominating the earth.  
Every phase of life in  
the countryside contributes to the existence of cities. What the shepherd,  
the woodman, and the miner know, becomes transformed and “etherealized”  
through the city into durable elements in the  
human heritage : the textiles and butter of one,  
the moats and dams and wooden pipes  
and lathes of another, the metals and jewels  
of the third, are finally converted into  
instruments of urban living: underpinning  
the city’s economic existence, contributing art  
and wisdom to its daily routine. Within the city  
the essence of each type of soil and labour and  
economic goal is concentrated: thus arise greater possibilities  
for interchange and for new combinations not  
given in the isolation of their original habitats.”

*Lewis Mumford, “The Culture of Cities”.*



Bombay—1870



Bombay—1965



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Within the borders of our urban centres  
can be found the most impressive achievements of man’s skill  
and the highest expressions of man’s spirit, as well as the worst  
examples of degradation and cruelty and misery  
to be found in modern America.

The city is not an assembly of shops and buildings.  
It is not a collection of goods and services.

It is a community for the enrichment  
of the life of man. It is a place for the satisfaction of man’s most  
urgent needs and his highest aspirations. It is an instrument  
for the advance of civilisation.....

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I want to begin that process today.”

*From a message to the Congress by President Lyndon B. Johnson March 2, 1965*

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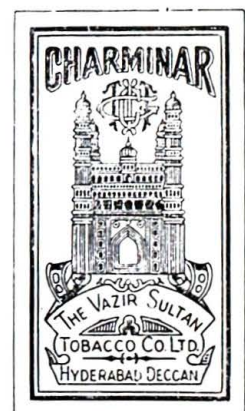
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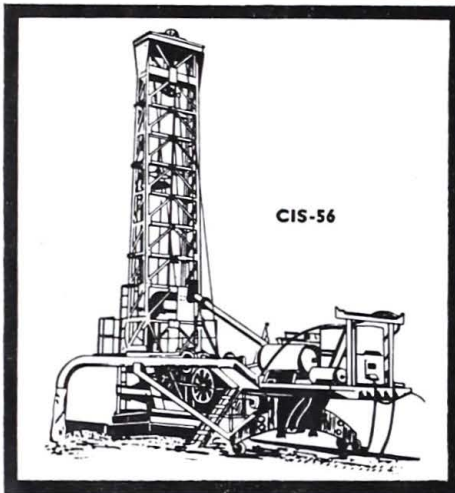
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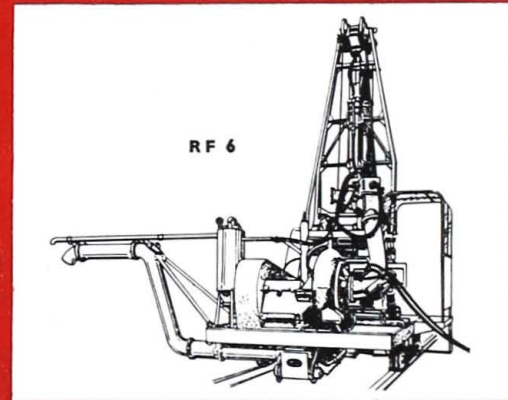
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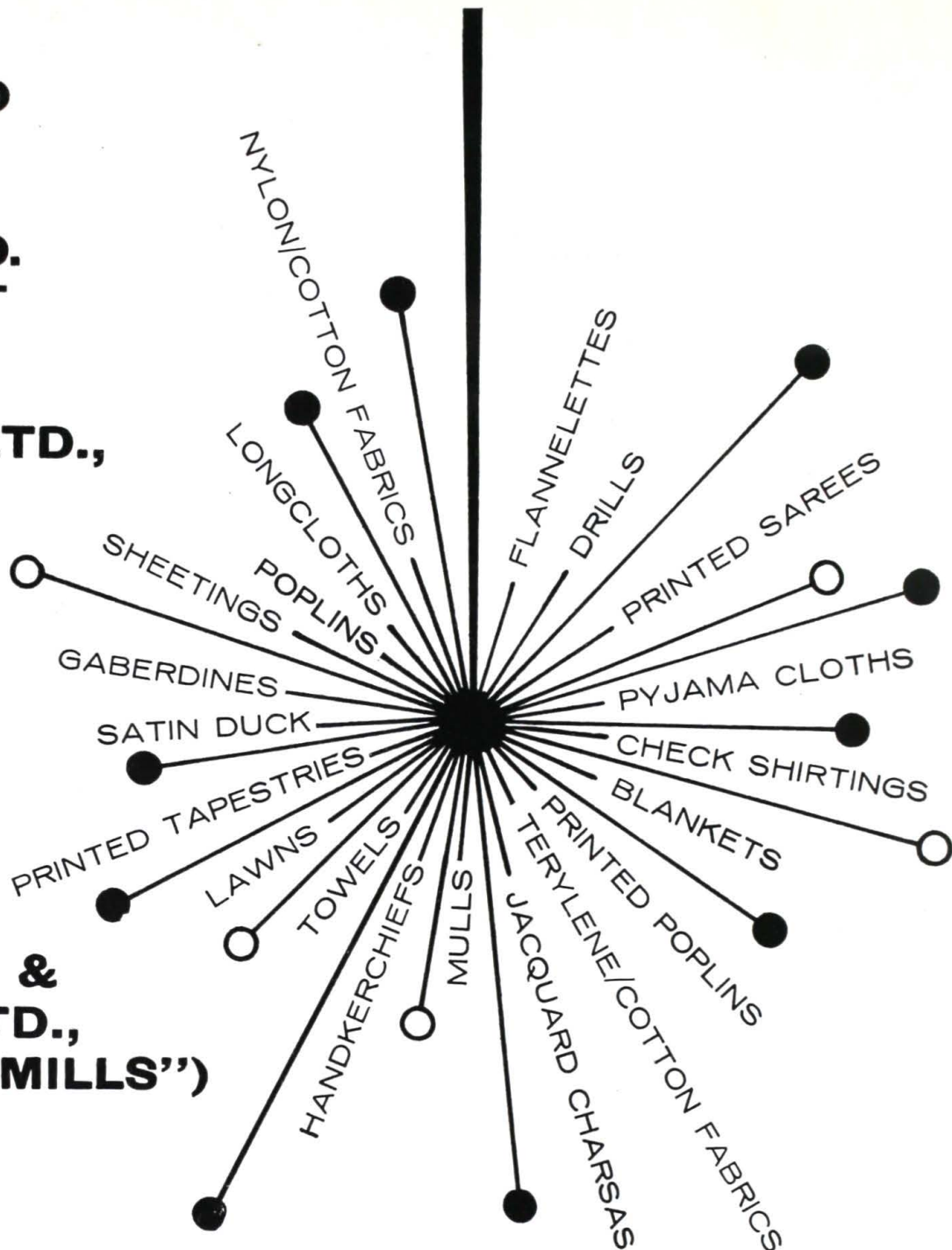
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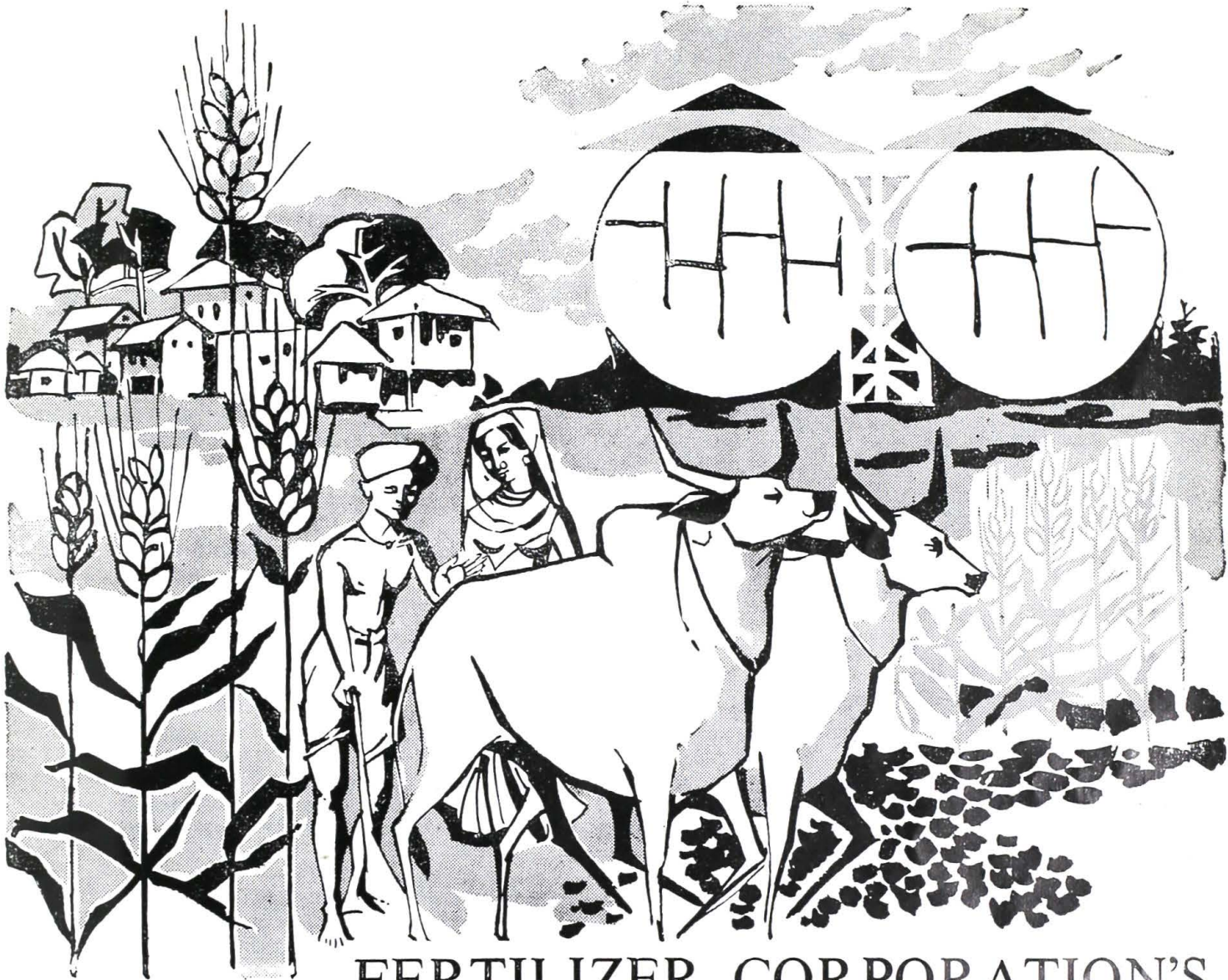
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7. Any change in normal bowel habits

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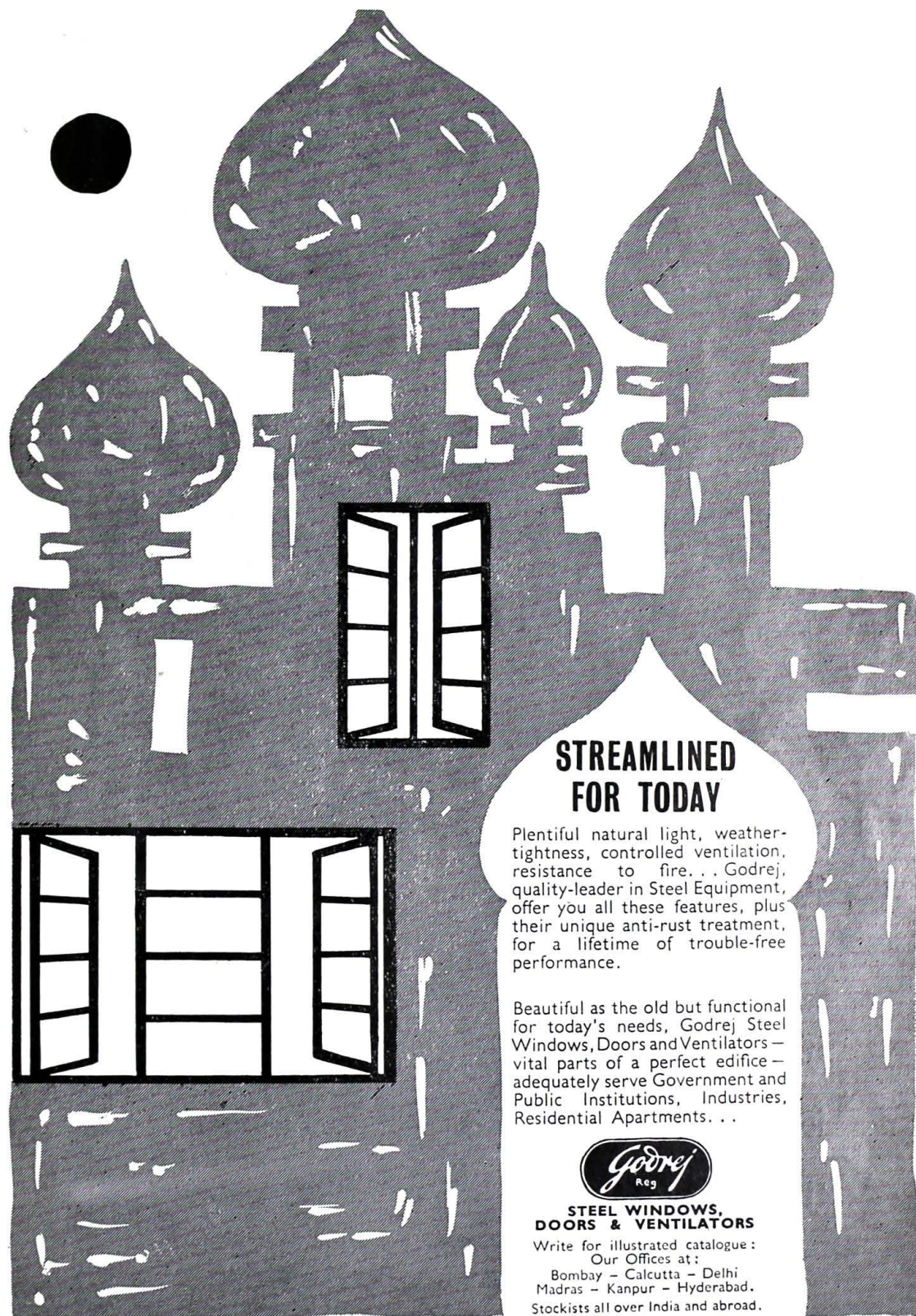
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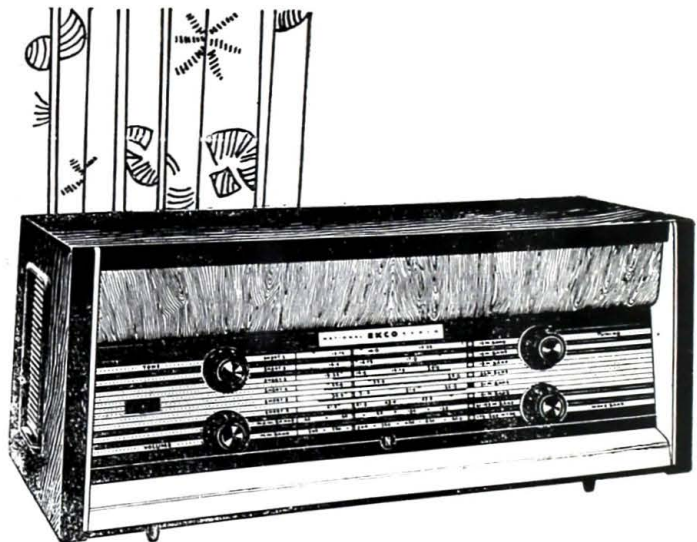
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## WONDER WORLD OF COMMUNICATION NO: 6

The Electric Eel (*electrophorus electricus*) has a highly developed system of navigation in the dark ocean depths. Completely devoid of ocular aid, the eel moves about with the greatest ease by a system of transmission and detection of electrical pulses.

Simple as this may seem, biological communication has provided valuable clues to modern communication, detection and navigational systems.

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